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TRANSACTIONS
OF THE
WOOLHOPE
NATURALISTS' FIELD CLUB.

[ESTABLISHED 1851.]

1886—1887—1888—1889.

“HOPE ON”



“HOPE EVER”



HEREFORD:

PRINTED BY JAKEMAN AND CARVER, 4 & 5, HIGH TOWN.

1892.



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1889.

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 Cornu, Maxime, Mons., Docteur des Sciences, Aide Naturaliste au Museum, 1, Rue des Ecoles, Paris.
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 With, Mr. G. H., F.R.A.S., F.C.S., Chandos Street, Hereford.
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 Blashill, Mr. T., F.Z.S., Spring Gardens, London, S.W.
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 Capel, Rev. A. J., M.A., The College, Hereford.
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 Cheiake, Mr. W., Aylstone Hill, Hereford.
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 Davies, Mr. Gilbert, Grey Friars' House, St. Nicholas Street, Hereford.
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 Elliot, Rev. W., M.A., Brinsop, Hereford.
 Ely, Rev. Edwin A., Bwlch, Trewyn, near Abergavenny.
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 Harrison, Mr. W. H., Quartermaster, Eign Road, Hereford.
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 Levason, Mr. Peyton, Bridge Street, Hereford.
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 Moore, Mr. H. C., 26, Broad Street, Hereford.
 Morris, Mr. J. Griffith, St. Owen Street, Hereford.
 Oakley, Rev. Bagnall W., Newland, Coleford, Gloucester.
 Paris, Mr. T. C., Hampton Lodge, Hereford.
 Phillips, Mr. Thomas, Wellington, Hereford.
 Phillott, Rev. Canon H. W., M.A., St. John Street, Hereford.
 Phillott, Mr. G. H., Nash Cottage, North Place, Cheltenham.
 Pillely, Mr. James B., 2, High Town, Hereford.
 Pillely, Mr. Walter, Eign Street, Hereford.
 Piper, Mr. G. H., F.G.S., Court House, Ledbury.
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 Powell, Rev. T. Prosser, Dorstone.
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 Pulley, Mr. Joseph, Lower Eaton, Hereford.
 Purchas, Mr. Alfred, Broad Street, Ross.
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 Roberts, Mr. A. W., Castle Hill, Hereford.
 Robinson, Mr. E. L. G., Poston, Vowchurch.
 Robinson, Mr. Stephen, Lynhales, Kington.
 Ronalds, Mr. Hugh, Edgecombe, Swainshill, Hereford.
 Rootes, Mr. Charles, St. Owen Street, Hereford.
 Rootes, Mr. W. Rudge, Ross.
 Salwey, Mr. Theophilus, Ludlow.
 Severn, Mr. J. P., Penybont Hall, Penybont.
 Shackleton, Rev. Thomas, M.A., Broomy Hill, Hereford.

- Shellard, Mr. Orlando, Barton Manor House, Hereford.
 Shepherd, Rev. W. R., Preston-on-Wye, Hereford.
 Southall, Mr. Henry, F.R. Met. Soc., The Graig, Ashfield, Ross.
 Stanhope, Rev. The Ven., The Hon. B. L. S., M.A., Byford, Archdeacon of
 Hereford.
 Stanhope, Rev. W. P. S., The Hon., Holme Lacy, Hereford.
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 Symonds, Mr. J. F., Broomy Hill, Hereford.
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 Taylor, W. (M.D.), 71, Queen Street, Cardiff.
 Thompson, Rev. G., La Châlet, Great Malvern.
 Turner, Mr. Thomas, St. Owen Street, Hereford.
 Tweed, Rev. H. W., M.A., Bridstow, Ross.
 Vaughan, Rev. F. S. Stooke, Wellington Heath, Ledbury.
 Vevers, Mr. Henry, St. Owen Street, Hereford.
 Waldron, Mr. Clement, District Registrar, Llandaff.
 Warner, Rev. R. W., Almeley, Kington.
 Watkins, Mr. Alfred, Broomy Hill, Hereford.
 Watkins, Rev. Morgan, M.A., Kentchurch, Hereford.
 Wegg-Prosser, Mr. F. R., 26, Eaton Square, London.
 Wesley, Rev. Charles, Grosmont.
 Weyman, Mr. Arthur, Solicitor, Ludlow.
 Whitfield, Mr. W. C., St. Ethelbert Street, Hereford.
 Williamson, Rev. H. Trevor, Bredwardine, Hereford.
 Wilson, Mr. Henry, Eastnor House, Great Malvern.
 Wood, J. H. (M.B.), Tarrington, Ledbury.
 Woodhouse, Mr. J. G., Burghill House, Hereford.
 Wyatt, Rev. W., M.A., Broughton Rectory, Brigg, Lincolnshire.
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MEMBERS ELECTED.

1885.

Bird, Mr. Charles P., Drybridge, Hereford.
 Campbell, Captain, Tillington Court, Hereford.
 Croft, Sir Herbert, Bart., Lugwardine Court, Hereford.
 Davies, Mr. Gilbert, St. Nicholas Street, Hereford.
 Ely, Rev. Edwin A., Bwlch, Trewyn, near Abergavenny.
 Lambert, Rev. W. H., Stoke Edith Rectory, Hereford.
 Molony, Major, Fairfield, Peterchurch.
 Oakley, Rev. W. Bagnall, Newland, Coleford, Gloucester.
 Powell, Rev. T. Prosser, Dorstone.
 Watkins, Rev. Wm. Morgan, M.A., Kentchurch, Hereford.
 Whinfield, Colonel, Wyeville, Bridstow, Ross.

1886.

Anthony, Mr. Charles, jun., The Elms, Aylstone Hill, Hereford.
 Ballard, Mr. John Edy, High Street, Ledbury.
 Bourne, Lieut. Gilbert, Cowarne Court, Ledbury.
 Bull, Mr. Ernest Henry, St. John Street, Hereford.
 Chapman, Paul, M.D., St. John Street, Hereford.
 Clarke, Mr. Robert, 4, Portland Street, Hereford.
 Corner, Mr. James, Holmer Park, Hereford.
 Davies, Mr. Luther, Solicitor, Abergavenny.
 Inman, Mr. Thomas Frederic, Apsey House, Batheaston, Bath.
 Lilley, J. H., M.B., Hereford.
 Lilley, Mr. Charles E., Ledbury.
 Lucas, Colonel, Belmont, Hereford.
 Webber, Mr. Frederick Glyn Incedon, Ledbury.
 Weyman, Mr. Arthur, Solicitor, Ludlow.

HONORARY MEMBERS.

Watkins, Mr. M. Burton, Treaddow, Hentland, Ross.
 Wharton, Mr. H. T., M.A., F.Z.S., 39, St. George's Road, Kilburn, N.W.

1887.

Fitzsimons, J. B., M.D., King Street, Hereford.
 Gilliat, Mr. Sidney W. E., Gazerdine House, Ledbury.
 Grant, Mr. J. W., Hope End, Ledbury.
 Ingham, Mr. H. T., How Caple Rectory, Ross.
 Levason, Mr. Peyton, Bridge Street, Hereford.
 Phillips, Mr. Thomas, Wellington, Hereford.
 Pilley, Mr. James B., 2, High Town, Hereford.
 Rootes, Mr. W. Rudge, Ross.
 Wesley, Rev. Charles, Grosmont.
 Williamson, Rev. H. T., Bredwardine, Hereford.

HONORARY MEMBER.

Lane, Mr. Theophilus, 8, Bellevue Road, Southampton.

1888.

Bevan, Rev. J. O., F.G.S., F.R. Met. Soc., Vowchurch.
 Cresswell, Mr. G., J.P., Stretton Sugwas, Hereford.
 Dunn, Rev. J., Much Marcle Vicarage, Dymock, Gloucestershire.
 Edwards, Mr. A. C., jun., High Town, Hereford.
 Gascoigne, Rev. H., Curate of All Saints, Hereford.
 Lambert, Rev. Willis F. A., F.L.S., F.R. Geo. Soc., Peterchurch.
 Lane, Oswald, M.D., Bridge Street, Hereford.
 Lee, Rev. Augustus, Lugwardine Rectory, Hereford.
 Meadows, Mr. Thomas, J.P., Aylstone Hill, Hereford.
 Pilley, Mr. Walter, Eign Street, Hereford.
 Remington, Rev. R., Mansel Lacy, Hereford.
 Robinson, Mr. E. L. G., Poston, Vowchurch.
 Watkins, Mr. Alfred, Broomy Hill, Hereford.

R U L E S

OF THE

Woolhope Naturalists' Field Club.

I.—That a Society be formed under the name of the “WOOLHOPE NATURALISTS' FIELD CLUB,” for the practical study, in all its branches, of the Natural History of Herefordshire, and the districts immediately adjacent.

II.—That the Club consist of Ordinary Members with such Honorary Members as may be admitted from time to time; from whom a President, four Vice-Presidents, a Central Committee, Treasurer, and Honorary Secretary be appointed at the Annual Meeting to be held at Hereford in the early part of each year. The President and Vice-Presidents to change annually.

III.—The Central Committee shall consist of three Members, resident in the city or in its immediate vicinity, with the President, Vice-Presidents, and Honorary Secretary, *ex-officio*. It shall be empowered to appoint an Assistant Secretary; and its duties shall be to make all the necessary arrangements for the meetings of the year, and take the management of the Club during the intervals of the meetings.

IV.—That the Members of the Club shall hold not less than three Field Meetings during the year, in the most interesting localities for investigating the Natural History of the district. That the days and places of such regular meetings be selected at the Annual Meeting, and that ten clear days' notice of each be communicated to the Members by a circular from the Secretary; but that the Central Committee be empowered, upon urgent occasions, to alter the days of such regular Field Meetings, and also to fix special or extra Field Meetings during the year.

V.—That an Entrance Fee of Ten Shillings shall be paid by all Members on election, and that the Annual Subscription be Ten Shillings, payable on the 1st of January in each year to the Treasurer, or Assistant Secretary. Each Member may have the privilege of introducing a friend on any of the field days of the Club.

VI.—That the Reports of the several meetings and the papers read to the Club during the year, be forwarded, at the discretion of the Central Committee, to the *Hereford Times* newspaper for publication as ordinary news, in preparation for the *Transactions* of the Club.

VII.—That the cost of any lithographic or other illustrations be defrayed by the author of the paper for which they may be required, unless the subject has been taken up at the request of the Club, and in that case, the cost of such illustration, to be paid for from the Club funds, must be specially sanctioned at one of the general meetings.

VIII.—That the President for the year arrange for an address to be given in the field at each meeting, and for papers to be read after dinner; and that he be requested to favour the Club with an address at the Annual Meeting on the proceedings of the year, together with such observations as he may deem conducive to the welfare of the Club, and the promotion of its objects.

IX.—That all candidates for Membership shall be proposed and seconded by existing Members, either verbally or in writing, at any meeting of the Club, and shall be eligible to be balloted for at the next meeting, provided there be FIVE Members present; one black ball in three to exclude.

X.—That Members finding rare or interesting specimens, or observing any remarkable phenomenon relating to any branch of Natural History, shall immediately forward a statement thereof to the Hon. Secretary, or to any member of the Central Committee.

XI.—That the Club undertake the formation and publication of correct lists of the various natural productions of the County of Hereford, with such observations as their respective authors may deem necessary.

XII.—That Members whose subscription shall remain for *three* years in arrear, after demand, be held to have withdrawn, and their names shall accordingly be omitted from the list of Members at the ensuing Annual Meeting.

XIII.—That the Assistant Secretary do send out circulars, ten days at least before the Annual Meeting, to all Members who have not paid their subscription, and draw their particular attention to Rule XII.

XIV.—That these Rules be printed annually with the *Transactions*, for general distribution to the Members.

CORRIGENDA.

Page 120, line 2, for May read June.

Page 125, line 7 from the bottom, for Victis read Vectis.

ADDENDA.

HEREFORDSHIRE LEPIDOPTERA. 1892.

Revised Summary of the Macros and Micros :—

MACROS :—			
Diurni	44	out of	65
Nocturni	65	„	112
Geometræ	198	„	283
Cuspidatæ	24	„	33
Noctuæ	195	„	318
			811
	Total	526	
MICROS :—			
Deltoides and Aventiæ	9	„	15
Pyralides	42	„	77
Crambites	35	„	83
Tortrices	213	„	335
Tinæ	424	„	716
Pterophori	16	„	36
			1,262
	Total	739	
			2,073
		1,265	

THE FOLLOWING MEMBERS WERE ELECTED
DURING THE YEAR 1889.

Banks, Mr. Wm. Hartland, Trinity College, Cambridge.
Barker, Rev. H. Auriol, M.A., Kings Pyon Vicarage, Weobley, R.S.O.
Brierley, Rev. H., M.A., Upper Bullinghope, Hereford.
Butler, Mr. Cecil, Dulas Court, Pontrilas, Herefordshire.
Crespi, Mr. Alfred J. H., Cooma, Wimborne.
Curtiss, Mr. W. C., Merrivale, Ross.
Ireland, Rev. Wm., M.A., Lucton School, Kingsland, R.S.O., Herefordshire.
Le Brocq, Mr. W. P. J., M.A., The Preparatory School, Brecon.
North, Rev. H., M.A., Breinton, Hereford.
Oldham, Captn. C. Dansey, Hampton Park, Hereford.
Paynter, Rev. Thos. Beville, B.A., How Caple Rectory, Ross.
Poignand, Malcolm, M.D., Monmouth.
Seacome, Rev. A. H., Cusop Rectory, Hay.
Sharland, Mr. Wm., 26, Broad Street, Hereford.
Southall, Mr. H. J., Solicitor, Leominster.
Trafford, Mr. Guy, Michaelchurch Court, Hereford.
Webster, Rev. W. H., Wynona, St. Janes' Street, Hereford.

HONORARY MEMBER.

Phillips, Mr. E., Cambridge, F.L.S. ; M.B.O.U. ; M.P.I.O.C. ; (Member of the
Permanent International Ornithological Committee), The Elms, Brecon.

TRANSACTIONS FOR THE YEARS 1886, 1887, 1888, 1889.

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Woolhope Naturalists' Field Club.

RECENT ADDITIONS TO THE HEREFORDSHIRE MOSS FLORA.

[The following paper on "Recent Additions to the Herefordshire Moss Flora," by the Rev. Augustin Ley, read at Leominster, at the Meeting of the Woolhope Club, held June 19th, 1884, was accidentally omitted from the Volume for 1884 where it ought to have appeared at page 177.]

It is now just four years since I ventured to lay before this Society a list of the Mosses which had been observed in Herefordshire, chiefly through the labours of the Rev. J. F. Crouch, Rector of Pembridge, and subsequently by myself. The Mosses enumerated in that list formed a goodly array of some 249 species. This number, making up far more nearly $\frac{1}{2}$ than $\frac{1}{3}$ of the total number of species known to inhabit the area of the British Isles, was no unworthy representative of the Moss Flora of a single county, not occupying a position in that area which would suggest *a priori* any special richness in this department of botany.

Since that time several additions have been made, and I am sorry to have to add, one, if not more than one, species has had to be withdrawn. Still the gains have been more noticeable than the losses; and I think it will be allowable now, with the Society's kind permission, to report progress in the Herefordshire Moss Flora.

Your indulgence is especially needed in a branch of Natural History which interests but few; and which, to the outsider, can hardly help taking the repulsive form of a list of unknown Latin names, descriptive of entities, the whole universe of which he only knows as "moss." I can only plead, Come inside! Make them your friends! There is a little world of interest in these plants, when you get to know them well.

Well then, not to beat the bush any longer, we have added to our records 18 new species; about each of which I propose, with your permission, to say a few words, taking as before the earlier *Catalogue of British Mosses* compiled by Messrs. Hobkirk and Boswell for the *Botanical Record Club* as my basis of classification.

The first upon my list is

90. *Campylopus pyriformis*, *Brid.* This *Campylopus* is one of the most common of the genus, and is an old friend of every botanist among the hills and moorlands from Land's End to Caithness. But we did not expect it to have

established itself in Herefordshire ; still less in the position in which it proves to have done so, namely in the Lord's Wood of the Great Doward Hill. Here this plant occupies some square yards of ground ; fruiting after its manner with capsules by the hundreds and the thousands, and by this mark at once declaring itself distinct from the other *Campylopodus* which are so shy in fruiting.

Still in the same alliance, I have to announce

92. *Archidium phascoides*, Brid. ; a little Moss which has puzzled systematisers to determine its right position. It has no very near relatives in Europe, though many in other quarters of the globe : and it seems best placed under the Dicranal alliance, though among its imperfectly developed members. It is itself scattered in fair abundance through middle and south Europe, becoming rarer northwards. It is known in Britain from Cornwall to Aberdeen ; but had been searched for in Herefordshire in vain, until this Spring, when it was discovered clothing a barren bank overhanging the Monnow valley in the parish of Llanrothal, D. 1.

We now pass to the large family of *Screw Mosses*, of which we have more than one new member to introduce to our lists.

148. *Barbula rigida*, Schultz. The story of the discovery of this Moss in Herefordshire shows that your lists might well be fuller than they are, were your observer a more knowing man behind a sharper pair of eyes. It was pointed out to me by Mr. Boswell in a small tuft of *B. ambigua* which I had gathered on Shucknell Hill, D. 6. Truly these little plants require what Schimper calls an "oculatissimus vir, a worthy man with an eye in his head," to detect them ! The present species may, it is likely, be found in other stations, though it can hardly be general, in Herefordshire, since its occurrence is improbable upon any form of sandstone.

The same locality has given us another member of this group.

151. *Barbula cavifolia*, Schpr. This Moss, like the last, is a lover of oolite and limestone clays, being on such soils common ; but it will no doubt, for that very reason, remain a rarity in Herefordshire. It is a doubtful member of the *Barbula* family, and has been bandied about between this genus and *Pottia*, to which it is now again relegated. I found it in small quantity at Shucknell Hill during the present year ; it also occurs on the borders of Dean Forest, on the Silverstone Farm in Hope Mansel parish, where I found it some years ago, but supposed at the time that the station lay in Gloucestershire.

Yet another fresh *Screw Moss* to be credited to Herefordshire is

167. *Barbula Hornschuchiana*, Schultz. This is seemingly a far scarcer plant everywhere. But it is not so particular in its habitats ; inhabiting sandstone, clay, or limestone banks ; and it is likely to prove far more widely distributed in Herefordshire. At present it has been found on a sandstone lane bank in the parish of Llangarren, D. 1 ; on a turf wall on the limestone of the Great Doward, and in a marly railway cutting at Fawley Station, in D. 2. The Llangarren specimens were with fruit.

The county of Hereford is thus well represented in the *Screw Mosses* ; 24 out of the 35 species inhabiting Britain having now been detected within its limits.

Of the remaining 11, there are none which one would suppose likely to be met with in this county; still, among such cosmopolitan plants as Mosses, this hardly justifies us in concluding that our List of the genus is yet complete.

One other member of the same alliance has been added to our Flora, in the subalpine

189. *Distichium capillaceum*, L. This is one of the numerous group which the local Flora owes to the Llanthony hills. Along with *Encalypta ciliata*, *Rhabdoweissia fugax*, *Gymnostomum rupestre*, *Zieria julacea*, and others, the *Distichium* is to be found in tolerable abundance on the Tarens of the Llanthony valley; and will probably also occur on those of the Hatterel range, in Herefordshire proper.

We now come to the *Bristle Mosses*—*Orthotricha*. One or two of these have been added; and we may confidently hope that more will yet yield themselves to patient investigation. Those we have now to speak of are

248. *Orthotrichum cupulatum*, Hoffm., with its variety ***nudum***. The variety is the more general plant; and delights in stones in or about streams. It grows finely on an old wall by the Wye at the Great Doward, and occurs again at St. Peter's Well, Peterchurch. The type is not confined to stream sides, but occurs on the limestone of the Great and Little Dowards, and again in the Golden Valley, on stones in the Cwin, Dorstone.

One more fresh *Bristle Moss* we have in

257. *Orthotrichum stramineum*, Hornsch. This, though not included in the previous list, is now proving itself general in the county. The Rev. J. F. Crouch had found it at Pembridge as far back as 1869; and lately it has occurred at Kentchurch, in the neighbourhood of Pontrilas, and on Garway hill, D. 1; at the Great Doward, D. 2; at Brampton Bryan, D. 10; and at several spots near Knill, D. 11.

Among the *Brya*, or *Thread Mosses*, I have two additional species to report. The first is

335. *Bryum torquescens*, B. & S. This handsome *Bryum* is claimed chiefly by the Great Doward. I found it there first in 1877, but passed it by as a form of *B. capillare*. In the present year however I found it in two fresh spots in larger quantity, and succeeded in establishing its claim to the name of *B. torquescens*. Its narrow clavate capsule, of a beautiful ruby red when ripe, distinguishes it at a glance, when once learned, from *B. capillare*. It appears to delight in horizontal ledges of nearly bare limestone; occurring in old quarries at three stations at the Doward, and again along with other lime-loving plants in the large sandstone quarries at Caplar hill.

The second species of this genus I have to speak of is a far greater rarity. It is

349. *Bryum canariense*, Brid. This again is to be credited to that home of rare plants, the Greater Doward. It was gathered by myself somewhere on the area of the hill, though I do not remember the precise locality, as far back as the year 1874, and remained hoarded among packets of mosses which I was unable to name until the present year, when Mr. Boswell on seeing it at once

pronounced it *B. provinciale*, Philib. (*canariense*, Brid.) This seems to be a rare plant everywhere; extremely so in Britain, where its only previously known home was at Hurstpierpoint in Sussex. There it was found by Mr. Mitten about the year 1848, in small quantities, and barren. Our plant is in fruit. Now that attention has been drawn to its occurrence, we may hope that it will be re-found, and in greater abundance.

The next new Moss which I have to announce is a *Flat Moss*—*Fissidens*.

408. *Fissidens decipiens*, *De Not.* The addition of this species to our List is due rather to further study of plants previously gathered, than to extended investigation among the hills and rocks. In the previous paper it had been blended with *F. adiantoides*; but it appears on closer study that the majority of our Herefordshire specimens are really to be placed to *F. decipiens*, which has now been detected in 5 Districts, while *F. adiantoides* is only known in two. The two species are nearly, though not quite, confined respectively to dry and damp situations; the first loving the dry rocks of limestone hills; the other, boggy ground or dripping rocks. *F. decipiens* I have indeed never seen on bog, where *F. adiantoides* grows and fruits luxuriantly.

We now come to one of the most gratifying finds, so far as rarity goes, which I have to speak of. It is

413. *Epipterygium Tozeri*, *Grev.*; a plant of real rarity, and when fruiting of exceptional beauty as well. It has been detected on the steep banks of the Wye at Breinton. It is, in this situation, without fruit; and it bears so close a resemblance to *Bryum carneum*, in company with which it grows, that it is likely enough now that attention has been called to it, to be detected in other stations also, where it may be more likely to fruit than on the banks of the Wye, which are liable to such constant change and displacement through winter floods. This Moss was first discovered in Cornwall; and has since been met with in a few Continental stations in the South of France and North Italy. In the British Isles its stations hitherto have been confined to a few upon the south coast of England, and Dublin in Ireland: the addition of Herefordshire therefore is interesting, as forming a step between these two. Its position in the Classification is very uncertain; and its separation from the old genus *Bryum*, to some members of which it is very closely allied, will perhaps scarcely be maintained.

The next addition to our Flora, as well as the one just mentioned, appears to shew that the riches of the Wye valley still remain unexhausted. It consists in

434. *Myrnia pulvinata*, *Wahl.* This plant, after many years search in the county, has at length been detected in the Wye meadows under Clifford, in D. 13. It is a Moss closely resembling the *Leskea polycarpa*, which is so abundant throughout Herefordshire, clothing the stumps where fertilised by the mud of brooks and rivers, and inhabits apparently quite the same localities. It is, however, far the rarer plant, and remained quite unknown in the county till last year, when it was detected on a single stump in the station above indicated.

We now return to the Downards, and I have pleasure in announcing a fresh Hypnoid for these rich hills in

481. *Eurhynchium striatulum*, Spruce. This again is a Moss which has been looked for in vain in Herefordshire for some years. It is a rare Moss, loving shady limestone; in which situation it has been this year found at two stations on the Great Doward, and in fair abundance.

We have an extremely limited surface of bog and marsh in our county, and are consequently poor in bog plants. Even such common marsh mosses as *Hypnum fluitans* and *cordifolium* are far to seek in Herefordshire, the latter being quite a rarity. It is, therefore, with pleasure that I can add

519. *Hypnum Sendtneri*, Schp, to the county lists. This is the name given for me by Mr. Boswell to a falcate *Hypnum* occupying a considerable space of ground on the site of the old Dam pool on Howle Hill near Ross. It grows at this spot with extreme luxuriance, but I have not yet found its fruit.

The last on my list of novelties is due rather to change of nomenclature than to additional research. It is

526*. *Hypnum virescens*, Boulay. This plant was until lately combined as a variety with *H. falcatum*, and has now been erected into a separate species. It differs both in habit and colouring from that moss. Both are inhabitants of Herefordshire, and in our county the present Moss seems to be the rarer plant, and has only been detected in the lower country, while true *H. falcatum* is abundant also in the hills, where it fills the spring-heads of the open sub-moorland ground.

It must not be thought that the enumeration of the above 18 fresh species exhausts all, or nearly all, the work which has been done among the Herefordshire Mosses within the last four years. On the contrary, the experience of every botanist will tell him how small a proportion of the notes relative to plant life which he thinks it worth while to place on record at the end of a day's ramble refer to new species, and how many to new facts bearing upon plants previously known. The real work must be measured by a comparison of the details which will, we trust, be shortly published in the forthcoming Flora of the county with those appearing in the original paper on the Mosses of Herefordshire. These, however interesting to the special student, would be tedious to introduce into a paper like the present.

Some noticeable features, however, crop out from these details, which are capable of being stated with interest, and with a few of these I will conclude.

Three of the fourteen botanical districts, lying in the east of the county, had, at the time when this subject was brought before you previously, been scarcely touched, as far as Mosses are concerned. The Ledbury, Frome, and Bromyard districts have now had a certain amount of work done in them, with the result that 36 of the most common species are now ascertained to grow in each of the 14 districts; that is, practically, over the whole of the area covered by the Herefordshire Flora. These are as follows:—

Weissia viridula	Neckera complanata
„ cirrhata	Anomodon viticulosus
Dicranum scoparium	Thuidium tamariscinum
Didymodon rubellus	Isoetecium myurum

<i>Barbula muralis</i>	<i>Homalothecium sericeum</i>
„ <i>unguiculata</i>	<i>Brachythecium velutinum</i>
„ <i>lævipila</i>	„ <i>rutabulum</i>
<i>Ceratodon purpureus</i>	<i>Eurhynchium striatum</i>
<i>Grimmia apocarpa</i>	„ <i>prælongum</i>
„ <i>pulvinata</i>	<i>Rhynchostegium rusциforme</i>
<i>Orthotrichum affine</i>	<i>Amblystegium serpens</i>
<i>Bryum cæspiticium</i>	<i>Hypnum filicinum</i>
„ <i>capillare</i>	„ <i>cupressiforme</i>
<i>Mniun undulatum</i>	„ <i>resupinatum</i>
„ <i>hornum</i>	„ <i>cuspidatum</i>
<i>Atrichum undulatum</i>	„ <i>purum</i>
<i>Fissidens taxifolius</i>	<i>Hylocomium squarrosum</i>
<i>Leucodon sciuroides</i>	„ <i>triquetrum</i>

Twenty-one more only fall short of a single District, or two Districts, to make them complete. They are the following :—

<i>Dicranella heteromalla</i>	<i>Webera albicans</i>
<i>Dicranum majus</i>	<i>Bryum argenteum</i>
<i>Didymodon sinuosus</i>	<i>Polytrichum formosum</i>
<i>Barbula ambigua</i>	<i>Fissidens bryoides</i>
„ <i>aloides</i>	<i>Homalia trichomanoides</i>
„ <i>subulata</i>	<i>Leskea polycarpa</i>
„ <i>intermedia</i>	<i>Eurhynchium Swartzii</i>
<i>Zygodon viridissimus</i>	<i>Hypnum molluscum</i>
<i>Orthotrichum diaphanum</i>	„ <i>stellatum</i>
„ <i>Lyellii</i>	<i>Hylocomium splendens</i>
<i>Funaria hygrometrica</i>	

The plants, therefore, of this second List may at any moment fall into their places in the first List, and the whole of the 57 species may be treated practically as plants ascertained to be ubiquitous throughout our area. Judging from the data thus at hand, it will probably be near the truth to say that about 70 of the most common species—that is considerably more than $\frac{1}{3}$ of the species ascertained to grow in the county—are spread ubiquitously over the surface of the county.

Herefordshire may claim to be the home and headquarters of several species of interest, noticeably those which delight in the fertilising mixture of sand and mud brought down by swift hill streams. The valleys of the Monnow and the Teme are the headquarters of the local *Barbula Brebissoni*. On the stumps of these two rivers the foliage of this plant spreads out by the yard, and its capsules may be counted by the thousand. It is most remarkable that alongside of this abundance on the smaller rivers, the plant should never have been detected on the Wye, the character of which is essentially so similar.

The valley of the Wye again is the home and headquarters of *Orthotrichum Sprucei*, and the whole of Herefordshire, especially the river valleys, is the headquarters of another *Barbula cylindrica*, which grows most luxuriantly, and fruits freely, throughout at least a great part of the county. The Wye valley

again is the home and headquarters of the obscure little *Bryum Barnesi*, which has now been found at many stations in the county, all, however, with the exception of one, on the Dore at Peterchurch, on the Wye banks. It has not yet, I believe, been found elsewhere in Britain except the original station in Cumberland, where Mr. Barnes discovered it.

Herefordshire may again be claimed as the home of both the *Scleropodia*, the one species, *S. illecebrum* being most abundant in the lane banks of red sandstone, at least in the south of the county, the other, *S. caspitosum* abounding on all the streams. Both species fruit in the county.

To the Golden Valley may, perhaps, be awarded the distinction of being the home and headquarters, for Herefordshire if not for England—and if for England, then for Europe—of the rare little *Eurhynchium Teesdalii*. It occurs in rills in numerous stations in the neighbourhood of Peterchurch. I never saw it so fine as in a rill at Snodhill Park, two miles from Peterchurch.

It would be as endless as uninteresting to detail all the mistakes and misapprehensions, the opinions expressed, retracted, and re-retracted, which have occurred in the process of eliciting facts like these from Herefordshire hills and dales and river banks. The only permanent mark these misapprehensions have left upon our Moss list is the erasure of a single species from the county catalogue—*Bryum erythrocarpum*, Schwg. The specimens once referred to this have all proved to belong either to *B. murale*, Wils., or to *B. atro-purpureum*, W. & M., so that for the present, though we trust not permanently, *B. erythrocarpum* must be acknowledged to be a name and nothing more, in the Herefordshire Flora.

One curious *negative* result noticed in the previous paper must be alluded to again here, because four years of further search have greatly strengthened the force of the negation. It was stated there that not a single species of the common *Ulota* had been met with in the county. Four years more of extended search have not revealed a single scrap. The absence of these Mosses from the area represented by the Herefordshire Flora appears complete; though no probable reason for their absence has been suggested. At least, if not wholly absent, they must be very rare.

It remains to mention one or two rare species, which have been found, not indeed in Herefordshire, but sufficiently near its borders to justify a place in the annals of the Woolhope Club; especially as it is not impossible that the attention thus directed to them may lead to their detection within the county itself. Some notice will be found in the *Journal of Botany* for last year (Vol. xxi., 1883, p. 253) of a Moss new to the British Isles which was found by me in the neighbourhood of Brecon. This Moss, *Bryum gemmiparum*, De Not., occupies rocks in the bed of the Usk, in small quantity, at a single station near Brecon. Again in the same *Journal* (id. p. 294), mention is made of a *Campylopus* new to science as a variety, and named by Mr. Boswell, Var. *elongatus* of *C. brevifolius* Schpr., which he detected in company with me on the Wye near Aberedw. Both these rarities are quite worth looking for in the higher reaches of the Herefordshire Wye, where ground occurs to some extent of the same character as that which produces them at the other stations named.

A few weeks ago, I picked, in company with the same botanist, *Campylopus paradoxus*, Wils., and *Splachnum sphaericum*, L. fil., on the Monmouthshire hills in the neighbourhood of Abergavenny. Both these discoveries extend the geographical range of their respective species a good distance to the southward in Britain ; that is from Lancashire and North Wales to the extreme south-west of the Severn Province of the *Cybele Britannica*. It is quite within the range of probability that both of these may occur on the Llanthony Hills, within the range of the Herefordshire Flora.

It only remains for me to thank you for a patient listening ; and to trust that I have said sufficient to show that there is still much to interest, and much to learn, in the Bryology of our delightful county ; riches still unworked in the rich hills and dales of Herefordshire ; waiting only for a single hearted love of these simple treasures, to disclose themselves.

“Thou gavest me wide Nature for a Kingdom
 And power to feel it, to enjoy it. Not
 Cold gaze of wonder gav'st Thou me alone,
 But even into her bosom's depth to look,
 As it might be the bosom of a friend.
 The grand array of living things Thou madest
 To pass before me ; mad'st me know my brothers,
 In silent wood, in streamlet, and in hill.”

Woolhope Naturalists' Field Club.

1886.

THE Annual Meeting of the Woolhope Naturalists' Field Club was held in the Club Room, Hereford, on Thursday, the 29th April; present—the retiring President, Mr. C. G. Martin; the President elect, Mr. G. H. Piper, F.G.S.; Alderman Cam, Mr. Henry Wilson (President of the Malvern Naturalists' Field Club); Messrs. A. Hancocks, H. C. Moore, O. Shellard, J. W. Lloyd; Revs. W. Bowell, G. H. Clay, H. B. D. Marshall, P. H. S. Strong, and M. G. Watkins; Dr. T. A. Chapman and Mr. Theo. Lane (Secretary).

MISCELLANEOUS.

The financial statement was read and approved, and the dates and places for the Field Meetings of the year were fixed as follows:—1st—27th May, Thursday, Newent; 2nd—25th June, Friday, Raglan Castle or Berkeley Castle; 3rd—29th July, Thursday, Moreton-on-the-Marsh or Thornbury Camp; 4th—20th August, Friday, Backbury Hill and Woolhope Valley; 5th—Fungus Foray, Thursday, October 7th. The ballot was taken for Mr. Frederick Inman, F.L.S., and he was declared unanimously elected; also Mr. Arthur Weyman; and a few names of gentlemen were proposed, to be balloted for at the next meeting.

Auditors.—The resignation of Mr. J. T. Owen Fowler was notified. The vacancy was not filled up, Mr. James Davies continuing his services as Honorary Auditor.

Editorial Committee.—A long discussion then took place relative to the reformation of an Editorial Committee. As the arrears of the publication of *The Transactions* had accumulated since the year 1876, thus extending over so large a period as ten years, it was considered that the compilation would be expedited by placing the undertaking either in the hands of one Editor, or at least in that of a very limited committee. It was finally resolved that Mr. H. C. Moore be elected Editor, which office he accordingly undertook.

Herefordshire Pomona.—The President had the gratification to announce that a presentation would be made by Lady Emily Foley at the Deanery on Tuesday, May 4th, to each of the two ladies, Miss Bull and Miss Ellis, of a miniature portrait on ivory of the late lamented Dr. H. G. Bull, together with a sum of 100 guineas, as a recognition by members of the Woolhope Naturalists' Field Club and other subscribers of the artistic ability and devotion of these ladies during eight years to the illustrations of "The Herefordshire Pomona."

THE LATE DR. BULL.

It was resolved that the sum of 25 guineas should be appropriated by the Club for a portrait of Dr. Bull to be hung up in the Woolhope Club Room.

The President read the following letter from Mrs. Bull, in reply to one of condolence from the President and members of the Club :—

Hereford, November 9th, 1885.

To the Central Committee of the Woolhope Naturalists' Field Club.

Dear Mr. Martin,—I thank you very much for your truly kind letter, conveying to me the most grateful expressions of sympathy from the members of the Woolhope Naturalists' Field Club.

To them all my dear husband was united by unusual ties of friendship and esteem. For so many years of his life his connection with the Club has been one of such intense pleasure—affording him the relaxation he needed, from the necessarily anxious cares of his professional life, and to the honour and usefulness of the Club he devoted his best literary work. It is, therefore, with feelings of the deepest gratitude that I receive for myself and for my children the expression of the sincere sympathy so generously felt for us in our heavy loss.

Believe me, dear Mr. President,

Very truly yours,

ELIZABETH BULL.

The business ended, the President gave his retiring address, which was listened to with much attention.

THE RETIRING PRESIDENT'S ADDRESS.

Gentlemen,—According to Rule viii. of the Woolhope Naturalists' Field Club, I have now to undertake the last of the many onerous but pleasant duties which devolve upon the President, that is, to deliver an "Address at the annual meeting on the proceedings of the year, together with such observations as he may deem conducive to the welfare of the Club and the promotion of its objects." The publication in the *Hereford Times* of the various meetings of the Club, with full and minute details of all circumstances of interest connected with them, renders it unnecessary for me to do more than review, very briefly, the transactions of the past year. The first field meeting was held on the 19th May, and was attended by 36 members. Llanvihangel Station was the place of assembly. From thence the route was taken, through charming and undulating scenery, to inspect the interesting Church of Partricio. The visitors were met at the Church by the Rector, who, with much courtesy, gave them a cordial welcome. He showed the members some fine MSS., a "black letter" Welsh Bible of the year A.D. 1620. He pointed out to them the Creed, the Ten Commandments, the Lord's Prayer, and sundry texts of scripture, printed in "black letter," on the walls of the nave and chancel. The most noteworthy object in the church is the rood loft and screen, beautifully carved in oak, in a fine state of preservation. Our attention was especially directed to the curious Norman font. Evidence was given to prove that the font was coeval with the dedication of the church A.D. 1060. At the western end of the church, there is a small chapel, evidently of a late date,

probably the 13th century. After the members had made an observant and critical inspection, they seated themselves in the pews to listen to an able paper by Mr. F. R. Kempson, who gave a lucid and learned explanation of the very interesting old sanctuary, pointing out all the features most worthy of attention. After Mr. Kempson's excellent paper, the members were asked to observe a mural figure at the west end of the church,—a delineation in red paint of a human skeleton, full size,—which had until recently been hidden under a covering of whitewash. The Rev. John Davies, of Pandy, sent a short paper upon it, which was read. This was followed by some apposite comments by the Rev. Sir Geo. H. Cornwall. The cry of "Forward" was then sounded, and the members were summoned to proceed to the second place of interest named in the programme for the day—the Gaer Camp. The weather, which hitherto had been fine, now changed, and rain began to fall steadily. The Gaer Camp was ascended, and crossed, but its characteristics and surroundings really could not be made out. It will well repay a visit at some future opportunity. The party descended, as hastily as circumstances would permit, to the little Inn at Pandy. Here the business of the Club was transacted, followed by dinner, after which Dr. Bull read his paper, in continuation of a series, on the "Birds of Herefordshire." During the day some interesting plants had been gathered. A fine bed of *Narcissus biflorus* was found within half a mile of Llanvihangel Station. Sir George Cornwall picked the curious little plant, *Montia fontana*. By the side of one of the deep lanes, *Adoxa moschatellina*, a plant rarely found in Herefordshire, was growing pretty freely. On the leaves of some of the plants Dr. Bull observed, what was to him most interesting, the microscopic fungus, *Puccinia adoxa*. Perhaps what were most generally admired were the vast quantities, growing in the hedgerows in rich profusion, of the bird cherry, *Prunus padus*. Its graceful pendant racemes of white flowers elicited many expressions of admiration from the members.

The second Field Meeting was held on the 18th June, at Aconbury Camp, Priory, and Church. Archæology and Botany chiefly occupied the members, of whom there were 38 in the field. The party started in brakes from the Free Library, and drove to the Callow Hill. Most of the members descended to botanize the cornstone slopes by the sides of the road. Here were found three specimens of the bee orchis, *Ophrys apifera*, a locality where there is no record of its having been previously observed. Leaving the road and ascending the hill by a foot-path through the wood, the members soon dispersed to search for plants which were known to be growing plentifully in certain favourable places. An unusual number of the bird's nest orchis, *Neottia nidus avis*, and the butterfly orchis, *Habenaria chlorantha*, were soon found. Several specimens of *Gymnadenia conopsea* were shown, which were gathered the previous evening in a meadow below the camp. The columbine, *Aquilegia vulgaris*, was found growing plentifully in the wood, and near the centre of the camp, the wild raspberry. *Rubus idæus* was very abundant. Dr. Wood, of Tarrington, brought from Canon Frome some fine specimens of *Cephalanthera grandiflora*, quite a new locality for that handsome plant, and also some specimens of *Orchis pyramidalis*, and *Ophrys*

apifera from the same district. On the summit of the hill a paper was read by Dr. Bull, descriptive of the camp. He regarded it as a military stronghold, and pictured the contests which may, or may not, have taken place in the district of which it is the centre. A short discussion followed, and it was manifest that other more prosaic and utilitarian views were held by some of the members, as to the origin and conformation of the so-called camp. The Rev. W. Tedman and Mr. Lewis held that it had been, previous to the last half century, a grazing farm, and then a rabbit warren; that the holes in various parts of the camp were simply quarries; that the walls, which are principally on the northern and eastern slope of the hill, were built of the stones from those quarries, and were intrenchments, not to keep out an enemy, but to keep in the rabbits. This view was supported by the Rev. W. Chudleigh, who alleged that there were similar camps in Dorsetshire. A New Zealander who had examined them told him the Maoris construct their pahs in a similar manner. They thereby secure nightly protection to their people and cattle.* The members next descended the south-eastern slope of the hill to inspect the church. Here some interesting inscriptions were found, and some of the members derived much pleasure from taking rubbings of them. In the churchyard another paper was read, which Dr. Bull entitled "Fragments of the History of Aconbury Church and Priory," upon which the Rev. F. T. Havergal commented with equal zest and learning. Mr. Robert Clarke had admirably prepared the illustrations for the paper. The record of the day's proceedings would be incomplete without a grateful recognition of the kind and genial hospitality of Mr. and Mrs. Flower, of Aconbury Court, who took great pains to make the visit of the club a complete success. The members then returned to Hereford, and dined together at the Merton Hotel. Here the ordinary business of the club was transacted, and a further contribution to the series of papers on the "Birds of Herefordshire" was read by Dr. Bull. On this occasion he read of the "Swans, Geese, and Ducks."

The third Field Meeting was the "Ladies' Day," and was held on the 10th of July, at Abergavenny, for the ascent of the "Sugar Loaf." We were favoured with fine weather, though there was a decided haze, and the distant ranges could not be seen. The members and the visitors mustered in strong force, 99 altogether, and about three-fourths of them ascended the mountain. On the summit, who could desire a finer rostrum! Our good friend, Mr. Piper, read to us our only geological paper during the year, an admirable address on the "Old Red Sandstone." He told us he had that morning travelled from Ledbury to Abergavenny, and had never been off the Old Red Sandstone. The unscientific mind began to wonder what was the condition of our globe when the formation of this mighty mass began? Where could all the materials have come from, the disintegration of which produced such immense depositions? What could have been the number of æons required for the deposit of strata of such a thickness?

* The probability is that both views are right. The camp has been used for both military and agricultural purposes.

What could have been their original thickness before they, in their turn, became subject to denudation and degradation? We were specially indebted to Mr. Piper for coming, at a very brief notice, to supply the place of another gentleman who had promised us a paper on the geology of the district. From unforeseen circumstances over which he had no control, he could not fulfil his engagement. At my earnest wish, Mr. Piper, who is always ready and obliging, most kindly came instead. Descending the mountain leisurely, the next part of the day's programme was a visit to the Priory Church to inspect the grand old monuments there, and to listen to their history by the Rev. F. T. Havergal. His remarks were most interesting, and were fully appreciated. He was followed with unflinching attention while he descanted learnedly on the various effigies with the delight of an enthusiastic antiquarian. Leaving the church the members proceeded to the Castle. Strange that there does not appear to be any history of the Castle! Under the shadow of the venerable ruins a substantial meal was provided—not the least enjoyable of the day's proceedings. Then followed a paper on "The Orchidaceous Plants of Herefordshire," and Dr. Bull had another instalment on "The Birds of Herefordshire." On this occasion he read about "The Doves."

The fourth Field Meeting was at Risbury Camp on August 27th. I was then in Switzerland, but I remember reading in the *Hereford Times*, which was sent to me there, that the day had been one of pouring rain, and the attendance of members was necessarily small. Dr. Bull read a paper descriptive of the camp. Mr. T. Davies Burlton contributed one on "Some traces of Roman and Saxon occupation of the District of Risbury." The Rev. Augustin Ley gave one of singular interest, and crowded with valuable information, on "The Botany of the Honddu and Grwynne Valleys." Dr. Bull read another on "The Pheasant," in continuation of "The Birds of Herefordshire." Damp and discouraging as the day had been, Mr. Ley was able to report some rare and excellent botanical "finds," which are duly chronicled in the day's transactions.

Two events have occurred during my term of office which will make the year 1885 one of the most memorable in the history of our Club. The one is the completion of "The Herefordshire Pomona"; the other is the almost simultaneous death of Dr. Bull. With regard to the "Pomona," I need not occupy your attention for more than a few moments. It is a work which needs no commendation from me. It has been most favourably noticed by several of our leading journals, and has been honoured with Royal approval. I may remark, *en passant*, that a circular was issued last autumn to our members suggesting that a testimonial should be presented to the two talented artists of the "Pomona," as a recognition of the splendid services they had rendered by painting all the illustrations gratuitously. In response to that appeal, the gratifying sum of £236 9s. has been received. The presentation to the two ladies is to be made at the Deanery on Tuesday next, the 4th May. The second event, the death of Dr. Bull, demands more than a passing comment. On the 10th October, 1872, the late Dr. Steele, in his address as the retiring President, made some observations which, with your permission, I will quote. It would seem that a proposal had

been made to recognise Dr. Bull's services to the Woolhope Club in some public way. I cannot say what the proposal was, but it was firmly declined, and Dr. Steele thus spoke:—"But, gentlemen, if Dr. Bull has set his face resolutely against the acceptance of a substantial proof of our heartfelt acknowledgment, he cannot entirely escape from the consequences of his own deeds, or smother the feelings of regard, of admiration, and of gratitude for his courteous, indefatigable, and successful efforts to promote the usefulness and the welfare of our Association. I know that in thus speaking of Dr. Bull I am only giving expression to the sentiments of every member who has had the pleasure of meeting him in the field, or has profited by his ever ready tongue, his facile pen and skilful pencil."

It is hardly necessary for me to dwell on the signal services Dr. Bull has rendered to our Club. Nor need I say one word of the gap, still keenly felt, which his death has left in our ranks. But I may add my own personal testimony to the impression which the character of our valued friend made on those who had the pleasure of his friendship. He was not only respected and beloved; he was beloved, and is deplored. That was strikingly manifested by all classes on the day of his funeral. During the last year it was my privilege to spend many hours on several occasions with him, and I can truly say the more intimately I knew him the more I esteemed him. His connection with our Club was not in any sense of a perfunctory character. Not only was he the Editor of our transactions, he was mainly the organiser of our Field Meetings. There was scarcely a gathering of our members which he attended but was enriched by his communications, or was benefited by his remarks upon the communications of others. He loved work, and the objects and aims of the Woolhope Club supplied him with congenial work. One is amazed at the number of the contributions which he found time to write during the brief intervals afforded by the scrupulous and punctual attention which he gave to the duties of his profession. He himself was one of the foremost to acknowledge the generous services of Dr. Hogg, Mr. Worthington Smith, and others in connection with the "Herefordshire Pomona," but it was upon Dr. Bull more than anybody else that the preparation and publication of that grand work devolved. There was, however, one special work of the Woolhope Club where Dr. Bull reigned supreme. I allude to the annual fungus forays. They were originated by him. They brought the Woolhope Club into prominence among men of science, and for twenty years they brought men of science to our city and county to engage in their pursuit. It is not an exaggeration to say that nowhere else in England has Fungology been more systematically studied than in Herefordshire. If you take up Dr. Cooke's "Handbook of British Fungi," or his volumes of beautiful "Illustrations," or the Rev. John Stevenson's recently published "British Fungi," the name of Dr. Bull, as the authority, is of frequent occurrence. The habitats of vast numbers of the plants described and delineated in those works are familiar to every member of the Woolhope Club. The honour of all this must be ascribed to Dr. Bull. When a great leader of men died nearly a century ago it was remarked by one of his adherents, "God buries His workmen, but carries on His work." The work of the Woolhope Club, which is according to its rules, "the practical study, in all its branches, of the Natural

History of Herefordshire and the Districts immediately adjacent," is yet far from complete, and cannot be allowed to lapse because its leading member has been taken from us. It may perhaps be admitted that the prominent part which Dr. Bull took in the transactions of the Club was not an unmixed advantage. Our members knew that he might always be depended upon. If nobody else wrote a paper, *he* would certainly be prepared with one. But in such an Association as ours, though there may not be many members with the well-stored mind, the self-reliant nature, and the decision of character of Dr. Bull, yet there must be a great amount of latent and undeveloped talent among us. During the year 1885 thirteen papers were read at the ordinary field meetings. (I do not include the Fungus Forays. Several excellent papers were read at them by Dr. Cooke, the Rev. J. E. Vize, Mr. Plowright, Mr. Phillips, and others, but Dr. Bull was then too ill to make any detailed record of them, though the serious nature of his illness was not suspected, even by himself). Six were on archæology, four on ornithology, two on botany, one on geology. Of those thirteen papers seven were contributed by Dr. Bull. He told me he had been promised three papers by other members, but before the meetings they had written to express their regret that they would be unable to attend. If those members could have fulfilled their engagements, Dr. Bull's contributions would have been his four papers on ornithology. In the future we shall not have him to fall back upon. We have been fortunate in the election of a President, who is the leading geologist in the county, and who has already filled the honourable position wisely and well. He will receive the cordial and hearty support of the members, and I am confident satisfactory proof will be given that the Woolhope Club shall be as prosperous in the future as it has been in the past. Loyalty to Dr. Bull's memory should be an additional incentive, if one were needed, that it shall be so. As one of England's greatest poets has written,

"He mourns the dead who live as they desire,"

and what Dr. Bull's "desire" was, the past 20 years' uniform and consistent work affords ample testimony. Some work which he had in hand for the club is, it is to be feared, left incomplete. I refer to the "Birds of Herefordshire." Another work which he was anxious to see published, "The Flora of the County," was undertaken by the Rev. Augustin Ley, and it could not possibly be in better hands. The transactions of the club from 1877 have been kept in abeyance by the mammoth work, "The Herefordshire Pomona." It is hoped these will soon be printed. Dr. Bull told me he hoped to persuade one of our members to undertake the "Fishes of Herefordshire." Such a series of papers by an enthusiastic lover of "the gentle craft" could not fail to be interesting.

But in truth, there are an abundance of topics for the votaries of natural science to write upon. We have both the organic and inorganic worlds, both the past and the present to study. I have a glimmering recollection that one of our Presidents, in his retiring address, deprecated the predominance that geology had assumed in the attention of the members of the Club. Alas that the same cannot now be said! The very name of our Club has a geological signification.

But who among our members now, except our President, studies the wonderful records of the rocks, and challenges them to reveal their secrets? Yet, it may confidently be asked, what district is there in our country where geology may be better studied than in this country? Then again where are our botanists, and what are they doing? We know that the Rev. Augustin Ley has done, and is doing, splendid work, but I fear other workers in this department of science might almost be counted upon our fingers. May we not also appeal to our entomologists for some more of their fascinating papers? I have not read any transactions of our Club with more pleasure than those which Dr. Chapman contributed. May we not hope for more of them? Last year I asked our talented friend, Dr. Wood, to favour us with an article—and we all know how thoroughly competent he is to write one, which would be as instructive as it would be interesting—but his professional engagements prevented him. I should like to hear a series of papers read on the interdependence of the floral and the insect world. We have members who could write them without difficulty; gentlemen who are both botanists and entomologists. Very few know, or even suspect, how important flowers are to insects, and how much flowers themselves are dependent upon insects. I remember reading somewhere “that insects might be called the marriage-priests of the floral world.” The simile is a happy one. It is mainly through them that our world is adorned with tens of thousands of objects which gladden the eye with their beauty, and regale the senses with their fragrance. I am sure if some of our members would take this subject in hand they would add to their own pleasure, while they enlightened us, and they would elicit the grateful acknowledgments of the Club.

I have ventured to make these observations because I have a feeling, which is shared by others, that we have rather wandered from the original constitution of our Club. Instead of rocks and plants, insects and reptiles, beasts, birds, and fishes, we have of late years given prominence at our meetings to the study of churches, camps, and old buildings. I do not object to a fair proportion of archæology, but I would suggest a return to the old lines. Natural science should be our main study. By patient, persistent, and accurate research we should investigate the natural phenomena and objects by which we are surrounded. The majority of our members are probably inquiring observers rather than trained naturalists, but in a Club like ours both classes are brought together. There is the friction of mind upon mind; questions can be asked; information can be communicated; light and instruction can be imparted, and mutual advantages are derived.

And what delights can equal those
That stir the spirit's inner deeps,
When one that loves but knows not, reaps
A truth from one that loves and knows?

It only remains for me to express my cordial thanks to the members for the kindness and considerateness they have shown to me, and the loyal support they have all rendered to me during the past year. I earnestly hope and sincerely believe that the prosperity and success which have been so marked a feature of the history of the Woolhope Club in the past will be continued in the future.

THE HEREFORDSHIRE POMONA.

PRESENTATION TO MISS BULL AND MISS ELLIS.

THE invaluable services of Miss Bull and Miss Ellis, of Hereford, in painting the original drawings for illustrating the Herefordshire Pomona, were to some extent recognised by a testimonial on Tuesday, May 4th, 1886. Throughout his great work, the late Dr. Bull was encouraged by Lady Emily Foley, the rich and fruitful gardens of Stoke Edith House being ever open to the Woolhope Naturalists' Field Club; and it was with her ladyship that the idea originated of making the presentation under notice. It was also, we may mention, through her ladyship that Her Majesty the Queen commanded a copy of the Herefordshire Pomona to be specially prepared for the Royal Library at Windsor. About eighty of the nobility, gentry, and professional gentlemen subscribed, and the testimonial to each lady took the form of a miniature portrait on ivory of the late Dr. Bull, together with a cheque of 100 guineas. The interesting ceremony took place in the drawing-room of the Deanery, and many of the subscribers were present.

The following is a copy of the circular issued:—

Hereford, November, 1885.

“The Herefordshire Pomona” which promises to be of great use to the Orchards of the County, having now been completed, it appears to be the general opinion, that the artists, Miss Ellis and Miss Bull, to whose talents and patient perseverance the work owes so much of its beauty and exactitude, are entitled to some expression of public appreciation on the termination of their labours.

Miss Ellis is a Queen's Gold Medalist of the Bloomsbury School of Art, a lady of great artistic ability, who has lately come to reside in Hereford. Miss Bull, as the subscribers are generally aware, is the accomplished daughter of the late Henry G. Bull, Esq., M.D., of this City, the learned general Editor and originator of the work, to whom the Woolhope Club is greatly indebted for numerous interesting papers contained in it, and for the immense amount of information he has collected together on the various branches of Pomology.

These ladies have given, gratuitously, their valuable services for eight successive years, and have produced a series of illustrations unequalled in any previous work of a similar character. It has been suggested that the subscribers to these beautiful volumes, and many others personally interested in Apple and Pear Culture, would be willing to co-operate with the Club in the presentation of a suitable testimonial to them. We are permitted to add to this circular the following extract from a letter addressed to Lady Emily Foley by the distinguished Pomologist, Robert Hogg, Esq., LL.D., F.L.S., of London.

99, St. George's Road, S.W.

“Dr. Hogg presents his compliments to Lady Emily Foley, and approves very highly of her Ladyship's proposal to recognize the devotion and ability with which Miss Ellis and Miss Bull have worked upon the illustrations for the

“Herefordshire Pomona.” That such valuable work should be allowed to pass unacknowledged in some substantial form, would cause a reflection on the County of Hereford. But the Country generally has cause to be proud of such a work, for it is, without doubt, the most splendid in artistic execution and fidelity in design that has ever been produced upon this subject.”

We beg therefore to state that we shall be happy to receive any subscriptions which may be offered to us for this purpose, and that they may be paid either to us or to the Gloucestershire Banking Company, Hereford.

C. G. MARTIN,

President of the Woolhope Naturalists' Field Club.

J. REGINALD SYMONDS,

Hon. Treasurer and Secretary to the Herefordshire Pomona.

H. C. MOORE,

Honorary Secretary to the Fruit Exhibitions.

THEOPHILUS LANE,

Secretary to the Club.

The Dean said he should be interpreting the wishes of those present if he asked Lady Emily Foley to make the presentation. Mr. Henry Higgins seconded the proposition, which was supported by Mr. Piper.

Mr. Reginald Symonds (the hon. secretary) intimated that several letters in explanation of inability to attend had been received. Dr. Hogg, in his letter addressed to Lady Emily, said that after the considerable share he had taken in conjunction with the lamented Dr. Bull in the preparation of the Herefordshire Pomona, it was a great disappointment to him not to be able to be present on such an interesting occasion. It was very gratifying to him to know that so substantial a recognition of the devoted services Miss Bull and Miss Ellis had rendered not only to their county, but to their country, by their illustrations to the Herefordshire Pomona, which far excelled anything of the kind produced in England, and which were in no way inferior to the efforts of the best artists of the continent, had been secured. The other letters were from Lord Bateman, Sir William Vernon Guise, Mr. J. Pulley, M.P., Mr. James Rankin, Mr. W. Henry Barneby, Mr. B. St. John Attwood-Mathews, Mr. Edwin Lees (Worcester), Mr. E. Caddick (Birmingham), Mr. Arthur Hutchinson, Rev. Prebendary Phillott, Rev. C. H. Bulmer, Rev. J. E. Vize (Welshpool), Mr. James Davies, and Mr. C. Rootes.

Lady Emily Foley then read the following address, and gracefully made the presentation :—

The Herefordshire Pomona having now been completed, the Woolhope Naturalists' Field Club, under whose superintendence it was brought out, and the ladies and gentlemen, whose names are appended, from a wish to manifest their appreciation of the artistic ability and devotion displayed during eight successive years by Miss Bull and Miss Ellis, who painted from Nature, solely for the love of art, the original drawings for the necessary illustrations, have great pleasure in requesting each of these ladies to accept a miniature portrait on ivory, of the late lamented H. G. Bull, Esq., M.D., the learned general editor and originator of the

work, together with the sum of one hundred guineas, in recognition of their eminent services in the production of a book which has justly been styled by the distinguished Pomologist, Robert Hogg, Esq., L.L.D., F.L.S., London, "the most splendid work in artistic execution, and fidelity in design, which has ever been produced on the subject."

The signatures appended to the address were those of the following :—Lord Bateman, the Earl of Powis, Lord Windsor, Hon. and Rev. B. L. Scudamore-Stanhope, Lady Croft, Sir William Vernon Guise (Elmore Court, Gloucestershire), Lady Emily Foley, Lady Henry Somerset, Lady Hindlip, Hon. and Very Rev. George Herbert, Dean of Hereford ; Rev. Sir George H. Cornwall, Bart., Sir Harford J. J. Brydges, Mr. J. Pulley, M.P., the late Dr. Bull, Mr. Arthur Hutchinson, Mr. T. B. Acton (Grove Road, Wrexham), Mr. B. St. John Attwood-Mathews, Mr. R. W. Banks, Mr. W. H. Barneby, Mr. H. C. Beddoe, Mr. Thomas Blasbill, Mr. J. A. Bradney (Rockfield, Monmouth), Rev. C. H. Bulmer, Rev. C. Burrough, Mr. E. Caddick (Birmingham), Alderman Cam, Rev. Canon Capel (Abergavenny), Mr. T. Carver, Mr. Joseph Carless, jun., Dr. Chapman (Burghill, Hereford), Rev. G. H. Clay (Aston Rectory), Rev. Prebendary R. H. Cobbold, Mr. E. W. Colt-Williams, Mr. James Davies, Major Doughty, Rev. W. D. V. Duncombe, Rev. Canon Du Port (Denver Rectory, Downham), Dr. Glendinning (Abergavenny), Mr. E. H. Greenly, Rev. Prebendary F. T. Havergal (Ross), Mr. Henry Higgins and Mrs. Higgins, (Thinghill), Dr. Robert Hogg, Rev. E. J. Holloway (Clehonger), Mr. John Hopton, Rev. Michael Hopton, Mr. W. J. Humfrys, the late Rev. W. Jones-Thomas (Llanthomas), Mr. John Lambe, Miss Hutchinson and Miss Charlotte Hutchinson (Hagley Park), Rev. W. H. Lambert, Mr. Theophilus Lane, Mr. Edwin Lees and Mrs. Lees (Green Hill Summit, Worcester), Rev. A. Ley (Sellack), Mr. James W. Lloyd (Kington), Mr. J. H. B. Lutley, Mr. C. G. Martin, Mr. J. J. Merriman (South Kensington), Mr. H. C. Moore, Mr. J. Griffith Morris, Mr. T. C. Paris (Hereford), Mrs. Pateshall, Mr. C. H. S. Perceval (Longwitton Hall, Morpeth), Mrs. Robert Platt (Staley Bridge), Rev. Prebendary H. W. Phillott, Mr. G. H. Piper, Rev. D. Price (Little Marcle), Mr. J. Rankin, Very Rev. Prior Raynal (St. Michael's Priory, Belmont), Mr. J. Riley (Putley Court), Mr. C. Rootes, Mr. J. F. Symonds, Rev. W. S. Symonds (Pendock Rectory, Worcestershire), Rev. F. H. Tatham, Mr. Vachell (Cardiff), Mr. R. V. Vassar-Smith (Charlton Park, Cheltenham), Rev. J. E. Vize (Forden Rectory, Welshpool), Mr. J. G. Woodhouse, and Mrs. Woodhouse, Dr. J. H. Wood (Tarrington House, Ledbury), and Mr. R. F. Woollett (The Mount, Newport).

Mr. Higgins said he was requested by Miss Bull and Miss Ellis to express their warmest thanks for the testimonial which had been given to them. Having discharged that duty, he could not but say how much they were indebted to those ladies, for it was a sure fact that if Dr. Bull had not secured the gratuitous services of Miss Bull and Miss Ellis, they should never have had that beautiful work ; it would have been too costly a book to have engaged professional artists. In obtaining the gratuitous services of these ladies Dr. Bull was able to carry out his work, and, therefore, they were greatly indebted to them. But not only that, it

was a great thing for two young ladies to spend eight years of youth in a public work of this character. He thought it was very commendable when two young ladies came forward and devoted themselves to a public work of this character, and it was a thing which they ought to recognise in the way they had done.

Mr. G. H. Piper observed that it was due to them to return a vote of thanks to Lady Emily Foley for so kindly and gracefully making the presentation. He made the proposition to them in his official character as President of the Woolhope Naturalists' Field Club, which, as far as the powers of its members would allow, assisted in bringing out the Herefordshire Pomona, the completion of which they then celebrated by making that appropriate presentation to Miss Bull and Miss Ellis. The work had been successful from beginning to end, and the presentation crowned the efforts of those ladies who assisted in producing it. He proposed a vote of thanks to Lady Emily.

Mr. C. G. Martin (the retiring President of the Woolhope Field Club) seconded the proposition, and, in doing so, said he did not quite agree with Mr. Higgins as to its being absolutely necessary that they should have had gratuitous help. Those who thought so seemed to forget the wonderful fertility of resource of Dr. Bull. If he had not been favoured with the splendid services of these ladies, he would certainly have devised some other means to carry out the object upon which he had set his heart. However, they were deeply indebted to Miss Bull and Miss Ellis for their services.

The Dean said that on behalf of Lady Emily Foley he thanked them for the compliment they had paid her. He assured them that it had given her ladyship very great pleasure to attend on that occasion. Her ladyship, like them all, had greatly admired the beautiful illustrations of the Pomona, which were due to the skill, the artistic skill, of Miss Ellis and Miss Bull, and she also joined with them all in remembering their late lamented friend (Dr. Bull) with the greatest possible respect. He again assured them that it had given her ladyship great pleasure to attend on that occasion.

The proceedings then ended.

Woolhope Naturalists' Field Club.

THURSDAY, MAY 27th, 1886.

THE first Field Meeting of the season took place at Newent. The members from Hereford were met at Ledbury by the President, Mr. G. H. Piper, who brought a contingent from his neighbourhood. Sergeant Mews was at the station with his heliograph, a small circular mirror about eight inches in diameter, attached to a tripod some four feet in height. He seemed perfectly master of the instrument, and explained its use with much intelligence. The business of the Club was at once transacted, and upon the arrival of the train for the branch line to Gloucester, seats were taken for Newent, whilst Sergeant Mews took up his post on Doghill, whence he was to communicate with our party upon May Hill. After a short drive from Newent, under an uncomfortably cold May shower of rain, a halt was made at Cugley, some two or three miles out of the town. The President humorously informed us that by going through a fine field of wet clover and other wet verdure (which happened to be more than usually luxuriant this year, owing to extraordinary rains of this ordinarily merry month of May), we should find "Crockett's Hole," a hiding place of Protestant Martyrs in the reign of Mary Tudor. At this moment any hiding place would have been welcome had it been attainable without so much discomfort; but when it was put to the vote, the chorus of voices in unison from the carriages resolved unanimously that the visit to the hiding place should be postponed *sine die*, especially as the President promised to give us, after dinner, some traditions and facts upon the subject. The storm clouds now rolled by, and the rest of the day was exceptionally fine, but the uphill journey to May Hill was rendered more tedious to one detachment of the party by the unwilling temper of some of the horses, which objected to such hard work against the collar, but, owing to the amiability of the naturalists, who willingly relieved the sullen animal of a portion of its draught, and by the persuasive action of the driver, the place of destination was somehow or other eventually reached by everyone. Bright sunshine greeted us when we dismounted and congregated at the summit of the high road which formed the nearest point to the top of May Hill, about half a mile distant from this spot. From here a rutty track for country carts and waggons leads to the top of the eminence, where the celebrated Severn Channel landmark, consisting of a small plantation of old Scotch firs, which had apparently weathered several centuries of vicissitudes of climate, attracted our attention; and the charming panorama of hills in various counties all around the horizon, indicated the importance of this station as a camp, and a commanding position for fire beacons. Field-glasses, ordnance maps, mariners' compasses, and sandwiches were now, and for a considerable period, deliberately

discussed, and whilst we were in vain endeavouring to catch a gleam of sunshine on the distant Doghill, behind the town of Ledbury, glimpses would occasionally, but only momentarily, illumine our own position. Under the superintendence of Mr. J. E. Ballard, a heliograph of his own construction was fixed, and a long continued discourse, from our side only, was carried on, but as the members got more and more impatient for a reply, the President came to their relief by giving a description of the geology of the district, upon the conclusion of which the distant mirror was at last observed shining most brilliantly, whereupon our signalman at once took up the refrain from the merchant of Venice—

How fair that little candle throws his beams !
So shines a good deed in a naughty world.

In answer the distant signalman now made rapid use of his heliograph whilst the sun was shining upon his position. He had so much to communicate, and manipulated his instrument with such rapidity, at least so it seemed to some of us who had not had much experience with the Morse alphabet, that we began to excuse ourselves by accusing him of being in a bad temper. Sergeant Mews, however, who had been attached upon signalling duty to General Sir Frederick Roberts's column in Afghanistan, was too experienced an old hand to allow himself to be ruffled by the caprices of May clouds. Having convinced ourselves that long experience alone would make us sufficiently masters of the Morse alphabet—the same as is used in the Telegraph department—to enable us to carry on a correspondence with the heliograph, we were warned that we must begin the descent. Upon this bleak hill our botanists failed to find anything worthy of notice, but a few geological specimens were gathered from the neighbouring quarries, where may be found *atrypa*, *pentamerus*, *petraia*, &c., &c.

Returning homewards by a different route Taynton Church was visited, its registers examined—dating from 1536 ; this is one of the earliest registers in the kingdom. Its position was observed to have been built due north and south with the object of gratifying Puritan tastes. Its remarkable pulpit, partly 14th century, has a panel of Henry VII's time, and the front and cornice Jacobean, with an iron cage, in good condition, for holding the preacher's hour-glass. The pulpit is at the south end of the building, whilst the altar table, which formerly used to stand in the middle of the church, is now situated upon the eastern side. The President here read a paper upon "Taynton Church" and matters pertaining to it, with remarks upon the curious and interesting register. There are but few existing hour-glasses now. The following gleaning from *The Quiver* gives some interesting information upon the subject of

PULPIT HOUR-GLASSES AND HALF-HOUR GLASSES.

Shakespeare makes mention of hour-glasses. Holbein painted them certainly twice—once in his "Dance of Death," and again in a portrait mentioned by Walpole. Nearly every pulpit appears to have been furnished with one. Old churchwardens' accounts abound with entries relating to them. Yet they have become so scarce as to form the subject of antiquarian jottings. An

inventory of the items in All Saints' Church, Newcastle-upon-Tyne, in 1632, mentions "one old houre-glasse," and "one halfe-hour glasse," showing that the two periods of time were equally considered. In some of the few instances where the frames are still preserved, the glasses that held the sand, or powdered egg-shell, have been broken and not replaced. These frames are generally made of iron, but in St. Dunstan's Church, Fleet-street, there was a silver frame, which was melted down not so very long ago and made into two staff-heads for the parish beadles. In St. Albans, Wood-street, there is an example often mentioned, so placed that the preacher can reach it and turn it. But the examples in London are extremely rare. The county of Norfolk is somewhat richer in specimens of these "spies of time," as Longfellow calls them, being able to count up some half-dozen frames. Suffolk, too, had an example at Flixton, in the first half of this century, but when the church was restored it was removed. At Wolvercot, and at Northmoor, Oxon, there are frames. Berksire has a fine example in Hurst Church. Wiltshire has preserved another in Compton Basset Church. This sacred edifice is much admired by antiquaries for its fine old rood-screen, which is in good preservation. There is a staircase to the rood-loft, and there are twelve niches in the piers of the screen where it is supposed there were once figures of the twelve Apostles. Adjoining the south side of the screen, in front of the masonry containing the winding stairs to its summit, is the pulpit, which is modern, and projecting from the wall close by is an iron bracket upholding the hour-glass placed there some time in the seventeenth century. Kent, too, has an interesting specimen. This is at Cliffe Church. A second Kentish example was removed a few years ago from the pulpit in Oxford Church. And the frame of a third may still be seen at Leigh. Near Hull, in the church at Keyingham, there is another frame. Puxton Church, Somerset; Odell Church, Bedfordshire; and the Church at Hammoon, Dorset, had examples quite recently, and may still have them. In all the length and breadth of our pleasant land, however, it would be difficult to point to many more than a score of examples out of the hundreds and hundreds that once formed familiar features in it to the church frequenters of the last two centuries.

Returning now to the proceedings of the day, the next object of interest passed *en route* was the battle field at Barber's Bridge, in commemoration of which a stone monument was erected by Mr. Price, of Tibberton Court, a few years ago. Near this spot during the excavation of the Hereford and Gloucester canal several skeletons were found buried, and many others were discovered in 1868, which were undoubtedly those of the Welshmen under Lord Herbert, here severely defeated by Waller and Massey on the 24th of March, 1643. The President stated that, by the kindness of Mr. Price, he should be enabled to read a paper very carefully written by the late Major Price, which contains the fullest information to be gained on the subject.

Proceeding homewards, the parish church of Newent was examined, and a paper read upon it by the President.

After an excellent dinner at the George Hotel, the President gave us his promised paper on "Crockett's Hole," and his reading of another paper on the subject of the Battle of Barber's Bridge, was interrupted by the announcement of

the omnibus being ready to proceed to the railway station. The following members and visitors attended:—The President: Mr. Geo. H. Piper; vice-Presidents: Rev. F. T. Havergal and Rev. D. Price; members: Dr. J. H. Wood, Major Molony; Revs. Bowell, Beavan, Elliot, Holloway, Jones, Wm. H. Lambert, Marshall, Pelly, Stoodley, and Stooke-Vaughan; Messrs. Beddoe, Carless, Fortey, Hebb, Jones, Lloyd, Lambert, Moore, Paris, Purchas, Riley, and Salwey; and the following visitors: Captain Frowd, Lieut. Gilbert Bourne, Revs. Easton and Hammond, and Messrs. Corner, Walter B. Hengler of Cugley Farm, Lilley, and A. Price.

[The following is the paper by the late Major Price, previously referred to:—
kindly lent to Mr. Piper, and read by him.

ON SOME SKELETONS DISCOVERED AT BARBER'S BRIDGE, NEAR GLOUCESTER, IN 1868.

IN the Spring of 1868, a gang of men were employed in taking off the crown of the hillock *on which we now stand* for the purpose of filling up a pool which, at that time, lay at its base. In the course of the work a number of skeletons were discovered lying side by side at a depth of from 18 inches to 2 feet below the surface of the ground; 86 in all were exhumed, and the remains re-interred in one grave on the spot. Various attempts were made to account for the presence of so many bodies in this field. It was known that, in the latter part of the last century, when the canal was being excavated, a number of bodies were also discovered close by, but no explanation was given of the circumstance, excepting that they were assumed to be the bodies of men who had fallen in some of the many skirmishes which took place in this neighbourhood during the civil wars. The foreman of the works at that time lodged at a house occupied by the daughter of an old blacksmith, named Taylor, who had died a year or two before, at the age of 97. Having heard that enquiries were made respecting these bodies, she told the foreman that they were the remains of Welshmen, who had been engaged in the Siege of Gloucester, and had been slain on the spot; that when she was a child, she was in the habit of passing through this field with her father to visit relations in Hartpury, and that he often pointed out the spot to her as that on which these Welshmen had been buried; that she perfectly well remembered being always afraid, in consequence, of passing through this field alone at night; and that she had often heard her father say, still more recently, that, if ever the mounds were disturbed at Barber's Bridge, there would be found the bodies of many soldiers who were killed down below by the brook side, and brought up there to be buried; that they were Welshman who had fought at Highnam, and had been driven back, and met at the brook by another body of soldiers, and there surrounded and killed; that there was no bridge over the brook then: that the bridge had been built in his lifetime: that he had been told by his father, that his grandfather was an eye-witness of the fight. This woman—Hannah Taylor, died in the early part only of last month, but has frequently repeated these statements, invariably closing them with these words, "they were Welshmen, and they were very fine men."

A stirrup, discovered under the bridge, on the site of the ancient ford or passage across the brook, and which it was natural to suppose was in some way connected with the other remains, seemed to point to an earlier period than the civil wars. The Society of Antiquaries, to whose inspection it was submitted by Mr. Niblett, however, pronounced it to be of the 13th century (see their

proceedings of June 30th, 1867, page 529). A cannon ball and some few buckles and buttons, however, which were discovered with the skeletons have been pronounced to be of a more recent period; and further enquiries were therefore directed to the local histories of the Siege of Gloucester.

Shortly after this, two old men, Samuel Colwall and Charles Smith, at that time both of them living in one of the Tibberton Alms Houses, of whom only the former now survives, confirmed the statements of Hannah Taylor. Colwall said that his father worked in the construction of the Canal, and that the bones discovered at that time were said to be the remains of Welshmen who came up to besiege Gloucester for the King; that they were entrenched at Highnam, and attacked the gate which then stood on Westgate Bridge, but were beaten back; that they fought a battle on Ludnam's Hill, the field in which Mr. Gambier Parry's church now stands; that they were defeated and driven along the road to Barber's Bridge, where they were met by fresh troops and cut to pieces; that their "trenchments" were to be seen when he was a boy, and he believed were still to be seen in the wood, on each side of the Newent road, near the three mile stone on the "point of the hill"; that he lived for many years at Highnam, and afterwards with his father at a house in Highleadon, known as the Camp House, now the property of Mr. Ellis, of Minsterworth, and has often heard that soldiers formerly "camped" round that house at night, and were posted at the brook by day, and that the brook was called Red Brook, as it still is at and below the bridge, because it ran red with the blood of the slain. As Samuel Colwall is still living close at hand, he will be able to confirm these statements if seen at the alms houses, but he is not able to get far away from home. In the material facts he was confirmed by Smith, who lived and worked at Highnam when a boy, and remembers when the turnpike road was diverted at the Cross Hands about 40 years ago that many bones and buttons and other relics were discovered in the excavations. There was now very little difficulty in connecting these remains with the Welsh Army under Lord Herbert, which was encamped at Highnam, and defeated and captured there by the combined forces of Massey and Sir William Waller, on the 24th March, 1643. Archdeacon Fearney in his manuscript in the Bodleian Library, at Oxford, relates a conversation he had in 1717, with a Welshman who had served in this army as a boy, and Samuel Taylor's father who had died at a very advanced age, might have been living at that time. When the bones were found in cutting down the hill to form the Canal embankment, but little more than 150 years had elapsed since the surrender of the Welsh army, and men of the age of Samuel Taylor at his death, and even men no older than my informants in the alms houses now may well have related in 1795 the details received by them from eye witnesses of the events of March 24th, 1643. The fate of this Welsh army is locally recorded in "Corbett's Military Government," and it is officially recorded in Sir William Waller's letter to both Houses of Parliament, both of which are reprinted in the *Bibliotheca Gloucestrensis* at pages 29 and 195. The latter is printed in the *Journals* both of the House of Lords and House of Commons, as well as in the tract from which the *Bibliotheca Gloucestrensis* has reprinted it. It is a singular circumstance that neither of these records

speaks of any serious loss of life on the occasion, though there is abundant evidence from other sources that there was a loss variously stated at from 300 to 600 men. Neither is any loss of life mentioned in the account of these transactions given in the historical introduction to the *Bibliotheca Gloucestrensis* on page 36. This, however, seems to have been in great measure compiled from Corbett's narrative, and therefore would contain no facts that were not recited by Corbett himself. Corbett does not say that a single man was killed in the two days fighting, and, speaking of Sir William Waller's attack, he says that "after his approach not a man of the enemy was slain or hurt." Sir William Waller himself says in his official report, "in a short time without the losse of above two, they rendered up the place upon 'quarter'." It is difficult to reconcile this statement with the abundant evidence which may be adduced of a very heavy loss, but as one of the most detailed accounts which will be presently quoted, attributes the slaughter to an act of treachery on the part of Sir William Waller, an allegation constantly repeated and nowhere refuted at the time, it is probable that Corbett was discreetly and charitably silent on the subject. He was Massey's chaplain, and Massey was a conspicuous actor in the scene.

In the Biographical and Historical Memoir of Corbett published in the *Bibliotheca Gloucestrensis*, the following passage occurs:—"Hence it will be found that, whilst the main facts of Corbett's military relation are incontrovertible, his statement, if not generally corroborated by the testimony of contemporary writers, is at least not invalidated by any Historian of those perilous days." Some inaccuracies in Corbett's statements must clearly therefore have been within the knowledge of the writer of this memoir.

It may be convenient here to read Sir William Waller's official letter to both Houses of Parliament.

"MY LORDS AND GENT.

"We hear it is not wel taken, that you heard not of the taking of the Welsh at Highnam, nor of the losse of Malmsbury. Upon our coming to Gloucester, we immediately sent; it seems many of our letters miscary; for Malmsbury we committed it to Sir Edward Hungerford: we left him not without commanders, he had two Sergeant Majors, able men, and the Companies of his own regiment, and a Company of dragoones, with ammunition and two hundred muskets, to put into the Countrymen's hands, that offered themselves very freely: We conceived that Sir Edward Hungerford's power in the country, with that strength would easily have defended that place. But for reasons best known to himselfe, he quitted it. It was not for us to have stood long there, nor for the advancement of your service nor for us to garrison towns, unless it is intended we shall leave the field. From Malmsbury, marching day and night we came to Framelet ferry, and having our boates from Gloucester readie, we passed our army over Severne, and forthwith to Huntley, and so to Highnam, where, before the enemy had any notice, we fell upon their backs, and in a short time, without the losse of above two, they rendered up the place upon quarter, where he had one thousand foure hundred and forty foure common prisoners well armed, commanders and gentlemen about one hundred and fifty, many of the chiefe of Wales and Herefordshire."

As this letter makes no allusion to such a loss on the part either of the Parliamentary, or of the Royal Forces, as would account for the number of bodies found at Barber's Bridge, and, as the local tradition seemed to connect these bodies so very directly with the battle at Highnam, information was sought from other merely than local sources, and chiefly from pamphlets and newspapers of the period, of which a large collection exists in the British Museum. It was the more important to refer to these as even Sir William Waller's report, as printed in the Journals of Parliament, cannot be fully relied upon.

In "*Mercurius Aulicus, or Court Journal*," of 20th April, 1643, from which further quotation will be given, the following passage occurs :

"It was advertised from London that a letter from Sir William Waller (wherein he makes great mention of his victories, but none of his losses) was by the House ordered to be put in print, but with such alterations and omissions as Sir Thomas Barrington should think most expedient to advance the cause."

It is clear therefore that we cannot rely either upon the statement of Corbett, or of Sir William Waller himself.

The chief newspapers of that day were the "*Perfect Diurnal or Parliamentary Organ*," the "*Mercurius Aulicus or Court Journal*," the former published in London, the latter in Oxford; the "*Kingdom's Weekly Intelligencer*," the "*Continuation of Special and Remarkable Passages*," and "*Certain Informations*," with some others of lesser note. Copies of those were carefully examined in the Library of the British Museum, and especially in the very remarkable collection of newspapers and tracts, known as the "Thomason Collection," presented to the Library by George III. These seem to have been most carefully got together from day to day as they came out, and several of the extracts which follow are taken from the volume sent by Thomason to Charles I., at Oxford, and which fell from the hand of the King, when mounting his horse. This fact is duly recorded by Thomason himself on the fly leaf and the cover, and many of the pages are stained by the mud of the road.

The two following extracts are from the "*Perfect Diurnal*" March 27th to April 3rd, 1643 :

"And so having intelligence that the Lord Herbert was gotten into Gloucestershire with some considerable forces of Welchmen, and has come over the River of Severne to a place called the Forest of Deane (where they began to make worse havock than Skinnington did, not long since, in the same with a tumultuous crew); the said Sir William, when they expected his coming to Cicester, advanced with his forces towards Deane and fell upon the Lord Herbert's forces there, and Colonel Massey who is Governor of Gloucester, coming also with two or three regiments from thence upon their arreare, it is informed that about 600 of the Welchmen were slaine, and 1000 taken prisoners and all their colours, arms, and ammunition taken."

"By letters from Gloucester it is for certain informed that Sir William Waller hath lately given the Welch forces before Gloucester a very great defeat, which is said to be after this manner : Sir William with his forces coming neare Cicester made show, the better to conceale his purpose, as if he intended to fall

upon the towne, but his ayne was at Gloucester, and had so ordered the business that Gloucester men had notice of his intent ; and that with the help of his flat-bottomed barges, which he carrieth along with him in the nature of waggons, and are very useful both by land and water, he would transport his forces along the River of Severne past Gloucester, and fall upon the reare of Lord Herbert's Welch forces when they should the least dread him, and withall gave the Gloucester forces notice when they should fall upon the front of the Welch Army, as he would upon the reare, which designe was no better plotted than it tooke effect ; for when the Lord Herbert was in skirmish with the Gloucester forces, upon their comming out to him with full thought to cut them all off, being so few in comparison of his, Sir William Waller brought his forces neare the Forest of Deane, and fell upon the reare of them with such fury that the Welchmen soon showed their Welch valour, and would gladly have tooke flight if they had known which ways to escape them. Sir William making such havock amongst them that there was slaine, as is conceived, at least 500 in the place, neare 1000 taken prisoners, with all their arms and Ammunition, and the rest of the forces wholly routed, the Lord Herbert, as was at first supposed to be slaine, for that he could not be found ; but it is since informed he got away and fled to Oxford, leaving all his Welchmen behind him which made them swear by Saint Taffie, they'll never fight for him againe, unless he passe it under his hand and seale he will stand it out."

These two extracts are from the "*Parliamentary Organ*." That which follows is from the "*Mercurius Aulicus*," which was the organ of the King's party. The loss is here fully admitted, although it is accounted for by an allegation of treachery against Sir William Waller.

"This day was taken up in scouring and examining the reports which came from Gloucester, touching a blow said to be given by Waller to the Lord Herbert's forces neare that city, which being first noised to be a total overthrow of that little army, and after confidently affirmed to be nothing, but rather that they had the better and repulst the enemy, ended at last in this relation : that the Lord Herbert had entrenched his forces at a place called Hineham, on the further side of Gloucester, beyond the Severne expecting forces to come down from the hither side and so block it up. That Waller, perceiving the co-operation of the King's other forces with those at Hineham would be a great danger to the Towne passed over the Severne secretly, at a place called Newnham, about Friday, and fell upon the back of the Lord Herbert's quarters, who then was at the Court, but met with such resistance that there he *lost 400 of his men*, and so gave over for that time. Finding the next day that the King's forces were willing to admit of parley, he hearkened to it, and entertained a treaty with them, having lost so many of his men in the former onfalls. But while they were upon debate of the conditions and almost come to a conclusion, some of the men perceiving *one of the outworkes* to be but meanly manned (most of his Soldiers being withdrawn in confidence of some faire end by the present parley), gave in upon the same and wone it, and from then set upon the rest : that the horse both troopers and dragoons, seeing how little hope there was of safety if they should abide it, went fairly off

and saved themselves for better times, leaving about 300 of their foot behind them, who were had prisoners into Gloucester, besides 300 or thereabouts which were killed in the defence of the works. This is the sum of the intelligence as near as possible I could collect it."

The following extracts are from the "*Kingdom's Weekly Intelligencer*" of Tuesday, 28th March, to Tuesday 4th April, 1643 :

"But I hope I shall supply that defeat with a successe in another place of far greater consequence, by Sir William Waller against the malicious Welchmen, who while he gave out he would take in Cicester and Tewkesbury before he marched against the Lord Herbert, in the night time diverted his course, and having a bridge ready provided of boats which the Earl of Essex sent to Gloucester when he was at Worcester, and marched over the brave river Severne, and fell upon the reare of the Lord Herbert's Welsh forces, whilst the Gloucester men came in the front and slew neere upon six hundred on the place, and tooke above one thousand prisoners, and neere two thousand armes, besides the Lord Herbert's long guns, and other Engines of War. But a more particular relation hereof you shall have in the conclusion of this week's intelligence."

"Whereas it was mentioned a particular relation should be made of the manner of the defeat given to the Welsh in Gloucestershire, the parties that holds a weeklie correspondence thence hath not writ, or rather his letter is miscarryed. But so many letters are come to London to Merchants and others of the truth of that fact, that there is no doubt of it. Some of the letters speake of but three or four hundred at most that were slaine, but all agree in the taking of one thousand three hundred prisoners, and two thousand arms, and one hundred gentlemen commanders of great qualitie in Wales and most Papists."

The following occurs in the "*Continuation of Certain Special and Remarkable Passages*:"

"The great overthrow given to the Welch army before Gloucester, by letters from thence on Monday last, was more fully confirmed to this effect, dated the first of April—

"SIR,

"I presume the Report of Sir William Waller, his good successe against the Welch is very common with you, yet, least you may not have full information of the truth, I have made bold to insert upon assured knowledge. Sir William, pretending when he went from Malmesbury to fall upon Cirencester, sent hither all his prisoners whereof one hundred have taken oath to fight for the King and Parliament, and are entered into pay, but Sir William made towards the Forest of Deane, and give passage over the River made use of 30 boats that were intended for service at Worcester, and with them made a bridge over Severn, and so marches forcing his passage through the Forest to Highnam, a place were the Welch forces were entrenched, and fell upon the reare of them, while other forced out of Gloucester fell upon the front, and so encompassed them, slew many, tooke 1326 prisoners, 500 horse, with neere a hundred commanders, since which overthrow given to the Welch some other of the King's forces tooke a troope of Sir William Waller's horse, but he soon recovered it again, and above 51 horse

more of theirs, nine hundred pounds in money and store of victual sent in by the country."

"The letters from Oxford do confesse the defeate at Gloucester very little less than is before related."

The following extract is from number 36 of the "*Continuation of Special and Remarkable Passages*:"

"By letters out of Gloucestershire it is informed that Sir William Waller slew (as has formerly been alluded to) about 500 Welshmen, and took at least 1000 prisoners, 1600 arms and 4 pieces of ordnance, there being about 100 officers, with great store of horses and other provisions for war; the Lord Herbert's own troop being taken, which consisted of 100 brave horses, many of them having been long provided by the Earl of Worcester, the Lord Herbert's father, divers of them being valued at a hundred pounds a horse. Sir William Waller marched to Tewkesbury, which the King's troops evacuated at his approach, and went to Worcester."

The following extracts are from "*Certaine Information*," of March 30th, No. 11, and Friday March 31st:—

"And though Sir William Waller made show of falling upon Cirencester, the more to amaze and detain the cavaliers there to defend it, yet he left that town and marched directly towards Gloucester, where boats were ready to convey him and his army over the River of Severne into the Forest of Deane, and being got over the river he wheeled about and came upon the reare of the Lord Herbert's Welch army that have a long while besieged that city on the west side of it, the Garrison in Gloucester being appointed to sally out and fall upon the front of them; so that between both, the miserable seduced Welchmen were taken in a toil and cut off without any great resistance; there were between foure and five hundred of them slaine upon the place."

"This day further information came out of Gloucestershire concerning the late defeat given to the Lord Herbert's Welch army that besieged the City of Gloucester, as namely—that Sir William Waller tooke about 1300 of them prisoners, slew nearly 600 of them, and also that he took about 1500 armes, the most of their muskets being neere upon a foot longer than all ordinary muskets are; that amongst the Welch were found many women which had knives near half a yard long to effect some notable massacrees with them."

The account of this engagement is also given in a little book published in 1647 under the title of "*England's Worthies*," at page 79:—

"He also, most undauntedly (with the help of renowned Colonel Massey then Governor of Gloucester) set upon 2000 of the King's Welch forces in the Forest of Deane under the command of the Lord Herbert, beat them out of their trenches, slew about 600 on the place, took 400 of them prisoners, took 6 troops of as brave horse as all England could show; almost all their armes and ammunition, together with 5 pieces of ordnance."

Mr. Skillicorn has in his possession a little tract published in the year 1643, the title being:—

"A famous victorie obtained by Sir William Waller against the Lord

Herbert and the Welch cavaliers in the Forest of Deane, in the County of Gloucester, where six hundred of the Welchmen were slaine, and a thousand taken prisoners by the Parliament Forces, the said Lord Herbert, General of South Wales being slain ;”

And from it is taken taken the following extract :—

“And to make this intended victory (which was afterwards obtained) the more complete, Sir W. Waller gave notice of this designe to Col. Massey, who is Governor of Gloucester, with directions for him at such a time to issue forth with a considerable party from thence on the other side of the river, being the time which he intended to fall upon the Welch forces ; which businesse on both sides being pursued with effect (according to the most certain relation) fell out to be thus :—

“Sir William Waller suddenly returning from about Cicester, and with a speedy march coming to Deane, fell upon the Welchmen, who at the first seemed to make strange of running away and therefore for a while fought very manfully till about six hundred of them were slaine and neer a thousand taken prisoners, so that very few could escape to the mountains to bring tidings of their countrey’s valour.”

The two following extracts from the “*Mercurius Aulicus*” of March 29th, 1642-3, and April 2, 9, 1643, show that Waller was charged with treachery and perfidiousness in his attack on the Welsh intrenchments :—

“News also came this day that Sir William Waller having by his perfidiousness and treachery beaten up Lord Herbert’s quarters as before was stated had marched on Tewkesbury, which he took and pillaged.”

“It is affirmed also that the Lord Herbert’s forces are much increased and greater farre than they were before, the Welshmen comming on unto him with great courage and readinesse in hope to be revenged on Waller for his perfidiousness and treachery showed to their Countrimens at Hineham.”

The following extract is taken from “*God on the Mount*,” published in 1646 :—

“To make his victorious name and fame yet more complete and full, he, (about the latter end of March) advanced his forces towards Cicester, but made no attempt against the said town (aiming at a greater victory which he would not neglect for the taking of such a poor placed and even flead town, and therefore of so small importance), but only faced it. And whilst he seemed to look on the Town he suddenly wheeled towards the Forest of Deane, where the Lord Herbert lay with about 2000 Welshmen who came over the River of Severn at Rossbridge. Now Sir William Waller had given notice of his designe to Colonel Massey, Governor of Gloucester Town, with directions unto him at such a time to issue forth with a considerable party from thence on the other side of the River being the time when he intended to fall upon the Welch forces, which business on both sides was pursued with singular good effect, for, as I said, Sir William returning suddenly from about Cicester, and with a speedy March coming to Deane, fell most resolutely on the Welshmen in their quarters, who at the first seemed to make strange of running away, and therefore for a while fought pretty valiantly

till about 600 of them were there slain on the ground, and at least a thousand of them were taken prisoners so that very few escaped to carry news of the mountaines of her Countrymen's valour."

Many other extracts might be given to the same effect, and the Historian of the period—Rushworth—gives as will be seen below, an account in all respects similar to the foregoing, in volume 2, page 263 :—

"About the same time the Lord Herbert, son to the Marquess of Worcester, with a considerable army of Welchmen, lay near Gloster and almost blocked up that City.

"Waller with his forces advanced to Cirencester, and made show as if he would fall upon that town. But the design was for Gloucester, of which he gave the men in Gloucester notice, who supply him with flat-bottomed boats, wherewith he suddenly transported his forces over the river Severn beyond Gloucester, and fell upon the reare of the Lord Herbert's Welch forces; whom at the same time a party out of Gloucester charged on the front, whereby there were about 500 of the Welch slain upon the place and 1000 taken prisoners."

Rushworth, part iii, vol. ii., cxi.

The outline of a field work may still be clearly traced on Ludnam's Hill, near to Mr. Parry's church, and two cannon balls found on or near the spot, and still in Mr. Parry's possession, together with the relics discovered at the Cross Hands, when the road was diverted, sufficiently identify the site of the battle referred to by Samuel Colwall, and the trenchments which he described on the Newent road, near the three mile stone, are obviously those thrown up to command that road, as recorded in the *Bibliotheca Gloucestrensis*, page 34.

The events of the 24th March, 1643, are thus sufficiently established, by Local Traditions; by Historical evidence; by Existing and recently discovered Relics of the Fight.

It is true that the tragic scene which has been supposed by some to have given its name to the Bridge is not amongst the historical details we yet possess, but an unbroken tradition, and the relics tell the same tale, and are supported by legitimate inference drawn from such facts as may be considered to be established.

It is also true that the name of Rudford nowhere occurs in the records, but Saxton's map, the only one which could have been in use, does not place Rudford and Highnam in such juxtaposition as to require that it should be mentioned.

Waller tells us himself in his letter that he crossed the Severn at Framolet Ferry, and forthwith to Huntley, and so to Highnam. Now he could only have approached Highnam from "Framolet" by way of Huntley for the purpose of getting round and behind the Welsh army, which was thus taken in a trap—for with Massey in front, the Severn on the one side, and the Leadon on the other, it was only necessary to possess the Ross and Newent roads, and there was "no ways to escape them." To effect this object Waller had only to march part of his force from Huntley through Tibberton to the Newent road, about three miles. But the old road, which is still used as a farm road, would bring him straight to the little hillock, now much reduced in height (having been first cut down by the

Canal Company and since by the present owner), which commanded the Highleadon passage, and on which the skeletons were found. The Welsh were scarcely likely to have left this passage unguarded; it was their line of communication with Wales. If held by any considerable force, Waller could not have left that force in his rear when marching to the attack on Highnam; and here, perhaps, occurred that resistance on the first day, which according to the "*Mercurius Aulicus*," cost him 400 men.

But even if the Welsh had relied on their entrenchments above the three mile stone, Waller was not likely to overlook the strategic importance of a position which would enable him to intercept the retreat of an enemy he must have felt confident he was about to put to flight, and the occupation of which by him would explain the disaster said by the old blacksmith to have befallen the Welsh on their retreat from Ludnam's hill. That Highleadon Passage was a point of strategic importance at that time may well be conceived by those who know it now, and as it would be if unbridged, and if it had not been so, Corbett would not have thought it necessary to tell us, in describing the march of Massey to Hartpury, in 1645, that "late in the afternoon our party began to advance, and at Highleadon Passage got over the Brook."

Moreover, the tradition handed down through Samuel Colwell would seem to show that the encampment at Highleadon was established chiefly for the protection of this passage, though it was only held in force by day.

It is submitted, therefore, that beyond all question the skeletons at Barber's Bridge, or at "Barbarous" Fridge, as some suppose the original name to have been, are the remains of such of the Welsh army as perished in their fight on 24th March, 1643, and though the original letter of Sir William Waller to both Houses of Parliament, as corrected by Sir Thomas Barrington, and in which no doubt further details were given, has not yet been discovered, it is possible that it may still exist among the large number of letters and papers belonging to the period which have recently been found in the Victoria Tower, at Westminster, and which were saved when the Houses of Parliament were destroyed by fire.

The only question would seem to be whether the remains may not be those of the 400 men said to have been lost by Waller himself, the first day, as stated by the "*Mercurius Aulicus*," but the tradition through the blacksmith's family that they were Welshmen is very precise, and as many other bodies have been found in Rudford Churchyard, and beneath the Chancel of the Church, which were evidently the harvest of some battle field; it is possible that these may have been the remains of Waller's men, and the others the remains of the Welshmen, especially as the victors would in all probability have shown the preference to their own dead, and have buried them in or near the Church.

"CROCKETT'S HOLE."

THE President, Mr. Geo. H. Piper, read a paper on Crockett's Hole at Cugley, the hiding place of Protestant Martyrs in the reign of Mary Tudor, bringing in traditions on the subject, and referring to the burning of "John Horne" in the "Court Orchard," near Newent Churchyard, immediately before the Queen's death.

TAYNTON CHURCH.

This Church was built under the Commonwealth, and to gratify Puritan tastes stands due north and south. It is believed that one other Church only was built in England during that troubled period.

The President read a paper also upon this subject.

The following has been found recorded in *Notes and Queries*, February 9th, 1889:—In 1700 a gold mine was discovered in a village called Taynton, on the northern border of the Forest of Dean, of which a lease was granted to some refiners who extracted gold from the ore.

NEWENT CHURCH.

A paper was read by the President upon Newent Church, with its early English tower and spire, and also some notes on the history of Newent, with curious details from a rare manuscript.

MAY HILL.

The observer stands at May Hill upon an elevation of 965 feet above sea level, on a Silurian island of the old Mesozoic sea, and looks from this Upper Llandovery elevation over Wenlock and Ludlow rocks, over the Old Red Sandstone country of Herefordshire, and the coal fields of the Forest of Dean, over Triassic rocks, and over the whole Liassic vale of Severn away to the Oolitic encampment of the Cotteswold Hill. See "Woolhope Transactions," page 71 of 1873. See also "Symonds' Records of the Rocks," pp. 146—147.

It is a subject of great regret that none of the papers upon these four subjects have ever come into the possession of the Editorial Committee. They have all been mislaid.

Woolhope Naturalists' Field Club.

JUNE 25TH, 1886.

“Proud of that long array of Church and tower
Raglan may claim a rude pre-eminence.”

Archæologia Cambrensis.

THIS, the second Field Day of this year, was the Ladies' Day, the programme of which was to visit Raglan Castle, proceeding by Ross and Monmouth, and returning by Usk, Pontypool Road, and Abergavenny. Leaving Hereford at 9.45, the members arrived at Ross at 10.15, where the interval of one hour and a half until the departure of the train *via* Monmouth was most pleasantly and appropriately occupied in visiting, by invitation, the botanical grounds of Mr. Henry Southall, at his residence, the Graig, Ashfield, distant six-sevenths of a mile from the railway station. The contrast between the dusty, hot road and the intermixture of delicious hues here displayed, with a fountain as a central *coup d'œil* was refreshing, as they greeted the eyes immediately upon entrance. Here were hardy perennials most charmingly grouped: the brilliancy and varieties of colour exhibited by the many species of *Aconitum*, *Delphinium*, *Campanula*, *Pyrethrum*, *Potentilla*, *Myosotis*, *Polemonium cæruleum*, *Veronica rupestris*, and many others, *Linum arboreum*, *Papaver pilosum* and *Ambrosium*, *Onosma taurium*, *Senecio doronicum* and other varieties, *Lactuca sonchifolia*, and a charming bed of *Tropæolum polyphyllum* presented to the eyes a continual feast. Rock roses and geraniums were there, *Genista sagitifolia*, a vigorous *Heracleum giganteum*, a Judas tree (*Ceris siliquastrum*), a fine shrub of *Polygonum* in handsome foliage at the entrance to the garden; whilst from the artistically constructed rockwork of conglomerate budded forth varieties of *Saxifrage*, *Sedum* (amongst which *Sedum Kamshatkanum* must be mentioned), the charming Orchid Lady's-slipper (*Cypripedium spectabile*) in vigorous healthy bloom at the water's edge, occasionally receiving spray from the fountain in which it so delights. Next to a handsome specimen of *Orehis maculata* was a butterfly orchis (*Habenaria bifolia*), and a bee orchis (*Ophrys apifera*). The fernery contained fine plants of *Osmunda regalis*, a small plantation of the oak fern (*Polypodium dryopteris*). The Limestone (*Polypodium calcareum*) and the Beech fern (*Polypodium phegopteris*) were growing side by side; the Holly fern (*Polystichum lonchitis*), the Marsh fern (*Lastrea thelypteris*), the Bladder fern (*Cystopteris fragilis*), var. *Dickieana*, *Asplenium trichomanes*, Black Spleenwort (*Asplenium adiantum nigrum*), sometimes called Black Maidenhair, and often erroneously the Parsley fern. Many members would have enjoyed to spend the day here, but before they had time to complete their survey, were reminded that there was another garden

immediately surrounding Mr. Southall's residence, "Graig" House, so called because the Graig-hill in Monmouthshire, near Grosmont, is a conspicuous object on the horizon, as seen from the grounds. After a rapid survey of the lawn, terrace, and "the cutting"—a sunken lower terrace—the members partook of refreshments, hospitably provided by the ladies of this carefully tended and delectable tenement, and, thus fortified, again went on their way.

The Rev. R. H. Cobbold and Mr. Arthur Armitage were members of the party now, but were unable to proceed further with it. At the Ross railway station a few others joined, and journeying onwards Raglan was reached at one o'clock. A short and pleasant walk through meadows, presenting occasionally a peep of Raglan village and church tower, and over what appeared to be the dry bed of a brook, but which really was the remnant of the outlying moat of the fortress, conducted to Raglan castle. The five stiles in the meadows offered no obstacle, for so comfortably and conveniently had they been constructed for the use of pedestrians that the highest of them presented no more than a height of twenty-three inches to step over. The day was charming; the noble ruin looked at its best. The visitors seemed impelled to halt and linger over the imposing dignity of the exterior, and the immediate proximity of a well-kept lawn presented an inviting locality whence to obtain a favourable view of the ruined citadel or keep, embracing at the same time the towers, one on each side of the main entrance gate, surmounted with their Machiacoulis—or overhanging parapets for defence—whilst under the shade of trees, and seated upon rustic forms, the party commenced the operation of unloading their luncheon baskets.

An excellent handbook to Raglan Castle—purchased upon the premises for the sum of sixpence, and published by Waugh, of Monmouth—was being simultaneously studied, when we discovered that we were eating our lunch upon the Grand Terrace. At one extremity of this was a fine hollow bole of an elm tree (*Ulmus campestris*)—which upon measurement at five feet from the ground was found to be twenty feet in circumference. It had rustic seats fixed within it, capable of accommodating five of our luncheon party, whilst seats exteriorly would give accommodation to ten more; an ingeniously constructed roof, thatched and covered with waterproof tarpaulin gave protection from the sun or rain. The roof presented at the distance the appearance of an enormous umbrella or mushroom, and was at once designated *Agaricus ulmarius*, and on inspecting within the cavity we found the veritable mushroom *Agaricus ulmarius* itself. The huge limbs of this tree, seven in number, fell during Divine Service on July 30th, 1876. This tree had a large arm in vigorous and healthy condition, but history gives record of a neighbouring elm tree of much larger dimensions, being 26 feet in circumference, having bowed its head to "stern ruin's ploughshare" in the hurricane of December 5th, 1822, a hurricane which left its marks in many parts of the united kingdom. Comparing the measurements of these trees with others of which the Woolhope Club has the record in its transactions, it is most probable that one or perhaps both gave its shade or covering to His Majesty King Charles I., when, after his discomfiture at Naseby in 1645, he sought and obtained protection from the grand old noble owner, the first Marquis of Worcester. After lunch, in

response to the signal by the horn, the party congregated upon the Grand Terrace.

The President had brought some hundred flowers of the green rose, *Rosa viridiflora*, which he had gathered from a tree in his own garden, and which the gentlemen of the party distributed amongst the ladies. He then read an interesting paper upon this *lusus nature*, but the interest, it must be confessed, was confined to the curiosity rather than to the beauty of this variety of rose; and no one was detected in search of a bud for inoculation. We have been promised an exhaustive paper upon this subject, which, we hope, will in due course appear in the Transactions. Mr. C. G. Martin exhibited some specimens of the fragrant Orchis (*Gymnadenia conopsea*) gathered the day before in the neighbourhood of Aconbury wood, which excited much more admiration on the part of the ladies, and was eagerly accepted. Mr. Henry Southall then read a carefully compiled meteorological report, concluding with a history of the remarkable floods of May last, and their local distribution. This paper cannot be condensed, but will add to the meteorological history, which for a period of many years Mr. Southall has faithfully contributed to the Woolhope Naturalists' Field Club. Mr. Inledon Webber followed with a genealogical history of previous owners of Raglan Castle; and Mr. Lloyd read a short pamphlet of the 17th century, illustrated by a sketch of the period, on the preparations for garrisoning and defending the fortress.

The party listened with attention to the papers, and now began the work of inspecting the noble pile of ruins. It was fortunate to have the courteous warden, Mr. Raglan Somerset, as our guide, who not only was well acquainted with the history of this possession of his ancestors, but took an interest in imparting his information to others. We are not going to give a lengthy description of this massive stronghold, which would be concisely given by adding Waugh's sixpenny "Guide to Raglan Castle" as an appendix to this brief memoir, but some observations upon its history made by the Rev. Thomas Williams on the occasion of the visit of the Cambrian Archæological Association at their thirty-first Annual Meeting at Abergavenny in August, 1876, having come into our possession, we cannot resist the temptation of giving a copy of this condensed history.

"It appears that, historically speaking, the earliest account which there is of Raglan is that the family of Clare possessed a castle there in the 12th century: and in the family history it is said that Sir John Morley, a military knight who lived in the time of Richard II. resided there as the Lord of Raglan Castle. Other authorities are said to trace the name of the founder to Sir William ap Thomas son of Gwillim ap Thomas ap Jenkin by his wife Maud, daughter and heiress of Sir John Morley, Knight, Lord of Raglan Castle. Grose places Raglan Castle amongst the strongholds erected in the time of Henry VII. in the time of Henry VIII., as Leland informs, Raglan "yn Middle Venceland, was a fair and pleasant castel, with to goodlye parkes adjacent"; and "the laste Lord Herberte," as Morgan told him, "builded all the best coffes of the castel of Raglan." Camden, in his account of the Silures, or Monmouthshire, notices it very briefly as a "fair house of the Earl of Worcester, built castel-like." Dugdale, in his *Baronetage*, and Smythe, in his *MS. Lives of the Berkeleys*, say:—"Richard Strongbow, Earl of

Pembroke and Lord of Chepstow (who died 1177), gave the domains and castle of Raglan to Sir Walter Bloet, in consideration of soldiers, money, and arms furnished by him for the expedition to Ireland, of which Strongbow was the leader, whose descendant, Sir John Bloet (*temp.* Henry IV.) gave his only daughter and heiress, Isabel, in marriage to Sir James Berkeley: he disposed of it to Sir William ap Thomas, who married Gladys, daughter of Sir David Gam, of old Court, in this county, who, with his father-in-law, fell at the Battle of Agincourt, in defending the person of Henry V., and were knighted on the field whilst in the agonies of death. William Herbert, son of Sir William ap Thomas, was created Earl of Pembroke and Lord of Chepstow and Raglan. Edward IV. entrusted him with the custody of the Earl of Richmond (afterwards Henry VII.), who was detained for some time in the castle of Raglan. The Earl of Pembroke, owner of this castle in 1469, raised an army of Welshmen in favour of Edward IV. against the Lancastrians, under the command of the Earl of Warwick. He was taken prisoner at the Battle of Dane's Moor, and was beheaded at Banbury. William, eldest son of this unfortunate nobleman, succeeded to the Earldom of Pembroke. He married Mary, sister of Woodville, Earl Rivers, by whom he had an only daughter, Elizabeth. She married Sir Charles Somerset, and in her right in 1506, he possessed the castle, and bore the title of Lord Herbert of Raglan, and in 1514 was raised to the dignity of Earl of Worcester. He was succeeded by his son Henry, second Earl, whose son, William, became third Earl. He died in 1587, and was buried at Raglan. Edward, his son, succeeded him. "In his youth this Earl was the best horseman and tilter of his times." He died in the 79th year of his age, and was buried at Raglan. He was succeeded by his son, Henry Somerset, fifth Earl, in 1628, who married Ann, daughter of Lord John Russell, and was created Marquis of Worcester in 1642. This nobleman was a great supporter of Charles I., and Raglan was the last castle that held out for the unfortunate monarch. The first summons to surrender the castle was received by the garrison with indignation. Colonel Morgan soon after advanced from Worcester at the head of a formidable force, and drawing up his troops before Raglan, on the 3rd of June, 1646, summoned the garrison to surrender; but the veteran Marquis refused to yield without the consent of the king. On the 7th of August, Sir Thomas Fairfax arrived from Bath, to undertake the siege in person, making his residence at Cefntilla, a garrisoned farm-house, about three miles distant from Raglan. Several communications afterwards passed between the Marquis and Sir Thomas, but no treaty was entered into. On the 14th August, 1646, Sir Thomas ordered a new approach, which Captain Hooper, the engineer, proceeded to throw up. The Marquis' case now became desperate; his garrison, which first consisted of eight hundred men, had been reduced to half that number, and a breach having been made in the walls immediately adjoining the Closet Tower, a final treaty was agreed upon, which took place on the 15th August, and on the 17th the treaty was concluded and signed. On the 19th the castle was surrendered to the Parliamentary general."

Fortunately there are extant so many documents relating to the events terminating in the surrender of the castle by the first Marquis as to form a

“perfect diurnal” of that operation, and the original letters between Cromwell’s Generals—Colonel Morgan and Sir Thomas Fairfax—are published. Those who would further pursue the stirring events of this period are recommended to read the works of our own historians—Webb’s “Civil Wars in Herefordshire;” “Memoirs of the Civil War in Wales and the Marches,” 1642-49, by J. R. Phillips; “Life of the 2nd Marquis of Worcester,” by Henry Dircks, C.E., published in 1865, by Bernard Quaritch, 15, Piccadilly, in which is a reprint of the “Century of Inventions,” a quaint book, showing Lord Herbert, son of the first Marquis, and better known in history as the Earl of Glamorgan, to have been a man of singularly scientific labours and ingenuity; he, undoubtedly, amongst numerous other engineering works, made use of an instrument of propulsion, termed quaintly by him his “fire water-work,” the prototype of the steam-engine (see sixty-eighth article in the “Century of Inventions.”) There is a good historical account of Raglan Castle, by Charles Heath, who lived in the neighbourhood of Monmouth from the year 1791, and in 1825 published the results of his many years’ historical investigations. Mr. Raglan Somerset exhibited an old book, dated London, 1647, called “England’s Recovery,” an interesting monument of the history of that period.

Perhaps we have lost many scientific papers owing to the ruthless destruction of the Library (esteemed one of the finest in Europe) of Raglan Castle, and undoubtedly have lost valuable papers connected with the public history of the county from the fact of its owner being a “Governor of all South Wales.” But “Coxe’s Monmouthshire,” and Williams’s Monmouthshire” have nevertheless records preserved of which their county may be justly proud. The following anecdote is from a work of the period:—“At the beginning of the Long Parliament there were certain rusticks who came into Raglan Castle to search the castle for arms, my Lord being a Papist; the Marquiss met them at the Castle gate, and desired to know whether they came to take away his money? seeing they intended to disarm him: they answered, No, but what they did was because he was a Recusant:—he said, he was a Peer of the realm, and no convict recusant: and therefore the law could not in reason take notice of any such things; and further some sharp and dubious words coming from the Marquiss, they were at last willing to take his word, but the Marquiss was not willing to part with them on such easie terms, having before resolved to return them one fright for another, which he thus effected: having carried them up and down the castle, he at length brought them over a high bridge, that arched over the moat that was between the Castle and the Great Tower, wherein Lord Herbert had lately contrived certain waterworks, which when the several engines and wheels were to be set a going, much quantity of water through the hollow conveyances of aqueducts, were to be let down from the top of the High Tower, which upon the first entrance of these wonderful assinegoes,* the Marquiss had given order that these catarrhacts should begin to fall, which made such a fearful and hideous noise, by reason of the hollowness of the tower and the neighbouring echoes of the castle, and the waters that were between, and round them both, that there was such a roaring, as

* A Portuguese word, meaning a young ass.

if the mouth of hell had been open wide, and all the devils had been conjured up, that the poor silly men stood so amazed, as if they had been half dead, and yet they saw nothing,—at last as the plot was laid, up comes a man staring, and running and crying out before he came at them, ‘Look to yourselves, my masters, for the lions are got loose’: whereupon the searchers gave such a loose, that they tumbled so over one another down the stairs, that it was thought one half of them had broken their necks, never looking behind them till they were sure they had got out of sight of the castle.”

In a store-room under the South Eastern Tower are now exhibited relics of former days. Amongst them are strong leaden pipes, which tradition ascribes as having formed portion of Lord Herbert’s “fire waterworks.” Large earthenware pipes and lead pipes have often been ploughed up in the Leaguer field—or field where the besiegers placed their batteries—formidable enough to be sure when we read from a letter dated Usk, August 15th, 1646. “That which is our main work is 60 yards from theirs, and that is the most. We have planted 4 mortar pieces, each carrying grenade shells 12 inches diameter, and 2 mortar pieces at another place, carrying shells about the like compass Our Engineer, Captain Hooper will (with God’s blessing) come within 10 yards in a few days, and then I believe we shall make galleries, mines, and many batteries.” The earthenware and lead pipes before referred to must have conducted a supply of water to the Castle grounds from the well at the Warrage Farm, in a field adjoining the old turnpike road to Monmouth, a distance of two miles from Raglan. Although this connection has long ago been destroyed, the water in the well in the First Court appears not only to be of excellent quality, but also inexhaustible.

It is very tempting to recapitulate what we saw as we followed our guide through the apartments including cellars, dungeons, stables, courts, halls, chapel, royal and official apartments; still more tempting is it to stray into the interesting associations connected with this Castle, and to dwell in admiration of the loyal old soldier who, in his 83rd year, rather than surrender his castle “made choice (if it soe pleased God) to dye nobly than to live with infamy”—but we must refrain from so long a historical subject. Suffice it to say that after many a summons the Castle was finally surrendered to Sir Thomas Fairfax on August 19th, 1646—the garrison consisting of nearly 500 officers and men, 20 pieces of ordnance, not above 3 barrels of powder—“but they had a mill with which they could make a barrel a day.” The horses were few and in miserable condition, for having long been starving for want of hay, and eaten their own halters, they were tied with chains. Shortly after its capture, the Keep or Citadel was undermined and partly demolished: the Committee of Sequestration sold the lead from the roof for £6,000: partly sold the timber of the surrounding park, the remainder being conveyed to Monmouth, whence it was shipped to Bristol to assist in re-building the houses upon the Bridge there—which houses had been burnt—and inflicted a loss on the family of Somerset which has been by some writers computed at a million pounds sterling.

The days of romance are over at Raglan.

“Gone are those days of chivalry and love,
 When in these courts the mail-clad Knight was seen,
 Eager with spear and burnished shield to prove
 His arm redoubted in the mimic scene
 Of warlike tournament; while forms I ween
 Of fairy loveliness were smiling round,
 Enhancing with their beauty, grace, and mien,
 The sight romantic; and each varied sound
 That rose from that fair throng, made it enchanted ground.”

Raglan Castle has been admirably built, and its contour indicates that it was designed by a mind educated in the principles of fortification and defence. The stone employed is “Old Red Sandstone” for although the colour is grey, nevertheless it is the best or upper lying portion of the “Old Red Sandstone” of Geologists. It has in all but a few places, withstood the vicissitudes of climates for centuries, being in many places remarkably well preserved, and exhibiting traceries and angles finely cut:—such as the Machiacoulis parapets, over the Towers, at the entrance—But when we are informed that there is no trace of any large quarry in the neighbourhood; when the nearest navigable river—the Wye—is eight miles distant at Monmouth and twelve miles at Chepstow—and when we consider the fact that one century after the demolition of the Castle the bark was stripped off the forest trees, and the trees allowed to decay, because the owners could not for want of roads, bring the timber into any market; and that travellers prayed for a speedy deliverance from the perils of the roads, we cannot help asking in our surprise—Where did the mass of stone building material come from, and how was it transported?

Upon the signal of the horn to muster and retrace our steps towards the Railway Station, it was not without reluctance that our party assembled. They took their departure gratified with the care and attention bestowed upon the noble pile of ruins by the agents of its owner, and gratified at having been allowed to look upon Raglan Castle. The journey homewards was by Usk—which also possesses a ruined castle. The position of Usk was such as to have been a station selected by the Roman Intelligence officer for the “Second Legion of Augustus.” At Usk Railway station a botanist observed in the station-master’s garden a Tamarisk tree in blossom—the same tree so well known on our sea coast. The journey through the county of Monmouth—famous for its forest trees—terminating with the scenery of the Bloreng, Little and Great Skirrid (Iscareth, separation), The Sugarloaf, and the Black Mountains (upon whose northern summit runs the boundary line between Herefordshire and Breconshire, that between Herefordshire and Monmouthshire being upon their southern extremity under the name of the Hatteral Hills), all viewed in the evening, formed a subject for quiet contemplation, and when the party reached Hereford, they had added another happy day to the history of the excursions of the Woolhope Naturalists’ Field Club.

The following is a list of the members and visitors who attended:—The President, Mr. G. H. Piper, F.G.S.; Vice-President, Rev. D. Price. Ladies: Mrs. Arthur and Miss Eleonora Armitage, Mrs. G., and Miss C., and Miss L. Bainbridge, Mrs. and Miss Baker, Mrs., Miss Rhoda, and Miss Ruth Barker,

Mrs. Ballard, Miss C. Bayliss, Miss Bray, Mrs. Campbell, Miss Cheiake, Mrs. Clarke, Mrs. Corner, Miss Cust, Miss A. E. Davies, Mrs. du Boulay, Miss Elliot, Miss J. Hathway, Mrs. T. Hutchinson, Mrs. and Miss Holloway, Miss Jones, Miss Kenney, Mrs. Lambe and friends, Miss Layng, Mrs. A. G., Miss and Miss B. Levason, Mrs. Lloyd, Mrs. and Miss Marshall, Miss Phillott, Miss M. E. Piper, Miss C. Rhind, Miss F. Robertson, Miss F. E. Sale, Mrs. Spooner, Mrs. Taylor, and Miss Webber. Members: Sir Herbert Croft, Bart., Capt. du Boulay, Capt. de Winton, Dr. Chapman, Revds. J. Barker, A. G. Jones, E. J. Holloway, H. B. D. Marshall, and J. Tedman; Messrs. Bainbridge, Cheiake, Clarke, Cleasby, Davis, T. Hutchinson, Levason, Lloyd, Martin, Moore, Phillott, and H. Southall; and the following visitors: Capt. Kenny, R.E., Surgeon-Major Bainbridge, H.M. Indian Army, Messrs. S. Ballard, B. Holloway, Lacon Lambe, A. Price, and E. Pilley.

Woolhope Naturalists' Field Club.

ON THE FLOODS OF MAY 1886, AND THE WEATHER OF THE PREVIOUS WINTER.

By MR. HENRY SOUTHALL, F.R.Met.S.

THE present paper is in the nature of a sequel or supplement to one read before the Club sixteen years ago on certain meteorological phenomena. Whether the subject is of very general interest or not, it is important that our Transactions should contain records of all exceptional atmospheric disturbances, in order that as accurate an account as possible may be preserved respecting them.

It is proposed first of all to allude briefly to the general character of the month of May, then to review the weather experienced in the late severe winter, and lastly to treat more particularly of the memorable storm of May 12-13, 1886, and the tremendous floods which followed it.

1. *General Character of the Month of May.*

The month of May was the second in the old Alban calendar, the third in that of Romulus, and the fifth in that of Numa Pompilius. It consisted of 22 days in the first mentioned, 31 in that of Romulus, and 30 in that of Numa. Julius Cæsar restored to it the odd day, which it still retains.

Its etymology appears to be doubtful. Our Saxon ancestors called it *Maius Month*, or in their native language *Tri-Milchi*, or Three-milk month, because the cows were milked three times a day.

In ancient times many observances were practised at this season in honour of Flora, the deity who was supposed to preside over fruits and flowers, and from these doubtless were derived the May-day and May-pole customs which have only just disappeared, and which were observed by the Court as late as the time of James I. A May-pole which formerly stood in the Strand on the site of the church by Somerset House, was taken down in 1717. Pasquil writes of those times :

For then true love and amity were found,
When every village did a May-pole raise,
And Whitsun ales and May games did abound,
And lusty youngsters in a rout
With merry lasses danced the rod about.
Then friendship to their banquets bid the guests,
And poor men fed the better for their feasts.

As regards climate, this month is subject to great vicissitudes, notwithstanding the increase of warmth and sunshine; there is, however, a rapid advance of

vegetation under the genial influences of the sun's rays. While in the month of January there are often days when with south-westerly winds the warmth of May is experienced, on the other hand in May the weather is often as cold as in January. Occasionally severe frosts occur late in the month; that of the 29th of May, 1819, was specially severe and long remembered. The second week is liable to the incursion of a cold wave, the temperature under the influence of north-east breezes often descending much below that of the preceding or succeeding periods, but whether this is a cosmical effect, or whether it is connected with the breaking up of the Siberian frost which occurs about this time, is still an open question. The coldest May this century was that of 1837, it being a continuation of a cold period commencing in March; it was succeeded by a fine warm summer, in which there was a good crop of fruit, especially apples. The month of May was very cold also in 1845, 1855, 1876, 1877, and 1879 (specially cold); it was considerably above the average temperature in 1822, 1833, 1834, 1841, 1847, 1848, 1865, and 1868. It is now nearly twenty years since we were favoured with a warm May. Sir Joseph Paxton did not consider a hot May as particularly favourable for vegetation. There is then often a great development of insect life, which—a occurred in 1846—may do much damage later on.

The average height of the barometer varies from 29·896 at the Shetland Isles, to 30·011 at Scilly. In Herefordshire 29·99 would be very near the mark.

The average rainfall during the month varies but little in different parts of the country, ranging from 1·66 to 2 inches, except in the west of Ireland and Scotland, where it amounts to 3 inches. At Ross the average is just 2 inches.

The mean temperature varies from 45·9° at Sumburgh Head, Shetland Isles, to 52·6° at Scilly. At Ross it is about 52°.

All deciduous trees, with the exception perhaps of the mulberry, come out into full leaf for the most part by the close of the month. The hawthorn flowered this year about May 20, or nearly a fortnight later than the average; one year I recorded it in blossom on April 20. With all its changes from heat to cold, May is still one of our most enjoyable months, and the time perhaps when the woods appear in greatest beauty and luxuriance.

2. *Summary of the Weather during the recent Winter and Spring.*

From July 29, 1885, to March 18, 1886, inclusive, the weather was almost continuously cold. This perhaps will be best illustrated by the fact that only six out of the consecutive thirty-three weeks were above the average temperature, and none were so between January 3 and March 20. The only comparatively warm periods were the ten days ending December 4, and the five days ending January 4. Snow fell at the end of September, earlier than had been previously observed this century. Frosts occurred on the ground every night from January 5 to March 18 (72 days), except January 29, 30, and 31, and February 13 and 14; at four feet from the ground they were continuous from February 15 to March 18 (31 days). The absence of warm days may be understood from the fact that there was no day between January 3 and March 19 when the thermometer reached 50° in the shade, whereas in 1884 there were 39 days of 50° or above.

The breaking up of the frost was succeeded by a week of very warm weather, the temperature rising to as much above the average as it had been below it, that of the week ending March 27 being 9° in excess. The next week was not quite so warm. April was rather cold, except from the 23rd to the 28th, on which last day a marvellous change to cold occurred, with a sudden shift of wind to N.E. The first week in May was delightfully warm and fine, but with that exception, and an occasional isolated warm day, the temperature has been below the average up to the present time, the greatest deficiency of late occurring between the 13th and 18th of June.

The winter was not, however, remarkable for severity of frost, the only very low reading being 8.6° on the night following the great snowstorm of January 5th and 6th. The Wye did not bear for skating even on the sides, but the number of days on which the sport was enjoyed on the meadows was very considerable. Probably a depth of snow in the aggregate of three feet fell last winter, or more than we have had since 1865, when about the same quantity fell.

As regards the rainfall. August, September and October, 1885, had about an average. November was wet, the Wye being in flood on December 1st from the heavy rains of the previous week and the melting of mountain snow. From December 6 to January 2 less than half an inch fell, which is extraordinarily little for that time of year. January (from the heavy snow falls) yielded over five inches. February and to the middle of March was very dry. From March 16 to June 2 no less than 12½ inches fell, making a total of 18.98, or nearly 19 inches since January 3, a period of exactly five months—the average fall being 11 inches, the most recorded previously being 16.20 in 1869, and the minimum 7.23 in 1864.

3. *The Great Rainfall of May 12 and 13, 1886.*

We now come to the great rain-storm of May, 1886. During the week ending May 8th, there was a gradual increase of temperature over Western Europe and over England, the rise being as much as 18°. On May 7th, temperatures of from 73° to 76° were recorded, but during the same time the weather continued very cold over Eastern and Central Europe.

The conditions immediately preceding the great rainfall were the formation of two areas of high pressure, known as anticyclones, one to the north of our islands, and the other over Spain. On the morning of Tuesday, the 11th, a depression had advanced from Spain over the north-west of France, which by Wednesday the 12th had grown much deeper, bringing with it considerable decrease in temperature over England, with easterly winds; rain had set in over the Midland Counties, and by 9 a.m. 23 had been registered at Ross, the centre of the depression being at this time situated between Cornwall and Ireland, with heavy rain at Holyhead, Liverpool and Pembroke. On the next morning—Thursday, the 13th—there was a long band of low pressure extending from the Dutch coast across the South of England and the English Channel with three distinct minima, but as this advanced to the eastward and became filled up, the rain ceased, and the barometer rose.

In "Symons' Monthly Meteorological Magazine," there is a map showing the amounts which fell in different localities during this period. From this it appears that the point of greatest fall was in South Shropshire, the amounts gradually decreasing in all directions from this centre; thus in the North of England and in Scotland they had scarcely any rain, and in London only about $1\frac{1}{2}$ inches, and in the mountain districts of North and South Wales, where there is generally a heavy fall, it was not particularly remarkable. Mr. Symons remarks: "Falls of upwards of 4 inches recorded in Monmouth, Hereford, Worcester, Radnor, Shropshire, Denbigh, and Derbyshire."

In the three days—May 11, 12, 13—the total fall at various localities was as under:—

Burwarton, Shropshire	..	..	..	..	7.09
Much Wenlock	...	...	...	...	6.40
Church Stretton	...	...	...	...	6.32
Bishop's Castle	..	...	...	...	5.62
Abergavenny	...	...	...	...	5.09
Orleton, near Tenbury	...	...	...	...	4.63
Leominster	...	..	...	...	4.53
Hereford	...	...	...	...	4.36
Chatsworth, Derbyshire	...	...	...	...	4.30
Malvern...	...	...	..	...	4.05
Chester	...	...	...	...	3.54
Ross	...	...	...	...	3.38
Gloucester	...	...	...	..	2.70
Llandrindod	...	...	...	...	2.24
Pembroke	...	...	...	...	2.18
Weston-super-Mare	...	...	..	...	2.17
Llandudno	...	..	...	...	2.12
Oxford	...	...	..	...	2.08

From May 10 to June 2 (24 days) there fell at The Graig, Ross, 6.71 inches—quite four times the usual quantity—and at Church Stretton 10 inches. There is no other May (and the record goes back in Herefordshire to 1818) which approaches this in amount. In 1782, however, it is recorded that 12 inches fell in the months of April and May, but the locality is not stated. In 1811, on May 27, a most violent storm of thunder, hail, and rain occurred at Hereford, and extended eastwards to Worcester; this storm is said to have caused a rise in the Severn at Worcester of 20 feet in 24 hours, which however seems scarcely credible.

The floods which followed the excessive downpour of rain in May of this year were very remarkable, especially because (as we have just stated) their occurrence at this time of year is so rare, and in the region of the greatest rainfall they far exceeded all previous experience.

The bridges of the Shrewsbury and Hereford Railway over the Corve, near Ludlow, and the Onny, at Onibury (both usually quite small streams), were carried away, as was also the bridge of the high road over the Onny at the latter

place. At Church Stretton the hills were in places deeply gullied, and the water rushed through the village in a regular river, the railway station and lines being submerged. Perhaps the most extraordinary floods were those which affected the river Teme and the Severn in the neighbourhood of Worcester. The Wye, the Usk, and the upper reaches of the Severn—although in high flood—were not, comparatively, nearly so much affected.

As regards the river Teme, I am indebted to the kindness of Thomas H. Davis, Esq., of Orleton, near Tenbury, who has been a very close and accurate observer of meteorological phenomena for 56 years, for the following very full account of the flood, together with comparisons between it and those of previous years. He writes under date of June 8th, 1886 :—

“On Tuesday the 11th of May, after a dark and gloomy day, small rain commenced falling about 5 p.m. and continued, with slight intermissions, till 10 a.m. on the 12th. A thick steady fall of rain then set in, which continued without interruption till 10 a.m. on the 14th, when it ceased, and before 1 p.m. the sun shone out, disclosing the Cleve Hills, with the Welsh Mountains covered with snow, and the valley of the Teme filled with an immense flood.

“The following is the amount of rain that was registered here on five successive days :—

						Inches.
“ May 10...	...	...	...	...	...	0·140
„ 11 ..	...	...	...	...	...	0·280
„ 12...	...	...	...	...	...	2·225
„ 13...	...	...	...	...	...	2·120
„ 14...	...	...	...	...	...	0·010
						<hr/>
			Total...	...	...	4·775
						<hr/>

“The rainfall on the 12th and 13th is the largest fall in two successive days that I have recorded here in 56 years. The nearest approach to it was in July, 1834, when 4·585 inches fell in four days, but the greater portion of this fell on the first day with thunder.

“On the 14th, the flood on the river Teme was four feet higher than the great flood of November, 1852, and higher than it was in the greater flood of 1795, and in the still greater flood of 1770. At Tenbury the flood-water was five or six feet deep in the principal streets, and all postal communication was cut off. Great damage was done to the shops, and one man was drowned in his kitchen. The water rose above the seats in the parish church. All communication between the two sides of the valley was cut off for more than 20 miles. The railway bridge on the Worcester and Malvern line was swept away, and several of the other bridges across the river were rendered almost impassable, especially the iron bridge at Stanford.

“On the 15th, the river Severn at Worcester rose above the mark of the great flood of 1795, and at Severn Stoke, below the junction of the Teme, it was still higher.

“As my daily record of rainfall commenced on the 1st of January, 1831, and has continued ever since, the following extracts may be interesting in connection with great floods.

“The fall of rain on five days in November, 1836, was as follows :—

Inches.	
Nov. 26—0·400	
„ 27—0·150	These quantities were taken
„ 28—0·345	at 9 a.m. and entered on that
„ 29—0·790	day, not on the previous day.
„ 30—0·240	
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Total ... 1·925	

On the 30th the flood on the River Teme at Stanford Mill was 6 inches higher than the one on the 7th September, 1821, and was the highest since 1809.”

“The fall of rain on 5 days in July, 1839, was as follows :—

Inches.	
July 27—0·250	
„ 28—0·075	Entered on the day of regis-
„ 29—0·010	ter and not on the previous
„ 30—0·645	day.
„ 31—1·500	
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Total ... 2·480	

This flood occurred before the end of the hay harvest, and great quantities of hay were washed off and lodged against the fences, and many fields of grain were spoiled. At Tenbury the streets were flooded to some extent, and the water entered several of the houses. The river was much higher than it was in the flood which occurred in the hay harvest in 1799; about 7 inches higher at Stanford Mill than it was in 1809; 15 inches higher than it was in 1815; 18 inches higher than it was in September, 1821; and 8 inches higher than it was in 1836; but 24½ inches lower than it was in the great flood of 1795.”

“In November, 1852, the rainfall on 9 days was as follows :—

Inches.	
Nov. 5—0·415	
„ 6—0·290	
„ 7—0·285	
„ 8—0·400	Entered on the day of regis-
„ 9—0·180	ter and not the day previous.
„ 10—	
„ 11—0·900	
„ 12—1·490	
„ 13—0·430	
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Total ... 4·390	

On the 8th the river Teme overflowed its banks and then retreated, but on the 13th the flood rose to within $13\frac{1}{2}$ inches of the height of the great flood of 1795, and was about 11 inches higher than that of July 1839, at Stanford Mill. The principal street at Tenbury was covered by the flood-water to a depth of 30 to 34 inches in places, and a great number of the houses were flooded."

At Worcester the flood of this year, 1886, reached a height 2 inches higher than in 1795, and only $2\frac{1}{2}$ inches lower than in 1770, which last exceeded by 10 inches the memorable one of 1672; the great flood of 1852 was 5 inches lower than that of this year.

At Gloucester—some 30 miles lower down the Severn—the height of the lock-gauge was 22ft. 3in., or three inches lower than in November, 1852, and $4\frac{1}{2}$ inches lower than in 1770.

At Ross the Wye rose to a height of about 14ft. 3in. above lowest summer level, being 2ft. 9in. below the flood of 1852, and nearly 4ft. below that of 1795, which latter appears to have been the greatest flood on the Wye of which we have any record.

The times of maximum flood at various places appear to have been approximately as follow (arranged chronologically):—

May 13, night, Church Stretton.

„ 14, 2 a.m., Welshpool; 4 a.m., Tenbury; noon, Shrewsbury.

„ 15, 1 a.m., Worcester; 7 to 11 a.m., Ross; 11 p.m., Tewkesbury.

„ 16, 11 p.m., Gloucester.

Dyde's "History of Tewkesbury" mentions high floods on the Severn in the year 1587 (July 19th), when a sudden inundation overflowed the meadows to such an extent that the inhabitants were compelled to leave the loaded carts behind them as they went to gather the hay, and so great was the accumulation of hay that "the townsmen were constrained with pitchforks and long poles to stand on the bridge of wood to break the cocks lest the bridge should be carried away by the force of them." In 1610, there was another flood; and again in 1640, when there were no less than eight floods between Midsummer and Michaelmas. On December 23rd, 1673, so great was the flood that the water came into the chancel of the Abbey Church, and was the highest the oldest inhabitant could then recollect. The years 1721 and 1722 were times for floods, and again in 1727, when there were no less than 20. With respect to 1754, there is an entry as follows:—"In this year there were nineteen shuts of water, which stopped the town mills an hundred days." But in the year 1770 there seems to have been the highest on record, and (like the present one) it reached its highest point on a Saturday, for on the 17th November we gather from Bennett's "Register and Magazine" that a Mr. Havard embarked near the turnpike in the High-street (by the Bear Inn), and made a voyage round the town, a journey which with its exciting experiences took him and his companions nearly three hours to accomplish. The south aisle of the chancel of the abbey was then partly under water, and Dyde observes that "two houses near the mills were washed down." In 1789 there was another high flood, boats being employed on the long bridge to

convey passengers over it. The floods of more recent dates have been equally numerous and very disastrous.

From the various particulars which I have now given, it will be seen that the late floods have been memorable and extraordinary in the highest degree, and in this respect form a fitting sequel to the prolonged and severe winter which preceded them.

Woolhope Naturalists' Field Club.

THE third Field Meeting of this year took place on Friday, August 20th. The object of the meeting was to view the remarkable "Valley of Elevation," of the district of Woolhope, which has acquired fame in the geological world by the writings of Humboldt in his "Cosmos" (Vol. v., p. 231, Bohn's edition), Sir R. Murchison in his "Siluria," Rev. W. S. Symonds in his "Records of the Rocks" and "Old Stones," and many other geologists. The district is so familiar to the older members of the Woolhope Club as to receive too often by them only a passing notice, owing to their—we regret we must say it—delusion, that the younger members have all made themselves acquainted with the records of these intensely interesting Silurian rocks, wherein those lovers of nature whose labours have revealed so much of the outcome of the stupendous agencies which operated around us, have left, as the fruits of a human lifetime, so large a foundation whereon to build. The party assembled in carriages opposite the Woolhope Club Room of the Free Library. They travelled through Lugwardine, Bartestree, and Dormington, along the Ledbury road, upon the rich alluvial soils of the ancient Wye and Lugg rivers, which soils overlie the lower Old Red Sandstone. In the low level and the high level drifts of this locality, relics of the ancient Lugg, and larger ancient Wye, rivers interspersed with lakes, molars of mammoth, rhinoceros, horse, bison, and Irish deer have been found in excavations which were carried on under the observation of the late member of our Club, Mr. Curley, C.E., and have been named by the Rev. W. S. Symonds—who has observed these ancient high level drifts upon the top of the hill at Hagley (Lugwardine) on the right of the main road and at Wilcroft upon its left, at an elevation of more than one hundred feet above the rivers Lugg and Frome. On page 166 of his "Records of the Rocks," 1872, he says: "This drift was evidently transported from the north-east, and not from the Woolhope country hard by. It is not merely a high level Lugg drift, but it appears to have been deposited by a broad stream which flowed from the Church Stretton district, partly, and only partly, in the direction of the existing Lugg. . . ."* Again, in "Old Stones," page 83 (1880), "Boulders, a ton weight, of Caradoc conglomerate from the north were found here, and with them masses from the Clew Hill basalt." Shucknall Hill, a conspicuous elevation about two miles further north-east, is a mass of Aymestrey rock which has been faulted on edge through the Old Red Sandstone. Bartestree is interesting because

* The deposit has been quarried largely at Hagley, and Wilcroft, and has rendered to searchers the teeth of the fossil horse (*Equus fossilis*), and a worn molar of *Rhinoceros tichorinus*—*Records of the Rocks*, p. 166.

of a dyke of volcanic trap rock (greenstone) having been forced, as seen in a quarry at Loose Hill, about a quarter of a mile south of Bartestree Chapel, through a fissure in the Old Red; whilst at Hagley Dome, about a quarter of a mile further north, and a hundred yards west of Hagley House, the upper Silurian formation is found protruding through the Old Red Sandstone. (For geological section of this district see article "The Silurian Rocks of Hagley Park," on page 167 of Woolhope Club Transactions for 1870; also "Geology of the Woolhope District," by Rev. Robert Dixon, page 170, et. seq. for 1867.)

The facts (1.) of the directions of the trap dyke at Bartestree and the faulted edge at Shucknall being both from W.S.W. to E.N.E.; (2.) of the parallelism of this break with the fault at Mordiford; and (3.) that a line drawn through Gorsley Common through Haugh Wood and Old Sufton would—if prolonged two miles N.W.—pass through Bartestree Dyke and Hagley Dome, lead to the supposition that they all occurred under the same exciting causes: it may be simultaneously.

Our party quitted the carriages a short distance beyond the sixth milestone from Hereford, at an altitude of 234 feet above sea level, and, walking up Perton Lane a distance of a few hundred yards, were joined by the Rev. Wm. H. Lambert, Mr. Lambert, Rev. A. G. Jones, and Dr. Wood; and later on by Mr. H. Wilson, President of the Malvern Field Club. On arriving at Perton Quarry, opposite Perton Farm, we espied our President (who had driven from Ledbury), hammer in hand, busily engaged in search of fossils in this disused quarry, which, he informed us, was of the Upper Ludlow formation, and the very outer-most part of the Woolhope upheaval, and here in the top beds of Upper Ludlow shales might be found *Pterygotus Banksii*, *Eurypterus Brodiei*, and other rare fossils, while the inferior beds would yield abundance of *Chonetes lata*, with an occasional *Homalonotus delphino-cephalus*, *Theca*, &c. After spending some time here, the most noteworthy fossils unearthed were, perhaps, a good specimen of the bivalve *Orthonota impressa*, with its hinge distinctly marked, which was found by Mr. W. H. Harrison, and some very well marked examples of the typical fossil, *Chonetes lata*, and the pretty little *Lingula* named *Symondsii*, after the Rev. W. S. Symonds. Quitting these strata of Downton Sandstone and Upper Ludlow, and ascending the hill by the same lane, we found ourselves in a cutting through what our President termed the Middle Ludlow, or Aymestrey limestone, where half-an-hour was occupied in trying to break the very hard nodules which were here found in great quantities, of a size from a pigeon's egg to that of a barnacle, and of which nearly every one contained a nut-brown *Lingula Lewisii*, or other characteristic fossil, sometimes found in a very well-preserved condition. This *Lingula* is much larger than the *Lingula Symondsii*, and is the typical fossil of the formation. *Euomphalus carinatus*, *Spirifer plicatellus*, *Atrypa reticularis*, *Meristella tumida*, and *Rhynchonella Wilsoni*, with several *Terebratulæ*, were also found. Still further ascending a hundred yards, we observed and visited a fine quarry on the right-hand side, distant only a few score yards from the lane, of Aymestrey limestone, which forms a wall around the greater part of the Woolhope Valley, extending from the rock whereon we stood, away above Tarrington and Putley, and by Marcle Hill right down to Oldbury Camp.

When we arrived at Cop Grove, distant only about three-quarters of a mile from where we had left our carriages, the President in his carriage proceeded along Lady Emily Foley's private drive towards our next trysting place, St. Ethelbert's Camp, on the summit of Backbury Hill, whilst the geologists and botanists made a circuit through the woods round by Wootton Farm, bearing first in a southerly direction for a short distance, leaving the gamekeeper's cottage in the dell below, and the elevation of the Cocksfoot (630·5 feet above sea level) above, both on their left hands; then, descending the hill upon the southern side, halted at the Dormington Quarries of Wenlock limestone, and the disused limekilns there, before turning in a westerly direction to the Wootton Farm, where the geologists regaled the inner man with the excellent produce of the dairy before again ascending the hill towards Backbury. Upon arrival on the plateau and at the main carriage drive, crossing the road here, entering and traversing the adjoining large field upon the right, we were conducted to the site of the extraordinary landslip of Tower Hill, on the Claston estate, in the parish of Dormington, which occurred here in 1844 (see Woolhope Club Transactions for 1867, page 180), where more than three acres of ground, bearing forty oak trees, slipped a distance of 200 yards: Sir Charles Lyell visiting the landslip shortly afterwards, in company with Mr. Symonds, found here very plentifully the fossil *Pentamerus galcatus*. Retracing our steps towards the main road, and regaining the private carriage drive where we had quitted it, we now resumed the ascent, and soon found ourselves entering St. Ethelbert's Camp by the ancient original entrance at its north-eastern angle: we explored the outer trench on its northern side, returning by the inner trench, and at the southern extremity, upon dislocated masses of Aymestrey limestone, at a height of 738·6 feet above sea level, with occasionally a yawning chasm underneath our feet upon the site known as Adam's Rocks, assembled to hear the President's address.

Upon first approaching this spot, the unexpected and rugged escarpments coming suddenly into view, presented a somewhat alarming aspect—the party having only a few minutes ago inspected the landslip at Dormington, and, being informed that country traditions ascribe this landslip from the southern end of St. Ethelbert's Camp to the period of the earthquake at the Crucifixion, when also the Scyridid Vawr—the great fissure—near Abergavenny, was rent in twain; and upon being told that at a distance of about two and a half miles, as the crow flies, towards the south-west of the ridge upon which we were standing, was the site of the landslip near Putley in 1575 which is called “The Wonder,” of which quaint notices may be found in “Silurian System” (Woolhope Transactions, page 180, of 1867); with all these surroundings of convulsions we may be forgiven a small amount of alarm, and excused for joining with Phillips in his reflections in his “Cyder” :—

“’Tis unsafe to trust
Deceitful ground; who knows but that once more
This mount may journey, and, his present site
Forsaking, to thy neighbours' bounds transfer
The goodly plants, affording matter strange
For law debates?”

The presence of ladies placidly seated within a few feet of the chasm before referred to reassured us—for here some ladies met the party, as also one of our members, Sir Herbert Croft, and a party of visitors. These landslips are not due to volcanic agency; they are not the result of earthquakes, but are due, either to the powerful hydraulic pressure of water which has penetrated into fissures in the rocks and soils, or perhaps in some cases to the expansive power of water when transformed into ice, but are chiefly attributable to water acting upon an unctuous clay—Walker's earth—lying between adjacent rocks which have a dip of inclination upon each other. Bands of impure Fuller's earth frequently occur in these formations, and are calculated to lead to unfortunate results.

Mr. Piper now delivered his address, and by his familiarity with this—by him—well-trodden and examined ground, together with the aid of diagrams which he supplied to the members, supplemented by his clear explanations, rendered the subject so interesting to his hearers as to teach them that geology consisted in something more than collecting fossils to put upon their shelves, for he led them to observe the wonderful processes of Nature in forming the hills and valleys and soils upon which we had been treading, and of which we now saw such a charming landscape. Pointing to Haugh Wood (*ho, hoo, how, haugh* being Scandinavian for a hill or barrow) and Broadmoor Common, Mr. Piper explained how the upheaval of the Upper Llandovery beds, now on the surface there, had disturbed the previously existing continuous surface of overlying formations by being protruded through these latter, and forcing them aside at various dips, and in their regular stratification as accepted by geologists, had produced this almost circular ridge, of which we had so favourable a view, whilst the existence of the valley was accounted for by the denudation of the softer shales and material, an outlet being left between the hills by means of the great geological fault above the village of Mordiford, where, may be—as our President not very seriously suggested—the last representative Saurian monster, on the gradual conversion of the beds, drying up of lakes and river, now represented only by the small brook, the Pentaloe, came down to quench his thirst in the ancient and greater river Wye, thus giving foundation to the tradition of the Dragon of the locality. Mr. Henry Wilson, President of the Malvern Naturalists' Field Club, proposed a vote of thanks to Mr. Piper, which was accorded by the members.

Before leaving this position, a plan, upon a large scale, of St. Ethelbert's Camp was exhibited by Mr. H. C. Moore, showing the camp to have been doubly entrenched upon the north side, and oblong rather than circular in shape; the landslip has occurred upon its southern side, and at the south-easterly angle, whilst the area of the camp is about four acres, it being at the present time about 145 yards from north to south, and 145 yards from east to west. Tradition has it that Ethelbert, King of the East Angles, proceeded from this camp to that of "Ofa the Terrible," King of Mercia, at Sutton Walls, when courting his daughter, Etheldritha, he was murdered, A.D. 792, by his queen, Quendritha.

The members now made their descent by various routes, and in their different pursuits, towards the Church at Mordiford, where the President read a

paper on the history of the Manor of Mordiford, and pointed out that from the Norman Conquest in 1066 to the present time, it had been held by two families only—viz., Ferrers and Hereford. In the porch on the south side of the church is inscribed a record of the remarkable flood of May 27th, 1811, of which a report may be read in the Woolhope Club Transactions for 1867, page 178, and in the *Hereford Journal*, May 29th, 1811. The painting of the Green Dragon of local tradition before referred to, used to be on the outside of the west wall of the church until its restoration about 1811. There is a Norman arch over the south entrance door from the porch. A large Norman buttress is still to be seen at the east end of the church on the southern extremity, and a smaller buttress of Norman work is also against the south wall of the church externally. Before the carriages were resumed at Mordiford, the botanists of the party, who had been busy all day, met, and upon comparing notes, found that they had experienced a grand field day. Someone suggested facetiously that a list might be made by obtaining a London catalogue, and striking out what they did not find:—A few only will be mentioned, but prominence must be given in the first place to *Gentiana amarilla*, *Dianthus armeria*, and *Epipactis palustris*; to which may be added the following:—*Viburnum lantana* and *Opulus*, *Epipactis latifolia*, *Paris quadrifolia*, *Aquilegia vulgaris*, *Listera ovata*, *Chlora perfoliata*, *Circea lutetiana*, *Centaurea nigra*, *Cyanus*, and *Scabiosa*, *Lythrum salicaria*, *Echium vulgare*, *Camp-panula trachelium* and *rotundifolia*, *Vicia cracea*, *Sylvatica*, and *Hirsuta*, *Daphne laureola*, *Melilotus alba*, *Cichorium intybus*, *Veronica serpyllifolia*, *Lysimachia nemorum*, *Euphorbia amygdaloides*, and *Cyparissias*, *Conyza squarrosa*, *Dipsacus fullonum* and *pilosus*, *Malva moschata*, *Solidago virgo-aurea*, *Verbascum thapsus*, *Sherardia arvensis*, *Melica uniflora*, *Hypericum perforatum*, *Androsæmum*, and *hirsutum*, *Scabiosa succisa* and *Columbaria*, *Knautia arvensis*, *Thlaspi perfoliatum*, *Borago officinalis*, *Calluna vulgaris*, and a host of others. Amongst the ferns:—*Asplenium adiantum nigrum*, *Trichomanes* and *Ruta muraria*, *Aspidium filix femina* and *Filix mas*, *Scolopendrium vulgare*, *Aspidium dilatatum*, etc.

The following formed the party:—Mr. Piper (President), Mr. H. Wilson (President of the Malvern Field Club), Sir Herbert Croft, Bart., Dr. Wood, Revs. Jones, Holloway, Horton and friend, W. H. Lambert, Orgill, Pelly, and Warner; Messrs. Bainbridge, Carless, Clarke, Harrison, Martin, Moore, and Roberts. Visitors: The Misses Herbert, Admiral Dorville, Mr. Paul Foley, Messrs. W. T. Carless, Lambert, E. Roberts, and two sons of Sir Herbert Croft.

The following paper was read by the President (Mr. G. H. PIPER, F.G.S.), on

M O R D I F O R D.

THE name of this place is probably of British origin, and may have been derived from Mae'-r-dwy-fford (the place on the road by the two waters), which view is supported by the fact that the old residents usually pronounced it "Mardiford." Or, it may be a modified form of Mord-gwy-fford, or Mawd-dwr-ford, meaning the passage or way through the muddy or over-flowing water. The word "More" is frequently a corruption of "Mere," a pool, and the name may come from the mere or marsh formed at the junction of the rivers Wye and Lugg.

At the time of the Norman invasion the Manor was held by Aluit, a free Saxon, by lease, from Ethelstan, Bishop of Hereford, to which See it belonged. William I. gave it to Henry de Ferrers, a Norman baron of great wealth and position, who fought at Hastings. He was the possessor of many other manors and lordships, and was conspicuous as one of the seven Commissioners who had charge of the great Domesday Survey in the year 1086.

At that time the rental of the Manor was assessed at £3, the value having been the same in the reign of Edward the Confessor. In many manors a depreciation in value may be observed, the value having been greater in the time of the Saxon monarch. King Stephen defeated David King of Scotland at the battle of Northallerton in 1138, and for his valiant services there Robert de Ferrers, son of Henry, was created Earl of Derby. This great family held high offices in the State until the time of Henry III., when Robert de Ferrers, eighth and last Earl of Derby of that line, having displayed persistent animosity to the King, his castles and lands were declared by the Parliament to be forfeited, and were granted to Prince Edward, who had before that time wasted his manors and lands in Derbyshire and Staffordshire, and destroyed the Castle of Tutbury, his principal residence.

The disloyalty of Robert de Ferrers had been punished by three years' imprisonment, when it was arranged that the Prince should restore the castles and estates on the payment of the sum of £50,000, which sum was guaranteed by eleven great barons, to whom the Earl conveyed his estates by way of counter security. One of these friends was Sir Bartholomew de Sudeley, of Sudeley Castle, near Winchcomb, then High Sheriff of Herefordshire; and, as money was not forthcoming for the redemption of the estates, they eventually became fully vested in the Prince, and still form part of the Duchy of Lancaster. Sir Bartholomew de Sudeley was instrumental in conveying the Manor of Mordiford to Henry de Hereford, ancestor of the ancient family of that name who still possess the Manor and estates. The Herefords were settled at Mordiford before the compilation of Domesday, and as early as the reign of Edward I. Roger de Hereford, son of Sir Henry de Hereford, held lauds there by soccage of Ralph

de Daunsey. Walter de Hereford was Sheriff of the County in 1155, and Thomas de Hereford was Sheriff in 1225. Another Sir Henry was Knight of the Shire in 1352. After the purchase of the Manor by Henry de Hereford it was holden of the Crown *in capite* by presenting the King with a pair of gold spurs when he should ride over Mordiford Bridge, instead of by soccage tenure as theretofore it had been. Nicolas de Hereford, born in 1330, was a prominent supporter of Wickliff, and assisted in the first translation of the Bible into the English tongue, but eventually became a member of a Carthusian Monastery at Coventry, where he died. Roger Hereford, who died in 1561, had increased his paternal inheritance from 400 acres to 1,300 acres, as appears by the inquisition taken in the fourth year of Elizabeth, after his decease, by the suppression of the Chantries of Mordiford and at Newton, and the Chantry of Saint George in the Cathedral Church of Hereford. His descendant, Roger Hereford, held possession during the Civil Wars, siding with the Parliament. His father paid a fine of £10 to escape knighthood at the Coronation of Charles I. Francis Hereford, son of Roger Hereford, a merchant of Dunkirk, left several children. Roger Hereford, a younger son, became naturalized in the Netherlands. These gentlemen are credited with having procured in Flanders, for Lord Scudamore, the cattle from which the celebrated herds of the county are descended. John Hereford was Sheriff of Herefordshire in 1700, and died during his year of office. His son, Roger Hereford, married Frances, granddaughter of Sir Edward Hopton, Knight, of Canon Frome, and was succeeded by his eldest son James, who, when Sheriff of Herefordshire, in 1761, presenting an address from his county on the Accession of George III., received the honour of knighthood, and dying without issue, in 1786, devised his estates to the eldest son of his eldest sister—James Caldecott, of Holmer House, and to his heirs male, requiring them to assume and use the name and arms of Hereford. The Manor and estates have been holden by this family for more than 500 years, and in addition to many Sheriffs and several Knights of the Shire, it includes two names of more than local reputation. Roger de Hereford, “an excellent astronomer,” was “one of the prime promoters of learning in the University of Cambridge, in 1170,” and Nicolas de Hereford, the coadjutor of Wickliff.

The bridge over the Lugg at Mordiford village must have existed in the 14th century, although the precise date of its erection is unknown, for in the year 1515, the Bishop of Hereford granted his license to Thomas Parke, of Mordiford, to collect alms towards the repairs of the bridge. At a later period of the same reign, Leland states:—“There were seven bridges over Lug, one of stone, the biggest of all was a littell above the confluence of Wye and Lug at Mordiford.” The present bridge, with its causeway, is 164 yards in length, the river being crossed by two stone arches.

The advowson of Mordiford Rectory was given to the Abbey of Gloucester and to its Priory of St. Guthlac, by Henry de Hereford; and, on the suppression of religious houses was granted to John ap Rice, a member of the Royal Household. At the close of the 17th century it was purchased by Paul Foley, Esq., M.P., with whose successors, at Stoke Edith, the patronage has since remained.

In the porch of the Church is the following inscription cut in stone :—“ On Monday, the 27th day of May, 1811, between the hours of 5 and 9 p.m., the village of Mordiford was visited by a tremendous storm of thunder, lightning, wind, and rain, by which the little river Pentoloe was swollen in some places to an extent of 180 feet in width, with a depth of 20 feet. In passing the village it swept away a large barn and cider-mill and a cottage adjoining, when William Husbands, miller, Ann Edwards, his niece, Elizabeth Greenly, widow, and her infant child, Jemima, were drowned. Just above the said village, on the road leading to Woolhope, many hundred tons of rock were blown up and carried through the said village, by which several of the houses of the inhabitants were much injured and the gardens nearly destroyed. A subscription was promoted for the principal sufferers, and a sum of eighty pounds was collected and distributed among them in proportion to their respective losses.—CHARLES JOHN BIRD, A.M., Rector of Mordiford.”

Judge Cooke in his 3rd volume of *Duncumb's History*, gives the following particulars relating to

[THE DRAGON OF MORDIFORD].

“The form of an animal, supposed to represent a dragon, was depicted on the west end of this Church from a remote date until 1811, when, obliterated during repairs to the edifice, it was not renewed. In A.D., 1670, Mr. Blount observed “On the wall of this Church a serpent is pictured with this inscription :—

This is the true effigies of the strange
 Prodigious monster, which our woods did range.
 In Eastwood it by Garson's hand was slayne,
 A truth which old mythologists maintayne.

“In 1799 an intelligent tourist, visiting this neighbourhood remarks, ‘The end of the Church of Mordiford is decorated with a painting of a large Green Dragon ; an ornament so unusual and seemingly unconnected with the nature and design of a place of worship, naturally excited our curiosity, which after some inquiries was gratified. The story was told with great seriousness, and is confidently believed in all its particulars by hundreds, and perhaps thousands, without ever attempting to divest it of the absurdities which oppose credibility. They further told us that the figure on the Church presents the exact size of the dragon, which must have been 12 feet long. Its head is depicted of a very large size, with a terrible aspect, a red mouth, and forked tongue. The wings are elevated and expanded, and it is web-footed.’ Another writer describes its sides as being painted green and gold, having griffin-like wings, with a large and formidable tail.

“The traditional account is that a dangerous animal infested the woody and rocky declivities in this vicinity, and that its ravages resembled those of the famed Dragon of Wantley ; that this animal was destroyed by stratagem, and that its existence was commemorated by the painting. A condemned criminal having promise of pardon, provided he destroyed the monster, is supposed to have accomplished the feat, when the animal was reposing, after his daily feeding, near

the confluence of the two rivers, the victor perishing in the moment of his success from the poisonous breathing of the dying dragon. Such is the popular story of the Dragon of Mordiford, which, like others of a similar description, although interspersed with fable, may possess some fact for its origin. After the advowson was given to the Abbey of Gloucester, its priory of St. Guthlac, in Hereford, frequently provided priests for the services of the parish. The armorial bearings of this priory, in the 14th century, were:—*Gu* a wyvern *pass*: wings displayed, tail nerved, *or*, on a relief 3 mullets, *or*: and a wyvern bearing a resemblance to a dragon; it is probable that the supposed ravenous beast derives its existence from this heraldic device painted by the monks on the walls of the Church, and protected through this legendary fable by generations of credulous rustics.”

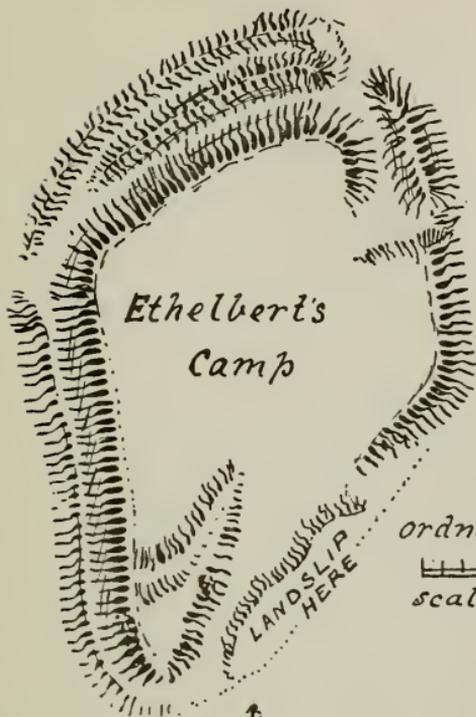
Robinson suggests that the fatal miasma that rose from the stagnant water at the confluence of the rivers Wye and Lugg found embodiment at a later date in the legendary dragon, whose poisonous breath destroyed all that came within its range. Dingley, in his history in marble, gives a lively sketch of the monster:—This drawing was made in the latter end of the 17th century. There must have been in England, at some period, a “survivor” of the great Saurian family. The Ichthyosaurus, Plesiosaurus, and others were marine monsters, but the Dinosaurs, or gigantic land-Saurians were eminently fitted for terrestrial life. Of these, the iguanodon attained the length of 60 or 70 feet, and was massive in proportion. The hylæosaurus reached to barely half that length—both of these were herbivorous, that is, they fed on forest trees amongst other dainties—but the megalosaurus, or gigantic lizard, was of enormous magnitude, and highly carnivorous. There were also pterosauria—winged lizards—with great bouy heads, long jaws, and many sharp-pointed teeth, with 20 feet expanse of wing; and many other creatures of huge proportions and enormous strength. Although there is no proof that these creatures existed after the glacial epoch, yet, inasmuch as representatives of the chelonia of the Trias; the crocodilia of the Lias; the lacertilia and batrachia of the Oolites; and the ophidia of the Tertiaries, exist at the present time, it may have been possible for some lonely monster of the Saurian family to have outlived all others of its species, and made its home in the swamps of the Lower Lugg, or the outlet of the Woolhope Valley, until a period far more distant than can be reached by the earliest inkling of history, but still within the misty range of remote tradition: and that was “The Dragon of Mordiford”!

Dormington

Hereford

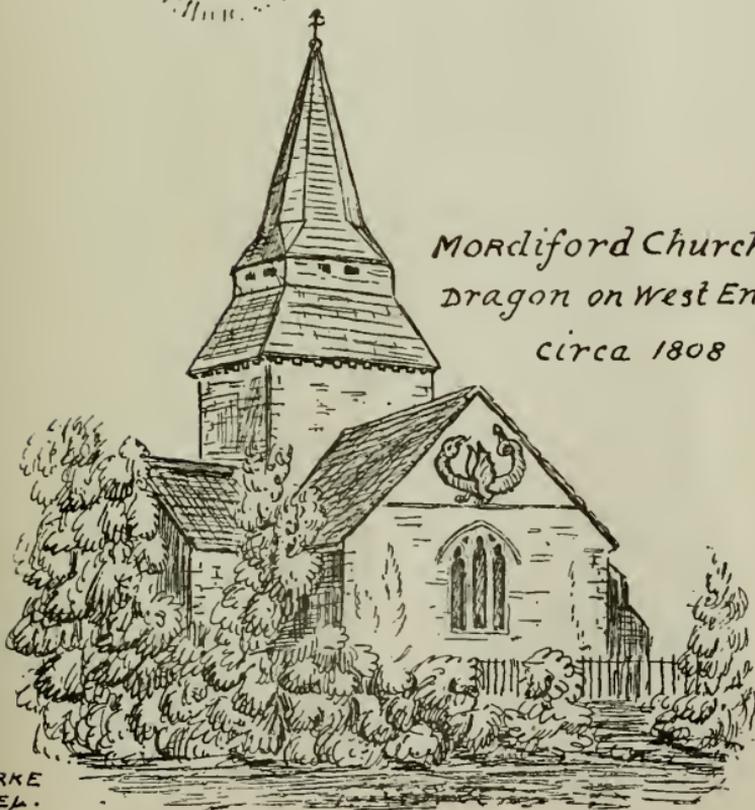
Woolhope Trans.,

1886.



Ordnance Survey
50 100
scale of 100 yds.

Mordiford Church
Dragon on West End
circa 1808





Woolhope Naturalists' Field Club.

FUNGUS FORAY, OCTOBER, 1886.

THE Fungus Foray this year commenced on Monday, October 4th, and the following mycologists, visitors, and honorary members took part in the proceedings:—Dr. Cooke, M.A., LL.D., A.L.S., &c., Rev. Canon du Port, Rev. J. E. Vize, Dr. Carlyle, Dr. Crespi, and Messrs. C. Bucknall, T. Howse, William Phillips, and C. B. Plowright. At 10 a.m. on Tuesday morning the mycologists started for a foray in the Whitfield Woods. The day was fine, though threatening, and the weather forecast predicted “perhaps thunderstorms later in the day.” For the season of the year the temperature was high—the highest temperature registered in the shade from various quarters was reported to be 77°. The party, however, after a pleasant day, returned to Hereford with a fair collection of fungi. On Wednesday, the 6th inst., the foray took place in the vicinity of Belmont House, where, after several hour’s work, the visitors were hospitably entertained by Colonel and Mrs. Lucas. On Thursday, the 7th inst., Mr. F. R. Wegg-Prosser met the visitors at Haywood Forest, where, to the surprise of the party, refreshments were found awaiting them at luncheon time. The Revs. E. J. Holloway and A. Ley, and Mr. H. C. Moore accompanied the mycologists on Tuesday and Wednesday; and Messrs. R. M. Lingwood and H. Southall joined the party on Thursday. Friday was to have been devoted to a foray on the grounds of Mr. Michael Biddulph, M.P., at Ledbury; but, owing to the depression of the barometer, the absence (through illness) of the President, Mr. G. H. Piper, and other causes, the foray was abandoned, and the mycologists returned to their respective homes on Friday. The Woolhope Club Room was open daily for the exhibition and study of the specimens collected. The annual meeting for the election of officers for the year 1887 was held on Thursday, October 7th, in the Woolhope Club Room. The Rev. Wm. Elliot was elected President; Messrs. Bainbridge, Fortey and Southall, Vice-Presidents; and Messrs. H. T. Wharton and Burton Watkins were elected Honorary Members. The subject of a portrait of Dr. Bull for the Woolhope Club Room having been discussed, it was resolved that Messrs. Maull and Fox, of Piccadilly, should be commissioned to execute a permanent carbon portrait—head and bust only—life size, finished in sepia, and in oak and gold frame, enlarged from a portrait in the possession of Mrs. Bull. The vote of £10 10s. was sanctioned for this purpose. After dinner an address was read by Dr. Cooke, and at the soirée at Mr. Cam’s house papers were read by Rev. J. E. Vize and Rev. A. Ley.

This was the nineteenth annual meeting of mycologists at Hereford since the institution of the Fungus Forays of the Woolhope Naturalists' Field Club in 1868. The labour and responsibility of conducting these forays were undertaken by one man; for several years they were unique, but have now been imitated in several places—*e.g.*, Paris, Scotland, Leeds, Epping Forest, &c.—but they have never been equalled. Are the meetings to be allowed to lapse? Can they not be invigorated? For there is no doubt that the absence of the energetic "presiding genius," Dr. Bull, has been keenly felt by all the visitors whom we have been in the habit of welcoming at our autumnal gatherings. Let each member of the Woolhope Naturalists' Field Club resolve what answer he is to give to these questions after he has read the following

ADDRESS

By Dr. M. C. COOKE, M.A., LL.D., A.L.S., &c., at the Fungus Foray
Dinner, October 7th, 1886 :—

"Gentlemen,—There are times and seasons when the most ready and apt amongst us experience a profound difficulty in facing the situation. When courage seems to shrink dismayed from the prospect of an unequal contest. When self-assurance leaves us all trembling and abashed. When the fulness of the heart overpowers all the efforts of the head. To-day, more than ever I remember to have felt, am I conscious of rising to a task and a duty which, were it not a duty as well as a task, I could not have attempted. Even now I should be tempted to relinquish it did I not feel that your sympathies are with me, and that there is not one within sound of my voice whose heart does not throb in unison with my own in the memories of this anniversary. This Woolhope dinner, of which we have so often partaken together, and yet so different from all its predecessors. This Green Dragon room, in which we have met so often with smiling faces, if not with uproarious mirth, and yet to-day our hearts are heavy and we cannot smile. We have eaten and we have drunken, almost in silence, as if a spirit hovered over us, and overpowered us by its presence.

" With a slow and noiseless footstep
Comes that messenger Divine,
Takes the vacant chair beside me,
Lays his gentle hand in mine;
And he sits and gazes at me
With those deep and tender eyes,
Like the stars, so still and saint-like,
Looking downward from the skies.

It is that 'vacant chair' which reveals the secret of the change in the dinner of to-day. It is the consciousness of that unseen presence which is gazing upon us with those deep and sympathetic eyes, that fills us with such strange emotions. Surely we should be less than human if we remained unmoved under the influence of such memories. To those of us who have come from a distance to meet at this annual celebration, the occasion is perhaps more suggestive, more impressive than it may be to those who have trod the streets of this old city for twelve months,

mingled in its sorrows, and its joys, and are beginning to accustom themselves to the absence of that old familiar face, which we as strangers look for to-day in vain. We who take up the current of Hereford life, not from yesterday, but from last year, as it were but yesterday, are the more keenly reminded of all that is missing, and can therefore claim your indulgence for reverting to so painful a theme. Friends have always been permitted to make their voices heard in testimony to the worth of departed friends. Marc Antony was allowed to say of the dead Cæsar: 'He was my friend, faithful and just to me'; and we but quote his words: 'You all did love him once, not without a cause.' And now, although not dreaming that a word from me is necessary, yet this is the first and only opportunity that we have had, who are the non-resident members of the Woolhope Club, to give expression to the feelings which stir within us, and we embrace it for that reason. It would be presumption on my part to assume that I knew more of him, or of his sterling worth, than you, amongst whom the greater part of his life was spent. In this city he needs no advocate, for his deeds speak louder than my words. But there are some reflections which it might not be inappropriate to suggest, and which would probably be more congenial than mere personal allusions.

"I have often felt that, especially in towns and cities of limited size, there are two classes of the community, two professions, which above all others enlist the sympathy and ensure the respect of the rest. These are the ministers of religion, who go from house to house to comfort those who mourn, and carry consolation to the broken-hearted, to speak peace to the troubled, and thus minister to the happiness of mankind. In big cities so much of the self-sacrifice of these men is concealed and smothered from the world, and is only known to the recipients of their ministrations, and the Master who supports them in their labour of love. The other class are those whose study and practice is to diminish bodily suffering, and bring relief to corporeal pain. The latter class had a noble representative in the friend we mourn. To how many of his fellow-townsmen and women, especially amongst the poorest, was he only known as a genial doctor, whose cheerful voice cheered them, and whose practical skill relieved them in the hour of agony! The silent tears which glistened in the eyes of many an aged pilgrim on the road towards Breinton on that memorable noon, spoke an eloquent tribute to the worth of him who was passing slowly to his rest.

"There is one trait of individual character which pertains to no profession, and no rank of life, which may to some extent be constitutional, but which, nevertheless, under good direction, works wonders in a life—and that is, mental and bodily activity. Some men will contrive within the limits of a natural life to perform as much real work as three ordinary commonplace men will accomplish, especially when done with method and for a purpose. It matters not that they have an exacting profession, or a thriving business; there is still plenty of leisure, or rather opportunity, for work in other directions. Need we go further for an example than to the editor of the *Herefordshire Pomona*—who could find exercise for his natural activity in that, and in magisterial duties, endless committees, fungus hunting, listening to the notes of Hereford birds, gathering wild flowers,

entertaining friends, keeping up a large and punctual correspondence, and yet, always ready, and in time, as if he had the least occupation of any man in the city? Who can wonder if, with the loss of such a man, it should seem as if a dozen hands had ceased. Not less influential in the accomplishment of good is earnestness of purpose. There are some persons endowed with a considerable amount of activity, but so volatile, that they are constantly passing from one thing to another, and the power which, persistently directed, would be irresistible, is diffused and lost. Such was not the one who occupied the now 'vacant chair.' If he had immense energy, he had also as much of earnestness. He seemed to appreciate the maxim, 'Whatsoever thy hand findeth to do, do it with thy might.' You who were better acquainted with his local work than a stranger can be, will know whether this estimate is a true one. Whether he would ever think of such a thing as a failure. How so much that he undertook succeeded with him by dint of perseverance, determination, and earnestness of purpose. Whether in hunting up the mistletoe, or tracing a Roman camp, his watchword was always "Forward." His motto was that of the banner with the strange device "Excelsior." And we may say of him, as was said of the Alpine youth :—

"There, in the twilight cold and gray,
Lifeless but beautiful he lay,
And from the sky, serene and far,
A voice fell, like a falling star,
Excelsior !

To many of us he was endeared by personal qualities which belonged to his private rather than to his public life, and hence should only be alluded to in passing. Such, for instance, was his geniality of disposition, his vivacity and cheerfulness, his straightforward integrity, the stability of his friendship, his invariable equanimity, and all the virtues which go to make up a good husband, father, and friend.

"For by the hearth the children sit
Cold in that atmosphere of Death ;
And scarce endure to draw the breath,
Or like to noiseless phantoms flit.

"But open converse is there none,
So much the vital spirits sink,
To see the vacant chair, and think
How good, how kind ! and he is gone.

And now let us pass to some of the members which this life has left behind. It is in the contemplation of the "footprints" which are left in the sands that we gather consolation for our losses, and accumulate strength to keep on our own journey. The life is not lost which leaves enough behind to keep its memory green.

"It will be rather appropriate to allude here to the volume of the Club Transactions for 1867, wherein is printed a paper by Mrs. Key on *Agaricus Georgii*, followed by some observations by Dr. Bull, which resulted in a vote of six pounds for three plates of edible fungi. This seems to have been about the commencement of the study of fungi, and their patronage by the Woolhope Club. In the following year an announcement, of which a fac-simile is given on next page, was printed and circulated, that on Friday, the 9th of

Woolhope Naturalists' Field Club.

1868.

President—DR. M'CULLOUGH.

AN EXTRA FIELD MEETING

WILL BE HELD AT HEREFORD, FOR A

Foray amongst the Funguses,

ON FRIDAY, OCTOBER 9.

It is proposed to have an Exhibition of Funguses at the Mitre Hotel, and Members who attend this Meeting are requested to bring with them a collection of Funguses from their own districts in the morning.

If the weather prove favourable, an Excursion will be made in carriages to visit Holme Lacy Park, by the kind permission of Sir E. Scudamore Stanhope, Bart.,—Caplar Hill and Camp,—and, if time permits on the return, the grounds of Sufton Court.

The carriages will leave the Green Dragon Hotel at ten o'clock—to arrive back again a little before three o'clock, to examine the collection of Funguses.

The dinner will take place at the Mitre Hotel, at four o'clock p.m., when several of the edible Funguses, cooked from the Club receipts, will be served. Tickets 4/- each.

After dinner, a paper on "FAIRY RINGS, AND THE FUNGUSES THAT INHABIT THEM," will be read by Edwin Lees, Esq., F.L.S., &c., to be followed by a discussion on the subject.

Gentlemen intending to be present are *particularly requested* to inform the Assistant Secretary, Mr. Arthur Thompson, St. Nicholas Street, Hereford, on or before Tuesday, October 6th, that exact arrangements may be made.

The cost for carriage conveyance will be 3s. each to gentlemen giving the required notice, but 1/- extra will be charged to those who come without notice.

GEORGE H. CORNEWALL,
Hon. Sec.

Moccas Rectory, Hereford,
Sept. 21st, 1868.

October, 1868, an extra Field Meeting will be held in Hereford for a foray amongst the funguses. This appears to be the inauguration of the now celebrated Fungus Forays of the Woolhope Club. The report of this meeting in the following year records the fact that the Foray was successful under the guidance of Mr. Edwin Lees and Mr. Worthington Smith, and twenty-one persons sat down to dinner. From this time forward the Fungus Foray was an annual institution which has now been continued for 18 years. It has much widened in its scope, and increased in its interest, so that it has gained repute all over Europe, and had many imitators. As far as I am aware it was the first of its kind, and for some time the only one, but subsequently others were held in Paris, and in several places in Great Britain. Beside our own mycologists, not forgetting Messrs. Berkeley and Broome, the Club has welcomed distinguished mycologists from the Continent. Messrs. Cornu, Boudier, De Seynes, and Quelet, being of their number. Undoubtedly the origination of these Forays, and the active sustenance of them, was due to the energy and enterprise of Dr. Bull. As certainly the establishment of these Forays had something to do with the preparation and publication of the *Handbook of British Fungi* in 1871, for at once the necessity for such a work became apparent. Later on it was suggested that some compact volume for field work would be an advantage, and in 1878, the *Clavis Hymenomycetum* made its appearance. Finally the excellent series of drawings of Fungi which had been made by Dr. Bull prompted the publication of *Illustrations of Fungi*, which were commenced in 1881, in consequence of the strong recommendation of some of the members of the Woolhope Club. Thus it will be seen that the influence of these Forays extended very far beyond the annual meetings, and indeed gave an impetus to the study of Fungi in this country. The whole number of species in 1860 had more than doubled in 1871, and these again have at least doubled again since that period. Primarily the earnestness of one man called these Forays into existence and maintained them, and secondarily, through them, stimulated the study of Fungi in Britain, and a considerable addition to its literature. A greater monument still was carved by his own hands on the pages of the *Herefordshire Pomona*. I think he would himself have wished for no more enduring or more worthy monument of his assiduity and perseverance. It was during later years the "great idea" of his life, and by it he will be remembered when his association with Fungus Forays will have been forgotten. The conception was an excellent one, and to the end it was magnificently carried out. Vast as were the difficulties which presented themselves to one who might fairly be characterised, at the first, as only an amateur pomologist, yet he surmounted them all by that indomitable energy and perseverance which was so characteristic of his career. "Forward" was still his motto, and, whether in the literary or the artistic aspect, he was not content if he recognised any detail which seemed capable of improvement. In a more humble way, and with less pretensions, we know how he exerted himself in the remarkable trees of Herefordshire, and this was even earlier, in point of time, than his fungological proclivities, and yet to the last he retained a fond remembrance of his first love. He could never see a big tree, but he seemed

ready to take off his hat to it, and acknowledge it as a friend. It was no less surprising to find, as little by little facts oozed out in conversation, that he was practically acquainted with the stations of the rarer-flowering plants of the county, and could have given valuable information to anyone who encountered the local Flora, and we have no doubt that the one in course of preparation will furnish evidence of his knowledge of the subject. Further, how can we forget the enthusiasm with which he went into the subject of old encampments? By no means an attractive one at first sight, and not associated in any occult manner with either mushrooms or apples, and yet he communicated his enthusiasm to others, and did not a little for the reputation of the county. In all these things he manifested a pride in the old city and county of Hereford. 'There is one more work,' he said to me last year, 'which I now hope to accomplish, and then I fancy I have done, and may take my rest, and that is a catalogue of the Fungi of Herefordshire.' Again, he said, 'I must get together all the notes I can for the Fungi of Herefordshire.' Together we spent many hours in comparing notes, and latterly in compiling lists which were intended to be preliminary to carrying out this design. His copy of the *Clavis* was noted for the county, and the idea was gradually taking root in his mind that the next important work to which he must devote himself should be this one. 'As soon as the arrears of the Transactions are brought up,' he said, only last autumn, 'I must set to work in earnest upon that catalogue of the Fungi of Herefordshire.' It would not be so difficult, with the material already in hand, as a nucleus, to carry out this, his last design, which he was not spared to execute himself. But who can gather up satisfactorily the threads of such an active life? I have only suggested some few that have occurred to me, with the view of impressing, if need be, on younger Woolhopeans how much may be done with promptitude, earnestness, and perseverance, and how the business of an active life need be no obstacle to much good work in other directions, in the advancement of human knowledge, and leaving our own little corner of the world all the better when we are called upon to leave it.

"Footprints that perhaps another,
Sailing o'er life's solemn main,
A forlorn and shipwrecked brother,
Seeing, may take heart again."

Hitherto we have been retrospective; indeed, all our feelings have a tendency to become retrospective, but, for all that, we must perforce attempt the prospective. It should be to us a duty to look to-day towards the future as well as to the past, and ask ourselves not so much on this occasion of the aspects and prospects of the Woolhope Club, as of that portion of the operations of the club which are of chief interest to us who attend this October meeting. It is true that it has been stunned by a severe blow, but what of its recovery? Is it to result in paralysis? We hope not. It will require extra vigour and energy to survive, and we ask if that is to be wanting? It will be for the resident members of the club to determine this for us, since it is the resident members on whom the responsibility and the labour rest. An answer in the affirmative means as much as this—a

replacement by collective effort of the energy and enthusiasm which has been quenched. This is not impossible, and it is certainly advisable in the interests of the club. Surely the members would not be willing to admit that, collectively, they are incapable of as much as one of their number found it possible to do? The non-resident members, recovering a little from the shock of this year, would not refuse their co-operation in the future. Let those who remain ask themselves, if they respect and revere the lost one, what would be his wishes had he remained, and endeavour to carry them out. Gathered together in this memorable room, which has already held so many similar gatherings, can we not imagine that his spirit hovers over us to-day; that it watches with some anxiety for the determination at which this meeting will arrive; that, if it could speak, we should hear the old watchword resounding through the length of this hall, with all its old energy, and yet with all its old geniality, "Forward!" Shall not the voice of the dead have some influence with you, and stir you up to some firm resolution for the future? Will you disregard now the mandate which so often you have listened to and obeyed? But, if you fail, how can you ever enter wood or forest again in these dull October days, watch the leaves falling, and hear

"The forests utter a moan
Like the voice of one who crieth
In the wilderness alone,
'Vex not his ghost.'"

If you would maintain a kindly and a perpetual remembrance of one who was ever a staunch friend and earnest worker for the Woolhope Club, you could not do this more effectually than by keeping up in its integrity the annual re-unions which he established, and did so much to maintain, in the interest of a pursuit which to him was almost a passion, through all changes, all mutations, like the babbling brook"—

"For men may come, and men may go,
But we go on for ever."

THE MICROSCOPE AS APPLIED TO FUNGOLOGY.

By the REV. J. E. VIZE, of Forden Vicarage, Welshpool.

THE students of fungi may naturally be divided into certain groups—those who study the larger kinds only, and those who study the microscopical forms, with or without the larger kinds too. As to the first of these, there is not the need of so thorough an examination of plants all the year through, as most of the larger kinds have no solid flesh capable of enduring severe frosts. The autumnal part of the year is the most favourable for them. Again, a microscope is by no means an indispensable part of the work; therefore the manipulation of the instrument, which, like everything else, cannot be gained by magic, is not necessarily a part of the education. As to the second group, the very fact of the use of the microscope gives extra relish for investigating the small forms of vegetable life. Moreover, the small forms may be examined all the year round—each separate month may give different developments of one and the same fungus. By this means the life history may be watched and studied, and become very absorbing as well as very instructive. The task may be difficult, but, when completed, the reward for the toil and labour bestowed is well repaid. Besides, the field of investigation for the microscopical student is very much more extensive as to the numbers of the plants, than for those who only take the large forms. The increase of new microscopical fungi is immensely greater than for the other kinds, hence new species may be found more frequently. Then, again, as to preservation of species for reference, the small forms are more easily preserved for future reference than the others, whether in the herbarium or as slides, notwithstanding the fact that there are difficulties in both. The herbarium in a place liable to atmospheric changes is sure sooner or later to be attacked with some vegetable growth to damage the specimens—a source of special annoyance with unique plants—or the ravages of insects may reduce your specimens to a powdery dust, and render what was formerly prized, equal in value to nothing. Then as to the microscopical slides, there really is a great deal of trouble with them. Their numbers accumulate. This is to be met by carefully arranging them, so that when you want a specimen out of your cabinet of one hundred, or some tens of thousands, you may at once be able to put your hand upon the exact specimen you want. I have given up every plan for the following, which is to have trays of uniform size containing room for 36 slides each, and to have always on hand a stock of empty trays to insert here and there, as necessary, just as you would put books on your library shelves. By keeping to families, genera, and a few details, such as not overcrowding, the difficulty of arrangement becomes easy.

Now, as to the medium in which these microscopical slides are to be mounted. Who knows which is the best out of the numbers there are? I have worked at the microscope for 35 years, and cannot tell yet, nor do I think the man is born who can tell. What suits one fungus does not necessarily suit

another. Canada balsam contracts the spores and is apt to contort them. Glycerine pure and simple simply refuses in course of time to remain in the cell of the slide, and works its way out. Glycerine jelly is nearly as bad, and, in common with gelatine medium, contracts and expands with the temperature of the weather, and therefore is unreliable. Thwaites's fluid, like water, may be very successful for a time, but will be sure to change the colour of the tissues eventually. Camphor water, and the other media which have been used in the vain attempt of beautifully balancing themselves, so as to check either the growth or decay of the plant, all fail. Nothing on earth is perfect. We may do our best, as we try to do, but success, however near, is not assured. If anyone asks me what media I should now use, and recommend others to use, my answer would be—for any fungi that would bear them (and they are not numerous) employ Canada balsam. First take the greatest possible care to keep the spores in their natural place by giving them as small a quantity, not of pure spirits of wine, which scatters them, but benzole, which has a different effect. Let the benzole separate, then mount. When Canada balsam will not suit, as is generally the case, I use gelatine, warming all the materials used. Water I may say is, to the best of my knowledge, indispensable when you want to see such portions of a fungus as the zoospores. Much advantage may be gained by putting on the label of the slide not only the name of the object, but the medium in which the same is mounted. I have slides in my cabinet of great scarcity, which it would be next to impossible to replace. Some of them have lost the whole of the medium in which they were placed through evaporation, and are almost valueless. Others have not gone so badly, but there are large bubbles of air in them, which are the forerunners of total evaporation. Had the original moulder of the same named the fluid in which they were placed on the slide there would have been little difficulty in bringing them back to their primitive condition.

May I use words of caution to beginners? Be very careful not to use high power object glasses with high eye pieces—if you want high powers always use low eye pieces. The strain on the eye is not anything like so great when this plan is adopted. Besides, with high power object glasses you may get any amount of magnifying power that is necessary. Again, use as little light as you well can from the mirror. It is a very wrong notion, indeed, that a great light is essential. Always get a subdued light, one that is not in the least liable to strain the eye at all. The definition of the slide will be just as good; indeed, better—the time occupied will be much better employed, because you will work longer, and the comfort to yourself at work will be considerably improved. Then, again, banish to the winds the idea that you cannot keep both eyes open when working with a single-tubed microscope—monocular as it is called. There are several ways by which this may be effected:—one is by having a black sheet of paper near to the second eye; another plan is to put your hand before your eye. Perseverance is all that is needed. One evening is quite enough to make anyone skilful in this respect if he is determined to succeed. He need no more fear seeing things on the table with the second eye than seeing the crown of his head, unless he is in training for drawing objects on the table by means of a camera

from the instrument, whilst with the one eye he looks at the object, and with the other draws the figure. A very little reflection will convince anyone how undesirable it is not to keep the nerves of the eye as nearly in their right position as possible. An undue strain is caused if they are strained, and the sight is injured if much work is done. Let us all, young and old microscopists, be very sceptical at times as to what we think we see with the very highest powers. Without wishing to detract an iota from the honesty of purpose and truth of my fellow-students, I am sure that a good deal unintentionally has been said to have been seen with the microscope which has never been seen at all. We set to work longing to discover something newer than the last new thing. We hope to find it, we begin to think we have found it, and we may go so far as to make ourselves believe we verily did see it *once*. The event must be recorded; we proclaim it, and in so doing propagate error. The microscope, like the photographic apparatus, has its defects. Let us enjoy seeing what glories there are in it, and without hesitation use it for the best and purest purposes.

NOTES ON SOME OF THE CLIFF PLANTS OF WALES.

By the Rev. AUGUSTIN LEY, M.A.—Read at the Fungus Foray Meeting on October 7th, 1886.

MOUNTAINEERING appears to exercise a peculiar fascination over Englishmen. The accidents which recur each season, in scarcely decreasing frequency, prove how ineradicable a passion it is with us. It may be doubted whether its dangers act very greatly in deterring men from its pursuit, or whether they are not, to at least an equal degree, an incentive to climbing.

It is, perhaps, a pity that so many ardent mountaineers are not at the same time zealous naturalists. No two tastes could work in more harmoniously together than the exploration of the wildest features of inanimate Nature, and the study of the rarest and most interesting among the children of animated Nature. No one can doubt that the love of the outward features of mountain scenery is made a deeper and more intelligent thing by a knowledge of geology. It is but a single step to the living vegetation by which the rocks and ravines are tenanted. Science tells us that these are often older in their features than are the seemingly "everlasting hills" which they clothe with such delicate and fragile grace. Their forms and distribution contain many interesting secrets waiting to be found out, and suggest endless questions which can be asked, if not answered. We will make another remark. It is this: that the interesting plants of a mountain are usually found crowded together. Every naturalist, who has tramped over mountains, knows how many miles of moorland and hill-side may be footed without lighting upon any, except the ordinary plants of mountain districts. Yet there is probably a spot, if he can find it, on every range of hills, where the rarer plants exist crowded together into the space of half-a-mile, or, it may be, of a few hundred yards. This spot is without exception the steepest, wettest, and coldest spot in the mountain range. Here the mountaineer and the naturalist may both enjoy their keenest pleasure, in the study of the wild forms which animate and inanimate Nature possess; and if the two passions co-exist in the same person, the pleasure realised will be more than doubled. The two fires do not put each other out. The two forms of pleasure have so much in common at their root that they do not interfere, but rather minister, each to the other. One cannot help saying to the lover of scenery for its own sake, or of climbing for its own sake—add science to enthusiasm, add a knowledge of geology, or of the principles of plant-distribution, or of some of those manifold plant speculations which in our own times have made botany from one of the driest into one of the most interesting of sciences, and the charm of your rambles will be multiplied and deepened a hundred-fold.

It is the purpose of this paper to compare together the cliff vegetation of Northern, Central, and Southern Wales, so far as it has come under the writer's notice, by selecting a few typical cliff plants from among the phanerogams and ferns, and noting the peculiarities of their distribution within this area. It

will need no apology to bring this subject before the Woolhope Club, when we remember that it touches our own local flora. We border upon Wales, and can claim a slice of really Welsh vegetation in the Black Mountain district, which lies to a great extent within the area of the Herefordshire Flora. We may therefore justly claim an interest, as Herefordshire naturalists, in the productions of the higher precipices of Wales, since it is our duty to investigate those of the "Tarens" of the Black Mountains.

Seven cliffs are described underneath, and are selected as being the only ones which the writer can make any claim to have himself explored at all thoroughly. They are at the same time fairly representative of the mountain precipices of Wales as a whole; and the results arrived at by a larger experience would probably not materially differ from those given by the seven selected. They will naturally fall into three groups. The first group is comprised entirely in Carnarvonshire, and reaches both the greatest altitude and far the greatest boldness. This is the Northern Group. The second lies in the counties of Merioneth and Montgomery, and is chiefly confined to a single mountain—Cader Idris, so well known for its exquisite scenery. This is the Central Group. The third lies in Breconshire, and abuts on our own county. This group falls into two divisions, its main portion in the mountain range occupying the south of Breconshire, and culminating in the Brecon Beacons, six miles south of the town of Brecon; and a subsidiary portion in the Black Mountain range, with its numerous small cliffs culminating in Pen-y-Gader. This is the Southern Group. It reaches a very respectable altitude in the Brecon Beacon (the highest ground in South Wales) 2,960 feet, and its cliffs are, in the same portion, bold and extensive, but it must take decidedly the third place in the richness of its Cliff Flora. In the Black Mountain portion its altitude (2,600 feet) is also respectable, but here the cliffs are far less bold; they hardly, indeed, deserve to be styled cliffs at all, but consist of ranges of rocks breaking at certain spots the regular slopes of the hill sides. These are locally termed "Tarens," which term, so far as I know, is a strictly local one, not employed in other districts of Wales, just as the cliffs of the Northern Group are locally termed "Clogwyns." I do not know the meaning of either of these two local words.

In the following descriptions I must lament the entire absence of any geological knowledge, which would have rendered them, had I possessed it, much more full and accurate, as, no doubt, it would have rendered my own botanical rambles more pleasurable and more fruitful.

In the Northern Group then we find:—(1) Clogwyn-y-Garnedd. This is the central cliff of the central summit in the Carnarvonshire mountain system, and lies immediately to the east of Yr-Wyddfa, the summit of Snowdon. The rocks of this precipice advance to within a hundred yards or two of the highest point of the mountain; that is, therefore, to about 3,450 feet. Its lateral extent may be half-a-mile, while its perpendicular height cannot be less than 300 to 400 feet. It is thus an extensive as well as a grand cliff. It is the head-centre of the cliff plants of Snowdon, and has produced, and probably still supports, all its vegetable riches. It has the subsidiary advantage to the botanist that, though

steep, it is by no means inaccessible; and most, though not all, of its rich recesses can be explored with a steady foot and a tolerable head. The precipice faces nearly due east.

(2) Cwm Idwall. This beautiful place certainly deserves the second place in a naturalist's heart, in the Carnarvonshire Hills. It lies on the northern escarpment of the second or Glyder range, lying north of Snowdon proper. It is well known for the beauty of its little romantic glen with Llyn Idwall lying in the embrace of cliffs, in the centre of which is the well-known chasm of Twll-du, which affords a view, looking downwards from the top, unequalled in Wales for wild beauty. This scene, like so many others possessing the same features, has the stupid English name of "The Devil's Kitchen." Surely the Celts showed a far more just appreciation of the beautiful, not to say of the true, when they dedicated so many of their mountain churches to St. Michael, in the innumerable "Llanvihangels" which stud Wales over in all its parts. The Cwm Idwall Cliff lies at a considerably lower elevation than Clogwyn-y-Garnedd. Its summit can hardly reach more than 2,800 feet; its depth may be 200 to 300, and its lateral extent one-third of a mile. It is, in parts, utterly inaccessible; and its rarities will never be exterminated by collectors until they have acquired the art of flying. It is well watered; so that after heavy rain its whole extent is seamed with falling rills; and it is, botanically speaking, rich; vying with Clogwyn-y-Garnedd in being the head-centre of Carnarvonshire Saxifrages, Woodsias, and the Lloydia.

(3) Going again farther north, the west cliff of Carnedd Dafydd may certainly claim the third place. The range of the "Carnedds" is the most northerly and the most extensive of the Snowdon Groups. It differs much in character from those lying further south, having in general far more of moorland, and far less of cliff in its surface. But in Carnedd Dafydd, its most south-westerly extension, there is a full measure of cliff; both to the east of the summit in Ffynnon Loer (which, I am sorry to say, I never explored), and to its west, in the head of Cwm Llafar. Here there is an extensive precipice, running up, under the head of the mountain, to 3,200 or 3,300 feet; having a vertical range of 250 to 350 feet, and a lateral one of nearly one mile of rock. This west cliff of Carnedd Dafydd has perhaps hardly attracted the attention which it merits from naturalists; being rich in material. I have myself visited it three or four times; yet, having been uniformly unfortunate in weather, I do not feel sure that I have worked it well. A thick mountain mist and rain, joined with a high cold wind, is not conducive to thoroughness in one's exploration of a cliff. It faces W. and W. by N.

(4) We must not omit two small but rich cliffs lying in the very heart of the Carnedd region, round two small and pretty lakes called respectively Melyn-Llyn and Llyn-Dulyn. The first of them I have not visited; and upon the second I had only daylight to spend one hour, which was, however, sufficient to convince me of its richness from my own point of view as a naturalist. The cliff here faces E. and N.E.; its elevation, perpendicular and above sea level, are both small; perhaps 200 feet in the one and 2,000 feet in the other case; its extent may be one-third of a mile. It possesses therefore a rather *lower* form of cliff vegetation; but it is well watered and apparently rich.

(5) In the second, or Central Group, I only know of *one* range of cliffs of much importance. These are the cliffs of Cader Idris in Merionethshire. This mountain is singularly rich in precipices; its northern flank for nearly three miles being almost one continuous precipice of greater or less vertical angle. But the finest and richest cliff upon the mountain is that forming the western wall of the basin of Llyn Cau. This beautiful spot is surrounded on its S., W., and N. sides by a semi-circular cliff, which, at its western point, becomes a very bold precipice. The central summit of the mountain here runs out into a secondary head, which breaks off suddenly above Llyn Cau into a precipice fully 400 feet in perpendicular altitude, with a lateral range of perhaps one-third of a mile. The summit of Cader Idris being under 3,000 feet in height, that of this cliff cannot be more than 2,700; but it is very bold and striking; and it is, botanically speaking, moderately rich. The northern cliffs of Cader Idris are somewhat dry and poor; this one is damper, and consequently richer. The Llyn Cau precipice faces due E.

I do not know of any other range of cliffs in the Central District deserving of very much attention from the botanist. The mountain standing next in altitude is Plynlimmon, on the Montgomery and Cardiganshire borders; but this mountain, though possessing an interest to us in Herefordshire as being the source of the Wye, is singularly disappointing in its cliffs. The only precipitous features which it possesses lie round the head of Llyn Llyged Rheidol; but they are very slight.

(6) Proceeding to the Southern Group, we find a very bold and extensive range of mountains occupying the south of Breconshire, and running from the neighbourhood of Abergavenny in Monmouthshire, right across Brecon, into Carmarthenshire. These hills have a steep northern escarpment overhanging the valley of the Usk, and reach their highest elevation six miles due south of the town of Brecon, where they assume the name of the "Brecon Beacons." The singular square top of the central elevation, with its subsidiary flanking heights and lateral valleys, forms, from the town of Brecon, a view well known for its beauty. This range of mountains possesses many cliffs well worthy of the botanist's attention. Several of these, I am sorry to say, I have not explored—notably the most westerly of the range, forming the Carmarthenshire boundary. But the finest cliff lies, as usual, immediately beneath its highest summit. Indeed, here the highest ground forms the actual edge of the cliff. This central precipice is far too precipitous to be conveniently attacked in all its parts. Its elevation above sea level is the same as that of the summit of the mountain, namely, 2,960 ft.; the height of the actual rocks at the same spot 250 ft. or 300 ft.; and the lateral extent one-third of a mile. The only other cliff with which I can claim any acquaintance in this range is the small cliff lying some four miles west from the centre of the range, and termed Craig Gledsiau. The botany here being essentially similar in all respects, I have grouped the two cliffs under one figure. It may be termed rich, at least in a few species; though many others are, as will be seen in the sequel, conspicuous for their absence. Both these cliffs face nearly due north.

(7) Last we place the cliffs in which we, as Herefordshire naturalists, have

an immediate interest—those of the Black Mountain Group, lying in the three counties of Brecon, Monmouth, and Hereford. Here we are upon quite a different scale of mountain scenery. The cliffs are not precipices, but ranges of rocks more or less precipitous, occupying the mountain side. They do not, of course, present anything like the richness of the precipices we have been enumerating; yet they deserve comparison with them, by supporting, as far as they go, a real cliff flora, distinct from that of the hills in general. Several of these “Tarens” as they are called, belong to the Herefordshire Flora: (1) a well-known and conspicuous one at Cwm-y-oy, which is, however, dry, and of little botanical interest; (2) one much richer, on the northern slope of the Ffwdog, about three miles above Llanthony Abbey; (3), a small, but interesting one on the north face of the Hatterel range above Longtown, called the “Red Daren”; and (4) another interesting one in the little valley of the Olchon, some four miles further to the north-west, which we may name the Olchon Daren. The last two lie in Herefordshire proper. There are several others; but the main cliff of the whole range is undoubtedly “Taren r’ Esgob,” in the head of the right branch of the Llanthony Valley. This lies wholly in Breconshire, and is the head centre of the interest of the wild Flora and Fauna of the Black Mountain Group. All the four last-mentioned face north-east.

It is worth while to notice, in passing, that, out of the whole number of cliffs here described, one only faces south (Cwm-y-oy Daren), and this one is the poorest and driest of all. One faces west (the Carnedd Dafydd cliff). Two face east (Clogwyn-y-Garnedd, and the Llyn Cau cliff). Eight face north or north-east. That is to say (regarding only the cardinal points), out of 12, 8 have the coldest aspects, 3 the intermediate, and 1 the warmest. I think that something like these proportions are general in mountain cliffs; and that this accounts in part for the peculiarly boreal character of the flora which they maintain.

It will be noticed that the chief districts of Wales, the cliff flora of which is quite unrepresented in the above list, are (1) its north-east section, in Flint and Denbigh; (2), its south-west peninsular in Carmarthen and Pembroke; and (3) its extreme south-east county in Glamorgan. Of the cliffs of these counties I know nothing; but the north-east section, and the county of Glamorgan should certainly be added before any inductions with regard to the cliff flora of Wales could be termed complete. They probably possess a cliff flora, to some extent, of their own.

Enumeration of 46 typical cliff plants, showing their distribution in Wales:—

1. *Thalictrum alpinum*, L. 1, 2, 3. Present in the higher cliffs of the Northern Group, absent from its lower cliffs, and from the Central and Southern Groups. Present northwards in the English Lakeland, and in Scotland.

2. *Thalictrum minus*, L., var. *montanum*. 2, 3, 4, 5, 6. The mountain form of *Thalictrum minus* is distinctly a cliff plant. Present in all the cliffs of the Northern Group, in the Central Group, and at Craig Gledsiau in the Southern Group, but absent from the Black Mountain. This cliff form reaches its southern limit in Britain in Somerset. Abundant northwards, especially in English Lakeland; present in Scotland.

3. *Meconopsis Cambrica*, *Fig.* 3, 4, 5, 6, 7. Northern, Central, and Southern Groups. Abundant throughout the Welsh Counties, and advancing into our area in the Black Mountain District. The Welsh Poppy is, properly speaking, a Glen plant, loving the damp shade of rocky ravines; descending in them nearly to sea-level in Carnarvonshire, and ascending from them to the cliffs; but absent from their higher portions. In the Black Mountain it is entirely a cliff plant, and is absent (?) from the Glens. Absent, northwards, from Scotland, and the English Lakes (?); present southwards, as far as Cornwall.

4. *Arabis petræa*, *Lam.* 1, 5? Northern and Central? Groups. This Rock Cress is quite one of the rarer cliff plants throughout the British Isles; reaching its greatest frequency in the Eastern Highlands of Scotland. Rare in the English Lakeland; rare in Wales. I have only seen it at 2,900 or 3,000 feet, upon Clogwyn-y-Garnedd. Absent southward? Queried by Watson for "Merioneth;" and doubtless upon Cader Idris, if anywhere in that county; but I have never found it there.

5. *Cochlearia alpina*, *Bab.* 1, 2, 3, 4, 5. Northern and Central Groups. A frequent and very characteristic cliff plant, preferring those that are very wet and cold, and advancing to their highest parts. This alpine form of Scurvy Grass is found, rarely, by streams in stations intermediate between the cliff and the sea-shore, as *e.g.*, on river rocks in Lowther Park, Westmorland, and in other stations in the English Lakes. See Baker's *Flora of the English Lakeland*, p. 31. Not apparently found in such positions, unless the streams take their rise in mountains with cliffs of sufficient altitude to produce it: absent, therefore, from the Wye and Usk, and other Radnorshire, Breconshire, and Montgomeryshire rivers. Hence the inference appears warranted that the plant *descends* to its lower stations from the mountain cliffs. Its absence from 6, the Brecon Beacons, is remarkable. Abundant northwards in the English Lakes and Scotland.

6. *Polygala vulgaris*, *L.*, *var. grandiflora?* 2, 4. Northern group. A noteworthy variety of the common Milkwort is abundant in the Cwm Idwall and Llyn Dulyd cliffs, which approaches very nearly the Irish form *grandiflora*, from Ben Bulbin. Its handsome flowers are uniformly of a dark blue, and it is in full flower in August, when the lowland plant is mostly past blooming. Absent from the higher Carnarvonshire cliffs, and absent southwards.

7. *Silene maritima*, *With.* 1, 2, 3, 5 (?) 6. Northern, Central? and Southern Groups. The mountain form of the Sea Campion is scattered throughout Wales, but only upon the higher cliffs, where it ascends nearly or quite to their highest parts. I did not meet with it on Cader Idris, and suspect that it is absent from the Central Group. The central cliff of the Brecon Beacon range is remarkable for the abundance and luxuriance of this plant, which here crowns the rocks up to their highest ranges. The flowers of the mountain form are larger and finer than those of the plant of the sea shores. Absent from the Black Mountain. Present northwards in Lakeland and Scotland.

The Sea Campion occurs sometimes inland, at low altitudes, on river gravel and sand; as on the Ystwyth, near Aberystwyth, and on the Teifi marshes, near Strata Florida. In the latter instance the plant appears to have ascended the

Teifi, between 40 and 50 miles from the coast (unless brought direct by sea birds). Unlike the case of *Cochlearia alpina*, these intermediate stations seem due to the plant ascending, rather than descending, the river courses.

8. *Silene acaulis*, L. 1, 2, 3. Northern Group, higher precipices. Absent from Central and Southern Wales, but abundant northwards, in the English Lakes, and in Scotland. Very abundant in the Cwm Idwall cliff. Nothing can exceed the beauty of the Cushion Pink, when in full flower.

9. *Cerastium triviale*, Link, var. *alpestre*. 1, 2, 3, 6. Northern and Southern Groups. This Mouse-ear Chickweed is very abundant on the higher cliffs of Carnarvonshire, and recurs in small quantities near the summit of the central cliff of the Brecon Beacons. See Mr. B. Barrett's *Contribution towards a Flora of Breconshire*, in the *Journal of Botany*, 1885, p. 43. It will probably be found a far more general mountain plant than had been supposed; though I did not find it on Cader Idris. I feel sure, also, that a complete series will be found to join the mountain form to the common lowland *C. triviale*. I have not seen any Welsh specimens of *C. alpestre* so well marked as the Scottish plant from Little Kilrannock; but I have the authority of Professor Babington for naming the Snowdon plant *alpestre*. Forms intermediate between this and ordinary *C. triviale* occur about springheads, on Micklefell, Teesdale; and should be searched for in similar situations upon our own Black Mountain ground.

10. *Cerastium alpinum*, L. 1. Northern Group, Clogwyn-y-Garnedd at 3,300 feet. Still to be found (1886) at this old and well-known station, but now in minute quantities, owing, it is to be feared, to collectors' depredations. Apparently not elsewhere in Carnarvonshire; and this is its southern limit in Great Britain. Abundant upon the Helvellyn range, Westmoreland; and far more general in the Scottish Highlands than the next.

11. *Cerastium latifolium*, Auct. ang. *C. alpinum*, var. *pubescens*, Syme.* Clogwyn-y-Garnedd at about 3,000 feet. I have not seen it at any other Carnarvonshire station; but this and the last Mouse-ear Chickweed should be found on Carnedd Dafydd. Absent from the Central and Southern Groups; present northwards in the Scottish Highlands. It is curious that this plant misses over the Lakeland summits.

12. *Alsine verna*, Bartling. 1, 2, 3, 4, 5, 6. Northern, Central, and Southern Groups. Though common on lower hills in many counties, especially in limestone districts, this pretty little Sandwort asserts itself as a true Cliff plant, by its abundance and luxuriance in such situations, both in Wales and elsewhere. It is probably present on all the higher cliffs of Wales; ascending in Clogwyn-y-Garnedd to 3,000 feet or higher. Very fine and luxuriant in Cwm Idwall; abundant on the Central Cliff of the Brecon Beacons. Its absence from the Black Mountain Tarens is remarkable.

13. *Alchemilla vulgaris*, L., variety. 1, 2, 3, 4, 5, 6, 7. Northern, Central, and Southern Groups. The Common Lady's Mantle exhibits a noteworthy variety when growing in mountain stations, which reaches its fullest

* NOTE.—This plant has, since the writing of this paper, been determined by Prof. Lange to be *Cerastium arcticum*. See *Journal of Botany* for 1887, pp. 373, 374.

development upon the lower mountain cliffs. Here the plant is twice the size of its lowland form, and is smooth in all its parts. There is a complete series joining the cliff form with that of the lowlands; and the plant from the Black Mountain Tarens stands about mid-way. This plant is not the form "*montana Willd*" of the London Catalogue; for that is described as "dwarf and very hairy," whereas this is large and quite smooth.

14. *Potentilla alpestris*, *Hall, fil.* 1. Northern Group; Clogwyn-y-Garnedd, at 2,900 feet. I have never seen this beautiful *Cinquefoil* at any other Welsh station; but it is given by Watson for "Montgomery" without a question, and queried for "Cardigan." I do not know any spot in these counties where so alpine a plant is likely to occur. Is it an inhabitant of Craig Breidden, along with its rare congener *P. rupestris*? It is not mentioned by Mr. Vize in his list of Forden plants. Perhaps further investigation may lead to its discovery in Brecon and Radnorshire, since it does not appear to confine itself to the highest cliffs.

15. *Pyrus rupicola*, *Syme.* 7. Southern Group. This form of the Whitebeam is the exclusive one upon mountains, and is especially a plant of limestone hills and dales. It occurs at two stations on the Black Mountain Tarens, viz., Cwm-y-oy, and on the northern slope of the Ffwddog; but I have never met with it upon the other cliffs included in this paper. Considering how very conspicuous a tree the Whitebeam is, this seems to show that it is at least very rare upon the cliffs of Central and Northern Wales. Its presence on the Black Mountain thus becomes interesting, as one of the limestone plants which are found in that district. It is difficult to trace the distribution of *P. rupicola* in *Top. Bot. Edl.*; where it is combined by Mr. Watson with *P. eu-aria*.

16. *Sedum Rhodiola*, *D.C.* 1, 2, 3, 5, 6. Northern, Central, and Southern Groups. A frequent and characteristic cliff plant, abundant throughout Northern and Central Wales, and recurring abundantly on the central crag of the Brecon Beacons, which is its most southerly (?) station in Britain. Absent from the lower cliffs, and from the Black Mountain Tarens: abundant northwards in Lakeland, and Scotland.

17. *Saxifraga oppositifolia*, *L.* 1, 2, 3, 5, 6. Northern, Central, and Southern Groups. Common in Carnarvonshire, rare in Central Wales, but recurring plentifully on the Brecon Beacon range. I have not seen this plant in Merionethshire, but it is given by Watson for that county. This Saxifrage is very abundant in Cwm Idwall, but hardly more so than in the Brecon Beacon, where both at Craig Gledsiau and the central crag it clothes the rocks, early in May, with its gorgeous robe of purple blossom. Abundant northwards in Lakeland and the Scottish Highlands.

18. *Saxifraga nivalis*, *L.* 1, 2. Clogwyn-y-Garnedd, at 3,000 feet and higher: Cwm Idwall. Long known as an inhabitant of the first named cliff, it is still to be found there (1886); but, it is to be feared, in quickly decreasing abundance. Absent from the Central and Southern Groups; present northward. Sparingly scattered along the highest summits in the English Lakeland; more abundant in the Scottish Highlands.

19. *Saxifraga stellaris*, L. 1, 2, 3, 4, 5. Northern and Central Groups. This Saxifrage is found throughout Carnarvonshire, and advances southwards to Cader Idris, and Plynlimmon, where its most southern known station in Britain is on the head of the Wye. Can it be really absent from the Brecon Beacon range? Common northwards, in the Lakeland and Scottish hills.

20. *Saxifraga cæspitosa*, L. 2. Northern Group. Very rare: see Mr. Baker's paper on the "British Dactyloid Saxifrages," in the *Journal of Botany*, 1870, p. 281. Mr. Baker here states that he has seen one specimen only of the Welsh plant, gathered by Mr. Wilson in Cwm Idwall in 1825. See, however, Prof. Babington's Note, *id.*, 1887, p. 281. I have never met with it in Britain. Absent from Lakeland; present northwards and westwards, on the highest Scottish and Irish summits.

21. *Saxifraga decipiens*, Ehrh. 2. Northern Group at Cwm Idwall. Very rare: see Mr. Baker, *l.c.*, p. 283. It is to be feared that these two Saxifrages have become extinct in Carnarvonshire. I myself gathered the present plant in Twll-duchasm in 1876, but I have not succeeded in finding it in two or three subsequent visits. Absent southward; westward, the South of Ireland presents very nearly allied forms. See Baker, *Journal of Botany*, *l.c.*

22. *Saxifraga sponhemica*, Gmel. 1, 2, 3, 4, 5, 6, 7. In every cliff I have visited of the Northern, Central, and Southern Groups. Forms which must be referred to this name are so inextricably mixed up with those referable to the next, that I am at present unable to distinguish them; but I have Mr. Baker's authority for assigning some of our Black Mountain plants to "good *sponhemica*." Brecon or Glamorgan will be its southern limit in Britain.

23. *Saxifraga hypnoides*, L. 1, 2, 3, 4, 5, 6, 7. Present in all parts of Wales, Northern, Central, and Southern, in abundance; and, generally speaking, far the most common form throughout Britain. In Carnarvonshire, and I think in the Brecon Beacon, the relative frequency of this and *S. sponhemica* is reversed, at least so far as the crags are concerned. Here the greater part of the dactyloid Saxifrage one meets with must certainly be placed to *S. sponhemica*. In the Black Mountain *S. hypnoides* predominates.

24. *Galium boreale*, L. 1, 2, 3, 6. Northern Group at many stations: Southern at one. This Bedstraw is thinly scattered among the Carnarvonshire cliffs, and recurs on the Brecon Beacon range at more than one spot in very small quantity. It is not recorded in *Top. Bot. Ed. I.*, for the Central Group, nor have I myself succeeded in finding it at Llyn Cau; but it can hardly really be absent from Cader Idris. It is more abundant northwards (Yorkshire, Lakeland, Scotland); but Breconshire is its southern limit in Britain.

25. *Saussurea alpina*, D. C. 1, 2, 3. Northern Group: on the higher Carnarvonshire cliffs at 2,200ft. to 3,200ft. Still in plenty, but very inaccessible, near the summit of Clogwyn-y-Garnedd; also at Cwm Idwall, and in fair plenty on Carnedd Dafydd. It appears to be more abundant in Carnarvonshire than in Lakeland, where it was long thought to be confined to a single station; but it has a wide distribution in the Scottish Highlands.

26. *Solidago virgaurea*, L., var. *Cambrica*. 1, 2, 3, 4, 5, 6, 7. Northern, Central, and Southern Groups. This Golden Rod is one of our most universally distributed, and most handsome cliff species. It is at home on the higher as well as the lower portions of the precipices, though it prefers their lower and warmer parts. Here it vies with various Hawkweeds in making the rocks gay with golden yellow. I have made no note of its occurrence on the Brecon Beacon range; but since it is abundant and characteristic upon the Tarens of the Black Mountain, it is sure to be found there.

27. *Crepis paludosa*, *Manch.* 2, 3, 4, 5. Northern and Central Groups. A glen plant delighting in damp rocky shade near waterfalls, this Hawkweed ascends, along with the Welsh Poppy, to the lower levels of the cliffs. It hardly deserves a place in a series of strictly cliff plants; but I wish to call attention to the absence of any record of this plant for the Brecon Beacon or the Black Mountain district. It can hardly be truly absent from the former, seeing that it has been recorded for Glamorgan; and it should occur in the Black Mountains, where, however, I have uniformly sought for it vain.

28. *Armeria maritima*, *Willd.* 1, 2, 3. Northern Group.

29. *Plantago maritima*, L. 1, 2, 3. Northern Group. I have, unfortunately, little or no information to communicate with regard to these two plants; but they should not be omitted from a paper attempting to deal with the cliff Flora of any portion of Britain; being two of the interesting group of plants whose common home with us is the sea shore, but which recur on mountain summits. I have met with both of them on the higher Carnarvonshire Cliffs; and both occur further to the northward, in the Lakeland and Scottish Mountains; but I believe neither of them to be inhabitants of the Central or Southern groups of cliffs in Wales. It would be interesting to know whether, like *Cochlearia alpina* and *Silene maritima*, they occur in any positions intermediate between mountain and sea shore. I believe this to be the case with *Plantago maritima*; but I have never heard of *Armeria maritima* being found in any intermediate stations.

30. *Oxyria reniformis*, *Hook.* 1, 2, 3, 4, 5. Northern and Central Groups. This is one of the most characteristic of our cliff plants, uniformly found in the damp cold ravines of mountain precipices, and never, that I am aware of, elsewhere. It is abundant upon all the Cliffs of Carnarvonshire which I have visited, and upon those of Cader Idris, but it apparently does not extend so far to the south as Breconshire. I have searched for it upon the Brecon Beacon Cliffs in vain. Merioneth is thus its most southerly county in Britain; while northward it has a wide distribution as far as the Orkneys.

31. *Salix herbacea*, L. 1, 3, 6. Northern and Southern Groups. Mr. Baker calls this plant and *Carex rigida* the "two most Arctic plants of the Lake district Flora." They hold the same position in the Welsh Flora also. *Salix herbacea* occurs in small quantities on all the highest summits of Carnarvonshire, and recurs again on the highest point of the Brecon Beacons, which is its most southerly British station. It is, properly speaking, an inhabitant rather of the stony exposed mountain top than the precipice. In the Brecon Beacons the edge

of the precipice forms the very summit of the mountain, and here a fine growth of the little Willow fringes the precipice; but it is quite out of reach. It has long been known at this station, having been discovered here, I believe, by the late Joseph Woods. Not found in the Central Group; northwards it is found on all the highest Lakeland and Scotch summits.

32. *Lloydia serotina*, Reich. 1, 2. Northern Group. This well-known plant still exists upon the Cwm Idwall Cliff, and is there fortunately quite out of reach. I do not know whether it is now to be found at any other Carnarvonshire station. Confined to Carnarvonshire in the British Isles.

33. *Luzula spicata*, D. C. 1, 2. Northern Group. This is another well-known member of the Alpine Flora of Carnarvonshire. I do not know where the Carnarvonshire station is, and have never seen a Carnarvonshire specimen. Northwards, on several of the highest Lakeland summits, in small quantity; much more abundant in the Scottish Highlands.

34. *Carex atrata*, L. 1, 3. Northern Group. In small quantities on the Snowdon and Carnedd Dafydd Cliffs; possibly also upon other cliffs in Carnarvonshire. It is equally rare in the Lakeland Mountains. Not found southwards.

35. *Carex rigida*, Good. 1, 2, 3, 5. Northern and Central Groups. On the highest ranges of most of the Carnarvonshire Cliffs, and on those of Cader Idris. It should occur in the Brecon Beacon Range, since it is often associated with *Salix herbacea*; but it has never been detected there. Merionethshire is thus its southern known limit in the British Isles.

36. *Aira cæspitosa*, L., Alpine varieties. 1, 2, 3, 4, 5, 6, 7. Northern, Central, and Southern Groups. Alpine varieties of this common Grass are abundant upon all the cliffs of Wales with which I am acquainted, extending from their lowest parts up to 3,000 feet or more. *Aira alpina* L. has been recorded for Carnarvonshire, but upon insufficient authority, and probably by an error. The forms of this Grass from the lower cliffs of Central Wales, and from the Tarens of the Black Mountain, approach ordinary lowland *A. cæspitosa* more nearly than those from the higher ranges. We have, however, upon the Black Mountain, forms which show a marked tendency towards the Alpine development. I am unable to draw any clear line between the lowland and highland plant; or to distinguish clearly the two varieties *brevifolia* and *pseudo-alpina*, of the latter.

37. *Aira flexuosa*, L., var. *montana*. 1, 2, 3, 4, 5, 6. Northern Central and Southern Groups. In this case, as in the last, it may be doubted whether the variety can in all instances be successfully distinguished from the ordinary lowland type. It must be remembered, however, that this lowland type is common on the moorland parts of all the higher mountains; while the *var. montana* is, I believe, a true cliff plant, occupying much the same parts of the mountain cliffs as the Alpine forms of *A. cæspitosa*, but preferring drier rocks, and not descending lower than 2,500 feet. The present Grass is also a rarer plant. It is abundant on Clogwyn-y-Garnedd, and recurs very characteristically on the highest edge of the central cliff of the Brecon Beacons, along with *Salix*

herbacea, at an altitude of 2,900 feet. Ordinary *A. flexuosa* occurs on the Tarens of the Black Mountain; the *var. montana* is apparently absent from them.

38. *Poa alpina*, L. 1. Northern Group. Clogwyn-y-Garnedd and Cwm Glas Bach, Snowdon, at about 2,800 feet, in small quantity. This Alpine grass, which occurs pretty abundantly on the Helvellyn Cliffs in Lakeland, and is abundant throughout the Scottish Highlands, occurs in small quantities, and in a small form, in the above stations in Carnarvonshire. Absent from the Carnedd Dafydd Cliffs?; absent southwards. It is, throughout Great Britain, a strictly precipice plant.

39. *Poa glauca*, Sm. 1. Clogwyn-y-Garnedd, Snowdon, on the authority of specimens gathered by Mr. W. Wilson. I do not feel sure that I distinguish this Grass correctly from the forms next mentioned; but I believe that I have met with it this year in Clogwyn-y-Garnedd, at about 2,800 feet. A Grass picked by me at Carnedd Dafydd in 1876 was doubtfully referred to this by Prof. Babington; but belongs, I think, rather to the next. Northern Group: not found southwards, nor in Lakeland; very rare in the Highlands of Scotland.

40. *Poa Balfourii*, Bab. 1, 2, 3. Northern Group. I refer to this plant, a distinctly glaucous grass, growing mostly with single stems, or at the most tufted, not cæspitose, which occurs upon most if not all the cliffs of Carnarvonshire. I have not seen this form upon the cliffs of the Central or Southern Welsh Groups; but it occurs on the Helvellyn Range in Lakeland and in the Scottish Highlands.

41. *Poa Balfourii*, Bab., *var. montana*? 3, 6, 7. Northern and Southern Groups. Under this name I intend another member of this troublesome group, which certainly appears to me to stand well apart from the last mentioned. It is a larger, densely cæspitose grass, without any approach to the glaucous bloom noticeable on *P. Balfourii*. This is very abundant in the Carnedd Dafydd Cliff, and probably in other Carnarvonshire stations; and the same, or a closely allied form, recurs abundantly upon the central cliff of the Brecon Beacons and in the Black Mountain, at Taren-r'-Esgob, in Breconshire; and at the Red Daren, and on that of the Olchon, in Herefordshire proper.

42. *Hymenophyllum unilaterale*, Willd. 1, 2, 3, 4, 5, 6, 7. Northern, Central, and Southern Groups. Widely distributed as this Filmy Fern is upon mountains, it reaches, perhaps, a greater abundance upon the precipices of higher mountains than in any other position. It seems to be in such positions well-nigh universally present. It is abundant in the Brecon Beacon Range, and just touches that of the Black Mountain at Taren-r'-Esgob; but has never been found within the bounds of the Herefordshire Flora.

43. *Asplenium viride*, Huds. 1, 2, 3, 4, 5, 6, 7. Northern, Central, and Southern Groups. This fern, like the last, is rarely absent from any mountain precipice; but it often occurs in very small quantities, probably owing to the depredations of collectors. I have myself found it upon every one of the cliffs enumerated in this paper; and it is a well-known inhabitant of Taren-r'-Esgob in the Black Mountain Group, to which spot, however, it is by no means confined in this group of hills.

44. *Woodsia hyperborea*, *Brown*; 45. *Woodsia ilvensis*, *Brown*. 1, 2, 3? Northern Group. I have nothing of my own personal experience to contribute towards the geographical distribution of these two well-known ferns. They undoubtedly formed, and perhaps still form, members of the group of Alpine plants inhabiting the precipices of Carnarvonshire; but I have uniformly searched for them in vain both here and elsewhere in the British Isles, nor have I ever seen Welsh specimens.

46. *Aspidium Lonchitis*, *Sw.* 1. Northern Group. Clogwyn-y-Garnedd at 3,000 feet. Probably the Holly Fern still exists in this precipice, in which I have seen it growing in small quantity. No certain record of its occurrence further south in Wales seems to exist. It grows in several stations in the Lakeland summits, and is much more abundant in the Scottish Highlands.

TABULAR STATEMENT.

	Northern Group.	Central Group.	Southern Group.
1. <i>Thalictrum alpinum</i>	1 2 3	...	...
2. „ minus, montanum ...	2 3 4	... 5	... 6
3. <i>Meconopsis Cambrica</i>	3 4	... 5	... 6 7
4. <i>Arabis petræa</i>	1	...	...
5. <i>Cochlearia alpina</i>	1 2 3 4	... 5	...
6. <i>Polygala vulgaris</i> , var.	2 4	...	...
7. <i>Silene maritima</i>	1 2 3	... 5?	... 6
8. „ acaulis	1 2 3	...	...
9. <i>Cerastium triviale</i> , alpestre	1 2 3	...	... 6
10. „ alpinum	1	...	...
11. „ latifolium	1	...	...
12. <i>Alsine verna</i>	1 2 3 4	... 5	.. 6
13. <i>Alchemilla vulgaris</i> , var.	1 2 3 4	... 5	... 6 7
14. <i>Potentilla alpestris</i>	1	... 5?	...
15. <i>Pyrus rupicola</i> .. ..		...	... 7
16. <i>Sedum Rhodiola</i>	1 2 3	... 5	.. 6
17. <i>Saxifraga oppositifolia</i>	1 2 3	... 5	... 6
18. „ nivalis	1	...	...
19. „ stellaris	1 2 3 4	... 5	...
20. „ cæspitosa	2	...	...
21. „ decipiens	2	...	...
22. „ sponhemica	1 2 3 4	... 5	...
23. „ hypnoides	1 2 3 4	... 5	... 6 7
24. <i>Galium boreale</i>	1 2 3	...	... 6
25. <i>Saussurea alpina</i>	1 2 3	...	..
26. <i>Solidago Cambrica</i>	1 2 3 4	... 5	... (6
27. <i>Crepis paludosa</i>	2 3 4	... 5	...
28. <i>Plantago maritima</i>	1 2 3	...	...

				Northern Group.		Central Group.	Southern Group.
29.	<i>Armeria maritima</i>	...	...	1	2 3	...	...
30.	<i>Oxyria reniformis</i>	...	...	1	2 3 4	...	5
31.	<i>Salix herbacea</i>	...	...	1	3	...	...
32.	<i>Lloydia serotina</i>	...	...	1	2	...	6
33.	<i>Luzula spicata</i>	...	...	1?		...	...
34.	<i>Carex atrata</i>	...	...	1	3	...	...
35.	„ <i>rigida</i>	...	...	1	2 3	...	5
36.	<i>Aira cæspitosa</i> , var.	...	...	1	2 3 4	...	5
37.	„ <i>flexuosa</i> , <i>montana</i>	...	...	1	2 3 4	...	5
38.	<i>Poa alpina</i>	...	...	1		...	...
39.	„ <i>glauca</i>	...	...	1		...	...
40.	„ <i>Balfourii</i>	...	...	1	2 3	...	...
41.	„ <i>montana?</i>	...	...		3	...	...
42.	<i>Hymenophyllum unilaterale</i>	...	...	1	2 3 4	...	5
43.	<i>Asplenium viride</i>...	...	...	1	2 2 4	...	5
44.	<i>Woodsia hyperborea</i>	...	...	1?	2? 3?	...	...
45.	„ <i>ilvensis</i>	...	...	1?	2? 3?	...	...
46.	<i>Aspidium Lonchitis</i>	...	...	1		...	...

The following reach their southern limit in the British Isles in Carnarvonshire. 17 SPECIES:—*Thalictrum alpinum*, *Arabis petræa?* *Polygala vulgaris* var. *grandiflora*, *Silene acaulis*, *Cerastium alpinum*, *Cerastium latifolium*, *Saxifraga nivalis*, *Saxifraga cæspitosa*, *Saxifraga decipiens*, *Saussurea alpina*, *Luzula spicata*, *Carex atrata*, *Poa alpina*, *Poa glauca*, *Woodsia hyperborea*, *Woodsia ilvensis*, *Aspidium Lonchitis*.

The following reach their southern limit in Central Wales. 6 SPECIES:—*Cochlearia alpina*, *Potentilla alpestris?* *Saxifraga stellaris*, *Crepis paludosa*, *Oxyria reniformis*, *Carex rigida*.

The following reach their southern limit in Breconshire. 13 SPECIES:—*Thalictrum montanum*, *Silene maritima*, *Cerastium alpestre*, *Sedum Rhodiola*, *Saxifraga oppositifolia*, *Saxifraga sponhemica?* *Galium boreale*, *Solidago Cambrica*, *Salix herbacea*, *Aira cæspitosa*, variety? *Aira montana?* *Poa montana?* *Asplenium viride?*

The following reach the Black Mountain Group. 9 SPECIES:—*Meconopsis Cambrica*, *Alchemilla vulgaris* var., *Saxifraga sponhemica*, *Saxifraga hypnoides*, *Solidago Cambrica*, *Aira cæspitosa*, var., *Poa montana*, *Hymenophyllum unilaterale*, *Asplenium viride*. Of these nine species all except one are included in the "Herefordshire Flora."

ONE SPECIES is peculiar (?) to the Black Mountain, *Pyrus rupicola*.

NOTE ON THE FLIGHT OF HEPIALUS HUMULI.

By Dr. T. A. CHAPMAN.

JUNE ten years ago I recorded an observation on this species, which was at that time apparently new, and was of sufficiently unusual character to make further observations desirable. So far as I know, no one has made such observations in the interval, and the opportunity to do so did not occur to myself until this summer.

Curiously enough my friend Mr. Barrett records, this year, a nearly identical habit in the case of *Hepialus Hectus*, a closely allied species.

It so happened that this summer a meadow conveniently near to my house swarmed with *H. Humuli*, and afforded me the desired opportunity of repeating my observations—and I devoted a short time on several evenings to noting its habits.

The first week in June is the usual date for *H. Humuli* appearing, but this year it was fully ten days later than usual, and it was not in full flight until the fourth week in June. It was on several of the long late evenings following June 21st that I made my notes.

The flight lasts for but twenty minutes. On a dull overcast evening from 8.50 to 9.10; and, when the sky is bright and clear, from 9.10 to 9.30; beginning at the first indications of dusk and ceasing when the white male became a somewhat dim object. No doubt in the shorter evenings earlier in the month the flight would take place at a somewhat earlier hour.

At first an odd male or two may be seen creeping up the grass stems and taking flight. Sometimes making a wild dash or two of a few yards, but almost immediately settling down to the hovering that has acquired for the species the name of ghost moth; and, before the vagaries of the first one or two have been noted, the males are seen to have turned out in force and to be busy hovering in all directions. I use the word hovering as the flight has not the regular oscillation of that of *H. Hectus* male, which looks precisely as if the moth were attached to the extremity of a pendulum, though it has some approach to it. One will occasionally dash off for a few feet or yards and take up a fresh spot, or passing near another hoverer, will be followed for a short distance; and so it often happens that two or three males may be seen hovering near or even close together, but after the first moment they pay no heed to each other. Meantime sundry females may be observed hovering over the tops of the grass, but instead of keeping to one spot they steadily move forward. These pass near the hovering males but rarely attract their attention, or only draw them out of position a few inches to at once return. The female moths acting in this way are ovipositing, dropping the eggs loosely into the grass, and if captured, continue to do so in the hand or into a box. The eggs, if dropped on a smooth surface, such as a piece of glass, rebound with much elasticity—a peculiarity met with in other species which drop their eggs loosely instead of attaching them to the

food plant. It is very marked, for instance, in Hipp. *Hyperanthus*, whose eggs rebound with almost perfect elasticity.

Now and then a female moth flies along in a wilder manner, dashes against or, at least, appears to collide with one of the hovering males, and with the momentum of her previous flight, passes forward perhaps as much as several feet, and settles on the grass. The male moth so challenged follows almost simultaneously. I observed this occurrence sufficiently frequently to make it certain that this is the manner in which, in *Hepialus Humuli*, individuals of opposite sexes find each other. On one occasion I had half-a-dozen male *Humuli* in view; a female came up with a dash to a male, within two yards of where I stood, but passed by within three or four inches of him without attracting (or apparently, on second thoughts, desiring to attract) his attention. Then she went in a precisely similar way at another male three or four yards further on, and then to one side where two male moths were hovering close together. One of these happened to be a very diminutive specimen, but this one she touched, and they settled down immediately in the usual manner. It was obvious in this case that the female was making a deliberate selection, and it occurred to me that the two males hovering together had deceived her into believing that they were one fine large specimen. What her views may really have been I do not, of course, know; but it seemed that in the result her selection was not a good one. Small males may have found it pay to thus join company with another specimen and exhibit a more brilliant and attractive mark.

When the twenty minutes of light suitable for exhibiting his silvery coat has elapsed, any male under observation may be seen to flutter down into the grass, close his wings, and creep down to the roots to hide till the next period of flight; and at the end of the minute or two spent in watching his movements it is found that only an odd male or two remains on the wing, and these immediately disappear. The increasing darkness renders it impossible to say certainly whether all the females, which are much less conspicuous on the wing, act in the same manner. I do not know whether a second flight takes place during the morning hours.

There can be no doubt, therefore, that in this species we have a reversal of the habit usual among moths, as in other classes of animals—the male being found by the female instead of the contrary, and that the peculiar colouring and flight of the male have special reference to this habit. It is curious that in the *Hepialidæ* the *Antennæ* are very feebly developed, whilst they are very largely developed in the males of those species, that are known as “sembling” freely—“sembling” being a method of capturing male moths by the attraction of a newly emerged female; and it has been supposed that the *Antennæ* in this case are the organs of a sense analagous to smell. It is clear that the males of *Humuli* have no need of such a sense. But I hear of an European species of *Hepialus* of which the males do actually “semble.” Whilst Mr. Barrett’s observations on *Hectus* tend to show that though, in that species, the female finds the male much as in *Humuli*, she is guided not by the shining silver of her mate, but by a rich pine apple like odour evolved by the male moth.

ON CROCKETT'S HOLE, AND HORNE, THE NEWENT MARTYR.

By G. H. PIPER, F.G.S., President of the Woolhope Field Club.

[Read at a Meeting of the Woolhope Field Club, at Newent, May 27th, 1886.]

ON Cugley Farm, in the parish of Newent, some 300 yards west of the highway leading from Newent to Huntley, may be seen a large excavation in the New Red Sandstone, locally known as "Crockett's Hole." It is in the corner of a field near to the farmhouse, and until the year 1884 was a spacious cavern cut out of the solid rock, which is here very soft and easily worked. It could be approached only by means of a hole in the bank of the hedgerow of the adjoining field, which is on a much lower level; but, unfortunately, in the wet season of that year, the weight of some horses on the upper surface broke in the roof, and for ever ruined an object of great local wonderment and interest, sanctified by traditions of incidents which occurred more than three centuries ago; a long period; but one that would, probably, represent a fraction only of the antiquity of the excavation.

The principal cavern would appear to have been some 14 feet by 12, and nine or ten feet high, but the dimensions at present are somewhat obscure. I satisfied myself about the height by pushing a pole down into the soft sand that had fallen from the roof.

Near to the summit of May Hill, on the eastern side, not far from the keeper's lodge, is another large hole in the earth. The distance thence to Cugley is about a mile and a half as the crow flies, and an ineradicable belief exists that a subterranean passage leads from one point to the other; and persons now living relate how their own immediate friends and relatives have endeavoured to prove the truth of the tradition, and clear up the mystery whereby it is surrounded.

The belief in this myth is supported by the circumstance that a large opening at the base of the cavern, at Cugley, may yet be seen. It is many feet below the surface of the field, and at the part of the cave nearest to May Hill: it inclines in that direction, but its length or continuance is quite problematical.

Respecting the earliest known occupants of Crockett's Hole, Rudder gives the following particulars:—"Near the top of the same hill (Yarleton Hill, *sic.*), is Crocket's Hole, so called because one Crocket and his companion Horne used to hide themselves there in the persecuting reign of Queen Mary. Horne was taken and burnt in the yard belonging to the Priory House, in Newent, which is not mentioned in Foxe's Acts and Monuments. His story is briefly thus, as related by Horne's son, who had it from his mother. Horne was a Papist and a man of parts, and meeting with several Protestants who had assembled near the side of

Yarleton Wood to discourse on religious subjects, at length became a proselyte, and refused to go to Mass; for which he was taken before the Bishop [Brooks] in his Consistory Court at Gloucester, and committed to some prison within the verge of the College. But escaping from it in the night, he returned home, and lay concealed in various manners. At last, his wife being with child was delivered, and entertainment made at the baptizing of the child; when the mother desired a cutting of some meat (probably what she knew her husband loved), which having received she laid it by. This being observed by the midwife, created a suspicion, whereupon she procured an officer to search for poor Horne, whom they found concealed under a vessel with the head out. He was immediately carried to his trial, condemned, and led to the place of execution singing the 146th Psalm, where he suffered with great Christian fortitude. Horne was so well beloved by his neighbours, and his execution so much execrated, that when the news was but whispered of Queen Mary's death, the women (men not daring to appear) took the priest that supplied the Church upon a horse, with his face towards the tail, and leading him through the town, sent him away." Rudder's History, p. 563. Rudder's statement that Foxe does not mention this case must be qualified. Foxe's account is as follows:—

"John Horne and a woman martyrs. September 25th, 1556. Nowe, not long after the death of the said young woman at Bristow, in the same manner wer ij mo godly Martirs consumed by fire at Wutton-under-Hedge, in Gloucestershire, whose names are above specified, which died very gloriously in a constant fayth, to the terror of the wicked, and comforte of the godly. So graciously dyd the Lorde worke in them, that death unto them was lyfe, and lyfe with a blotted conscience was death." Foxe's first Ed. 1563 pa. 1546. Foxe's account would appear to have been wrong in two particulars; in the christian name of Horne, and in the year of his death, which would appear to have been 1558 and not 1556; the 25th September, 1558, would have been less than "eight weeks" before Queen Mary's death, on the 17th November in that year. The correction is in these words—"Whereas in the last Edition of mr. Fox his famous works called *the booke of martyrs*, as likewise in all the former editions, there is meution made of one John Horne and a woman that suffered martyrdom for the testimony of their faith at Wotton-under-Edge in Gloucestershire, let it be knowne that the matter is mistaken through the default of those that made the certificate for Mr. Fox out of the registers of Gloucester or Worcester; for it cannot be proved that any such person or woman suffered at Wotton aforesaid. But it is true that one Edward Horne suffered martyrdom at Newente in the said diocesse, and was burnt there in a place called the Court Orchard nere the churchyard; and his wife was condemned with him, but she recanted and refused to suffer with him. I have bine at the place and spake with one or ij of the same parish that did see him there burnt, and do testifie that at his death he sunge the 146th Psalme, untill that his lips were burnt away, and then they saw his tonge move untill he fell downe in the fier. They of the parish do say they knowe the ij persons that mdde the fier to burne him, and they weare ij glovers or fell-mongers, whose names I have in my note-booke. He was executed about viij weekes befor Queene Mary died."

“The sonne of this martyr is now living in the same parish and called Christopher Horne, an honest poore man, beinge about 78 or 79 yeres and borne in queene maries tyme about a quarter of a yere before his father suffered. His mother that promised to suffer with her husband and recanted after she was condemned, was after married to one Whocke [Hooke?] of the parish of Teynton within a myle or 2 of Newent, where her first husband was borne; et hoc ex relatione ejusdem Christopheri Horne. By me John Deighton. I wish for the reverence I beare to the memory of Mr. Fox, whose person and place of dwelling I knew, and the honor and love I beare to his works, that this small error, which is none of his, were amended. “Who” (says Mr. Nichols) “Mr. John Deighton was we do not know,” but Strype (Eccl. Memorials, iii 463) supposes him to have been a worthy minister in those parts, and adopts his account. A John Deighton, a surgeon, said to have been of great attainments as such, was Sheriff of Gloucester 1620 and 1624. He might have seen Foxe, who died in 1587. Gentlemen of the name still hold a good position in the County of Gloucester. Nourse’s M.S. records, that, “old John Ashman, of [Little] Cugley, removed his house and built it in another place, which, they say, ended the curse, that was on the women for bringing the wood to burn Mr. Horn, who, when he was at The Swann (the Duke of Marlborough, which is now) burned off ye end of his finger in the caudle; being asked why he did so, answered, that he did not much feel it, and so freely would he give his body to be burned for the saek of his Saviour Jesus Christ.” 2 Fos. 226.

About the year 1665 one Fairfax, a disbanded soldier, advised by Lilly the astrologer, came down from London, and opened this hole, in hopes of discovering great riches therein, which drew many people thither. Some of them went into the hole, and told incredible things concerning it; at last one Witcomb going in drunk and dying there, put an end to all further examination.

In the year 1884 I interviewed—I believe that is the proper phrase—Mary Mayo, a widow, then living at Newent, aged 71. She told me that the cave was reached by descending a flight of 15 steps, and that she had been there frequently, with other children, but although she never went far into the inner passage, her two grandfathers, Paul Apperley—who lived at Taynton—and Richard Colwell, had been more adventurous.

They knew there was a chest of treasure about midway between Cugley and May Hill, because after toiling through the cavern for several hours, much of the distance upon their hands and knees, for want of head-room, they saw what appeared to be a large box, but it was on the other side of a stream of water so deep and wide that they could not cross it, and while they were deliberating the last piece of the pound of candles, which they had provided and taken with them, fell, accidentally, into the water and they were left in utter darkness! The difficulties they experienced in crawling out of the cavern, and the terrors occasioned thereby, prevented all further attempts at exploration. My informant stated that her grandfathers were young unmarried men when they engaged in this subterranean enquiry, and from the best information I could obtain the date of it would appear to be some time early in the reign of King George III. Many other similar tales are current round May Hill, but after taking considerable pains

I could find nothing in the traditional history, as given by living persons, which I considered worthy of credence, save this—all agreed that Crockett's Hole was the hiding place of the martyr, Horne.

Permission for a thorough exploration has been given by the owner of Cugley Farm, and arrangements will be made to carry it out at an early period.

1

NOTE.—During the progress of the publication of this Volume, this paper on "Crockett's Hole," read at the first Field Meeting on May 27th, 1886, has at this period come into the hands of the Editorial Committee. It is one of the four missing papers referred to on page 35.

Woolhope Naturalists' Field Club.

1887.

THE Annual Meeting of this Club for the year 1887 was held in the Woolhope Club-room, Free Library, Hereford, on Monday, April 25th. The following were present:—Mr. G. H. Piper, F.G.S., President; Rev. Wm. Elliot, President-elect; Vice-President, Mr. H. Southall; Mr. H. Wilson, President of the Malvern Naturalists' Field Club; and the following members—Revs. Wm. Bowell, E. J. Holloway, A. W. Horton, Augustin Ley, H. B. D. Marshall, and P. Strong; Dr. T. A. Chapman, and Messrs. Ballard, Cam, J. Carless, jun., Clarke, Gilbert Davies, Docking, Martin, Moore, Rootes, and Shellard.—The vacancy caused by the resignation on account of ill-health, of the office of Secretary by Mr. Theo. Lane, was filled up by reverting to the former constitution of the Club according to Rules 2 and 3—viz., by electing an Honorary Secretary and an Assistant Secretary. Accordingly, after expressing their recognition of the services of Mr. Theo. Lane, their thanks for his labour and devotion to their interests for the last ten years, the meeting elected Mr. H. C. Moore, Honorary Secretary, and Mr. James B. Pilley, Assistant Secretary.—The financial statement was read and approved. Various estimates, and especially such as were connected with diagrams to illustrate the "Transactions of the Club" since the year 1877 inclusive, were sanctioned.—It was announced that a volume would be shortly issued comprising the transactions during the years 1877, 1878, 1879, 1880, which would be the property of every member who had paid up all arrears, as well as his subscription for the current year 1887.—It was resolved that a vote of thanks be accorded, and entered on the minutes, to Mr. H. C. Moore for his editorial services, in the compilation of this the first volume of the ten years of arrears of "Transactions of the Woolhope Club."—The Rev. A. Ley gave a very satisfactory report of the progress of "The Herefordshire Flora."—The following works, presented to the Club, were laid upon the table for inspection:—Proceedings of the Cotteswold Naturalists' Field Club for 1885-1886; Transactions of the Essex Field Club, Vol. IV., Part 2, for December, 1886; the Essex Naturalist, Nos. 1 and 2, for January and February, 1887; Annual Report of Smithsonian Institution (Washington), for 1884, Vol. II; "Etudes sur le Phylloxera Vastatrix," by Mons. J. Maxime Cornu, being memoirs presented to the Academy of Sciences of the Institute of France.—The dates and places of meeting for the current year were arranged as follows:—Friday, May 27th, Mitcheldean; Monday, June 27th, Thornbury Camp; Thursday, July 28th, Ladies' Day, Grosmont and Skenfrith; Thursday, August 25th, Craven Arms; Fungus foray, the week commencing Monday, October 3rd.—The reading of the retiring President's address on "Searches for coal in Herefordshire" was deferred, only to be reserved, we hope, for publication hereafter in "The Transactions." In the present day any geologist knows that a search for coal under the Old Red Sandstone of Herefordshire must assuredly result in failure.

Woolhope Naturalists' Field Club.

MAY 27TH, 1887.

The first Field Meeting this year was held on Friday, May 27th. A large muster of members assembled at Barr's Court, and took train for Mitcheldean Road, the first station beyond Ross, on the road to Gloucester. The business of the Club was conducted at the Railway Station, when seven new members were elected. Mr. Theophilus Lane, in recognition of his services to the Club from April 23rd, 1878, a period of nine years, was elected an Honorary member. The Honorary Secretary announced the presentation to the Club of the "Flora of Cardiff" from the Cardiff Naturalists' Society. At a later period of the day, the fixture of Monday, June 27th, for the next meeting at Thornbury Camp, was altered to Thursday, June 30th.

Mr. Wethered, F.C.S., F.G.S., F.R.M.S., Hon. Secretary of the Cotteswold Field Club, having travelled from Cheltenham by an early train, and taken his breakfast at the Hotel near Mitcheldean Road Railway Station, met the Club upon their arrival at this Station. Mr. E. Brammer, keeper, Lea Bailey Lodge, also attended to guide the party through the Delve and other parts of Meend Hill, by the disused Roman workings for iron ore, unto "The Deep Cutting" near Mr. Brain's house, "Euroclydon," where they were to examine the upper beds of the Old Red Sandstone, and the interesting series of Transition strata which mark those physical changes which closed the Devonian period of the earth's history and introduced the Carboniferous. Here, it is reported, are exhibited "in 104 yards, 154 divisions of the passage beds between the Old Red Sandstone and the Carboniferous Limestone." The party, reinforced by members picked up *en route*, and by local visitors, now commenced the ascent of the Meend, and before gaining its summit, halted at an exposed mass of conglomerate, where Mr. Wethered, unfolding his diagrams, gave an outline of the geology of the locality. He understood that there were some members of the Club who had not made a study of Geology, and consequently he felt that no apology was necessary if he began at the beginning of the story which the rocks around them had to tell.

The strata which composed the crust of the earth was divided into three periods. The first was termed the Palæozoic from the Greek *palaios*, ancient, and *zoe*, life; the next, Secondary or Mesozoic from the Greek *mesos*, middle, and *zoe*, life; the third Tertiary or Cainozoic from the Greek *kainos*, recent, *zoe*, life. On the present occasion they were only interested in the first of these, namely, the Palæozoic, which, as the name implied, included the earliest rock formation of which they had knowledge. The Palæozoic consisted of the following formations or periods. First the Archæan, which were the oldest, second the Cambrian, third the Silurian, fourth the Devonian, which included the Old Red Sandstone, fifth the Carboniferous. At that moment they were standing on the upper beds of the Old Red Sandstone, and the lower beds, consisting of Sandstones, Shales, and

Clays, stretched away into Herefordshire. The rock under their feet was called the Old Red Conglomerate, and they would see that it was made up of hard quartz pebbles, and small grains of quartz, which might be compared to coarse sand. They would observe that the pebbles and grains of quartz had been rounded, which was evidence of their having been rolled about by the force of water. The deposit was a sedimentary one, and represented the floor of an expanse of sea or large inland lake. As to which of these two conditions existed at the time of the Old Red Sandstone formation, there was a difference of opinion. If they went into Devonshire, they would find rocks of the same age which were undoubtedly of marine origin; this fact was proved by the corals and marine shells found as fossils in the strata. On the other hand the fossils found in Devonian strata represented by the Old Red Sandstone were mostly of a type which inhabit fresh water. The Old Red Sandstone had sometimes been referred to as the "Age of Fishes," so numerous were they in those days. They belonged to the *Placoid* and *Ganoid* orders, and were distinguished, among other features, from the bone fishes of later periods, by the skeleton being of a cartilaginous nature. At last the Old Red Sandstone period came to an end, and was followed by the Carboniferous Epoch, to which England owed so much as being the source of our coal supply. The physical changes which took place could be well traced in the locality they were about to visit. As they proceeded in the direction of Drybrook, they would find that the Conglomerate, on which they were now standing, gradually changed; the quartz pebbles would become less numerous and be replaced by sandy beds, with an extraordinary variety of colour. If they examined the mineral grains of which those sandy beds were made up, they would detect them to be the remains of broken up and decomposed granitic rocks, thus showing that the material had been derived from the denudation of an ancient land surface of granitic rocks. These interesting beds simply represented a transition period; and soon vast numbers of marine calcareous organisms were to appear, and by their death their calcareous remains were to build up limestone rocks. If they, the Club, followed the Sandy Beds in ascending order, they would find that they gradually passed into Limestones and Shales. They had now arrived at the base of the Carboniferous Period, at rocks known as the Lower Limestone Shales. To understand those beds, and to realise what they taught, it was necessary to study them under the microscope, which was only to be done by reducing portions to thin sections, so that light could be transmitted through. He could not well bring a microscope, but he had brought some photographs of the sections taken directly from the microscope. One bed showed that it was made up of the remains of *Encrinites*, or Stone Lilies as they were sometimes called; another of the valves of *Ostracoda*, an order of small Crustaceans; in another *Polyzoa*, or Sea-mats, were numerous, and the remains of shells. An examination of a number of these sections of the beds showed that the Lower Limestone Shales represented a succession of sea floors. The Organisms lived in the waters of that sea, and by their death the Limestones were formed from the calcareous portion of their structure, which accumulated at the bottom. The formation of the strata doubtless extended over a long period of time, during which the physical conditions were varied, and thus

the life varied according as the conditions suited. For that reason they found Limestones of different structure and quality, which, of course, was regulated by the Organisms whose remains contributed to their formation. The Limestone forming process was at times stayed, during which intervals Clays and Shales were deposited. After a thickness of about 130 feet, they came to a different series of Limestone beds, and the Shales were absent: this was the Carboniferous Limestone proper, and was about 360 feet thick. The Organisms which contributed to its formation were not easily made out, as the rock had undergone chemical change since it was first deposited, and, generally speaking, only the outlines of the Organisms could be seen. On the top of that 360 feet of rock they came to another series of Limestones, and an examination of them showed that they contained Organisms of the same nature as those to which he had referred in the Lower Limestones. The Limestone deposits to which he had referred consisted then of three divisions, thus:—

	Approximate thickness.
Lower Limestone Shales	130 feet
Carboniferous Limestone Proper	360 ,,
Upper Limestones	116 ,,

At the time of the deposition of the Upper Limestones, the sea floor was probably rising, for they found the Limestone replaced by a Sandstone known as the Millstone Grit. This rock was the base of the Coal Measures. Apparently the sea floor continued to rise until conditions existed which allowed of that vegetation to grow which formed our Carboniferous Coal.

Upon the conclusion of Mr. Wethered's address, the party proceeded towards "The Deep Cutting," a cutting in the road from Ross to Drybrook. On their way a halt was made at some rough broken ground—termed the "Delve." This spot in the Forest exhibits the vestiges of labour of man many centuries ago. In some places rugged masses of rocks project, at other places yawning chasms present themselves around the unwary traveller, and prompt him to keep his eyes open lest he fall into pitfalls, the remains of ancient disused workings in pursuing the course of the vein of iron ore. There should be no reason to doubt that these are justly called "Roman Workings," when we consider the proximity of the town which the Romans called "Ariconium," mentioned in the thirteenth Iter of Antoninus, which occupied the site of Bury Hill, near Bollitree, Weston, three miles from Ross—over which neighbouring area British and Roman coins have been found, dating from Claudius to Magnentius, *i.e.*, from A.D. 41 to A.D. 353, and also large masses of iron scoriæ, evidence of smelting furnaces having been employed. It has been said that the floors of some of the forges have been discovered.

Still proceeding onwards, upon arrival at "The Deep Cutting," the Lower Limestone Shales were examined, and some good fossils obtained. The Transition beds were then seen, and further details as to their structure and origin were given. The party passed over the Carboniferous Limestone, which, however, was

in this locality covered with surface soil. There was a quarry in which the Upper Beds, and the transition into the Millstone Grit, might have been seen, but the rain came down with such determination that no halt was made. Further on, on their way towards the Wilderness, a shelter was found under trees until the rain ceased, and then the party proceeded onwards towards the Cement Works, having abandoned their intention of visiting the large quarries in the Carboniferous Limestone at "The Wilderness" on account of the threatening state of the weather. At Mr. Colchester Wemyss's "Wilderness Cement Works" they were met by his courteous Manager, Mr. J. M. Carr—under whose guidance they were at first conducted to a cutting recently made intersecting the Upper Limestone. After an explanation of the strata, the whole process of making cement, possessing all the hydraulic properties of the so-called "Portland Cement" was studied, and the skill and experience required in so incorporating the admixture of its constituents, Carbonate of Lime, Silica, and Alumina, in such proportions as to ensure perfection of hardness and properties of setting in water, were pointed out, the many chances of failure being at the same time demonstrated. Mr. Carr conducted the members over some more vestiges of the "Roman Workings," close to the Cement Works—one called "The Waggon" presented a very uninviting dungeon-like appearance; here again it behoves the traveller to be wary where he plants his feet.

The Church was now visited under the guidance of the Rev. H. H. Hardy, the Vicar. It is dedicated to St. Michael, hence the name Micheldean—which is now more usually spelled Mitcheldean. The Church has a Nave and Chancel, one aisle on the South side and two aisles on the North. A Tower at the South-West angle surmounted by a lofty and tapering spire. The old oak roofs over the two North aisles, of different patterns, are fine examples of the flat Perpendicular style, being richly moulded and carved throughout with angels in high relief; a 14th century barrel-shaped roof covers the Nave, divided into panels, with carved bosses at the intersections of the rib mouldings. There is no Chancel arch, but at the division of the Nave and Chancel, immediately under the roof, are the remains of some ancient woodwork which probably stood over the rood screen, of which there is now nothing remaining. This woodwork is divided into panels, the paintings on which represent figures—too distant to be distinguished, and much hidden below by a modern wooden arch. The old Norman font has been restored, the upper portion newly worked to fit on to the old part below, having figures in the arches similar to the font in Hereford Cathedral. In the South-east angle of the South aisle is a very good piscina and credence. In the modern vestry at the Eastern end are two brasses fixed to the walls, each about 2 feet 6 inches in height, supposed to be the effigies the one of Margery, wife of Thomas Baynham, daughter of Richard Hodge, A.D. 1444, and the other, of Alice, wife of Thomas Baynham, daughter of William Walwyn, A.D. 1456. The Church possesses a peal of eight bells of exceptional beauty. Its register dates from the year 1680.

The more active members then visited the Terra-Cotta Pottery Works, situated on the Longhope Road, at a distance of one mile from Mitcheldean, where they witnessed the whole process of working the material, from its

excavation in the quarry from beds of very fine red sandstone, similar, but superior in strength to the famous Mansfield stone, to its execution in Terra-Cotta fine art examples of many a variety.

The trumpet now sounded the "assembly" for dinner, which was prepared at the George Hotel by Host Baynham. This afforded a favourable opportunity for taking a list of the members and visitors, which is now appended: The President, Rev. Wm. Elliot; Vice-Presidents, Mr. F. Bainbridge, Mr. H. Southall; Mr. E. Wethered, F.G.S., &c., Hon. Secretary of the Cotteswold Naturalists' Field Club; Rev. Sir George H. Cornwall, Bart., Colonel Lucas and friend, Major Doughty, Dr. Wood, Revs. Howell, Burrough, Holloway, Horton, Jones, Ley, Phillott, Tedman, Tweed, Watkins, and Williamson, Messrs. Clarke, Cleasby, Davies (James and Gilbert), Luther Davis, Gilleat, Harrison, Hutchinson, (Thomas), Lloyd, Purchas, Riley, Shellard, Vevers, and H. C. Moore, Hon. Secretary. The following visitors attended:—Revs. E. R. Firmstone, G. E. Gilbanks, and H. H. Hardy, Messrs. Carr, W. Pilley, N. F. Searancke, E. E. Yearsley, with Mr. W. F. Poulton, of the Malvern Naturalists' Field Club, and others whose names did not transpire.

For the following notes on
 THE BOTANY OF MITCHELDEAN DISTRICT

we are indebted to the REV. AUGUSTIN LEY.

THE most remarkable flowering plants and mosses of Mitcheldean Meend, seen or searched for by the Club on this day's date were the following :—

Ascending the hill from the station, just within Herefordshire, the rare Umbellifer *Myrrhis odorata* was found. On the wooded conglomerate rocks several rare mosses are known; *Plagiothecium elegans* and *Dicranum fuscescens*; one of the damp rocks was covered with *Racomitrium fasciculare*. In the hollows of sandpits, among the conglomerate, are the only stations in the neighbourhood or county for the beautiful Cave moss *Schistostega osmundacea*. The broken limestone ground on the summit produced the rare *Tortula recurvifolia*—while on clay at Silverstone farm the *Tortula cavifolia*—still rarer in Herefordshire—has been found. The shady rocks of the old deserted workings were covered with two other curious *Tortulas*—*tortuosa* and *sinuosa*; and the minute *Fissidens*—very rare in the neighbourhood—*Fissidens pusillus*. Another *Fissidens* was fruiting there freely—*F. decipiens*. The shady rocks near the mouth of the tunnel produce a rare grass—*Festuca sylvatica*, but it was too early in the year to see it.

The flat surface of the Meend about Wigpool pit rejoices in many rare plants. *Senecio*—probably *viscosus*—was picked in one of the sand pits; in which also the rare *Dicranum subulatum* has been detected. In the damper spots the elegant little Willow, growing about half a foot in height, *Salix repens*, is abundant, and was flowering and fruiting freely. Here, also, in several spots grows the very rare and local violet, *Viola lactea*—not the showy and well-known mountain Pansy, *Viola lutea*, but a much more rare and less handsome plant. It was searched for, however, in vain, owing to the lateness of the season. Several patches of genuine bog still remain, which support the two Sundews, *Drosera rotundifolia* and *intermedia*, the latter in greatest plenty; also the handsome Scottish Asphodel, *Narthecium ossifragum*.

The two heaths, *Erica tetralix* and *cinerea*, are both abundant, and the Whortle-berry, *Vaccinium Myrtillus*. The Club-moss, *Lycopodium clavatum*, is very rare here, but has been found by Dr. Serancke. A pretty little variety of the common Dandelion, *Taraxacum levigatum*, was abundant, in full flower. The Juniper, which might be expected to grow here, seems to be quite absent. Several interesting mosses occur in the pieces of bog: the two Apple-mosses, *Philonotis fontana* and *calcareae*, were both found, also *Fissidens adiantoides*. Three, or perhaps four species of Bog-moss (*Sphagnum*) grow here; *S. acutifolium* and *Cymbifolium compactum*, and *subsecundum* in at least four states, the type, well marked *contortum* and *turgidum*, and a very large form in watery ditches, which is said to be unique. A portion of the surface of the hill was planted with fir and oak some twenty or thirty years ago, and in these plantations and their outskirts several rare Brambles are found. *Rubus fissus* and *plicatus* are abundant,

and it is possible that other members of the sub-erect group may occur. One of them, probably *R. fissus*, is occasionally found in the Forest with *double* blossoms, resembling small roses, in which state it is very showy. *R. umbrosus* also abounds here, and the local *R. Borreri*. The ground in these plantations is carpeted in spots with the beautiful *Polytricha*, the most beautiful among which, *P. formosum*, with its fawn-coloured seta and light yellow calyptra was, at the time of our visit, in perfection. Two *Campylopi* also were found in plenty; one of which, probably *Campylopus pyriformis*, was fruiting abundantly. *Webera nutans* var. *bicolor* was also in abundant and beautiful fruit.

On a wall-top, descending to Mitcheldean, a quantity of the curious Extinguisher-moss, *Encalypta vulgaris*, was found, and growing with it the local little *Gymnostomum microstomum*. At dinner the very local fern Moonwort, *Botrychium Lunaria*, was exhibited, which had been obtained by Dr. Serancke from the neighbourhood of Ruardean.

ON THE LIFE HISTORY OF ANTHOCARIS CARDAMINES.

By DR. T. A. CHAPMAN.

THE "Orange Tip Butterfly" (*Anthocaris Cardamines*) is supposed to be "common everywhere." Any interest there may be in these observations is not therefore due to the rarity of their subject. The egg of this butterfly and the newly-hatched larva are not however familiar objects to most entomologists, and have not, I believe, been described in any English work, and therefore possess sufficient freshness to justify my laying these notes on them before the Club.

The subject is also appropriate to this meeting, as at this season it is usually possible to find the butterfly, the eggs and the young larva. This year, however, the season is so late that this hope will be disappointed, as, though the butterfly was on the wing three weeks since, it has since disappeared; and I shall not be lucky enough to be able to show you the eggs, as the main flight of the insect is probably not yet out. Last year the spring was also late, and eggs were not laid before June, and were to be found as late as June 30th. Usually the middle of May is the date of oviposition.

Last year white butterflies were very scarce, and it so happened within the range of my observation, that any white butterfly seen proved to be a female *Cardamines*; *Pieris Rapæ* usually so abundant, was so scarce that I was unable to obtain eggs of it for comparison with those of *Cardamines*. Early in June I observed the female of *Cardamines* settling on the flowers of *Alliaria Officinalis*, the common Jack by the Hedge or Garlic mustard, and noted that whilst sipping the honey from the flowers she also deposited an egg on the flower stalk. At the date when this occurs there is usually about an inch of the stem occupied by the seed pods already formed, and the pedicel selected for the egg is usually that of a flower nearly over, so that it might equally be called a young pod. Only one egg is laid in one head; if a second be found it is probably the result of a visit by another butterfly. The *Alliaria* grows in little colonies in the hedge banks, and usually each colony afforded one head containing an egg, and no more—though there were exceptions, some colonies being uninhabited, and others with several eggs. A large patch of *Alliaria* did not afford a second egg more frequently than a small one.

The *Alliaria* is undoubtedly the food plant of *A. Cardamines* in this district. I found eggs also on charlock and on turnip, and the larva is said to feed on various other Cruciferæ, but all these in this district may be regarded as exceptional.

The egg is very like that of *Rapæ*, but is larger and darker, both are of the inverted vase shape usual in the *Pieridæ*. The height of the egg in *Cardamines* is 1.10 mm., the greatest diameter 0.52 mm.; of *Rapæ* the height is 0.90 mm, and the diameter 0.41. In *Cardamines* the longitudinal ribs are 13 in number, several joining towards the top, so that the rosette at top has 10 or 11 rays. *Rapæ* has

11 ribs uniting into about 7 at top. Both are of a pale pearly green when first laid, indeed almost white, in Rapæ the green becomes more pronounced and passes into a yellow. But in *Cardamines* the green is very evanescent, passes through yellow into deep orange and almost brown. It hatches on the 8th day, though there is little doubt that this period will vary with the temperature. The larva takes from 18 to 24 days to feed up to its full growth, the shorter period being that of a larva hatched June 30, and fed during July. A still longer period is probably the rule with larva hatched early in May, as must happen in most seasons. It moults four times at intervals of about three days, and spends six or seven days in the last skin before suspending itself for its change to the pupa.

The newly hatched larva proceeds to a pod of from a quarter to half an inch long, and eats of its substance just below the stigma; when older it is less particular as to the size of the pod attacked, and will eat of a nearly mature pod; it feeds exclusively on the pods and their contained seeds. I never saw one eat a leaf.

The following are the dates of moulting in two instances:—

Hatched	June 26	June 30
1st Moulting	June 30	July 3
2nd Moulting	July 2	July 5
3rd Moulting	July 5	July 8
4th Moulting	July 7	July 11
Change to pupa	July 12	July 19

In its first skin the larva is pale buff, with black head tubercles and hairs. The tubercles have the arrangement that is so common throughout the whole of the Lepidoptera, and which persists throughout the larva stage in most concealed feeders, such as the Hepiali, some noctuæ, [tineæ, and tortrices. *Xylophasia monoglypha* (polyodon) is a fine example of these typical tubercles. They are four dorsal (trapezoidal), one subdorsal, and a post-spiracular, on either side, a subspiracular, and other ventral tubercles; the legs and prolegs are black; the length when about to moult is 3 mm, at hatching about $1\frac{1}{2}$ mm. In the second skin it reaches 7 mm in length; the head is a dark olive, the body greenish olive, and as if overlaid by a thin white enamel. The tubercles are as in first skin, but there are faint indications of some others. Each segment is divided into four subsegments, of which the first carries the anterior trapezoidal tubercles, the second the subdorsal, and the third the posterior trapezoidal. In the third skin the length reaches 12 mm, the colour is green shading to a white lateral line of porcellanous appearance. The colouration is now indeed that of the full-grown larva. The head and all the segments are clothed with black dots carrying hairs. The segments are now subdivided into seven subsegments, along which these dots are arranged in regular rows; the tubercles proper are still conspicuously large amongst these—the anterior trapezoidal on the second subsegment, the subdorsal on the third, and the posterior trapezoidal on the fifth. In the following, namely, the fourth and fifth skin, the only subsequent change is the subsidence of the original tubercles, so that only by careful observation can they be distinguished from the other dots which lie in regular rows along the subsegments.

There is one point regarding the larva I have not yet alluded to, viz., that the hairs of the typical tubercles and also of the secondary dots are tipped with globules of fluid. Similar globules may be detected on the hairs of the young larvæ of *Rapæ* and of *Brassicæ*, but in *Cardamines* they are much larger and more conspicuous, so that no doubt of the nature of the club at the end of each hair is possible; especially as they are shortly renewed if wiped off. They are proportionally largest in the youngest larva in its first skin, but more numerous in the second, and still more in the third, as the secondary dots develop, and here are proportionally larger on the hairs of the tubercles proper than on the dots. I have no theory to offer as to the object and use of this curious provision.

The larva always becomes restless when ready to change to pupa, and no doubt at large wanders off to some secure place to undergo that change. I have never found a pupa on the stem of the food plant, and a few larvæ, observed at large, disappeared at this point of their history. Since it spends nearly ten months in the pupa state, it is necessary that it should be well protected during this period; its well-known remarkable form as a pupa is no doubt protective.

I need not describe the full-grown larva, the pupa, or the imago, as these are sufficiently well-known. Among the specimens reared from the egg are several as large or larger than are to be captured as butterflies, and also quite as richly coloured. The males outnumbered the females by three to one, but as the number reared was small this was probably accidental.

HEREFORDSHIRE LEPIDOPTERA.

By Mr. THOMAS HUTCHINSON.

IT is considerably over thirty years since I first took a specimen of *Ouraapteryx Sambucata*, and started the collection which some members will remember seeing at Grantsfield on the day the Club met at the Bach Camp in 1884, and it is over twenty years since the Club has been furnished with a complete list of the Lepidoptera that have been taken in the county: *vide* the Transactions of the Club 1866, page 307, which, with a supplemental list in 1870 (both supplied by my mother), and another list in the same year by Mr. Harman, are, as far as I know, the only records the Club possess of the County Lepidoptera; and I have now much pleasure in furnishing the Club with a complete list up to the present time. It will be found that very large additions have been made. To make the list as complete as possible, Dr. Wood, of Tarrington, has rendered me very great assistance by kindly furnishing a list of his captures, and Mr. James B. Pilley, of Hereford, has also assisted me with the names of a few rarities he has met with. I have marked the list so as to show, as far as possible, the district in which each species occurs.

In the *Diurni*, or Butterflies, the county is fairly rich, 42 species having been taken out of 65 found in Great Britain and Ireland. Besides these, my father, about forty years ago, saw a specimen of the rare Camberwell Beauty, *Vanessa Antiopa*, and the late Mr. E. Newman reported that he used to take the rare *Lycæna Acis* quite commonly in a field at the Bach, in the parish of Kimbolton; but, although we have often hunted, we have never met with it, and I am afraid it has disappeared from the district. In 1855 I took a specimen of *Pieris Cratægi*, and two more were taken in 1860 in the orchard at Grantsfield, and two or three more were seen, but since that date it has not occurred, nor has it been taken, so far as I am aware, elsewhere in the county. In 1860 I also took in the same orchard a female *Leucophasia Sinapis*, which frequents woods, and is generally common where met with. We have only taken one other specimen in the Leominster district, but it occurs elsewhere in the county.

In the box which I exhibit will be seen two specimens of *Anthocaris Cardamines*, the subject of Dr. Chapman's interesting paper; also the larva preserved by Lord Walsingham, and its curious boat-shaped pupa cases. *Colias Edusa*, the clouded yellow (there are a pair in the box with its preserved larva), occurs commonly every six or eight years, and is not met with during the interval. This is not an uncommon trait with some species, but wherefore is a mystery; and it is also uncertain whether they exist in the ova or pupa state. We have also taken the female variety of *Edusa* known as *Helice*, the black markings of which are the same as in the ordinary type, but the yellow is a pale lemon instead of a dark orange colour. The males do not vary in this way. In 1868 my brother took a specimen of the rare pale clouded yellow *Colias Hyale*. Dr. Wood reports the capture of *Apatura Iris*, the Purple Emperor, and Mr. Pilley

says that it has been taken at Dinedor, and also seen at Aconbury, Backbury, and near Ross. It frequents the tops of oak trees, and is very difficult to capture. The larva feeds on the broad-leaf willow *Salix caprea*. I am also indebted to Mr. Pilley for the record of *Arge Galathea* seen near Rotherwas *Nemeobius Lucina* taken at Haughwood, and *Lycæna Egon* taken at Litley and elsewhere. As a rule butterflies have not been common of late years, but *Vanessa C-album* is generally common throughout the county, although for some years it is hardly seen, whilst perhaps in the following year it is unusually abundant. There are three specimens of this insect in the box: an upper and an underside of the autumn brood, and an underside of the spring brood. My mother was the first to draw attention to the fact that this species is double brooded, and in favourable seasons she has no doubt that there is a midsummer brood as well. The spring variety, it will be observed, is much paler than that of the autumn type, and was named *Hutchinsonii* by the late Mr. Doubleday. The larva and egg cases are also shown. The pupa, which is called by hop-pickers the silver grub, has a silver mark on each side resembling the white C mark on the underside of the hind wings of the imago.

Of the "Nocturni," which include the Sphinges and Bombyces, out of 112, 66 occur in the county, the most noteworthy of which, *Achrotonia atropos*, the Death's Head, measuring over five inches from tip to tip of the wings, is usually taken in the larva or pupa state in the autumn among potatoes. It is generally considered tender and difficult to rear. As a rule, the imago will not emerge till the following year, and, sometimes, not for two or three years. The best plan is to place the pupa in light mould in a flower-pot on a gentle hotbed, and force it out the same year; then no difficulty will be found. A pupa dug up in the garden at Grantsfield, although the case was cut through across the antenna with the fork, and a moisture exuded from the wound, was treated in this way successfully, notwithstanding the wound. The injured antenna was shorter than the other. This is the only British Lepidoptera that has the power of making a sound. I have heard the imago and pupa squeak as loud as a mouse, and it is stated that the larva does the same.

Sphinx Convolvuli, which is a trifle smaller than *atropos*, measuring from $4\frac{1}{2}$ to $4\frac{3}{4}$ inches from tip to tip, is moderately common in the county. In 1868 I took twenty-seven over petunia. In August, 1870, I took a specimen of the rare *Deilephila Galii* also over petunia, and another was taken at Leominster in the same year. On September 12th, 1885, the still rarer *Charocampa celerio* was captured by a man in Widemarsh Street, Hereford, attracted by light, and taken by him to Mr. Pilley, in whose collection it now is, but I am sorry to say it is minus legs and antennæ. The man thought it was some kind of hornet and stuck it through the thorax with his penknife, and to prevent it doing any further mischief drowned it in paraffin. Mr. Pilley has since soaked it in benzine, and, considering all things, it is a very fair specimen. Dr. Wood reports the capture of another by the Rev. Mr. Napleton on a stable door at Tarrington about thirty years ago. I exhibit a specimen of *Charocampa Elpenor* of the same genus, with a preserved larva which gives the name of Elephant to the species, the anterior

segments being retractile. Just above, in the box, is a specimen of *Macroglossa stellatarum*, the humming bird, with its larva; and just below is *Macroglossa Bombyliformis*, very much resembling a bee. I have taken one specimen of each of the imago and larva of this species. Of the genus *Scsia* or Clearwings, which closely resemble wasps, hornets, flies, and ichneumons, Dr. Wood has taken nine out of the fourteen species. They are most of them rare and difficult to find; we have only taken two in the Leominster district, but, then, I know we have not looked for them in the right way. There are in the box two *Sesia Tipuliformis*, the larva of which is destructive to currant trees. *Zeuzera Esculi*—the Leopard,—so destructive to trees in the parks and squares of London, is rare in the county, but we have taken a few specimens in the perfect state, and found one larva full fed burrowing in a hawthorn stem. Its neighbour, *Cossus Ligniperda*, the goat, is only too common; a large oak tree near Grantsfield had to be cut down it was so infested with this larva; the wood was quite spoiled. Willow is its more usual food. It remains three years in the larval state, and is easily detected by the smell, which is as powerful as that of a fox or a goat. That most lovely and rare moth, as its name signifies, *Deiopeia Pulchella*, has been taken twice in the county, both times by young collectors; the first time by Mr. A. E. Edwards, of Hereford, at King's Acre, in June, 1880, and the second time by Mr. Du Buisson, at Breinton, two years later. It is generally taken, when capture does occur, on the south coast, and I believe some people hold the theory that it is blown across from France, and is not properly a British species, probably because of its foreign appearance. Now that it has occurred twice in Herefordshire, I think that theory—to use a vulgar expression—may be “blowed,” which these moths certainly never were. In the box is a specimen of *Euchelia Jacobææ*, which closely resembles *Pulchella* in form and shape. Passing over a number of species, including *Endromis Versicolor*, taken by Dr. Wood, of which you will see in the box specimens of male and female, eggs, larva, and cocoon, I come to the *Geometræ*, or thin-bodied moths, of which, out of 283, 189 have been taken in the county, which is a large proportion. The genus *Acidalia*, the largest but one of these genera, is the worst represented, 11 only having been taken out of 29. *Sterrhæ Sacaria*, which occurs very rarely in this country, was taken at Grantsfield in this peculiar way. The cook was talking to her brother; he saw and caught it in his hands, transferred it to hers, and she brought it into the house; considering what it went through it is very little injured. It is a small, delicate moth, about one inch from tip to tip, of a pale yellow colour, with a narrow, indistinct pink line extending from the tip to the inner margin of the front wing. My brother takes it abundantly in Natal. I have never heard it suggested that they are blown here by a tornado. Mr. Pilley reports the capture of *Pachynemïa Hippocastanaria* at Haughwood, which is remarkable, as it frequents heath, of which there is so little in the county. In the genus *Eupithecia*, the largest genus of the *Geometræ*, we are particularly rich—35 species out of the 49 having been taken. *Consignata*—our Grantsfield speciality—of which I exhibit a pair, was first taken by my mother in 1864 at the root of an apple tree, struggling with a spider. It frequents orchards, and the larva feeds on apple blossom. My

mother, who has been most successful in breeding many rare British species, has reared many from the egg. We have not taken it at large since 1874, but she has succeeded for thirteen years in in-breeding them, that is from the same stock, and she has obtained eggs again this year. I know of no case of in-breeding that will compare with this. The numbers get fewer each year, but the specimens are fine and well marked. For the other species of the genus *Eupithecia* I must refer you to the list, and pass on to *Lobophora sexalisata* and *hexapterata*. The one is found on willow, and the other on poplar in June. As their names signify, they have six wings, a small false wing appearing between the upper and lower wings of the male insect.

I now come to the *Cuspidatæ* or Pseudo-Bombyces, of which there are only 33 British species, and 24 occur in the county. *Dicranura bicuspis* and *stauropus fagi* are the rarest of them, and they have each been only taken twice. Of the first-named, I took the larva on alder at Dinmore, as reported in the Club Transactions for 1866. It was injured, and died. A year or two afterwards I took a beautiful imago sitting beside its cocoon on birch at the same place. My mother took *Fagi* at Bircher Common, and Dr. Wood records having taken another at Tarrington. There is a specimen in the box; it will be observed that the antennæ are pectinated with the tip filiform. Beside it, is its remarkable larva from which it takes its name, the *Lobster*.

Of the *Noctuæ*, the largest group of the Macro-Lepidoptera, there are 318 species, and 184 occur in the county. Among these there are many rarities, too many to mention all, but *Acronycta Alni* and *Xylomiges Conspicillaris*, both taken by Dr. Wood, should not be passed by without mention. I once took the larva of the former on oak near Berrington Wood, but it was stung by an ichneumon and died. It is a peculiar larva, until the last change being so exactly like a bird's dropping that it is difficult, when at rest, to believe it is not so. When the last slough takes place, the change is almost startling; a grand black-and-gold larva appears with remarkable clubbed hairs resembling the antennæ of a butterfly. There are two specimens of the imago in the box. It is also interesting to record that I have taken the whole of the 11 species of the genus *Teniocampa* on the same night at willow bloom. *Leucographa, opima, populeti* and *miniosa* are uncommon, and I do not know of *opima* being taken so far south elsewhere. I have also taken the whole of the genus *Xanthia*—six in number—at ivy bloom in the autumn. Single specimens only have been taken of *Dicycla Oo*, *Hecatera Dysodea* and *Serena*, and several other species. *Heliothis armigera* I have taken twice, once at rest on a door, and on the other occasion flying over lobelia. *Plusia Bractea* and *Festuca* have not occurred again since they were last reported twenty years ago. The former was knocked down by my father with a botanical trowel, and captured at the Brooches Quarry, and two pupæ of the latter were taken on the bank of the old Leominster Canal, spun up in light cocoons attached to some rushes.

This brings me to the end of the Macro-Lepidoptera, and I do not propose to trouble you with any detailed account of the *Micros*, as it is only of late years that we have begun to work them, but Dr. Wood has devoted his attention to

them for some time with great success, and, with the assistance of his list, I can show that the county record is a very good one.

The following is a summary of the Macros and Micros :—

Macros :

Diurni	...	...	...	...	...	...	42	out of	65
Nocturni	...	...	...	...	...	...	66	„	112
Geometræ	..	...	...	...	...	...	189	„	283
Cuspidatæ	..	...	..	..	...	...	24	„	33
Noctuæ	...	..	...	..	...	...	189	„	318
							510	„	811
Total	...	...	...	...	...	...	510	„	811

Micros :

Deltoides and Aventiæ	...	...	...	...	...	...	9	„	15
Pyralides	...	...	...	...	...	...	43	„	77
Crambites	..	...	...	...	...	...	33	„	83
Tortrices	...	...	...	...	...	...	198	„	335
Tineæ	..	...	...	...	...	...	371	„	716
Pterophori	...	...	..	..	...	...	15	„	36
							669	„	1,262
Total	...	...	...	...	...	...	669	„	1,262
							1,179	„	2,073

In conclusion, I may say that entomology deserves to be taken up more than it is by people who are fond of country pursuits, as it affords more constant amusement than any other branch of natural history. It is always at hand; moths may be taken all hours of the twenty-four, in every month of the year, and from the middle of our largest towns to the tops of the highest mountains. The facts which I have laid before the meeting, I think, show two things: First,—Considering how few entomologists there are in the county, the results are very satisfactory, and prove that the county is most rich in Lepidoptera. Secondly,—That the great rarities are, as a rule, taken by young beginners or in some irregular way; both of which facts should be an encouragement to anyone fond of natural history to take up this most interesting branch. I can assure anyone doing so that he will find it a constant amusement, which will last him his lifetime.

NOTE.—Since the foregoing paper was written many new species have been added to and included in the following list of Lepidoptera found in the county, which is complete up to date of publication, 1892.

HEREFORDSHIRE LEPIDOPTERA IN THE LEOMINSTER
AND TARRINGTON DISTRICTS.

When not marked the species occurs in both districts, when it occurs only in one of them, e.g. in Leominster, is marked thus, "1"; in Tarrington, thus, "—"; and to make the List as complete as possible, a species not occurring in either of those districts and known to occur elsewhere in the county, thus, "...," with the name of the place after that of the species.

DIURNI (Butterflies).

Leucophasia sinapis	Vanessa c-album	Thecla rubi
1 Pieris cratægi	„ urticæ	„ quercûs
„ brassicæ	„ polychloros	„ w-album
„ rapæ	„ io	Polyommatus phlæas
„ napi	„ atalanta	... Lycæna ægon (Hereford)
Anthocaris cardamines	„ cardui	„ agestis
Gonepteryx rhamni	— Apatura iris	„ alexis
Colias edusa	... Arge galathea (Malvern) ...	„ alsus (Hereford)
1 „ hyale	Satyrus ægeria	„ argiolus
Argynnis paphia	„ megæra	— Nemeobius lucina
„ aglaia	— „ semele	Syrictus alveolus
„ adippe	„ janira	Thanaos tages
„ selene	„ tithonus	Hesperia sylvanus
„ euphrosyne	„ hyperanthus	„ linea
Melitæa artemis	Cænonympha pamphilus	

NOCTURNI (Sphinges and Bombyces).

Smerinthus ocellatus	Macroglossa stellatarum	Zeuzera æsculi
„ populi	1 „ bombyli-	Cossus ligniperda
„ tiliæ	[formis	Hepialus hectus
Acherontia atropos	— Sesia myopæformis	„ lupulinus
Sphinx convolvuli	„ culiciformis	„ sylvinus
„ ligustri	„ formicæformis	1 „ velleda
1 Deilephila galii	— „ ichneumoniformis	„ humuli
... Cherocampa celerio	„ tipuliformis	1 Procris statices
[(Hereford) —	„ sphegiformis	Zygæna trifolii
„ porcellus —	„ bembeciformis	„ loniceræ
„ elpenor —	„ apiformis	„ filipendulæ

Nola cucullatella	— Euchelia jacobææ	Demas coryli
„ cristulalis	— Chelonia plantaginis	Trichiura cratægi
Nudaria mundana	„ caja	Pæcilocampa populi
Calligenia miniata	Arctia fuliginosa	Eriogaster lanestris
— Lithosia mesomella	„ mendica	Bombyx neustria
„ complanula	„ lubricipeda	„ rubi
1 „ complana	„ menthastri	„ quercûs
„ griseola	Liparis auriflua	Odonestis potatoria
— „ stramineola	„ salicis	Lasiocampa quercifolia
— „ rubricollis	„ monacha	— Endromis versicolor
... Deiopeia pulchella (Hereford)	Orgyia pudibunda	Saturnia carpini
	„ antiqua	

GEOMETRÆ.

Ourapteryx sambucata	Boarmia rhomboidaria	Acidalia remutata
Epione apiciaria	Tephrosia crepuscularia	„ imitaria
— „ advenaria	— „ biundularia	„ aversata
Rumia crategata	— „ extersaria	„ inornata
Venilia maculata	„ punctulata	„ emarginata
— Angerona prunaria	— Gnophos obscurata	Timandra amataria
Metrocampa margaritaria	Pseudoterpna cytisaria	Cabera pusaria
Ellopia fasciaria	Geometra papilionaria	1 „ rotundaria
Eurymene dolobraria	Iodis lactearia	„ exanthemaria
Pericallia syringaria	— „ vernaria	— Corycia temerata
Selenia illunaria	— Phorodesma bajularia	Macaria liturata
„ lunaria	Hemithea thymiaria	Halia wavaria
„ illustraria	Ephyra porata	Panagra petraria
Odontopera bidentata	„ punctaria	Numeria pulveraria
Crocallis elinguaria	„ trilinearia	Fidonia atomaria
Ennomos tiliaria	„ omicronaria	„ piniaria
„ fuscantaria	„ pendularia	Minoa euphorbiata
„ erosaria	... Hyria auroraria (Ross)	1 Sterrha sacraria
„ angularia	Asthena luteata	— Aspilates strigillaria
Himera pennaria	„ candidata	Abraxas grossulariata
Phigalia pilosaria	„ sylvata	„ ulmata
— Nyssia hispidaria	— „ pulchraria	Ligdia adustata
Amphydasis prodromaria	Eupisteria heparata	Lomaspilis marginata
„ betularia	Acidalia scutulata	... Pachycnemia hippocasta-
Hemerophila abruptaria	„ bisetata	[naria (Hereford)]
... Cleora glabraria	„ trigeminata	Hybernia rupicapraria
[(Dowards) —	„ osseata	„ leucophæaria
„ lichenaria	„ incanaria	„ aurantiaria
Boarmia repandata	— „ subsericeata	„ progemma

Hybernia defoliaria	Eupithecia expallidata	Coremia ferrugata
Anisopteryx resularia	„ absinthiata	„ unidentata
Chematotbia brumata	„ minutata	„ quadrifasciaria
„ boreata	[(Malvern)]	[(Whitfield)]
Oporabia dilutata	„ assimilata	Camptogramma bilineata
Larentia didymata	„ tenuiata	1 „ fluviata
„ multistrigaria	„ subciliata	Phibalapteryx tersata
„ caesiata (Black	„ dodoneata	-- „ lignata
[Mountains]	„ abbreviata	— „ vitalbata
— „ olivata	„ exiguata	Scotosia dubitata
„ pectinitaria	„ sobrinata	„ vetulata
Emmelcia affinitata	„ pumilata	— „ rhamnata
„ alchemillata	„ coronata	— „ certata
„ albulata	„ rectangulata	Eucosmia undulata
„ decolorata	Lobophora sexalisata	Cidaria psittacata
— „ unifasciata	„ hexapterata	„ miata
Eupithecia venosata	„ viretata	-- „ picata
„ consignata	„ lobulata	„ corylata
„ linariata	— „ polyommata	„ russata
„ pulchellata	Thera obeliscata	„ immanata
„ centaureata	„ firmata	„ suffumata
„ succenturiata	Ypsipetes ruberata	„ silacea
1 „ subfulvata	„ impluviata	„ prunata
„ plumbeolata	„ elutata	„ testata
„ isogrammata	Melanthia rubiginata	„ populata (Black
— „ satyrata	„ ocellata	[Mountains])
„ castigata	„ albicillata	„ pyraliata
1 „ virgaureata	Melanippe hastata	„ fulvata
„ albipunctata	„ tristata	„ dotata
— „ valerianata	„ procellata	Eubolia cervinaria
„ laricata	1 „ unangulata	„ mensuraria
— „ trisignata	— „ rivata	„ palumbaria
„ irriguata	„ subtristata	— „ bipunctaria
— „ pimpinellata	„ montanata	Anaitis plagiata
„ fraxinata	1 „ galiata	Chesias spartiata
„ indigata	„ fluctuata	— „ obliquaria
— „ campanulata	Anticlea rubidata	„ Tanagra chærophyllata
„ nanata	„ badiata	[(Malvern)]
„ subnotata	„ derivata	
„ vulgata	Coremia propugnata	

CUSPIDATÆ (Pseudo-Bombyces).

Platypteryx lacertula	Platypteryx unguicula,	Dicranura furcula
„ falcula	Cilix spinula	„ bifida
„ hamula	1 Dicranura bicuspis	„ vinula

Stauropus fagi	Ptilodontis palpina	Notodonta ziczac
Petasia cassinea	Notodonta camelina	„ trepida
Pygæra bucephala	„ dictæa	„ chaonia
Clostera curtula	„ dictæoides	„ dodonæa
— „ reclusa	„ dromedarius	Diloba cæruleocephala

NOCTUÆ.

Gonophora derasa	— Xylomiges conspicillaris	... Agrotis tritici (Ross)
Thyatira batis	Neuria saponariæ	— „ aquilina
Cymatophora duplaris	Heliophobus popularis	1 „ obelisea
„ fluctuosa	„ hispidus	— „ porphyrea
„ diluta	[(Ross)	... „ ravida (Ross)
— „ or	Charæas graminis	Tryphæna janthina
„ ocularis	Cerigo cytherea	„ fimbria
„ flavicornis	Luperina testacea	„ interjecta
„ ridens	1 „ cæspitis	... „ subsequa
Bryophila perla	— Mamestra abjecta	[(Hereford)
Acronycta tridens	„ anceps	„ orbona
„ psi	„ brassicæ	„ pronuba
„ leporina	— „ persicariæ	— Noctua glareosa
1 „ aceris	Apamea basilinea	„ augur
„ megacephala	„ gemina	„ plecta
„ alni	„ unanimis	„ c-nigrum
„ ligustri	„ oculea	„ triangulum
„ rumicis	Miana strigilis	„ brunnea
Leucania conigera	„ fasciuncula	„ festiva
— „ turca	„ literosa	— „ dahlii
„ lithargyia	— „ furuncula	„ rubi
„ comma	... Celæna haworthii (Here-	„ umbrosa
„ impura	[ford)	„ baja
„ pallens	Grammesia trilinea	„ xanthographa
Nonagria typhæ	Caradrina morpheus	Trachea piniperda
Tapinostola fulva	„ alsines	Tæniocampa gothica
Chortodes arcuosa	„ blanda	„ leucographa
Gortyna flavago	„ cubicularis	„ rubricosa
Hydræcia nictitans	Rusina tenebrosa	„ instabilis
„ micacea	— Agrotis puta	1 „ opima
Axylia putris	„ suffusa	„ populeti
Xylophasia rurea	„ saucia	„ stabilis
„ lithoxylea	„ segetum	„ gracilis
„ polyodon	„ exclamationis	„ miniosa
„ hepatica	„ corticea	„ munda
— „ scolopacina	1 „ cinerea	„ cruda
... Dipterygia pinastris	... „ cursoria (Ross)	Orthosia upsilon
[(Dowards)	„ nigricans	„ lota

Orthosia macilenta	Polia chi	Heliothis marginatus
Anchocelis rufina	„ flavocincta	... „ peltiger (Hereford)
„ pistacina	Epunda viminalis	
„ lunosa	Miselia oxyacanthæ	1 „ armiger
„ litura	Agriopsis aprilina	... Anarta myrtilli (Black Mountains)
Cerastis vaccinii	Phlogophora meticulosa	
„ spadicea	Euplexia lucipara	Heliodes arbuti
Scopelosoma satellitia	— Aplecta herbida	— Erastria fuscula
— Dasycampa rubiginea	„ nebulosa	Brephos parthenias
Hoporina croceago	„ tincta	„ notha
Xanthia citrago	Hadena adusta	Abrostola urticæ
„ cerago	„ proteus	„ triplasia
„ silago	„ dentina	Plusia chrysis
„ aurago	„ suasa	1 „ bractea
„ gilvago	„ oleracea	1 „ festucæ
„ ferruginea	„ pisi	„ iota
Cirrhædia xerampelina	„ thalassina	„ pulchrina
Tethea subtusa	„ contigua	„ gamma
„ retusa	„ genistæ	Gonoptera libatrix
— Dicycla oo	Xylocampa lithoriza	Anphipyra pyramidea
Cosmia trapezina	... Calocampa vetusta (Whitfield)	„ tragopognis
„ pyralina	„ exoleta	Mania typica
„ diffinis	Xylina rhizolitha	„ maura
„ affinis	„ semibrunnea	... Toxocampa pastinum [(Hereford)]
Dianthœcia carpophaga	„ petrificata	Catocala nupta
„ capsincola	Cucullia verbasci	Euclidia mi
„ cucubali	„ asteris	„ glyphica
1 „ conspersa	„ chamomillæ	— Phytometra ænea
... Hecatera dysodea (Hereford)	„ umbratica	
1 „ serena		

DELTOIDES.

Hypena proboscidalis	— Hypenides costæstrigalis	Herminia tarsipennalis
„ rostralis	Rivula sericealis	„ grisealis
— Hypenides albistrigalis	Herminia barbalis	

AVENTIÆ.

Aventia flexula

PYRALIDES.

Pyralis farinalis	— Pyrausta punicealis	Herbula cespitalis
„ glaucinalis	„ purpuralis	— Ennychia anguinalis
Aglossa pinguinialis	1 „ ostrinalis	— „ octomaculalis

Cataclysta lemnalis	Ebulea sambucalis	— Scoparia zelleri
Paraponyx stratiotalis	Pionia forticalis	— „ ulmella
Hydrocampa nymphæalis	„ stramentalis	„ cembrae
„ stagnalis	— Spilodes cinctalis	— „ dubitalis
— Acentropus niveus	Scopula lutealis	1 „ ingrattella
Botys pandalis	„ olivalis	„ mercurella
„ verticalis	„ prunalis	„ cratægella
— „ lancealis	„ ferrugalis	„ resinea
„ fuscalis	Stenopteryx hybridalis	„ truncicolella
„ urticalis	Scoparia ambigualis	— „ coarctalis
Ebulea crocealis	— „ basistrigalis	— „ pallida

CRAMBITES.

Crambus falsellus	Crambus geniculellus	Phycis betulella
„ pratellus	„ culmellus	1 „ carbonariella
— „ dumetellus	„ hortuellus	— „ adelphella
„ pascuellus	— Schœnobius forcicellus	— „ subornatella
— „ uliginosellus	— Myelophila cribrella	— „ abietella
„ pinetellus	— Homœosoma nebulella	„ roborella
„ perlellus	Ephestia elutella	— Rhodophaea consociella
... „ warringtonellus	— „ semirufa	„ advenella
[(Ross)	„ pinguis	— „ suavella
„ selasellus	Cryptoblabes bistrigella	— „ tumidella
„ tristellus	— Plodia interpunctella	Melia sociella
— „ inquinatellus	— Nephopteryx angustella	— Meliphora alveariella

TORTRICES.

Halias prasinana	Tortrix viridana	Peronea cristana
„ quercana	„ ministrana	„ hastiana
Sarothripa revayana	„ fosterana	1 „ umbrana
Tortrix podana	— „ branderiana	„ ferrugana
— „ cratægana	Dichelia grotiana	— „ tristana
„ xylosteara	... Amphisa gerningana	„ aspersana
„ sorbiana	[(Black Mountains)	Teras caudana
„ rosana	Leptogramma literan	„ contaminana
— „ diversana	1 „ boscana	Dictyopteryx leffingi-
— „ cinnamomeana	Peronea sponsana	[ana
„ heparana	— „ autumnana	— „ holmiana
„ ribeana	„ schalleriana	„ bergmanni-
„ corylana	„ comparana	[ana
„ unifasciana	— „ perplexana	„ forskaeana
— „ costana	... „ caledoniana	Argyrotoxa conwayana
... „ viburnana (Black	[(Black Mountains)	Ptycholoma lecheana
[Mountains)	„ variegana	— Ditula hartmanniana

Ditula woodiana	Sciaphila virgaureana	Ephippiphora nigricost-
„ semifasciana	„ chrysanthemana	[ana
— Penthina picana	— „ sinuana	1 „ signatana
„ sororculana	— „ pasivana	„ tetragon-
— „ capræana	— „ abrasana	[ana
— „ prælongana	„ hybridana	— „ populana
„ pruniana	— Capua favillaceana	— „ obscurana
„ ochroleucana	... Clepsia rusticana (Black	Olindia ulmana
„ cynosbana	[(Mountains)	— Semasia spiniana
... „ sauciana	Bactra lanceolana	— „ ianthinana
[(Black Mountains)	— Phoxopteryx uncana	-- „ ruffilana
1 „ gentianana	— „ myrtilana	„ wœberana
„ marginana	„ lundana	— Coceyx strobilana
— „ fuligana	— „ nigricana	„ splendidulana
Antithesia salicana	— „ diminutana	„ argyran
— Spilonota lariciana	— „ mitterpach-	„ hercyniana
„ ocellana	[eriana	— „ distinctana
— „ aceriana	„ lætana	— „ nanana
— „ dealbana	Grapholitha ramana	— „ vacciniana
— „ neglectana	„ nisana	Heusinene fimbriana
— „ incarnatana	„ campoliliana	... Pamplusia monticolana
„ suffusana	„ trimaculana	[(Black Mountains)
„ rosæcolana	„ penkleriana	— Retinia buoliana
„ roborana	— „ obtusana	— „ pinicolana
Pardia tripunctana	„ nævana	„ pinivorana
Aspis uddmanniana	— „ geminana	— „ sylvestrana
— Sideria achatana	Phlœodes tetraquetana	Carpocapsa splendana
Sericoris euphorbiana	„ immundana	— „ grossana
— „ bifasciana	Hypermezia cruciana	„ pomonana
„ conchana	Batodes angustiorana	— Opadia funebrana
„ lacunana	Pædisca bilunana	Endopisa nigricana
— „ urticana	„ oppressana	— Stigmonota coniferana
— Mixodia ratzeburgiana	„ corticana	— „ perlepidana
Roxana arcuana	„ profundana	— „ internana
1 Euchromia rufana	„ ophthalmicana	„ composana
— „ purpurana	„ occultana	— „ weirana
— Orthotænia antiquana	„ solandriana	— „ redimitana
„ striana	1 „ semifuscana	„ regiana
— „ ericetana	„ sordidana	— „ germarana
— Phtheochroa rugosana	Ephippiphora bimacul-	— „ roseticolana
... Cnephasia politana	[ana	— „ pallipontana
[(Black Mountains)	— „ cirsiiana	— Dicerorampha politana
„ musculana	„ pflugiana	— „ alpinana
— Sciaphila nubilana	„ brunnichi-	— „ sequana
„ subjectana	[ana	„ petiverana

— Dicrorampha plumbana	Catoptria scopoliana	— Eupœcilia subroseana
„ saturnana	„ aspidiscana	„ ciliana
„ plumbag-	„ expallidana	Xanthosetia zoegana
[ana	Trycheris mediana	„ hamana
... „ simplici-	Choreutes scintilulana	Argyrolepia baumanni-
[ana (Ponttrilas)	Xylophoda fabriciana	[ana
— „ consortana	„ pariana	— „ sub-bauman-
Pyrodes rheediana	— Lobesia reliquana	[niana
— Catoptria albersana	— „ servillana	— „ badiana
„ ulicetana	— Eupœcilia nana	„ enicana
„ juliana	„ maculosana	— Conchylis francillonana
„ hypericana	— „ hybridellana	„ inopiana
— „ cana	— „ curvistrigana	Aphelia osseana
— „ fulvana	— „ udana	Tortricodes hyemana
	— „ notulana	

TINEÆ.

Lemnatophila phrygan-	Tinea misella	Micropteryx subpurpur-
[ella	„ pellionella	[ella
„ salicella	— „ fuscipunctella	— „ sangii
Exapate gelatella	— „ pallescentella	— „ kaltenbachii
Diurnea fagella	„ ganomella	— Nemophora swammerda-
— Epigraphia avellanella	— „ biselliella	[mella
„ steinkellneri-	„ semifulvella	„ schwarziella
[ella	— „ bistrigella	.. „ pilella (Black
— Talæporia pseudo-bombyc-	— Lampronia quadripunct	[Mountains)
[ella	[ella	— „ metaxella
— Psyche calvella	„ luzella	Adela fibulella
— „ intermediella	— „ prælatella	— „ rufimitrella
— Solenobia inconspicuella	„ rubiella	„ degeerella
— Psychoides verhuellella	Incurvaria muscalella	„ viridella
— Diplodoma margine-	— „ zinckenella	— Nematois cupriacella
[punctella	— „ capitella	— „ minimella
— Xysmatodoma melanella	Micropteryx calthella	Swammerdamia comptella
— „ argenti-	„ seppella	„ spiniella
[maculella	— „ mansuetella	— „ grisecca-
— Phygas birdella	— „ allionella	[pitella
— „ bisontella	— „ thunber-	„ oxyacanth-
„ vaculella	[gella	[ella
— Scardia emortuella	— „ purpurella	— „ lutarella
„ cloacella	— „ salopiella	„ pyrella
„ arcella	— „ semipurpur-	— Scythropia cratægella
Tinea rusticella	[ella	— Yponomeuta plumbella
„ tapetzella	— „ unimaculella	„ padella
— „ albipunctella	— „ sparmanella	„ cognatella

Pepilla curtisella		Depressaria douglasella	—	Gelechia triparella
— Eidophasia messingi-		„ chærophylliv-	„	tenebrella
[ella		[orella	—	„ vorticella
Plutella xylostella	—	„ ultimella	—	„ tæniolella
„ porrectella	1	„ nervosella	—	„ immaculatella
Hypolepia sequella	—	„ badiella	—	„ anthyllidella
„ vittella	—	„ heracleella	—	„ atrella
„ radiatella	—	Psoricoptera gibbosella	„	bifractella
„ costella		Gelechia cinerella	—	„ gemmella
Ypsolophia sylvella		„ rufescentella	—	„ næviferella
— „ alpella		„ populella	—	„ subocellella
— „ lucella	—	„ nigra	—	„ osseella
1 „ asperella		„ lentiginosella		Chelaria conscriptella
— Harpipteryx nemorella	—	„ ericetella	—	Anarsia genistella
„ harpella	—	„ mulinella	—	Aplota palpella
— Pteroxia caudella		„ sororeulella	—	Nothris durdhamella
-- Orthotælia sparganiella	—	„ alacella		Sophronia parenthesella
Phibalocera quercella	...	„ longicornis	...	Pleurota bicostella (Black
Depressaria costosella		[(Black Mountains)		(Mountains)
„ liturella	1	„ diffinella		Harpella geoffroyella
— „ umbellella		„ terrella		Dasycera sulphurella
— „ assimilella	—	„ expolitella	—	Æcophora minutella
— „ nanatella		„ acuminatella		„ flavimaculella
— „ scopariella	—	„ artemisiella		„ trisignella
— „ atomella	—	„ senectella	—	„ lunarella
„ arenella	—	„ similis		„ tinctella
— „ subpropin-		„ affinella	—	„ flavifrontella
[quella	—	„ domesticella		„ fuscuscentella
„ alstromeri-		„ rhombella		„ pseudospretella
[ella	—	„ proximella		Endrosis fenestrella
— „ vacciniella		„ notatella		Butalis grandipennella
„ hypericella	—	„ lyellella	—	„ fuscoæneella
„ contermin-	—	„ vulgella	—	„ senescentella
[ella		„ luculella	—	„ fuscocuprella
„ angelicella	—	„ scriptella	—	Pancalia lewenhoekella
— „ carduella	—	„ fugitivella	—	„ latreillella
„ ocellella		„ maculella		Acrolepia granitella
— „ yeatesiella		„ tricolorella	—	„ autumnitella
„ applanella	1	„ maculiferella	—	Roslerstammia erleben-
— „ ciliella	—	„ junctella		[ella
— „ pimpinella	—	„ sequacella		Glyphipteryx fuscovirid-
„ albipunct-		„ aleella		[ella
[ella		„ leucatella		„ thrasonella
— „ pulcherri-	—	„ mouffetella		„ equitella
[mella	—	„ dodecella	—	„ oculatella

Glyphipteryx fischeriella	— Coleophora deauratella	— Laverna lacteella
Perittia obscurepunctella	„ alcyonipen-	— „ miscella
Tinagma sericiella	[nella	— „ raschiella
— „ betulæ	— „ paripennella	„ epilobiella
— „ resplendella	— „ wockeella	— „ ochraceella
Argyresthia ephippella	— „ lixella	„ decorella
„ nitidella	— „ vibicella	„ subbistrigella
„ semitestacella	— „ albicostella	— „ hellerella
... „ spiniella (King-	— „ anatipennella	— „ vinolentella
[ton)	— „ palliatella	Chrysoclista flavicapitella
„ albistriella	— „ currucipen-	— Anybia langiella
— „ conjugella	[nella	Asychna modestella
— „ semifuscella	— „ niveicostella	— „ terminella
„ mendicella	— „ discordella	Chrysocorys festaliella
— „ glaucinella	— „ troglodytella	Antispila pfeifferella
— „ retinella	— „ bilineatella	Stephensia brunnicella
„ curvella	— „ sylvaticella	— Elachista gleichenella
„ pygmælla	— „ glaucicolella	— „ magnificella
„ gødartella	— „ alticolella	„ albifrontella
— „ brochella	— „ lineolella	„ atricomella
— Cedestis farinatella	„ murinipennella	„ luticomella
— Ocnerosstoma pinariella	— „ caspitiella	„ kilmunella
— Zelleria hepariella	— „ annulatella	— „ cinereopunct-
— „ insignipennella	— „ cacuminatella	[ella
Gracilaria alchimiella	— „ argentulella	— „ trapeziella
„ stigmatella	„ virgaureella	— „ nigrella
„ falconipennella	— „ juncicolella	— „ subnigrella
[(Black Mountains)	— „ laricella	— „ humiliella
— „ semifasciella	— „ albitarsella	— „ subobscuraella
— „ populetella	— „ nigricella	„ zonariella
— „ elongella	— „ fuscadinella	— „ gangabella
— „ tringipennella	— „ fuscocuprella	— „ tæniatella
„ syringella	— „ gryphipennella	— „ megerlella
„ auroguttella	— „ viminetella	— „ biatomella
— „ ononiella	— „ olivaceella	„ pollinariella
— Coriscium brogniartella	— „ lutipennella	„ rufocinerella
— „ cuculipennella	— „ badiipennella	„ cygnipennella
Ornix avellanella	— „ limosipennella	Tischeria complanella
— „ anglicella	— „ wilkinsonella	„ emyella
— „ betulævorella	— Bedellia somnulentaella	— „ augusticolella
— „ torquilella	— Cosmopteryx orichalcella	— „ dodonæella
„ scoticella	Batrachedra præangustella	Lithocolletis roborella
— „ loganella	— „ pinicolella	— „ lantanella
„ guttella	Chauliodus chærophyllaella	— „ bremiella
— Coleophora fabriciella	— Laverna paludicolella	— „ lautella

...Lithocolletis vacciniella	— Cemiostoma scitella	— Nepticula floslactella
[(Black Mountains)	— „ wailesella	— „ lapponica
— „ cavella	— Opostega crepusculella	— „ sorbi
— „ pomifoliella	— Bucculatrix aurimaculella	— „ luteella
— „ corylella	„ cidariella	— „ angulifasciella
— „ spinicolella	„ ulmella	— „ atricolella
— „ faginella	— „ cratægifoliella	— „ arcuosella
— „ torminella	— „ demaryella	— „ microtheriella
— „ salicolella	— „ hippocastan-	„ argentipedella
— „ distentella		[ella — „ woolhopiella
— „ ulmifoliella	— „ cristatella	— „ betulicolella
— „ spinolella	— Nepticula atricapitella	— „ distinguenda
— „ quercifoliella	— „ ruficapitella	— „ plagicolella
— „ messaniella	— „ perpygmæella	— „ malella
— „ corylifoliella	— „ pomella	— „ tityrella
— „ viminiella	— „ tiliella	— „ fulgens
— „ alnifoliella	[(Dowards)	„ glutinosella
— „ heegeriella	— „ oxyacanthæcol-	— „ gratiocella
— „ cramerella		[ella — „ prunetella
— „ acerifoliella	— „ pyri	— „ regiella
— „ emberizæ-	— „ desperatella	— „ torminalis
[penella	— „ aucupariella	— „ continuella
— „ dunningiella	— „ viscerella	— „ alnetella
— „ nicelliella	— „ anomalella	— „ ulmivorella
— „ stettinella	— „ basiguttella	— „ æneofasciella
— „ kleemannella	— „ catharticella	— „ marginicolella
— „ schreberella	— „ septembrella	— „ dulcella
— „ tristrigella	— „ intimella	„ aurella
— „ trifasciella	— „ subbimaculella	— „ splendidissim-
— „ comparella	— „ apicella	[ella
— Lyonetia clerckella	— „ trimaculella	— Trifurcula immundella
— Phyllocnistis suffusella	— „ assimilella	— „ pulverosella
— „ salignella	— „ salicivorella	— „ pallidella
— Cemiostoma spartifoliella	— „ diversa	— Bohemannia quadrima-
— „ laburnella	— „ myrtillella	[culella

PTEROPHORI.

Pterophorus trigonodactylus	— Pterophorus zophodac-	— Pterophorus microdactylus
„ acanthodac-	[tylus	„ galactodactylus
[tylus	„ lithodactylus	— „ tetradactylus
„ punctidactylus	„ pterodactylus	„ pentadactylus
„ phæodactylus	— „ tephrodactylus	„ monodactylus
— „ serotinus	— „ osteodactylus	Alucita polydactyla

Woolhope Naturalists' Field Club.

MAY 30TH, 1887.

A VISIT to the Camp at Wall Hills, Thornbury, in the Bromyard district, situated in the north-eastern corner of our county, has for a long time been premeditated by our Club, and at last has become an accomplished fact. Two large brakes conveyed our party on Thursday, June 30th, along the Bromyard road, through the Frome district (see Map of Botanical Districts, Transactions, 1866), and the town of Bromyard, thence in a northerly direction, along the Tenbury road for a couple of miles, when a short divergence to the left brought us through Lower and Upper Horton to what might have been the original Roman road of access, by its southern entrance, into the Camp.

The Bromyard district has not been much explored by the Members of our Club. Geologically, we passed over in our route to-day the lower Old Red clays and marls; the hills of cornstones and sandstones, as at Castle Frome and Bishop's Frome, lying upon our east. Botanically, this district has very great interest, for here, near Tedstone Delamere, was once found that very beautiful and curious orchidaceous plant (so shy and uncertain even in such parts of Europe as claim it as indigenous) the *Epipogum aphyllum**. For several years this was the only instance of its occurrence in Great Britain, until it was once again found near Ludlow. The Rev. A. Ley left the party with the object of exploring Edwin's Wood and the neighbouring country, and to the sketch of his rambles we owe the subjoined report of the botany of the day. Nor were our Entomologists less busy. Notwithstanding the heat of the day, which rendered our travelling more slow, and necessitated a halt in order to give water to the horses, thus leaving but little time at our disposal, we must admit that they made the most of this little time. They captured the larvæ of several somewhat rare species including *Selenia illustraria*, *Notodonta dictæoides*, *N. trepida*, &c., &c.

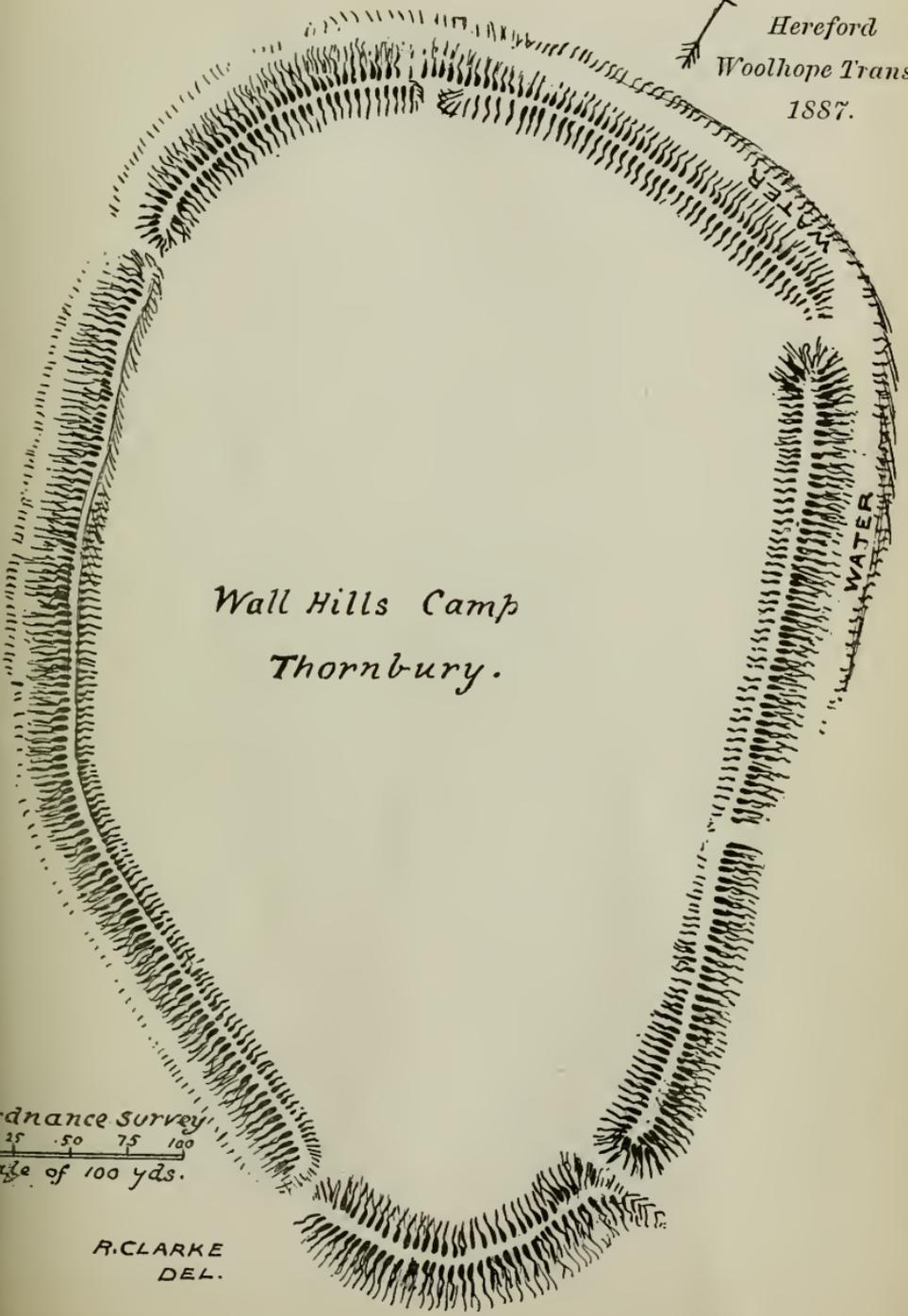
But to return to the camp at Wall Hills, Thornbury, which we reached by the main southern entrance. The mention of Wall Hills reminds us of the repeated retention in this county of the Roman *Vallum* in the modern appellation of Wall. We have Wall Hills at Ledbury, Wall Hill near Orleton, Wall Field near Cradley, Walford near Leintwardine, Walford near Ross, Sutton Walls near Hereford, Coxwall Knoll near Leintwardine, and others. For a discussion on the meaning of the term Wall, see "Transactions," 1883, p. 23.

Thornbury Camp, oval in plan, comprising an area of about 25 acres, is enclosed by a single rampart, surrounded by a deep ditch, at heights varying

* Since the period of our visit to this neighbourhood the "Flora of Herefordshire" has been published. See page 300, Plate I. for a representation of this rare plant.

Hereford
Woolhope Trans.,
1887.

Wall Hills Camp
Thornbury.



Ordnance Survey
25 50 75 100
Scale of 100 yds.

R. CLARKE
DEL.



from 63 feet on the east side to 70 feet on the west from its bottom to the summit of the earthwork rampart. The entrance on the south has been already mentioned, and on the north-east there is another entrance with a traverse or covering work. Traces of earthworks still remain extending to Northwood or Netherwood, which have been used to fill up the moat round the house. Another earthwork conducted to Kyre Common and a third to Collington. Mr. H. H. Lines, of Worcester, as shewn by a plan exhibited by Mr. Robert Clarke, taking an available internal area of 1,220 feet by 650 feet, and drawing out a camp in accordance with the regulations of the Roman Army, estimated that it was capable of accommodating so many as 4,094 soldiers. There is abundance of water on the eastern side, and near the north-east entrance. At the foot of the hill on the west, leading over the grounds of Thornbury House, towards Thornbury Church is an excellent unfailing spring called "Lady Well," from which, according to tradition, was an underground communication with the camp, terminating at the locality now occupied by the two yew trees on the western side. Mr. Perry, the present tenant of the large brick residence near the Church, called Thornbury House, informed us that he, when a boy, explored this passage to a distance of forty feet. In the time of his predecessor, and also during his own tenancy, the ground has subsided—in a direct line between the springs and the camp, about mid-way between them—to such an extent as to have required about a dozen loads of earth to fill up the cavity formed. So soon as the circuit of the camp had been completed, the President, Mr. Geo. H. Piper, read to the assembled Members a short paper on the subject of the Camp and its surroundings, which we regret we have not been able to obtain for publication.

Northwood or Netherwood, a farm of 600 acres, one mile north-east, was part of the estate of the Mortimers. William Baskerville, Lord of Eardisley, who had accompanied the army of the Earl of Richmond, afterwards Henry VII., from Leominster, received a grant of it from that monarch. Upon the authority of Blount, Roger Mortimer, son of Edmund and Philippa, daughter of Lionel, Duke of Clarence, was born at Netherwood, so was also Robert Devereux, Earl of Essex, the favourite and victim of Queen Elizabeth. From "The lives and letters of the Devereux, Earls of Essex," little can be gathered respecting Netherwood, beyond the fact that Robert, second Earl, was born there on November 10th, 1567.

Thornbury Camp may have been occupied by the earlier defenders of our country against the Roman invasion under Ostorius Scapula, for the following reasons:—It is situated in the line of route which would most probably be taken by Caractacus during his retreat from the advancing victorious Roman legions, after they had crossed the Severn, before falling back upon Croft Ambery, Wapley, and other camps, previous to his final overthrow at Gaer Caradoc, or at Brandon, or at Coxwall Knoll, or at the Breidden Hills near Welshpool, or wherever that event may have occurred. The inhabitants of these parts—the Silures—are represented by Tacitus to have been "a people resolute and fierce by nature, and rendered confident by the valour of Caractacus," who had risen to pre-eminence as a general not easily subdued. The inhabitants of the sea coasts of our island were liable to occasional invasions, and although those living in the

inland districts had no foreign enemies to encounter, the constant turmoil in which they lived, owing to their frequent conflicts with neighbouring tribes, who (as we observe elsewhere in the present day) were in the habit of raiding for seizure of cattle, etc., kept them trained in the arts of war, and rendered necessary the use of entrenched camps for the protection of themselves and their cattle. To the experience gained in self-protection is probably due the reputation Cæsar accorded to the inhabitants of being no mean enemies, and trained in the arts of war.

Mr. Piper reviewed the condition of the ancient Britons, and upon the authority of ancient writers considered himself justified in elevating them from the rank of barbarians to that of a more civilised and commercial community, owing to their trade with the more civilised Phœnicians; whilst giving them credit for patriotism and unity such as enabled them to extend the task of nominal subjugation by so powerful and warlike a nation as Rome over a period of between 300 and 400 years. During the reign of Claudius, A.D. 41 to A.D. 54, Britain was said to have become under the Roman sway, so far as a line drawn from the Wash to the Dee; and during the reign of Vespasian, A.D. 69-79, by the generalship of Agricola, the Roman frontier was advanced from the above line to that of the Solway, Frith, and the Tyne. Constantine was in Britain, A.D. 407; it was his action in leading the legions from Britain to Gaul, in order to vindicate his own pretensions to the Empire of Rome, that led finally to the abandonment of Britain by the Romans. In A.D. 410 Honorius addressed a letter to the cities of Britain bidding them to provide for their own defence.

Who then are these ancient writers from whom we derive the earliest mention of the country we inhabit—Pliny (Hist. Nat. II., 67) makes mention of Himilco, a Carthaginian, who *floruit*, B.C. 470, as having conducted a voyage of discovery from Gades towards the north, along the western shores of Europe, at the same time that Hanno the Navigator undertook his well-known voyage along the west coast of Africa.

Herodotus, B.C. 484 to B.C. 407, although disclaiming all knowledge of them, writes of the "Cassiterides or Tin Islands at the extremity of Europe towards the west." Some suppose this locality might refer to either the Scilly Islands, or islands off the coast of Spain, where tin was also found.

From *Early Britain, Celtic* (Prof. J. Rhys, S.P.C.K., 1884), we learn that some time after Herodotus, "one of the Scipios of Rome visited Marseilles and Narbonne to find out whether trade could not be established with the region beyond Southern Gaul, so as to injure the Carthaginians, whose sailors used to bring tin, not only from Spain and the Cassiterides, or the tin islands on the north-west of that peninsula, but also from Gaul."

Pytheas, a very enterprising Greek, in the times of Alexander the Great and Aristotle, probably B.C. 330, visited Britain on his more northerly explorations, and a second time upon his return, finally returning to Marseilles overland from the mouth of the Garonne. Pytheas gives us the earliest mention of the drink made by the inhabitants by mixing wheat and honey, *Metheglin*. He is supposed to have been the authority for their use of another drink, which the Greek writers,

Athenæus and Dioscorides, describe as made of barley and used instead of wine, under the name of *curmi*, in Irish, *cuirm*, and in Welsh, *cwrw*—beer.

It is worthy of remark that the earliest coins of our country were modelled after Greek coins made during the time of Pytheas, although struck long after his period. (Evans' "Coins of the ancient Britons," p. 24). The earliest being assigned by Mr. Evans, pp. 25, 26, to a date between B.C. 150 and 200.

Aristotle, B.C. 345, mentions the Britannic Isles, Albion and Ierne, which lie beyond the Celti.

Polybius, B.C. 160, mentions the Britannic Isles, and the working of tin. (*Roman Britain*, Scarth, p. 2).

Another Greek, Posidonius, with whom Cicero studied at Rhodes, visited Belerion, as he called the district in Cornwall where tin was found. He "is supposed to have been the authority of Diodorus Siculus (Bibl. Hist., V. 21, 22) for stating that the inhabitants of Britain lived in mean dwellings, made, for the most part, of reeds or wood, and that harvest with them meant cutting the ears of corn off and storing them in pits underground, whence were fetched day by day to be dressed for food, what had been longest in keeping," (*Celtic Britain*, p. 7), a method understood in the western Islands of Scotland even in the last century, the corn being prepared with the aid of a flame, "dressed, winnowed, ground, and baked within an hour after reaping," *id.*, p. 7.

"Strabo describes the Cassiterides, which lie near the ocean towards the north of the Haven Artabi, and says that formerly the Phœnicians alone carried on the traffic in tin, but the Romans afterwards obtained a knowledge of the locality and engaged in the traffic," (*Roman Britain*, Scarth).

Diodorus Siculus and Strabo both flourished temp. Augustus.

The invasion of Julius Cæsar, B.C. 55, gives us a reliable account of Britain within the easy reach of scholars, and succeeding accounts of Roman writers are taken from him. It may be here mentioned that an interesting reference to the Cassiterides or Tin Islands, the trade with the Phœnicians, and other matters of antiquity, will be found in the pages of "*The Astronomy of the Ancients*," by Sir George Cornwall Lewis, published by Parker, West Strand, 1867.

Although there appears to be no special mention of Thornbury Camp in the History of the Civil Wars, yet the fact that two cannon balls weighing respectively 17½lbs. and 12lb. had been found within the camp grounds, at present to be seen in the shop of the village blacksmith, and that Mr. Piper purchased the handle of a Scotch claymore sword which had been found in the neighbourhood, lead to the suggestion that Thornbury had been at some recent time occupied, possibly by the Scottish army under the General Leslie, Earl of Leven. We know that this army crossed the Severn at Bewdley, was at Tenbury on July 20th, 1645, that Canon Frome was assaulted and taken within a few days, and the brave Governor was buried at Ashperton on July 25th. *Webb's Civil War in Herefordshire*, Vol. II., pp. 209, 210. Thornbury Camp is situated a little more than one mile westward of the direct route southwards from Tenbury through Bromyard to Canon Frome.

As we have no more to say concerning Thornbury Camp beyond the fact that under the title of "Wall Hills, Bromyard," it was selected as one of the sites

for a Beacon Fire, upon the occasion of celebrating the Jubilee of our Most Gracious Queen's reign,—we will proceed to other matters. In the field below is a very interesting specimen of an oak tree and beech tree growing entwined closely together at the base, as if forming one solid bole, and bifurcating at a height of seven feet from the ground, with a circumference of thirteen feet at the height of six feet from the ground; the beech tree, having a more rapid growth than the oak, has considerably mastered the latter. Time did not permit a visit by the whole force of members to Thornbury Church, although it was urged by the Rector, the Rev. T. R. Maskew. Nevertheless some few managed to glean the following short notice of it. Thornbury Church, situated on the west side of the Camp, distant about half-a-mile, is a small church dedicated to St. Anne. It was restored in 1865, and consists of nave, chancel, a very massive Norman tower at the west end, and a new south porch. The remains of three pointed arches of the arcade which are *in situ* in the south wall of nave, indicate that there was formerly a south aisle. There is a Norman font, large, circular, and rudely carved; *Piscinæ* remain on the north and south sides of the chancel. The parish register, in excellent preservation, and exhibiting some excellent transcript writing, dates from 1538. The old bier is preserved in the tower with the initial G., and date 1667.

Seats in the carriages having been resumed, the return journey was commenced, and upon arrival at Bromyard Church the members were met by the Vicar, the Rev. W. Martin, who conducted the party over his Church. The parish registers, dated from 1538, were examined. The vicar also exhibited some bonds which it was necessary for tradesmen to deposit with the town authorities before commencing to trade within their jurisdiction. The church, dedicated to St. Peter, is cruciform in structure, and is apparently built upon Norman foundations, consisting of a nave with north and south aisles, north and south transepts with a tower at the intersection, a chancel, and a vestry on the north side. Some small crosses, considered to be dedication crosses, are cut in the masonry on the jambs of each of the three Norman doorways, which latter are very good examples of this style of architecture—the tympanum has been altered at a later period. The ancient Norman font, rescued from its hiding place, has been placed in its proper position, and is enriched with some curious Norman carving (probably symbolical) on its large cylindrical bowl. The altar table, standing upon massive Jacobean columns, is believed to have been presented to Bromyard Church by Dr. Cope, Canon Residentiary of Hereford Cathedral, and Vicar of Bromyard who died, aged 66, on September 5th, 1821. A fac-simile of an Anglo-Saxon Charter, now preserved in the Vestry, Hereford Cathedral, was exhibited by Mr. W. Pilley. The original is on parchment, about twelve inches long by four inches wide. The Charter is a grant by Bishop Cuthwulf, A.D. 840, and the congregation of the Church of Hereford, with the consent of Berhtwulf, King of the Mercians, to Ælfstan Dux, of certain lands for three lives, and afterwards to the Monastery of Bromyard, subject to the payment of certain rent therein specified, and free from all services, except the “*trinoda necessitas*,” *i.e.*, the charges on land for bridges, castles, garrisons, &c., for the King's service.

This was fortunately found in the office of a Solicitor, Mr. Kent, of Fakenham, and presented to Hereford Cathedral by Mr. Lee Warner.

Dinner was served punctually at the Hop Pole, Bromyard. After dinner the President (the Rev. William Elliot) read a paper on recent discoveries of fragments of Roman pottery, amphoræ, ancient querns, the skulls of at least twenty goats, bones of the sheep, pig, horse, oxen, and, possibly, deer, found in a disused well in the parish of Brinsop. Mr. G. H. Piper having made some further observation upon the Camp at Wall Hills, Thornbury, proposed the subscription of two guineas from the funds of our society towards exploring the subterranean passage reported as existing in connection with the Camp; which proposition, on being put to the meeting, was carried. The President called the attention of the members to the fact that the work, "The Birds of Herefordshire" (the majority of papers relating to which had been read by the late Dr. Bull before the members of the Club), now being compiled by Mrs. Bull as a memorial to her late husband, would be published, uniform in size with the Woolhope Transactions, stamped with the Woolhope seal, and would have a photograph of Dr. Bull as a frontispiece. The price of the book would be 5s.; all orders to be given to Mrs. Bull, direct, or to Messrs. Jakeman and Carver, the publishers.

The carriages left Bromyard at five o'clock, and arrived at Hereford in time for the evening trains in all directions. Subjoined is a list of the company present:—Rev. Wm. Elliot, President; Mr. G. H. Piper and Mr. F. Bainbridge, Vice-Presidents; Drs. T. A. Chapman and J. H. Wood, Revs. A. G. Jones, A. Ley, D. Price, J. Tedman, H. T. Williamson, T. R. Maskew, Rector of Thornbury, and W. Martin, Vicar of Bromyard; Messrs. J. Carless, R. Clarke, P. C. Cleasby, John Docking, S. Gilleat, G. H. Hadfield, P. Levason, J. Riley, with Messrs. James B. Pilley, Assistant Secretary, and H. C. Moore, Honorary Secretary; and the following visitors:—Rev. H. L. Brühl, Mr. A. Gott, and Mr. W. Pilley.

POSTSCRIPT.

During the publication of this volume (1892) we have met in Voume I. of *The Hampshire Antiquary and Naturalist*, a notice of an article on "Greek trade—routes to Britain," by Prof. Wm. Ridgeway, which appeared in the first number (for March, 1890) of *Folk-lore*; (London, David Nutt) stating that:—"First the Phœnicians voyaged to the Cassiterides direct . . . then the Phœcean colony at Massalia (Marseilles) opened up a route up the Loire, across Armorica to the Isle of Wight. This brings us to the question of the identity of the Isle of Wight (the Victis of the Romans) with the Ictis of Diodorus Siculus and the Mictis of Tinæus or Pliny. That it is so seems incontrovertible, and any difficulty in reconciling it is far less in the case of the Isle of Wight than in those of St. Michael's Mount or Thanet. The Isle of Wight route is ingeniously supported by the discoveries of coins found along the lines of the two main routes described by Strabo, by the Seine and by the Loire or Garonne. Coins of the type of those of Massalia, dating back to about 450 B.C., have been found among the various

nations of the west of France, from Toulouse to Armorica ; “ they are likewise found in the Channel Islands, and in the south and west of England, as at Portsmouth, at Mount Batten, near Plymouth, and in Devonshire.” On the eastern route extending from Auvergne through central France to Kent, the coins are of the later type of the gold stater of Philip of Macedon, which dates only from about 250 B.C. From which it is evident that the earlier route was from the Isle of Wight to Armorica. The more eastern route appears to have been developed by the Belgæ, who obtained predominance in the south-east of England before the time of Julius Cæsar.

With reference to the omission of tin by Strabo, in his account of British trade, Professor Ridgeway argues that “ when the Romans in the time of Cæsar discovered the short route to the tin islands off the coast of Galicia (north-west of Spain), the British trade almost ceased, so that when Strabo wrote (1 to 19 A.D.) tin was no longer exported from Britain.”

When we consider the naval architecture of the period, the bireme of the Phoenicians, improved by the introduction of the trireme by the Greeks, we are struck with admiration of the enterprising spirit of the ancient mariners. Their communication with our coasts was, however, eclipsed by a performance two centuries before any date above-mentioned. About B.C. 600, Neco, whose attempt to re-open the canal between the Nile and the Red Sea, which had been originally constructed by Seti I. and Ramesses II., was attended with such mortality amongst the workmen, despatched some ships with Phœnician mariners from a port on the Red Sea, with orders to sail southwards, keeping the coast of Africa on their right, and see if they could not return to Egypt by way of the Mediterranean. The enterprise succeeded. The ships rounded the Cape of Storms, and returned by way of the Atlantic, the Straits of Gibraltar, and the Mediterranean, to the Mouths of the Nile. But they did not reach Egypt *until the third year!* Rawlinson's *Ancient Egypt*, page 356. *History of the Nations.*

ON THE DISCOVERY OF A DISUSED ANCIENT WELL IN THE PARISH OF BRINSOP.

By the Rev. WILLIAM ELLIOT, M.A., President of the Woolhope Field Club.

MY main reason for drawing up the brief account which I have the honour now of reading before you has been that, little as I have to say, and offering no pretension to having discovered anything of a very high degree of interest, yet, such as the discovery was, it might find a record in the Transactions of your Club. Preserved in this way from entire oblivion, it is quite possible that it may prove at some future time to supply a link in the antiquarian history of the county; so frequently do things trivial in themselves serve a useful purpose in confirming, or elucidating, more important observations, when taken in connection with them. Moreover, my own antiquarian knowledge is so very slight that I should like to elicit the opinion of those among you more qualified in that way than myself on one or two points that seemed to me to offer questions for resolving. I beg you to accept this by way of apology for the meagreness of my statement.

In the month of September last year my attention was called by my neighbour, Mr. Norman Edwards, of the White House, to a strange subsidence which had occurred in the previous May in one of the fields of his farm, called on the Tithe Map, "The Eleven Acres." To the depth of a little more than two feet the ground had sunk to the extent of an irregular circle of eight feet in diameter. Now this had not taken place with any inclination from the circumference towards the centre, but regularly and uniformly, so that the sides of the cavity formed were as cleanly cut as if the spade had cut them; and the barley, with which the field was sown, had grown regularly in its rows on the depressed surface, and been cut, as over the rest of the field, in the harvest. The obvious suggestion that there was a well of some kind underneath was confirmed by experiment, when, at about three feet from the surface, we came upon the stones of which the well was formed.

I engaged a professional well-sinker, and we proceeded to examine it. We found that the well was entirely filled with earth at the top. It was regularly "steened" with undressed stones of varying size, put together without any mortar or cement, but skilfully and strongly built. I suppose we were right in assuming, from its difference in this respect to the remains of Roman masonry, and from what we found in it, that it was of an older date of construction than the time of the Roman occupation. For about 10 or 15 feet we dug out the earth contained in the well. Amongst this we found the pieces of pottery which I will by and bye describe, as well as many bones of animals. Then for about 16 feet more the space was filled with several tons of rough blocks of stone, such as might probably have been used for building, and these had bones amongst them. For the last two or three feet there occurred, first clay, getting wetter and wetter as we went on, and then very wet sand. At the depth of 36 feet we were obliged to stop the work.

The water was slowly coming in, and though this was not enough to prevent our going on, yet the workman found, by pushing his rule between the interstices of the steening, that the backing had been drawn by water into the well, so as to leave a space of something like two feet. This filtering in of the soil was the cause evidently of the wet sand of which I spoke; and I judged from this that we had not yet reached the true bottom of the well. But the hazard of the whole thing tumbling in now became so great that it was impossible to proceed.

At the mouth the well measured 2 feet 4 inches one way, by 2 feet 6 inches another. At 14 feet from the surface the diameter had increased to 3 feet 6 inches, roughly, and then it increased very rapidly, so that at about twenty feet of depth the man working was able to stand under the projecting sides so as not to be seen from the top. Then it narrowed again until, at 36 feet, where we left off, it was only 2 feet 6 inches. I am particular in giving you these details of size in order to convey to you an idea of the strength of the construction, and also for a specific reason which I will mention presently.

But there was a somewhat remarkable feature in this construction besides its want of uniformity in the enclosed space. At 30 feet from the ground there appeared on the west side of the well a narrow opening in the steening of about 9 inches in width. The wall was tied above it by two large stones, apparently rather more dressed than the rest of the stone work, one of 22, and the other of 24 inches in length. This opening went on increasing in width and in depth, being carefully steened on the two sides which sloped to meet one another, so that 6 feet lower than where we first came upon it—that is when we stopped digging—it was 2 feet 4 inches wide by 2 feet 6 inches deep; forming a triangular recess in the side of the well. The bones of animals found comprised, so Mr. Moore, who examined them, tells me, those of oxen, horses, pigs, goats, sheep, and probably of deer. None of them appeared to be human.

I am sorry to say that all the remains of pottery that we found were simply fragments. These consisted of a great many small bits of vessels. There was one piece of highly glazed ware, such as I believe is called Samian, the foot of some jar or urn. Of the more common red ware, there were portions of the lips of two urns, in all probability, Cinerary urns, one of which gave a diameter of 7, the other of $4\frac{3}{4}$ inches as that of their opening at the mouth. Of the dark coloured, or what is known as the Upchurch ware, there were similar lips, giving respectively, 6, $6\frac{1}{2}$, 7, $9\frac{1}{4}$, and 14 inches as the diameters.

Of stone remains there were only two. One is the segment of a circular stone used as the upper stone of a quern. I have not got the dimensions of this stone, but it is to be seen, as are the few bits of pottery, in our Museum. The other is apparently part of the lower stone of a small hand quern in which an upper one revolved. Besides these we found three pieces of rudely baked and fashioned utensils. These Mr. Clarke was good enough to take with him to the British Museum and show to Mr. Franks there. He was informed by that gentleman that they were portions of such amphoræ as the Romans were accustomed to import oil or wine in from the islands of the Levant. He saw a perfect specimen of one of these jars standing about five feet high. This had come

from Rhodes, and was composed of the same material as the fragments found by us.

My own impression is that a Roman villa stood somewhere in the immediate neighbourhood. The shape of the ground rather encourages this idea. Magna Castra at Kenchester may be about a mile off as the crow flies; and Bishopstone, where, as you know, traces of such a villa were clearly found, somewhat less. Credehill Camp, and the site of a small Roman station, now occupied by Brinsop Church and churchyard, are nearer still; so that the locality was a favourite one. A small fragment of Oolite, like the oolite of Bath, which we found in the well, may or may not be suggestive of some better class of dwelling having been on the spot, of which it formed a part. I should imagine that the well was used by the people who lived in such house as the place to shoot their rubbish in. The stones nearer the bottom may have been taken from some ruder building pulled down; while the bones of animals and the broken crockery speak for themselves.

So far, I am afraid that I have not said much to interest you, and only the reasons that I gave when I began have induced me to trouble you with so much detail. But there are now two points which I should like anyone to inform me on, and which I suggest to you for your opinion. The first is: How did it happen that the ground sank down in the regular way which I described to you? My own theory is that the well rested on a rocky floor, to which we were unable to reach, and that beneath that floor was a spring cavity, which had been always filled with water; but I think it possible that the excessive rainfall which we had in May, 1886, and which amounted at Brinsop to 7·25 inches, may have produced some change in the soil such as allowed this cavity to be drained. Then I suppose that the flooring may have given way, and let the whole well sink bodily down. Now you see that this theory demands this heavy draught on your credulity—that the steening of the well, its contents of stone and earth, and the soil which backed it outside the steening, must have all gone down uniformly together, like a cartridge in a gun barrel. This is very hard to realise as being so. And what makes it more strange, if it were so, is that, built as I told you the well was, with its rapidly enlarging and then contracting space, the stones should not have been loosened by the movement downwards, but should have allowed us to get down as far as we did. Still, I cannot think of any other way in which the depression on the surface of the field could possibly have been produced so regularly in its shape, and so suddenly in the time of its being formed, as was the case.

The other point which admits of some little interest relates to the recess which I said we found in the side of the well at the depth of 30 feet. What in the world was that for? The well, from its narrow opening must have been hard enough to construct as it was. What made its builders add this difficult piece of building at such depth underground? If the whole thing had been larger, and not of such considerable depth, one might have fancied it designed for a store place of some kind at a time when it was drier than now. Is it known that there are instances of this peculiarity of construction elsewhere, such as might throw light on this particular building, what it was built for, and who were the builders of it? I pause for a reply, and thank you for your kind attention.

BOTANICAL NOTES.

By the Rev. A. LEY.

Not many observations were possible during the drive; but the stream at Withington Marsh was bright with the yellow flowers of a plant which is rare in Herefordshire, the Great Water Nasturtium (*N. amphibium*): and at Stoke Lacy the road-side was carpeted with the beautiful Rock Rose (*Helianthemum vulgare*). A rare and curious variety of this was seen in two spots, of which the petals were of a very pale straw colour. Here also a specimen of the pretty Orchis (*O. pyramidalis*), which is a very local plant, was picked by a member of the Club. One peculiar trait of the Bromyard district is the abundance of the annual wild cabbage, which is called by botanists *Brassica Briggsii*, in all the tillage land and by the road sides. This was noticed directly the neighbourhood of Bromyard was reached; and, indeed, it extends throughout the district as far as the Teme Valley. Where the *Brassica* occupies the fields there the common Charlock (*Sinapis arvensis*) disappears; and when the *Sinapis* is in possession, there the *Brassica* is not to be found; but the *Brassica* is accompanied by another Charlock, the Black Mustard (*Sinapis nigra*) in the tillage land; while all the three species grow together upon the bushy banks of the Wye.

When Thornbury was reached, the main body of the members proceeded to the Camp, where they met with a profusion of the Larger Broom-rape (*Orobancha major*) which is a parasite upon the roots of the Common Broom. This plant has been long known to inhabit Thornbury Wall Hills; the Rev. T. Hutchinson having found it there full thirty years ago. One or two zealous entomologists and botanists turned aside to explore a well-known hunting field, Edwin Wood, where, at least as far as botany was concerned, they were amply rewarded, in spite of the heat, and the crowd of biting insects which rendered their researches a petty martyrdom. Edwin Wood is one of the two sole known habitats in Herefordshire for the beautiful and graceful Solomon's Seal (*Convallaria multiflora*) which was found there years ago by the late Miss Williams, of Edwin Loach. To-day this rare plant was looked for in vain, and indeed there are no recent records of its having been found; but the closely-allied and better-known Lily of the Valley (*Convallaria majalis*) was picked. The wood is clearly part of the aboriginal Herefordshire forest, being full of Ling, and overshadowed with coppice Beech and Mountain-ash. But its chief treasures to the botanist are its local brambles, two at least among the forms of this perplexing tribe, and those very well marked and striking ones, being unique as far as the county of Hereford is concerned. We will not venture upon names in these plants, but we may say that one of them is at least very near the true *R. suberectus*, of the Devil's Bridge, and the other near the *R. foliosus* of Warwickshire, but one or both may turn out to be forms new to the British Isles. Both were found in nice flower, and were packed up and brought away in triumph by the botanists. Three Hawkweeds were noticed, one of which (*Hieracium murorum*) is quite a rare plant in this part of the county:

here parts of the wood were gay with its flowers. The return to Bromyard was made along the banks of the Frome, which proved somewhat disappointing to the botanists, being a slow rather ditch-like stream flowing under dense bushes. But a small patch of a rare moss, *Amblystegium radicale*, was noticed in it at one spot, while the artificial pool which is formed in the brook at Ruckenhill was gay with the handsome red spikes of the Amphibious Persicaria (*Polygonum amphibium*), already in bloom. At the dinner-table the *Birds-nest Orchis* (*Nicotia Nidus-avis*) was exhibited by Mr. Bainbridge, picked by him upon Dinedor hill, and when put beside the other parasite (*Orobanche major*) which had been found, exhibited a striking similarity between the two thieves of the plant world, though they are not really close connections. These two plants have taken to bad ways, and live upon the work of their neighbours; and the dull dead browns of their leafless flower-spikes showed in striking contrast to the fresh bright green and pink hues of the honest *Orchis pyramidalis*; a warning to higher members of society than themselves lest they also take to live by begging and stealing, and their faces bewray them.

Woolhope Naturalists' Field Club.

JULY 29TH, 1887.

FORTUNE favours the brave, and thus it happened that all those stouthearted half-hundred, who, during a drought of unusually long duration, accompanied by a temperature which had continued persistently high for several weeks, accepted the invitation to drive fifteen miles, and to walk five miles, on Friday, July 29th—the Ladies' Day—were rewarded by an agreeable refreshing change, clouds tempering the burning rays of the sun, and the mountain air on Garway Hill renovating their spirits.

The journey was performed in carriages to Kilpeck, where a halt was made for one hour, and an inspection made of the Norman Church and the adjacent ruins of the old castle. The site of the Priory, of which there are no remains, was pointed out as being about a quarter of a mile south-east of the castle.

In the Church a paper was read by the Vicar, the Rev. E. R. Firmstone, and at the ruins of the Castle Mr. G. H. Piper read the result of his researches upon all its historical associations.

The description of the Church, to do it justice, would occupy a large sized volume; and it has received notice in a volume of good proportions in G. R. Lewis' "Illustrations of Kilpeck Church," published in 1842; but a limited address can only deal with some salient points of this ancient edifice. After listening to the papers, the party, reinforced by several more members, having resumed their seats in the carriages, proceeded four or five miles, gradually ascending from Kilpeck (349'6 feet above high water, by a bench-mark on the south wall of the Church), until their arrival at an inn on the road side in the parish of Orcop, which carried a sign-board bearing the five-syllable name Bagwylydiartte. Here their minds were much exercised in the correct spelling and the meaning of this word. The name is not given in Speede's map, dated 1610. Isaac Taylor in his map, 1754, a century and a half ago, spells the name as one word, Bagalidiott. In Price's map, 1817, it is spelled Bagwyldiart; in a so-called official map of Hereford, dated 1868, it is spelled Bagalide. In Bryant's map, dated 1835, it also appeared as one word, Bagylidiart. The old Ordnance map spells it in two words, Bagwy Llydiart, and upon reference to the Ordnance Survey Authorities, who are at present engaged upon the survey of this locality, they adhere to this spelling; and upon good grounds, for they inform us that the inhabitants of the district spell the name Bagwy Llydiart, the post-office documents spell it Bagwy Llydiart, and that the words are to be found in the dictionary. "Bagwy" signifies a cluster, a bunch, and "Llydiart" a gate. We find in the neighbouring parts of Wales the name of "Llydiart" occurring where the mouth of a pass is found—as

well as the word "*pens*" for the hills, and "*cwms*" for the valleys—the Briton thus truly having left his marks upon the land.

From Bagwy Llydiart the ascent was gradual and easy for the pedestrians to the summit of Garway hill, and the refreshing breeze most gratifying. The view from Garway Hill, 1,197 feet above the level of the sea, exhibits an extensive panorama embracing the heights of Radnorshire forest, the Clew Hills, and the Longmynd of Shropshire, Malvern Hills in Worcestershire, Herefordshire Beacon, Forest of Dean, and the Cotteswolds in Gloucestershire, the Skyrrid, Sugar Loaf, and other hills in Monmouthshire, Pen Cerrig Calch, Gader Vawr in Breconshire, and the whole range of the Black Mountains, with occasionally, in a clear atmosphere, a peep of the Severn Channel, and the county of Somerset beyond.

There are probably few Members of our Club who possess a copy of No. 4 of our *Transactions*. The Geological panorama from Garway Hill is so well given on page 4 of that number, in the retiring address of the President, Mr. R. W. Banks, in February, 1861, that we will introduce the following extract:—"From its summit a magnificent prospect opened to our view: to the west lay the Skyrrid, and the hills of the upper division of Old Red, which surround Abergavenny; to the north-west, the long range of the Black Mountains, and in the same direction, considerably in advance, the comparatively low range of Cornstone hills, which extends from St. Devereux to the Wye at Whitney; looking to the north, over the wide valley of Old Red, Lady Lift and Dinmore Hills appeared, beyond them the Ludlow rocks, represented by Hergest ridge and Bradnor, and, in the extreme distance, Radnor Forest, occasionally hidden by passing showers; to the east, the well-known features of the Titterstone, Clew Hill, and Wenlock-edge, and the somewhat tame outline of the Longmynd, the oldest of our fossiliferous rocks, thus affording a view of the whole range of Palæozoic rocks. Turning round to the south, Monmouth and Ross lay before us, and the valley of the Wye, flanked by the coal basin of the Forest of Dean; to the east, the Malvern Hills, with the range which runs along the vale of the Severn, and the more distant Cotteswolds, representatives of the Oolite formations, in the background. It would be difficult, perhaps, to find a spot where a better view can be obtained of the Old Red Sandstones of Herefordshire, which at Pen-y-Gadr Fawr, rise to the height of 2,545 feet, and which are in this district estimated to be 10,000 feet thick."

The descent from Garway hill was made through the deer park of Kentchurch Court, passing a noble oak tree measuring 32 feet 5 inches in circumference at a height of five feet from the ground, a yew tree with a solid bole, 30 feet, and a great Scotch fir behind it, 11 feet 7 inches in circumference, through Yew Tree plain, past Waterloo Cottage, crossing the Monnow by an iron foot-bridge near Corras to Grosmont, where, after a walk of four or five miles from Bagwy Llydiart, the members were glad to find refreshments for them prepared in the ancient Town Hall situated in the centre of the village. The Town Hall was rebuilt in 1831, by the Duke of Beaufort, on the site of the old building. This was much larger when Grosmont was a town of considerable importance, having its mayor and burgesses so recently as the commencement of this century, and its government conducted by the families, amongst others, of the Clives and the Scudamores.

On the basement floor of the Town Hall two large octagonal stones were observed, whose original locality and object are lost to tradition. Possibly they may have been connected with an ancient market cross, although they can hardly be considered, as has been suggested, to have been the base and capital of the columnar shaft.

After dinner the following papers were read:—"Notes on Wagtails," by W. W. Fowler, Esq., M.A., Fellow of Lincoln College, Oxford; and the "Geology of the district," by the President, Rev. Wm. Elliot. These appropriate and highly interesting papers speak for themselves, and form a valuable communication to "The Transactions." The authors having been thanked, the Rev. Charles Wesley, Rector of Grosmont, conducted the party over the Church.

GROSMONT CHURCH.

Built in the form of a Latin cross, consists of a nave and aisles, with a porch on the north side, transepts, chancel with a chapel on its south side, and central tower surmounted by a spire. It is dedicated to St. Nicholas, and is supposed to have been erected in the 13th Century by Eleanor of Provence, Queen Consort of Henry III. The Crux arches, according to Mr. J. P. Seddon, under whose supervision the recent restorations have been carried out, are of the Transition period between the Norman and the Lancet, this being the earliest style of architecture in the building. The chancel is fully developed Lancet. The tracery and details of the chapel attached to the chancel, and called the Eleanor Chapel, are Geometrical. The east window of the north transept with the internal porch door indicate a later date. The western façade, octagonal tower, and spire, may be referred to the latter part of the 14th Century, and the porch to the 15th Century. In the church is an unfinished effigy of gigantic proportions of Henry, Earl of Lancaster, who was born at Grosmont, and surnamed Grismond, clad in coat of mail, and bearing a kite shaped shield of the 13th Century.

Restoration of the chancel, strengthening of the tower, and access to the belfry by a staircase in the south-east angle of the tower, were a few years ago executed by Mr. J. P. Seddon, F.R.I.B.A., supported chiefly by liberal donations from Mr. J. E. W. Rolls, and his son, Mr. John Allen Rolls, of the Hendre. The restorations of the nave and other parts of the building are now being carried out, owing to large benefactions from the same gentlemen.

The site of one of the obsolete punishments was visited in a lane called Poorscript lane, west of the Church, where existed at the commencement of this century, near a pond, that awe-inspiring instrument, the "ducking stool."

The Rector generously provided tea for the large party, who spent what remained of the time at their disposal by visiting the adjoining castle.

GROSMONT CASTLE.

Is traditionally spoken of as the "Castle of the Red Rose"; the red rose, it must be remembered, was the badge of the Lancastrians. It was named Rosslyn Castle, a corruption of the Celtic word *Rosllwyn*, a rose bush. Probably

Grosmont was occupied in the earlier days of the English stockades, although the ruins now existing indicate no period earlier than that of Henry III., with alterations made probably in the time of Edward I. The importance attached to this district by the successive races of Celt, Roman, Saxon, and Norman, and maintained in later times in this part of the Marches, is evidenced by the existence of the strong places of Grosmont, Skenfrith, Oldcastle, Longtown, the fortified house of Perthir, and Monmouth Castle, all on the banks of the river Monnow, with Usk, Abergavenny, Crickhowell, Tretower, and Brecknock in succession on the river Usk. The Castle of Grosmont has always been associated with the neighbouring castles of Skenfrith, and Llantilio (or Whitecastle), forming with them the celebrated trilateral. Grosmont and Skenfrith are four and a half miles apart; Whitecastle, only reached by a long steep ascent, and undefended by any river or watercourse, is five and a half miles distant from Skenfrith, and five miles from Grosmont. The history of Skenfrith, with its frequent changes of possessors, especially in the 13th Century, has been given by the Rev. C. J. Robinson, in the "Transactions" for 1875, pages 125 to 130. The history of Grosmont is a repetition of that of Skenfrith, its perusal shows the uncertain tenure of lands held immediately from the Crown in those days, and the reader is led to sympathize with the Barons in their resistance to the arbitrary proceedings of John and his son Henry III. Grosmont was the most important of the three castles, and was occupied as a baronial residence. It is of moderate size, enclosing an area of about 110 feet long, by between 70 and 80 broad. Its principal entrance is upon the eastern side, with an earthwork or barbican as a covering-work. The deep ditch which surrounds the whole work was probably crossed by a drawbridge. The entrance gate was protected by a portcullis, of which the grooves are to be seen, with two holes for the wooden bars. Upon entering the inner court, the large hall is seen on the north side, a strong low tower on the south-east, a larger tower on the south-west, and from the western curtain the buildings project, and exhibit a fireplace, the flue from which rises as an octagonal chimney shaft crowned by an elegant lanthorn as finial, somewhat resembling a chimney on St. Briavel's Castle on the river Wye, in Dean Forest, Gloucestershire.

On the accession of Henry IV. these estates, like all others of the House of Lancaster, became vested in the Crown, and continued in possession of the Kings as Dukes of Lancaster, until recent times.

The destruction of the Castle is ascribed by tradition to the period of the Wars of the Roses, when all the castles of the county were dismantled by William, Earl of Pembroke, by order of Edward IV. In the reign of James I. (1603 to 1625) it was reported a ruin. This ruin is now the property of the Duke of Beaufort, by whose ancestor it was bought about 1824; the same care and attention is bestowed upon its preservation as is so conspicuous a characteristic in all those memorials of the feudal ages which are under the supervision of his Grace.

The return journey to Hereford was commenced at six o'clock; the descent of that very steep declivity, named Cupid's Hill, leading from Grosmont to the river Monnow, was performed cautiously and safely; the intellectual recreation

and the happy medium of temperature having contributed conjointly to the health and enjoyment of the half-hundred who had been so bold as to partake in the proceedings of this Ladies' day, during the long continued condition of drought.

The traditionary exploits of John of Kentchurch are still kept in remembrance by the inhabitants of this district; not the least of which is the building of the bridge over the Monnow in one night! Mr. J. E. Southall writes in our local newspaper, the *Hereford Times*, of November 11th, 1891, from Waterloo Road, Newport, Monmouth:—"John Kent is no mythical being, but an historical personage. His name is usually written Sion (pronounced Shone) Cent by Welsh writers, and he lived from about 1300—1368. He was a Churchman—*i. e.*, a Roman Catholic priest, who was taken under the sheltering wing of the Scudamores (then probably a Welsh speaking family) at Kentchurch. He was a good man, and though apparently attached to the Roman Catholic creed, in the early part of his life attacked the immorality and errors of the Popish monks. Lollard opinions, we have reason to believe, were strongly disseminated in West Herefordshire from Deerfold Forest down to the Monmouthshire border, and it is not impossible that Sion Cent was a leader among their adherents. Gweirydd ap Rhys in his *Hanes Llenyddiaeth Gymreig* (History of Welsh Literature), from 1300 to 1630, published recently in Liverpool, says that strange stories were circulated about him by the Monks, and that they asserted he was in league with the Evil One, on account of his writing against them. It was in fact a cry with mothers to quiet refractory children, "Sion Cent is coming." Twenty-five poetical compositions are reputed to belong to this author, but it is probable that some of them are by later hands. One on "Y Byd a'i wagedd" ("The world and its vanity") is so certainly, as it contains an allusion to Guy, Earl of Warwick, who played such an active part in the Wars of the Roses."

"I should be glad to have any information as to the past history of the Welsh language between Longtown and Kerne Bridge. It is still living to a very small extent, almost, though not quite, on a line between those two places."

In reply to which we have the following information from Mr. James Davies.

In the history of Cilgerran Castle and Parish, near Cardigan, by John Roland Phillips (Ab. Geraint) the author states that all who have noticed Sion Cent inform us that he was born in or near Cilgerran. He adds that according to the "*Eminent Welshmen*," he was an illustrious bard and divine, and flourished between 1380 and 1420, but that according to the "*Cambrian Biography*" he lived between 1420 and 1470. However, as it is stated in the Iolo MSS., that he lived in the time of Henry V., the former is more likely to be correct. According to the "*Myfyrian Archæology*," he was ordained, and served the Church of Newcastle Emlyn, but was afterwards presented to the Vicarage of Kentchurch, where he continued until his death. According to the "*Cambrian Biography*," he was a Lollard, and wrote several treatises on Theological subjects in Latin, and many poetical pieces in his native language. He was patronised by the Scudamores of Kentchurch, where he was called Sion Cent, and Dr. John Kent. In the History of the "*Literature of Wales from the year 1300 to 1650*," by Charles Wilson, there is an interesting notice of this celebrated man, and a list of

forty-four of his poetical productions, together with many able critical remarks upon some of his pieces.

With respect to the inquiry as to the existence of the Welsh language between Longtown and Kerne Bridge, it may be stated, that according to the "Archæologia Britannica" of Edward Llwyd, published in the early part of the last century, there was a Gwentish British dialect spoken in Gwent, and in Irchenfield in Herefordshire, which was in use after the Norman Conquest; for, according to the Domesday Survey, the Kings of England had three Churches in Irchenfield, the Priests of which were employed to go on embassies for the English Court into Wales, a knowledge of the Ancient British tongue being necessary in those days for such missions.

The Welsh language lingered in the extreme west parts of Herefordshire—such as Longtown—and the Black Mountains and bordering districts, until the early part of the present century. In Rowstone Church there is still preserved a Welsh Bible, which marks the continuance of the language until a late period.

In other Churches also in this region directions to Churchwardens in Welsh and English were to be seen twenty years ago.

Before leaving John Kent, it may be interesting to etymologists to know that on the Wye, near Goodrich, is a stone called Kent's stone. Kynaston is not far distant. As regards the derivation of Kentchurch, we are informed that probably it is from St. Keyna's Church. See *Rees' Welsh Saints*, pp. 153, 340.

The following attended the meeting:—Rev. W. Elliot, President, and his friend Mr. W. W. Fowler; Messrs. F. Bainbridge and G. H. Piper, Vice-Presidents. Ladies—Miss Baker, Miss Beddoe, Miss E. Bull, Miss L. Bull, Miss Chapman, Miss du Buisson, Mrs. Clarke, Miss Davies, Miss Hopton, Mrs. A. W. Horton, Mrs. C. A. Horton, Miss Jones, Mrs. Lindsay, Mrs. Moore, Miss Morgan, Mrs. W. Pilley, Miss Piper, Mrs. Warren and two friends. Gentlemen—Revs. J. E. Grasett, M. Hopton, A. W. Horton, A. G. Jones, D. Price, F. H. Tatham, H. W. Tweed, M. G. Watkins, and Chas. Wesley, Dr. T. A. Chapman, Messrs. R. Clarke, J. Docking, Luther Davis, James Davies, F. Ford, J. Lloyd, T. C. Paris, James B. Pilley, Assistant Secretary, and H. C. Moore, Honorary Secretary. Visitors—Messrs. — Browne, A. B. Donaldson, C. A. Horton, F. W. Lindsay, and Rev. E. R. Firmstone.

KILPECK CHURCH.

Upon arrival at Kilpeck Church, the members were received by the Vicar, the Rev. E. R. Firmstone, who addressed them as follows:—

MR. PRESIDENT, LADIES, AND GENTLEMEN,—Your good Secretary, Mr. Moore, has accredited me with a much higher ambition than I myself can lay claim to, of reading to you an exhaustive description of the detailed beauties of this marvellous little church. I have by me certainly a few extracts, read by a member of the Cambrian Archæological Society, some years ago, I suppose, at a meeting here before my time; but they are not very full or complete. I have also a few fragments of the history of the successive lords and owners of the manor and castle of Kilpeck—but they are only fragments. I have also received

from Sir George Cornewall, who is unfortunately unable to be present with us to-day, some very interesting remarks on the subject of the ancient Basilicas, on which style the architecture of Kilpeck is undoubtedly modelled, which I have his permission to read. For the following remarks I am indebted almost wholly to an excellent paper read by one of your members, Mr. Thomas Blashill, before the British Archæological Association, at the Hereford Congress in 1870. We enter at the South door. In the arch of this doorway the general design is quite consistent with ordinary English work of the twelfth century. We have the Norman zig-zag and star-shaped sinkings. The outer ornament of the arch is composed of medallions joined together by grotesque masques, as in the font of Stottesdon, in Shropshire. Some of the medallions contain birds exactly like those on the twelfth century font at Winchester. The tympanum is filled with ordinary carvings representing the vine. The rim of heads and grotesque figures which surrounds it is a remarkable adaptation of the common twelfth century ornament called the beak or cat's head. The figures amongst foliage on the left-hand side of the doorway are said to be in Anglo-Saxon costume—an ordinary graver of the period would have certainly put them in Norman armour, or in some more graceful shape, as in the sculpture of the west doorway of Chartres Cathedral. Many of the quaint little pieces of sculpture in the Corbel Table, which runs round the eaves of the building, represent such subjects as resemble at any rate the signs of the Zodiac, and all sorts of grotesque men and animals. In two places, one over the south doorway, and again at the east end, appears the distinct mark of Christianity, the Lamb of God, and the Cross of Salvation. The west end of the church has for its most remarkable feature the three strange gargoyles, which project from the wall of the church just as in old timber constructions the ends of the wall-plates were made to project, and were carved into fanciful shapes. Indeed, this feature looks like the reminiscence of some previous timber building. These strange heads of crocodiles or dragons may be compared with the monstrous snake-like figures which twine about the doorway. I cannot but think that they represent, wherever they occur, that old serpent or dragon, the Devil. At the south doorway he is found tempting man to sin, and to eat the forbidden fruit; while at the west end, he is represented in three forms being driven away from the church. Mr. Blashill points out that the prevalence of such figures and grotesque forms is highly characteristic of the Celtic School of ornament. These were indeed afterwards adopted and largely introduced into all the succeeding periods of Gothic Art. The belief in dragons was quite common down to the 17th century; the learned classifying them in species as a zoologist would now classify a particular genus of animals. The ornament in the west window is almost purely Celtic, and may be compared with the Irish crosses and carved stones. The columns at the sides are of the same size as the roll above them. This is quite an Irish feature, and betrays a want of knowledge of the relation which a column bears to the arch it carries. A Romanesque architect would have made the column smaller, and the arch more square in section, with a small roll moulding or zig-zag ornament on the edge. The chancel arch is of ordinary Norman character. Its jambs, usually ornamented with

columns, are here carved in the forms of saints carrying their various attributes ; clearly one or more of the Apostles are among them, for here is St. Peter bearing a key. In the south wall of the chancel or choir are an Early English window and a Priest's doorway, probably inserted about the middle of the thirteenth century. The apse is vaulted with ribs, ornamented with Norman zig-zag, and having a central boss composed of grotesque heads, very similar to work at Elkstone, in Gloucestershire. The font is one of those large shallow bowls of the twelfth century workmanship, of which several remain in the county of Hereford. One almost similar in size and in shape is at Bredwardine Church, in this diocese. The great size of the font points to the rule in the mediæval times of immersing infants instead of, what is now the rule, aspersing or sprinkling them. In the apse there is a holy water stoup, having a pair of arms clasped round it, which appears to be of very ancient date, probably as old as any portion of the church. In conclusion be it observed that, although the general design of this church is of an ordinary type, the style of sculpture has a character of its own. For, while the twelfth century sculptors generally in England adopted eagerly that mixture of Byzantine and Romanesque ornament which was introduced from Normandy, developing it in a fashion of their own, the man who did this work of Kilpeck church evidently set himself to adapt the ancient style which was then dying out in these islands of the west. And although we see frequent instances in which that style peeps out in the late Norman work, yet this was the only part of the country in which any determined effort was made to work in that old manner which was doomed to disappear before the great artistic revival then taking place in Western Europe.

NOTES ON KILPECK CHURCH.

By the REV. SIR GEORGE H. CORNEWALL, BART.

The interest attaching to Kilpeck Church does not lie only in the remarkable sculptures by which it is enriched, but its design recalls the ancient Roman Basilica, and, therefore, the earliest type of Christian church, at least in the west. English churches are usually terminated to the eastward by a flat wall, instead of the apse or "chevet" which is so universal on the Continent, where, as at Kilpeck, the church is terminated by a semi-circular apse, we at once perceive that the design is an uncommon one. Such an arrangement can only be explained by saying that we have here a church modelled on the Roman Basilica or Hall of Justice. The Roman Basilica was placed usually in the Forum, and consisted of a nave longer than broad, supported on columns with a flat roof, and terminated by a large semi-circular apse, wherein against the east wall was the seat of the quæstor, and on the steps on either side were ranged the assessors ; an altar, on which libations were poured before any important business was transacted, occupied a position nearly identical with that in which the Christian altar would be placed, and a space was railed from the nave, wherein the pleadings took place ; the spacious nave itself was also used by merchants as a place of exchange. The Roman Basilicas were grander and more imposing than the heathen temples, and when the Empire was converted to Christianity, there was little difficulty in

applying them to the uses of a Christian church ; another reason why they should be so applied being that the early Christians were a poor community, who would be unable to build churches of their own. The seat of the quæstor became the throne of the bishop or presbyter ; the attendant clergy would take the place of the assessors ; such seats are still to be seen in the Church of Torcello near Venice. The space appropriated to pleaders would become the ritual choir, as in the Church of San Clemente at Rome, where one of those early choirs of white marble with its ambones or pulpits still exists. The altar also would be adapted to Christian rites.

The Romanesque Architecture, of which our Norman is a branch, founded its style on the Roman Basilica, not necessarily ponderous and rude as is usually our Norman work, but deriving its inspiration from the later classical architecture which the Romans retained when the use of the arch became common and which gradually grew until at last it developed into the pure Gothic of the thirteenth and fourteenth centuries. Kilpeck then is a building moulded on the earliest type of Christian Church ; at Kilpeck is the apse recalling the tribune of the Basilica, also the thin Early Norman buttress which recalls to us how the column, when the strength of the arch was more fully understood, became only a pilaster ; the pilaster passing through many stages till it became a simple buttress ; the large round arches dividing nave and chancel, recalling the feature which was most important and effective in the Roman classical buildings. It is probable that these early Norman churches were intended to be ceiled, or at least that the internal roof should be flat ; the ancient Basilica of Maxentius at Rome, now called the Temple of Peace, has a vaulted roof, it is true, but in all the best examples of Christian Basilicas the roofs are flat. The open roof crushes and dwarfs that which is the feature of the Church, the round arches dividing the nave from chancel and apse. It may be remarked that, whereas the apse as an eastern termination to our cathedrals is rare, Westminster Abbey is an exception. England is particularly rich in chapter houses, and it may be supposed that the apse, as the place where the bishop sat in council, was superseded by the chapter house, the chancel being therefore specially reserved for the sacred rites of the church ; and conversely it may be supposed that the circular baptisteries common in Italy, a class of building possessing much in common with our chapter houses, as far as being circular detached buildings, were reserved for the administrations of the Sacraments, services for the dead, etc., thus possessing a peculiar sanctity. Whether this idea can be maintained or not, we have in Kilpeck a form of church built about the year 1100, which is designed on the plan of the earliest edifices applied to Christian worship, a link between the later classical architecture and the Gothic, interesting because even in this remote spot the types prevalent in Rome were followed, and, although of a style capable of development, as in the majestic Norman of our own cathedral, possessing all the elements of growth, till it culminated in the glorious buildings of the Edwardian period. In such a simple structure we trace the foundation from which all church architecture sprang, and an inherent power foreshadowing the beauty to which architecture as an art was capable of reaching.

KILPECK CHURCH.

[Extracts from Mr. G. R. LEWIS' Monograph.]

Mr. G. H. Piper, F.G.S., Vice-President, brought with him extracts, which are too long for insertion here, whilst the Vicar, Rev. E. R. Firmstone, exhibited at the same time Mr. G. R. Lewis' Monograph upon this building. Mr. Piper remarked:—The church of Saint David at Kilpeck, is one of the most perfect and most interesting specimens of Norman ecclesiastical architecture in England, remarkable in every feature, and worthy of the careful study of the most learned archæologists. The remarks I am about to read are chiefly extracted from a book published in 1842 by the late G. R. Lewis, an artist who was connected with the county of Hereford by marriage, and as I have the volume with me you will have the advantage of seeing the very numerous and beautifully executed lithographs of the cornices, corbels, and other details of the building which might otherwise escape your notice. Mr. Lewis had the advantage of visiting the church when the original roof was still on the apse, and in the year 1818 he made several sketches of it. At that time the walls bore unsightly coatings of white, buff, and grey wash, but he saw the remains of a good deal of fresco painting upon the walls, and upon the sculptured forms. Those present who remember the gratification we derived during the year 1878 in the inspection of the most interesting mural paintings at Kempley Church (see 'Transactions of Woolhope Naturalists' Field Club' for that year, page 79, *et seq.*) will most regret the destruction of similar decorations here. Mr. Lewis deals largely and learnedly with symbols in the general design and details of the building.

For following him through his ingenious symbolical interpretations, the enquirer must be referred to the work itself, which is admirably illustrated with engravings.

NOTES ON KILPECK PRIORY.

[By the Rev. WM. BAZELEY, Matson Rectory, Gloucester, and Secretary of the Bristol and Gloucestershire Archæological Society.]

The munificent donations of Hugh Fitz Norman in 1134 were probably made on condition that a dependent Priory or cell of Benedictine Monks should be established at Kilpeck, and this was done within a few years. The object of Hugh, son of William Fitz Norman, in making this decision, was to have a civilising centre among his tenants and serfs, as well as a regular supply of chaplains for his churches of Kilpeck and Dewchurch and his castle chapel. The monks of the new Priory would be partly clerical and partly lay, and whilst the former were engaged in the services of the church, or the household duties of the Priory, the latter would be cultivating the Priory lands. We must not look upon the monks of those days as drones or as revellers. They lived under strict rules, and had plenty of healthy occupation as well as religious privileges. The Prior of Kilpeck seems to have had the entire charge and responsibility of the Priory lands, although he was of course bound to render some allegiance to his lord, the Abbot of St. Peter's. In return for this he had a vote in the election of a new

Abbot, and was summoned to Gloucester for that purpose. His connection with the great Abbey of St. Peter must have been a great security to him, living in such lawless parts as the Marches of Wales. If he were injured, or unjustly deprived of his rights, his lord would be both able and willing to procure redress.

There was a difference between Kilpeck and the other dependent Priors of St. Peter. Whereas the others were at one time independent foundations, and were led for security, or to please their patrons, to incorporate themselves with the Abbey of Gloucester, Kilpeck was never entirely free, but was founded after the Priory lands had been bestowed upon the Abbey. There are very few references to Kilpeck in the Abbey Registers. The history of the Priory has yet to be discovered. That it had a history may be considered certain, for Kilpeck was on the road from Hereford to South Wales, and had a strong fortress in its immediate neighbourhood. For many years after its foundation the restless Welsh made incursions in the direction of Hereford, and the monks had the choice of taking refuge within the Castle walls, or suffering at the hands of an unsparing foe.

There were three Papal confirmations of the Priory of Kilpeck to the Abbey of Gloucester: by Pope Clement III. in 1190; by Celestine III. in 1195; and by Innocent III. in 1200.

Hugh Foliot, Bishop of Hereford 1219—1234, with the assent of Richard, Prior of Kilpeck, and Adam, vicar of Dewchurch, arranged what part of the Priory tithes were to be received by the said vicar, and what privileges and responsibilities belonged to him.

Thomas de Bredon, Abbot 1224—1228, purchased eight acres of land below the garden of St. David, half a meadow and half a wood of Roger Walensis, son of Roger, and then let them to him, to hold of the Priory of Kilpeck for twelve shillings annually. This transaction shows us the relative positions of the Abbey and the Priory. Whenever there was any important business to be transacted it was done in the name of the Abbot. At other times the Prior was in command. Still, as time went on, no doubt the authority was more and more centralised until the Prior became simply an inferior officer of the Abbey.

In 1266-7, the rents or fees which are said to be due to the Abbot for his personal use from the Priory of Kilpeck are two shillings and sixpence. In the same year there was a survey made of the Abbey manors. Kilpeck and Dewchurch do not appear, thus showing that the Priory was still comparatively independent. In 1271, John Le Breton, Bishop of Hereford, in a confirmation of the Abbey property in his diocese, mentions Kilpeck Priory as a dependent cell. In 1276, Reginald de Homme, Abbot of St. Peter's, let the lands and premises, which had been bought by Thomas de Bredon of Roger Walensis, to William Shrivenham, Prior of Kilpeck, for seven shillings annually. These are stated to be worth eight shillings a year, but the Prior made a reduction of one shilling annually. This shows that the rental value of this land had decreased 33 per cent. during the half-century, as Roger rented it at twelve shillings a year.

In 1284, William de Shrivenham was summoned to Gloucester, as Prior of Kilpeck, to assist in the election of a new Abbot; and one of the Priors, John de

Gamages, Prior of St. Guthlac's, Hereford, was elected Abbot. It is hardly likely that any Prior of Kilpeck was so advanced at a single step. The whole account of the elections is given in the Abbey registers.

In 1317, there were sad complaints that the monks were not well treated at the dependent cells, and one John Thokey issued injunctions to the Priors of St. Guthlac, Ewenny, Bromfield, Stanley, and Kilpeck, ordering one mark to be given to each monk annually, half at Christmas and half at Easter, for a feast. He forbade, however, on pain of partial excommunication, the use of flesh or wine during Advent and the three weeks preceding Lent, except in case of sickness.

In 1422—48, Kilpeck Priory was dissolved. The monks were withdrawn to Gloucester, and from that time Dewchurch and Kilpeck were considered an ordinary manor of St. Peter's, and were let to tenants as such. In 1535, the annual value of this manor was said to be £7 5s. 5½d. net.

In 1539, the great Abbey of St. Peter was dissolved, and a grant of this manor was made to Baldyn Treville, from whom it descended to the Booths, and the Clives, and, later still, it has changed hands, and is on the Mynde estate, and in the possession of the Symons family.

KILPECK CASTLE

Was reported to be in ruins before the introduction of gunpowder, in fact as early as the reign of Edward I., 1272—1307. Two fragments, of Early English work, are the sole remains of masonry to be found on the site of this ancient castle. These remnants, one on the north about 40 feet in length and 18 feet high, the other on the west about 30 feet long and 14 feet high, at a distance apart of about twenty yards, represent the ruins of a polygonal shell keep, with faces of 13 or 14 feet each. This keep, or citadel, is built upon the summit of an elevated knoll measuring about 25 yards north and south, and 40 yards east and west. This elevation is surrounded by a ditch, save where the natural contour of the ground admits of the institution of a steep slope as an escarpment. Beyond the outer ward, on the south, is another large platform occupying an area of three or four acres, separated by a broad ditch. On the west are traces of a series of embankments, terminating, at a distance of about 200 yards, in a large embankment across a deep dingle. Mr. George Clark, author of *Medieval Military Architecture*, considers that these are indications of a series of long and deep ditches of water, or lakes, to strengthen the defences of the Castle upon its western side, and, we will add, to serve as fishponds. The entrances to the outer ward are upon the south by a flanked deep hollow way, and on the east along the ditch. A causeway leads from the outer ward across the intervening ditch to the mound upon whose summit the shell keep is built.

We always respect a suggestion from so experienced an authority upon ancient military defences as Mr. George Clark, we will therefore quote his inference drawn from his examination of these works. "Originally, advantage

was taken of a natural knoll, of an irregular figure, about 300 yards north and south by 125 yards east and west, which was surrounded by a single ditch, or where the ground allowed, by a scarp only. It may be that here, as partially at Malvern and in other examples, this long inclosure was sub-divided by two cross cuts into three parts, of which the central formed the citadel. This would probably be the work of the British.

Then it would seem that a later people, the English, took possession, and threw up a mound at one corner of the citadel, isolating it by its proper circular ditch, the principal dwelling being on the mound, and the horseshoe remainder below containing the base court for the dependents, while the north and southern portions would serve for protected enclosures for cattle.

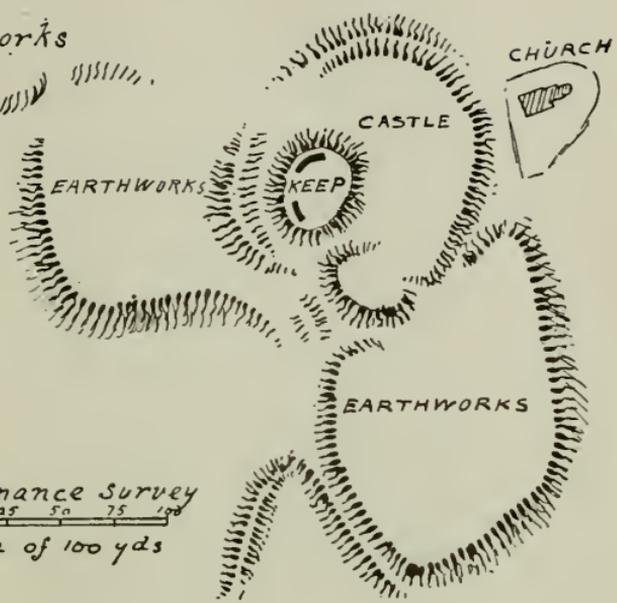
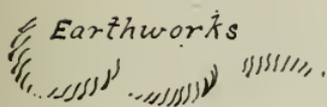
When the Normans took possession, they seem to have built a shell keep upon the mound, and to have employed the base court below as an outer ward, probably surrounding the whole with a stone wall, now removed, and replacing the English stockade. This would constitute the Castle proper, to which the north and south platforms would be appendages, no doubt stockaded for cattle."

Kilpeck Castle & Church

Hereford

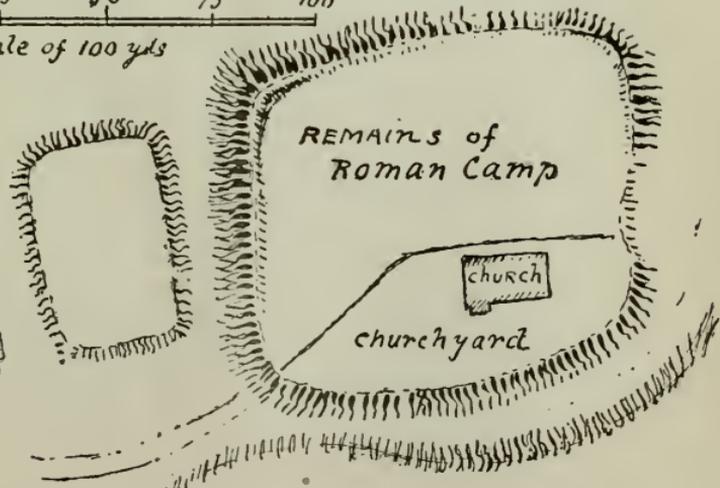
Woolhope Trans.,

1887-8.



Ordnance Survey
0 25 50 75 100
Scale of 100 yds

0 25 50 75 100 yds
Scale of 100 yds



R. CLARKE
DEL.

Brinsop Camp & Church.



NOTES ON WAGTAILS.

[By Mr. W. W. FOWLER, M.A., Sub-Rector of Lincoln College, Oxford.]

I do not know that I could choose a pleasanter subject than this for a paper to be read among Herefordshire meadows. Here, I think I may answer for it, all the three kind of wagtails are to be found, about which I am going to say something; and though I do not suppose that all who hear me have distinguished them exactly, yet we all know what a water-wagtail is, and there must be few of us who have not sometimes paused in our walks or our fishing excursions to admire their symmetry of form, their beauty of colouring, their graceful flight, their unobtrusive confidence, and their constant unresting activity—an activity which some mysterious grace of mental build never suffers to degenerate into fidgettiness.

It is curious that a group of birds so clearly marked off, in outward appearance at least, from others, should be to learned ornithologists matter of confusion and conflict; but such is the case even at the present day. It is true that the first great writer on English birds, John Willughby, who wrote in the middle of the 17th century, distinguished accurately our three common species; but, a century later, White of Selborne, who knew the South of England only, was by no means clear about them; and since his time, now that the wagtails of all Europe, and indeed of the whole world, have come under careful observation, endless trouble has arisen, both in defining and in naming species. I am not going to lead you into this labyrinth, out of which, I am free to confess, I should not easily find my own way; but I shall refer once or twice to Continental wagtails, in case by chance any traveller abroad should come across them and confuse them with our English birds.

The three kinds with which I have to do are—1, the pied wagtail, *i.e.*, the common black and white bird, which we all know well; 2, the yellow wagtail of the meadows, which comes to us in the spring and leaves us in the autumn; 3, the grey wagtail of the streams, which can always be at once distinguished from the others by its very long tail. All these three resemble each other closely in their habits, as well as in their build; they all, for example, love the neighbourhood of water, they all have the same peculiar flight—a graceful flight consisting of successive waves, or upward and downward curves—which enables us to detect them even at a long distance; they all have the same quality of voice, a short and shrill but musical whistle, usually consisting of a double note, which cannot for a moment be confused with the note of any other bird, unless, indeed, it be with that of their nearest relatives, the pipits; they all move their tails gently up and down, build their nests on or close to the ground, and lay eggs of which the ground colour is nearly always a pale bluish or brownish white, spotted more or less with brown or grey. They all, too, have the small first primary feather of the wing wanting; but this they share with their cousins, the pipits, whom they resemble very closely in all points but such as are most obvious to the eye. They all walk,

or rather run, instead of hopping—their delicate little legs being often in such swift motion as hardly to be seen as they go; and they all feed chiefly upon insects, and love our English streams and meadows for the never-failing abundance of good things found there.

Yet, in spite of all these points of likeness, there are also many points of difference, even in the habits of these species, as well as in the colour of their plumage; and in what I have to say about them, I shall dwell chiefly on these. I shall now take them one by one, beginning with the best known, the pied wagtail, reserving for my last five minutes a last stray remark on the habits of the whole group.

1. The pied wagtail will always have a special interest for British naturalists, for it is one of the very few birds which are rarely to be met with except in our islands. But, just as the red grouse, which is the only bird entirely peculiar to Great Britain, has cousins closely resembling it on the Continent, so too the pied wagtail. If a traveller sets out on a journey due eastward from England to Asia, he will see no more of our pied wagtail after he has left the north-west coast of France or Belgium. There he may chance to find a few; but further east he will find only the white wagtail; a bird not often seen with us, which is called white only, I suppose, because it is not so black as its cousin. This bird, which seems to have almost exactly the same habits as ours, will keep him company by rivers and streams until he passes the boundary of Europe; beyond that a very similar bird, called the Siberian or white-winged white wagtail, which winters in India, will greet him, and, if he pushes on to Japan, he will find yet a fourth variety. I say variety; for indeed all these are really, no doubt, forms of the same original species, varying a little in plumage, as might be expected of birds living in districts so remote from each other. Of these our British bird seems to be the darkest in colour, following the rule that the vicinity of what Lord Beaconsfield once called 'a melancholy ocean' gradually darkens the tints of many birds—but all these birds are really so much alike that no one with an unpractised eye would be likely to distinguish them. And 'one sees so many intermediate forms,' says Mr. Tait, in "the Ibis," 'that it is in some cases impossible to determine with confidence to which species the bird belongs.' Our pied wagtail does not, however, confine itself entirely to Great Britain: though many stay here all the year, a large number leave us every autumn, and seem to make their way along the western coast of France, to Spain and Portugal. On the west coast of Portugal, a writer in the *Ibis* has recently told us (Vol. v., No. 18, p. 186) they are abundant on the shore in winter; and he has seen them, when lately arrived, pursued and attacked by the resident white wagtails, which looked on them as intruders. As regards their journey in this country before they reach the sea, I have one or two facts to tell you which will give some idea of the course taken by those birds which spend their summer in this part of the country and in Wales.

Three or four years ago, a friend of mine, a master at Westward Ho College in North Devon, wrote to me just at the end of September of a strange immigration of pied wagtails which had occurred there a day or two before. It was a warm

evening, and the windows of the large school building, which fronts the sea, were open, and the lights within were of course visible out at sea. Suddenly the rooms were invaded by a host of pied wagtails which swarmed in, circling round and round the ceilings like bats, and were easily caught with butterfly nets. I suggested at the time that these were the Welsh birds, which were crossing over in order to pursue their way to the south coast of England, and so eventually over to France; and I am pretty sure that this was the right explanation. If it has not been confirmed, so far as I know, by the reports of the light-house keepers in those parts, that is probably owing to their want of energy and knowledge.

Some of these birds may go directly over Devonshire and away to sea at once; but it is likely that the greater number gather along the south coast, moving in an easterly direction until the strait is narrow enough for them to cross comfortably. I have seen them in September in such countless numbers in ploughed fields by the Dorset coast that I could be sure they were in process of migration, and a most admirable writer, the late Mr. Knox, has well described how they move gradually eastward in Sussex. I think then that we can hardly doubt that such Welsh wagtails as migrate at all, do so by crossing the Bristol Channel, making for the southern coast, and keeping along it until it suits them to cross again to France. But there is abundance of room for further observation, which in the case of conspicuous birds like these, could hardly be a difficult and surely would never be an ungrateful, task.

I should like to say much more about this bird; but I must confine myself to two brief observations.

These pied wagtails are among the birds which have the knack of building in odd places. I have somewhere read of a pair which built on the axle of a shunted railway carriage on a branch line; when the nest was finished and eggs laid, it happened that the carriage was brought into use again, but the bird continued to sit on its nest during successive journeys, and finally reared its young in safety. Bishop Stanley also tells a similar story of a wagtail which built its nest under the half-deck of a pleasure boat which was in frequent use, and there also succeeded in bringing up its brood; and of another which built in a noisy factory, within a foot of the wheel of a lathe. In my home in Oxfordshire they are very fond of choosing holes in the stacks of coal at the station, possibly from a kind of protective instinct which prompts them to select a home where their black hue might enable them to slip in and out unobserved.

The variations of colour in this bird are almost endless; the sexes are different, and different at different times of the year, the male costume in winter being very like that of the female in summer; and the young in first plumage, as is the case with all wagtails, differ in the most marked way even in a single family. Some are grey-brown all over, with only a few black marks, e.g., on the throat; some are almost black, or very grimy and sooty-looking. These young birds often puzzle the uninitiated during autumn and winter, and I have heard them called grey wagtails even by a naturalist of some pretension. But (though I cannot now say more about these various stages of plumage) you cannot well be mistaken if you reckon all wagtails that are black and white, or grey and white, and that have

no yellow about them to speak of, as belonging to this species; the only other possibility is that they might belong to the race of the white wagtails, and that would be a most unlikely circumstance in a district so far to the west of England as Herefordshire. But even here it may be always worth while looking at a pied wagtail to make sure that it is not a white wagtail; and the latter may be detected almost at once, even from the female pied wagtail, by its much whiter back, and the sharp line of distinction between the back and the jet-black of the head.

2. A word or two next about the yellow wagtail, a slighter and less hardy bird than the last, which rarely or never dares to spend the winter with us, and is perhaps all the more welcome when its gentle whistle is first heard on an April morning, in meadows fast greening with the influence of spring showers. When the pied wagtail was first distinguished by naturalists from its Continental cousins, of whom I spoke just now, it received the most unfortunate name of *M. lugubris*, or the wagtail in mourning, in allusion to its black and white dress. To give such a name to a wagtail (it was given by a Dutch naturalist) is to forget that feathers do not make a bird any more than clothes makes a man; and I do not think that a wagtail could look melancholy even under the most painful circumstances. I am glad to say that no such misfortune has happened to the yellow wagtail, the sprightliest, boldest, and I might almost venture to say the happiest, of all its kind. It has often been called, in Latin as in English, the yellow wagtail; but the greater number of authors have given it in a Latin form the name of the great English naturalist, John Ray, the friend of the Willughby whom I mentioned just now, and even in English it is now known to ornithologists as Ray's wagtail. It received this honourable name some half a century ago, because it was then first discovered that this bird, like the pied wagtail, is almost peculiar to England, and is quite distinct from the common continental yellow wagtail. Strange to say, it has turned up again since then in Central Asia in summer; and it is known to winter in Africa, even as far south as the Transvaal; so that in spring two currents of yellow wagtails must set from Africa, the one going north-east to Asia, and the other north-west to England. Here is indeed one of those curious unsolved bird-mysteries which make the science of ornithology more fascinating, the more our knowledge of it advances. And, to add to our perplexity, we have also to face the fact that the space between these two currents is occupied by several other kinds of yellow wagtails, all much alike in shape and habits, and for the most part in hue, but differing just in some one point of plumage, and mixing themselves up together in the most delightful confusion, as if wilfully and teasingly determined to make the men of science pay for classifying them. The only one of these which I shall mention is the blue-headed wagtail, which is the true yellow wagtail of the Continent, and the type of its class. A very few of these seem to come to us every year, and, just as it is worth while always to look at pied wagtails, to be sure that they are not white wagtails, so it is just as well to glance at the yellow wagtails we see, in case we might some day meet with one that has a bluish head. Should that be the case, the stranger is a rarity, a chance straggler from Holland or France. These most charming birds come to us, as I said, in April. It was on the 26th of April this year that I saw a more wonderful sight of them than I

had ever before seen, or (as I may be pretty sure) than I shall ever see again. A young friend, an enthusiast, came into my rooms at Oxford the evening before, and told me that he had that day seen some *Dunlins* on the bank of the Isis, as it flows by the great Port meadow, the property of the Freemen of Oxford, which runs for a mile and a half north-west of the city. As these little sea-shore birds had never been reported there before, I started the next afternoon, hindered and baffled by a strong and bitter wind, which turned to pelting rain, and also by a toothache, which was not improved by the raging of the elements; but I was well repaid for my trouble. I found the *Dunlins*, but I found also, what was far more wonderful and beautiful, the whole length of the river's bank, on the meadow side of it, occupied by countless yellow wagtails. As I walked along, they got up literally from under my feet, for they were sheltering just beneath the meadow's lip, so I came upon them quite unawares. When a turn in the bank gave me a view ahead, I could see the bank spotted yellow all over with their brilliant breast-plumage, for I was walking with the wind, and they, of course, were facing it, to avoid having their plumage uncomfortably handled by the gusts. They were not afraid of me, and settled down again almost directly, so that my progress was like that of a hay-making machine, which just lifts the hay as it passes, and then lets it settle down again after dallying a moment with the breeze. These birds had clearly only just arrived after their long journey from Africa, and I think they must have come together and unpaired; for their numbers diminished regularly day by day, and at the same time I began to see pairs in their usual places in the neighbourhood, evidently preparing to nest. In a few days they were nearly all distributed over the country-side. Whether they always came thus in troops, and then distribute themselves, is more than I can tell; but on this occasion it was so, and the fact is new, so far as I know, in the natural history of the bird.

Of the nesting of the yellow wagtail among the buttercups and marigolds I have no time to speak, but am well content to refer anyone, who does not know the nest, to the specimen of it in Lord Walsingham's collection in the South Kensington Museum, where bird and nest are so beautifully concealed in the grass, that you can hardly see them at a first glance. The eggs are very thickly spotted with a yellowish-brown tint, which, no doubt, helps to conceal them among the yellow-green stalks of the grass, and the darker shadows thrown by taller plants. But though they thus hide their nests and eggs with infinite care, in the breeding-time it is astonishing how bold this little bird can be; more than once it has let me approach it within a yard or two, as it runs delicately through the grass picking off invisible insects from the fresh shoots; and several times I have known it decoy both me and my dog away from the nest, by letting us come very close and then running or half flying a little way on in front. It knows very well that a dog is dangerous, and may find out its young, and I once knew both cock and hen stand up to my dog in such a ludicrously determined way—the cock in front, as if to protect his wife—that I stopped the dog with a sign, and the big and little animals continued to regard each other as if on equal terms, until my irrepressible laughter sent the wagtail off.

When the young are able to fly, I know no more beautiful sight than to see them play in a hayfield. True, they are not of the bright yellow their parents wear, and are often almost entirely brown, though they differ greatly one from another; but their movements in the air it is a constant pleasure to watch. They dance, and spring, and twist, and turn; now they are on the ground, now high in the air, and now at the other end of the field, and now as suddenly back again. Nor do they limit themselves to the hayfields. I have repeatedly seen them the last few days in osier beds, on railway wires, on the top branches of high trees, and even in cornfields, perching on the ears of wheat. So light and sylph-like are they that the corn-stalks were scarcely bent beneath their weight; and I could not help singling out one of these stalks on which the bird had been resting, and trying to measure with the touch of my finger the pressure of that fairy figure. A week ago I watched a family perched upon the railway telegraph wires; they let me come close underneath them, and performed now and then for my benefit the feat of running along the wires, making use of their hind claw, which is very long, to maintain their hold; in fact their claws formed a complete circle round the wires. They keep together in families for some time at least after they can fly, and sometimes these families congregate together, for one evening after sunset I found the meadow by the brookside alive with them. Their shrill double note was heard on every side, and with it the shorter and less shrill whistle (also a double note) of several families of young pied wagtails. But I am being tempted by these fancies, tempted even now to dwell on them at greater length than I have a right to, instead of turning to their quieter cousin, the grey wagtail of the brook.

3. In dealing with this, the last and most beautiful of our three wagtails, I have no ornithological puzzles to detain me. You may roam over the whole continent of Europe and Asia, and see the same bird that haunts our streams. They do indeed tell us that in the East his tail is shorter; and some have thought to make a different wagtail of him on that account. But I think we may put this aside as but an idle tale. I think I have myself noticed that on the Continent the tails of these birds are not so very long as they are with us; but they are quite long enough to mark the bird, and to be moved continually up and down with that grave and regular persistence which belongs to no other wagtail.

Every fisherman knows the grey wagtail, and will bear me testimony when I say that grey is not a very good name for him. If he stands fronting you on a water-washed stone, as you fish up stream, he will show you his black gorget of the breeding-season, and the beautiful yellow of all his under-parts; if you chance to see him from behind, you will have to allow that his back is greyish-brown, but as it nears the tail it becomes greenish-yellow, and the long tail itself is not grey, but nearly black, in colour, with the two outer feathers bright white. It is in fact very like the yellow wagtail; and its eggs are the same colour; but the black gorget brings it rather into relation to the pied wagtail, which has the same addition to its dress in spring. Yet from both birds it is quite distinct, in habits as well as appearance, and seems to stand quite by itself in the little world of wagtails.

In this island it is always resident ; but here, and apparently in all countries where it dwells, it desires a change in spring and autumn. In the lower and flatter lands it is only seen in autumn and winter ; in Oxford it never fails to come in September (or sometimes earlier), and as regularly leaves us in January. I have taken some pains to ascertain whether it is ever seen in Oxfordshire after that month ; but all that I can hear of it is that once or twice a pair have been known to breed in some place, such as under the stone work of a lock, where there has been the constant rush of water which they love.* In January they are off, almost to a bird, to Wales and Cumberland and Scotland, where the streams break and tumble instead of oozing gently through moist meadows ; and there they stay till the young broods are grown. So long as these young broods are unable to shift entirely for themselves, they remain together under the eyes of the parents, and will play together like wagtails of other kinds. On the 26th of last month, I was strolling on a mountain-path in the Bernese Oberland, when I came suddenly into a little glen, through which a stream rushed, at the foot of a wall of rock some 50 feet high. Dancing about stream and rock, almost like swallows, and occasionally resting on the rock's face, or on the young pines which grew about it, was a family of these graceful birds. So restless were they, so quick and nimble in every action, that the eye could hardly follow them, and it was with the greatest difficulty that I could get my glass fixed upon one of them. The same agility is shown when these young families come down in September from the mountains, which are then getting too cool for them, and congregate by the banks of some large river in the valley. I have seen them in great numbers, just after their arrival, very busy in catching flies over the water of a rushing glacier-stream, and mixing with their cousins the white wagtails ; the air seemed to be full of dancing birds, and the banks alive with gently-moving tails. As they hung in air over the stream, the tail was often spread out wide, like that of a hovering kestrel, whilst the rapidly-moving wings danced them up and down.

But as a rule, when grown older, the grey wagtails are somewhat quiet and deliberate in their ways, though always full of grace ; they are, indeed, if I may be allowed to use the expression of both sexes, extremely lady-like birds. And there is a certain look in them of great content—or even of self-satisfaction—as they trip along, unaware that they are observed, by the water's edge ; with no lack of food, with the pleasant noise of the water ever in their ears, and with those long tails of theirs ever going up and down, as if in rhythm with the water.

And now for a word about this tail-wagging, about which you have heard so much in this half-hour, and which in many counties has given them the name of " Dishwasher." It is the one great characteristic of the birds, and deserves a passing comment in conclusion. What does this continual motion of the tail mean ? This may seem at first an unnecessary, if not an absurd, question. But we know what is meant when a dog wags, or a cat waves its tail ; and the only difference would seem to be that in the case of cats and dogs the motion is occasional, while with the wagtails it is habitual. I have never seen a satisfactory explanation of it,

*In June, 1891, Mr. O. V. Aplin and I found a nest in the wall of a mill-dam near Banbury. (W.W.F.)

though Mr. Dixon, in his delightful "Rural Bird-life," tells us that it is to help the bird in keeping his balance; and this, no doubt, is partly true, but not of wagtails only. All I shall venture to do shall be to make two suggestions which may perhaps bring us somewhere near a conclusion.

First, I would point out that the three species I have been talking of are not all equally persistent waggors (I must use this for want of a better term). The tail of the grey wagtail is, I think, never for a moment still, and it is not moved quickly, but steadily and gently, up and down; that of the pied wagtail is not quite so regular in its motion; it is still for a few moments, and then rather rapidly vibrated; and the yellow wagtail may often be seen to keep his tail quite steady, as he stands upright, or runs among the osier beds. I have constantly been observing these tails this year, and this is the result I have arrived at. Now the yellow wagtail is the least water-loving of the three, the pied wagtail is equally addicted to the streams and the fields, while the grey wagtail is hardly ever seen away from the water-side. Can it be, then, that the motion of the water has some mysterious influence on the motion of the tail?

Secondly, I believe that the nervous system of a bird is more highly developed and more delicate than that of any other animal, if we may judge by their constant restlessness, and the extreme vigilance and rapidity of their sight and their motions; and this, in small birds especially, is apt to show itself in the tail, which is flickered horizontally, as in the redstart, or jerked upwards, as in the wren and moorhen, or moved more gently, as by our wagtails; for the tail is of course directly connected with the spinal cord and the brain, and is an index or reflector of what is going on, unconsciously perhaps, within that brain. The motion of the tail may in fact be looked on, I think, as a sort of nervous trick, which the bird has developed in the course of ages, different species modifying it according to their habits and surroundings.

Putting these two suggestions together, I think we may arrive at a tentative conclusion. The peculiar tail motion of the wagtails is a nervous habit, induced by the flow of water: not, I think, simply to keep the tails from getting wet, which I do not suppose they mind, or to balance themselves on stones and pebbles, as they make little forward darts to seize a fly or beetle; but because the constant and cheering flow and murmur produces in them a feeling of even and gentle contentment, which not only their tails, but all their actions, indicate.

With this guess—for it is no more than a guess, and may well be too flimsy and fanciful—I must bid farewell to the fairyland of the wagtails, and thank you for letting me have the pleasure of acting as your guide there to-day.

The Rev. M. G. Watkins, in thanking Mr. Fowler for his very interesting paper on some varieties of the British Wagtails, remarked:—"Some of the pied and some of the grey wagtails remain in South Herefordshire throughout the year. Doubtless many more of both species migrate, the former to the Continent, the latter to other districts, but specimens of both can be found in every month of the year. This is only natural in the case of the grey wagtail, when it is borne in mind how full the country is of rushing streams and haunts which most please the

bird, such as the rivers Monnow and Dore, and their tributary brooks. In South Devon the grey wagtail quits the streams of the lower country, in order to breed among the hills of Dartmoor. This last year its nest was found by a brook-side at Kentchurch. No prettier sight can be witnessed at the side of a trout stream than the old grey wagtail, flitting up and down with her young brood. The second batch of young appears to remain with the mother-bird throughout the winter. The type of wagtail which is most similar to it (and which indeed only differs from it by possessing a slightly shorter tail), found in Siberia, Cashmere, and Northern India, is the *M. Melanope*. The yellow (or Ray's wagtail), I have not yet seen in South Herefordshire.*

As regards the Entomology of the day, owing to the absence of sunlight, very few insects were observed on the wing. Dr. Chapman captured a few larvæ, among them a specimen of that very rare *Dicranura bicuspis*, of which Mr. Hutchinson has once taken a specimen, and also the perfect insect. These are the only two instances as yet recorded of its capture in this county. *Notodonta dromedarius*, *Ennomos tiliaria*, &c., were also taken.

BOTANICAL NOTES BY MR. F. BAINBRIDGE.

The plants noticed *en route* were not numerous, the dry season no doubt having stunted the growth of some, and altogether scorched others, and, moreover, it is possible that the superior attractions of our fair friends on this occasion (the Ladies' day) may have diverted the attention of the otherwise Lynx-eyed botanists from their special and favourite pursuit. However, the day was not altogether barren of results, for, in the first place whilst *en route*, all eyes were attracted towards a meadow near Tram Inn by the enchanting pinkish-lilac blossoms of *Ononis arvensis* anglicè Rest-harrow, the generic name of this plant being derived from the Greek *onos* an ass, because that animal alone feeds on it. The French call it *Arrête bœuf*, from the fact of the long ligneous roots checking the course of the harrow and plough, those implements of husbandry in France—as formerly in England—having been drawn by oxen. Of *Ononis* there are two varieties in this locality, viz. :—*arvensis* and *spinosa*, of which the latter is more upright in growth. Here truly distance lends enchantment to the view, for, beware of the disagreeable glandular exudation from the roots of this plant, of which Lees, quoting from Gardiner's Flora of Forfarshire, remarks in "The Botanical Looker Out" :—"The flowers are so handsome that you are tempted to cull them for your nosegay; but when their nauseous odour comes in contact with the olfactory nerves, you discard them with a sigh, regretting that so much beauty should be coupled with so noxious a quality. But this, too, reads a lesson." True enough, the furrow-weeds of life had better be past without handling. Of Rest-harrow Gerarde says—"It is sooner found than desired by husbandmen,

*I have since seen the yellow wagtail in the extreme south of Herefordshire and in the north of Monmouthshire. In both cases the birds were in small parties of four or five in the early spring.—(M.G.W., 1892.)

because the tough and woodie roots are cumbersome unto them, by reason they do staie the plough and make the oxen stande." The next plants of general interest noticed were two species of *Hypericum*, the pretty litle prostrate *humifusum* and the *perforatum*,

"Hypericon was there, the herb of war
Pierced through with wounds, and seam'd with many a scar."

this genus from the colour of the flowers being universally brilliant yellow, and from the raylike spread of its numerous stamens, has been named from Hyperion, often used by the poets as a name for the sun itself. We had a fine over-look from Garway Hill, bounded in the distance by the great backbone of the Black Mountains dividing our county from that of Brecon, while in the valley below us the river Monnow took its tortuous and silvery way to debouch into the Wye a little below the county town of Monmouth. The pleasant breeze and delightful view from the hill having been sufficiently enjoyed by those who had toiled to the summit, the party made their descent, struggling through the dense growth of brackens which clothed the steep slope. This plant, the *Pteris aquilina*, is applied to many purposes, for not only whilst growing does it serve as a covert to deer and other animals, but when dried is largely used as bedding for cattle, also for thatching, and it is esteemed in the Highlands as a specific for rickets in children; moreover, when burnt, the ashes are used in the manufacture of soap and of glass. It enhances the interest of the plant to the non-botanical rambler to be shown a cross or oblique section of the stem which thus exhibits a good representation of an oak tree in full leaf. Some fine specimens of veritable oaks and yews were noticed in passing through Kentchurch park—two, one of each, being remarkable for their size. The oak measured 32ft. 5in. at 5ft. from the ground: the yew tree 30ft., and a great Scotch fir behind it 11ft. 7in., also at 5ft. from the ground. A herd of deer at a short distance lent life to the tranquil scene. Here was observed the largest leaved native plant we have in this country—the great *Burdock*, *Arctium lappa*—the derivation is from *Arth* (Celtic) a bear, on account of the rough bristly fruit, and *lappa* a hand, the idea being that it lays hold of everything touching it. The burrs of this plant so worry sheep by entangling their woolly coats, and cling to our clothes with such tenacity as to remind us of the dialogue:—

"Rosalind—Oh, how full of briars is this work-a-day world!

Celia—They are but burs, cousin, thrown upon thee in holiday foolery; if we walk not in the trodden path, our very petticoats will catch them.

Rosalind—I could shake them off my coat; these burs they are in my heart."

—As You Like It, 1, 3.

The next plant noticed was the somewhat uncommon *Verbena officinalis*, Vervain (herba sacra), a plant held sacred among the ancients, and used by ambassadors in making leagues, in sacrificial rites, incantations, &c., and by the moderns as an amulet hung around the neck, as "une Herbe à tous maux." This plant occurred near Mr. Trumper's house "The Lawns," growing on a rough stony bank.

Virgil, Ecl. viii., v. 65. "Verbenasque adole pingues et mascula tura."
Also Terence, in Andria. "Ex ara hac sume Verbenas tibi."

Even Mr. Morley has failed to restore the Vervain to its former reputation for healing scrofulous, and thirty other, complaints, notwithstanding his directions in his "Essay on Schropula" that the roots should be tied "with a yard of white sattin ribband" round the neck of a patient until he recovers. As it were resenting its position as an outcast, the plant clings to the neighbourhood of human habitations, inviting the attention of the village herbalist. In and about an old quarry of Old Red Sandstone, interspersed with an unctuons marl, grew the *Verbascum thapsus*, Mullein, or Shepherd's Club. The word is apparently altered from *Barbascum*, from *Barba*, a beard, in allusion to the downy substance with which the whole plant is coated, this nap having been used as tinder in the old flint and steel days, and also to make wick for lamps. One specimen brought to me for notice was not yet in flower, but proved to be *Inula Helenium*, Elecampane, which has lost its traditional virtue, save in the estimation of some cattle doctors, and some unprincipled dealers in drugs. Amongst numerous other plants, all of which have their little history, we observed, growing in a wood, that ornamental and useful Willow herb, *Epilobium angustifolium*, known by rustics as the "ranting willow," and in moist places grew the *Epilobium hirsutum*; then there was the *Alisma plantago*, and *Sparganium ramosum*, the roots of which yield a fæcula used as Salep, the *Euphorbia amygdaloides*, one of a curious and acrimonious class, as a balance to which was near at hand, the *Euphrasia*, or Eye-bright, plant of cheerfulness, which clears the visual ray; the *Melampyrum pratense*, *Prunella*, or Self-heal, *Bartsia odontites*, *Rhinanthus crista galli*, Penny-grass or Yellow-rattle, the sweet *Origanum*, Joy of the mountain, and its perfumed congener, the Bee-beloved Wild Thyme, so dear to the lovers of song. *Luzula sylvatica* was observed, and in passing through a wooded slope we couldn't help noticing the profusion of the pretty *Melica uniflora* or Honey-grass, which clothed the bank, and on an adjacent old wall was the delicate *Linaria cymbalaria*, whilst below, on the river's bank, was a profusion of *Lythrum salicaria*, with its fine spike of rich purple flowers; side by side grew the *Eupatorium cannabinum*, formerly used in medicine, possessing emetic and other qualities. Add to these plants the *Bryony*, *Betony*, *Agrimony*, *Petasites*, *Matricaria*, *Tormentilla*, *Tansy*, *Matva moschata*, *Geranium pratense*, *Achillæa* or Milfoil, all of which I observed during our present ramble, and most of which, although named in the pharmacopœias of the last century, are now only used with few exceptions by some wise old doctress, who practises on those full of faith in her powers, and somewhat less knowing than herself. Before closing this brief account, we must not omit to record such specimens of those favourites of the ladies—the Ferns—as we met with. We observed the *Polypodium*, or many-feet, the *Aspidium filix mas*, and *femina*, *Aspidium lobatum*, *Asplenium adiantum nigrum*, *Asplenium ruta muraria* and *alternifolium*, *Pteris aquilina*, and *Scelopendrium vulgare*. Upon arriving near Grosmont, the place of our refreshment, we noted appropriately on an old wall the biting stone-crop *Sedum acre* (*sedco*, *I sit*), and, in a less exposed situation, the *Sedum telephium*. These plants, growing as they mostly do on dry rocks or exposed places, seem designed to survive extreme drought owing to their succulent foliage, and to follow lichens and mosses in fulfilling nature's law of silently clothing the earth. May we not exclaim with Job—"Lo! these are parts of His ways, but how little a portion is heard of Him."

ADDRESS

[By the Rev. WILLIAM ELLIOT, President.]

IN attempting to interest you in the geology of the district through which our excursion of to-day has led us I should premise that I am not speaking of any knowledge of that particular district which I myself have gained at first hand. Such acquaintance (the truest and only complete acquaintance) with the great system of rocks over a portion of which we have passed as can be made by labour in the field and with the hammer I have had little opportunity of cultivating, and that not in this county. My remarks are gathered, therefore, from various writers learned in the subject, and, with respect to them, if the poetic comparison be not too ridiculously daring, considering the character of my composition, I might say, as I think it is Montaigne who somewhere says, that I have culled a nosegay of flowers, and only the string that binds them is my own.

You are, of course, generally aware that the rocks immediately beneath our feet at this moment, are a portion of that well marked formation which is known as the Old Red Sandstone, in contradistinction to those of a more recent origin which are called the New Red Sandstone. Its maximum thickness is estimated at about 10,000 feet. It is composed for the most part of red, grey, and sometimes yellow sandstone, with beds (as we reach the upper limits of the system, or in other words those last deposited,) of conglomerated pebbles, in many instances of large size, while here and there, as I shall have occasion to notice more particularly just now, there occur bands of impure earthy concretions of limestone, which are technically called Cornstones. The varying colours of the deposited sands, from the bright red, that gives its name to the formation, to the sort of cream coloured yellow to be seen in the neighbourhood of the Clee hills, are due to peroxide of iron with which the waters that deposited them must have been heavily charged.

In point of geologic order the Old Red Sandstone occupies a middle position between the ancient rocks of the Silurian system and the Carboniferous, or coal bearing, deposits. We observe the beds of the former passing beneath these sandstones, while they in turn are overlaid by the limestones and coal measures of the latter. And, occupying this position, they mark a very distinct epoch in the history of life upon the globe. Different species of shells, even if of the same genera to those found in the Silurian rocks, appear. Some of the most marked inhabitants of the older seas, the trilobites, become exceedingly scarce, and their place is taken by multitudes of fishes, of which only a few are to be found in the uppermost beds of the Silurian. Some of these fishes have their representatives in existing waters, and the familiar lobster is a sort of far off cousin of the large crustaceans who have left their remains embedded in these stones. To give you an idea of the number and variety of these denizens of the Old Red deeps, I may say that of one group of fishes alone,—the Placogonoids as they are called—no less than 113 or 114 species have been found in rocks of this and the contemporaneous Devonian age. On the other hand, although in the lowest or first

deposited beds of the series traces of vegetable life are to be found, and although, of course, it is impossible to say with certainty what forms of such life existed on the lands round whose shores played the waves of the Old Red seas, yet there is no evidence of any such luxuriance of magnificent flora as in a subsequent period produced by its decay our present beds of Coal.

If you will look at this map you will see that the formation extends from Bridgnorth on the north, down to Cardiff on the south, and into Pembrokeshire on the S.W.; from the Malverns on the east, to the hills of Brecon and Caermarthenshire on the west. It is developed in Scotland, Russia, and Belgium; and in North and South Devon, and Cornwall, rocks of a similar age, as appears from their fossil contents, constitute what is called, for the sake of distinction, the Devonian group. With neither of these localities, however, have I at present any concern, confining myself to the plan I here shew you. On the western side of the area, coloured here dark red, you will notice several detached portions, which are called "outliers" in geologic phrase, and whose existence I will ask you to bear in mind. The most northerly of these occurs not far from Shrewsbury, on the Long Mountain. There is another on Clun Forest, and another to the west nearer Newtown, and there are others near Knighton, near Presteign, and again near the Stanner Rocks and Old Radnor. Further, you will observe that the dark red flows, as it were, round a small patch of dark green, near Ludlow, round a larger near Monmouth, and skirts a larger still in Glamorganshire. These represent the Carboniferous, or coal bearing, rocks on the Clee Hill, the coalfield of the Forest of Dean, and the important coalfield of South Wales, respectively: so that you may consider of the lavender coloured portion, which denotes rocks of Silurian age, as being laid down first; of the dark red, or Old Red Sandstone, as being laid down over them; and of the green, or Carboniferous system, as being laid down over the Old Red.

Let us try to picture to ourselves this process of deposition of which I have spoken, for, of course, you will be prepared to understand that these great masses of what was originally loose sand, or loose gravels, were brought into their present positions by the agency of water. Imagine, therefore, a large expanse of shallow water. The earliest beds, as they are to be seen near Ludlow, Ledbury, and Kington, give evidence of this shallowness. Whether that water was salt or fresh is still a debated question. I will not trouble you with the scientific pros and cons for either view; it will be enough to state that the most recent authority holds that, at all events in the early day of the series, when the lowest beds were laid down, the deposition took place either in a very broad estuary of some river, or where at least the water of the sea had access to it. Then, by the gradual sinking of the ground (such as is ever going on on the surface of the earth somewhere), the depth of this inland sea or lake increases. The waters of the rivers that feed it bring down the detritus, the spoil, of existing rocks of what was the dry ground. Naturally this is laid down on the bottom in this kind of order: the heavier gravel and shingle nearer the shore, the sand, next in weight, farther out, the lighter particles of mud floating in the streams farther out still. So you have accounted for, the conglomerates, or pudding-stones, formed of the gravel; the

sandstone, of the sand; the marls, of the mud; and by the changing sets of currents, or perhaps of tides, or possibly of alternate rising and subsiding of the surface of the bottom, these different beds are laid down every now and again, and so appear and re-appear as exposed to us to-day.

Meanwhile from time to time the feeding streams become charged with lime, from the wearing away of some of the ancient limestones which they have been washing in their course; and then are laid down those concretionary strata which I told you are called Cornstones. All the while, in the deepening lake, the incumbent weight of water is solidifying the deposits, and hardening them into stone. But there comes a time when, having reached its lowest temporary point, the surface of the ground begins to be again elevated, and this elevation goes on until when we come to the uppermost beds of the Old Red, as you may see them on the sides of the Clee Hills, the Seyrriid, the Bloreng, and Pen Cerrig Calch, on the Usk, the conglomerates, composed of rough sand and pebbles, sometimes of large size, or quartz and porphyry, bespeak a gradual shallowing of the water up to a time when the hungry waves tore such fragments from their parent rocks, or seized them as they fell, rolled them into pebbles, and scattered them upon the lake's floor.

So we have come to an end of the formation process of the Old Red, but I would ask you to go a little further with me still. The Passage Beds from the Old Red to the Carboniferous system tell us of shallow waters, as did those from the Silurian upwards. Another subsidence of the earth's surface takes place, this time under changed conditions; so that what space was occupied up to now by an inland lake is now covered by wide open sea. This time too the deepening of the waters goes on to such an extent as to allow eventually of the formation of a great rock surface of what is called the Mountain Limestone. Such limestone is not, so far as is known, composed save at the bottom of deep seas. Once again, in process of time, elevation takes place. The sea becomes shallower and shallower, so shallow at last that the dry land appears in great measure in its place; and then begins that condition of things, of climate, of disposition of land and water, and so on, which allows of the growth of giant ferns, reeds, club-mosses, and other kindred plants. These have left in their decay their abiding record in our Coal beds: the dark-green—to refer to the map—has overspread the red. One more remark as to this period of formation. You will recollect, please, that what I have been speaking of has taken an incalculable period of time to work itself out. During that time the subterraneous forces of the earth have not been idle, molten streams of volcanic origin have burst through the crust, and, as at the Titterstone Clee Hill, have obtruded a great shaft of basalt, or, as at Bartestree, near Hereford, have upheaved a mass of greenstone, or, as at Malvern, of granitic rock; earthquakes have been at work, pushing upwards lower beds, as in the famous valley of Woolhope; the crust of the earth has cracked and folded itself, either from this earthquake expansion or from contraction and shrinkage from within; and the beds, which were of course originally laid down horizontal, have been slanted, upraised, thrown down, so that, for instance, the beds of Upper Old Red at Symond's Yat, which, geologically speaking, are thousands of feet above those

on which we stood at Garway Hill, are, as a matter of measurement by rule and line, now on a much lower plane.

And now to turn to the particular route which we have taken to-day, and its geologic description. The system of the Old Red is divided into three series : the Lower, or Cornstone series, so called from the occurrence throughout it of those beds of limestone which I have spoken of ; the Middle, or Brownstone series ; and the Upper Old Red series. We have been on the first of these during this excursion. You would find it to consist, towards the bottom, of bands of Cornstone interstratified with sandstones, red and grey, and beds of red marl. Above these in order, as at Rowlestone and on the flanks of the Black Mountain near Hay, there are grey building stones, and above these, and at the top of the series, another bed of Cornstone, as pointed out by our former president, Dr. McCullough. In the district we have now passed over you would see, if you examined the exposures on the way, the beds dip, that is to say slant, with great regularity in the same direction, towards the S.E., so that our course lay obliquely along the upturned edges of the rocks, (as you would have seen had they not been hidden by the soil), until we turned our heads east to mount Garway Hill, at Bagwy Llydiart, when we went at right angles to those edges. Open a book so that the edges of leaves slope from the page you are looking at to the cover, and run your finger diagonally from the cover to that page along those edges, and you will see what I mean when I say that we have been ascending the strata from lower to higher ones. On the crest of the hill we had reached the top of the Lower Old Red. I do not mean simply because we were so many feet above the sea ; because Grosmont Hill, and the Graig Hill, to the south of us, are lower in this respect than Garway Hill, but yet they are in the same geologic plane as it is. They are composed, as it is, of the uppermost rocks of the Lower Old Red. You might recognise how this can happen if you were to scoop out a piece from the edges of the leaves of the book I spoke of a moment ago. Your finger would still be travelling upwards in the series of the pages, even if it had to dip down in the depression of the scooped-out part.

If you should want to ascend to still higher strata of the Old Red you must go to the Sugar Loaf, the Scyrrid, the Black Mountain, Pen Cerrig Calch, or the Blorenge. There you would find rocks of the Brownstone, or Middle Old Red, and on the flanks of the Blorenge you would find, overlying these, beds of the conglomerate of the Upper Old Red, which, with yellow sandstones, mark the summit of the system. Such yellow sandstones you would find on the sides of the Clee Hill in Shropshire. Had we had time to hunt for fossils on our way I do not know that we should have found more than the remains of the fishes of the period, portions of the plates which covered them, or the horn-like appendages called spines, with which the shields covering the heads of some of them were furnished. The Old Red in general is not largely fossiliferous ; the uppermost beds are so in a greater degree than the lower, the middle hardly at all. My friend, and the common friend of many of us, Mr. Symonds, to whose learning and intimate acquaintance with the formation I need hardly say that I, or any one who wishes to know anything about the Old Red, must always be excessively

indebted, found, at Rowlestone, in rocks similar to those which we have been traversing, the head of a large crustacean, previously unknown to science, and which has been named *Stylonurus Symondsii*. Another such, named *Praearcturus Gigas*, was found in the same locality by Dr. McCullough, and is figured in our Transactions for 1870. Mr. Symonds speaks of a quarry in Kentchurch Park where fish remains are to be found, and of similar fossils discoverable in the Cornstone of Grosmont Hill.

The study of geology, however, is not comprised in the collection and labelling of fossils alone, nor in the correlating of differently-situated strata, important branches of it though both of these are. It has to account for the present configuration of the land on which we live, and the scenery consequent on that configuration. Some reference to this latter must therefore enter into my description. You are not to conceive, from what you see on the map before you, that the whole of the Old Red formation in the South of England is contained in the red-coloured portion represented there, even if we add the contemporaneous rocks of Devon and Cornwall. Deep borings in the neighbourhood of London have come upon Old Red rocks underlying strata of much more recent formation. At Erith they were reached at the depth of 1,000 feet, in London itself at that of 1,060, and near Cheshunt at that of 980. There is no absolute proof that these strata were extensions of those we see here. On the other hand, there is no particular reason for supposing that they were not, and that the Old Red sea or lake did not cover the whole intermediate region between this and Kent, and perhaps beyond. How comes it that we have this particular portion exposed to our view? How comes it that we have the beautifully undulating scenery with which we are familiar in our county, as well as the richness and fertility of soil that proceed from that exposure? The answer is in two words. From denudation. I have tried to take you with me through the process of formation, and I left you contemplating a series of beds normally horizontal, but broken up and disarranged by volcanic actions and by earth movements which disturbed them. Consider now the succeeding process, the undoing of the previous regularity. The face of the ground has been prepared by the forces of volcano and earthquake for the subsequent action of those agencies which have eventually produced the scenery on which we gaze to-day. Beds have been uplifted, thrown down, crumpled, slanted, now at one angle and in one direction, now otherwise. Then each in their turn, the wash of sea waves, the flowing of great rivers, the rain fall, the grinding of glaciers, and other agents, wear away the surface, and the soil so worn off is carried to form fresh deposits, hereafter to be seen in new systems of rocks. Where the rocks are softer, there naturally the wearing away is more pronounced. Hence the valley. Where it is harder the rock resists the denudation and remains standing up as a hill. All the eminences we have passed to-day, the hills of Dinedor, Callow, Aconbury, Saddlebow, Garway, Grosmont—all those which give such a charm to the landscape farther north, Credenhill, Foxley, Lady Lift, Bredwardine, Dinmore, and others, are what they are simply because they are composed of the hard limestone, the Cornstone, which has

enabled them thus to defy the denuding agency that would otherwise have levelled them. I must not stay to enter into detail here; but I may remind you of the probability of frequent risings and subsidences of the sea bottom, of rain-falls possibly more severe and continuous than any which we are now accustomed to, and of rivers more vast and irresistible than even the mighty Mississippi. And to give you only one instance of what water can do in this way, it has been calculated that 200 tons of solid matter is annually removed from every square mile of the Cotteswold country by clear water, the chemical properties of the water holding this matter in solution; to say nothing of what is carried away in suspension when the water is turbid and muddy. But this thought of what has been achieved by denudation and by erosion (that is by washing off and by scraping out), in the way of bringing the surface to the contour which we at present view, leads to another very surprising one with which I will conclude. More than once have I been privileged to hear Mr. Symonds in the field—and who that ever heard him can forget the lucidity and yet the depth of his descriptions of the wonders that he knew—more than once have I heard him dilate on the marvellous picture presented to the imagination of what must have been the condition of things even here where we now are at the close of the Carboniferous period and before denudation had set in. “It is impossible to doubt,” he writes in one of his works, “that the mass of carboniferous deposits once existed far above the present site of Herefordshire and much of Shropshire.” For reasons with which I need not trouble you now it is as clear as anything to be learnt from deduction can be that the South Wales coal field, the coal basin of Mitcheldean, and the small outlying detached portions of Carboniferous rocks to be seen on the summits of Pen Cerrig Calch, of Blorenge, and of the Clee Hill, were at one time parts of one continuous sheet. These have been preserved from denudation and remain: the rest has been worn away. Think what that implies. The thickness of the lower Old Red (to the uppermost beds of which we have reached to-day), has been put at its greatest as 2,500 feet, take that from the maximum thickness of the Old Red system 10,000 feet, and you get 7,500. Add to this the thickness of the carboniferous system, estimated in the South Wales field to be upwards of 12,000 feet, and, whether those figures are uniform over the area or not, you have at all events an immense mass which at one period of the world’s history filled to a great height the aerial space above us, and which has been swept bit by bit away, leaving only in the spots indicated traces that it ever was. You have the whole Carboniferous system taken away save from those isolated points. Besides that you have the whole of the upper Old Red and the whole of the middle Brownstones taken away from above the Cornstone hills and valleys of Herefordshire from here as far as Leominster or Ludlow. And besides that, still further, you have not only the Carboniferous and the upper and middle Old Red, but you have the Cornstone, lower Old Red, series taken away too from that part of Shropshire and Radnorshire which lies west of Corvedale up to where the scanty remnants of the latter show themselves in those outliers of the Long Mountain, Clun, Knighton, Presteign, and Old Radnor, which I asked you to carry in your minds at the opening of my address. Such a process, of course,

demands as of necessity the grant of an enormous length of time. It was thought once that we could place no limit to such time. Sir W. Thomson, however, has calculated that the sun has not illuminated the earth probably for more than 100 millions of years, and certainly not for 500 millions of years. This, at all events, gives us some kind of limit, though at the best we can but speak of the lapse of ages as inconceivably great. And why not? I confess that to my mind there is something as grand as it is fascinating in the thought of the Great Artificer of the Universe, in whose "sight a thousand years are but as yesterday when it is past," with what we men should call unexhausted patience "working hitherto." What more grand, or awful, than to follow, so far as our feeble apprehension lets us, the gradual completion of His purposes; to trace, for example, how the apparent waste of an exuberant vegetation results in one of the chiefest blessings conferred upon mankind? And even where one is brought face to face, as how often is it not so, with mysteries of creation that science has so far failed to solve, and that may remain for ever in this life insoluble, even these, to me at all events, do but confirm my admiration of His infinite wisdom and my assurance of His exquisite design, and, I would humbly add, deepen my reverent devotion. "O Lord how manifold are Thy works; in wisdom hast Thou made them all: the earth is full of Thy riches. So is the great and wide sea also."

I cannot end without expressing my thanks to Mr. Clarke for the kind trouble which he has taken in preparing the map that I have put before you.

[It is not thought necessary to reproduce here the map spoken of in the above paper. A reference to any coloured Geological Map of the West of England will sufficiently illustrate the writer's remarks.]

THE DROUGHT OF 1887.

The following letter from our member, Mr. H. Southall, F.R. Met. S., dated The Graig, Ross, August 9th, 1887, affords us a comparative estimate of the great drought of this year:—

The period through which we are now passing has no parallel for heat and drought since the year 1868. In that year it lasted 68 days, or from May 29th to August 4th inclusive—this year from June 4th up to the present time, August 10th, or so far for 68 days.

1868.—Rainfall 0·74 on 5 days.

1887.— „ 1·71 on 11 „

The total amount is greater, as will be seen, in 1887; but this is caused by the heavy thunderstorm of the 15th July, which, with one or two accompanying showers, produced 1·16th inch. This was, however, very partial even in this neighbourhood, and did not reach far in any direction.

At Oxford, for instance, I find that the total rainfall since June 3rd has only been ·69.

It must be remembered that, in addition to the summer drought, we had a severe one in the spring as well, and it may be said to have continued, with some intervals, since January 20th, or for 29 weeks.

The rainfall at the Graig has been as under:—

	Days.	Inch.	Average.		
January 20th to March 10th ...	50	·61	4·10	deficiency	3·49
March 11th to April 21st ...	42	1·60	2·52	„	·92
April 22nd to June 3rd ...	43	4·40	2·86	increase	1·54
June 4th to July 13th ...	40	·18	3·35	deficiency	3·17
July 14th to August 9th ...	27	1·53	2·30	„	·77
	202	8·32	15·13	Total deficiency	6·81

Thus for the first three months we had only about one-third of the usual fall. May was somewhat in excess, but the total is scarcely more than half the average amount.

Rain at Ross—

January 1st to August 9th, 1887,	10·84
„ „	1886, 23·49
„ „	1885, 16·66
„ „	1884, 18·19
„ „	1883, 20·30
„ „	1882, 19·81
„ „	1881, 14·31
„ „	1880, 19·80
„ „	1879, 22·36
The wettest year since 1859 was	1872—26·50 inch.
„ driest „	1870—9·21 „
„ „ „	1864—10·02 „

And the following letter in *The Times* of August 18th from Mr. G. J. Symons, F.R.S., is deserving of being recorded in the *Transactions*. It is dated from Mr. Prince's Observatory, Crowborough, Sussex, August 17th, 1887:—

A sharp thunderstorm between five and seven this morning, producing 1·12in. of rain, having finished the second absolute drought of this summer, it will probably be of general interest to know to what extent the drought of this year has been exceptional.

Mr. Prince's record at this observatory goes back to 1871; but long before that he was observing at Uckfield, and as the record has been continued in that town up to the present time, the Uckfield record will form the basis of this note. It is one of the best in the country, being absolutely continuous from 1842 to the present time, subject only to the gauge having been moved 300 yards when Mr. Prince left Uckfield to reside here.

There has long been a want of a clear and unmistakable definition of a drought, but as those which I suggested a few years since seem to be generally accepted, I shall adhere to them—at any rate until something better is proposed. These definitions are:—Absolute drought—a period of 14 or more days with no measurable rainfall. Partial drought—a period of 28 or more days with not more than 0·25in. of rain.

At Uckfield there have been this year two absolute droughts, the first from June 4th to July 3rd (both inclusive), or 30 days, the second July 30th to August 15th, or 17 days.

A 17 days' absolute drought is not unusual; during the 45 years embraced by the Uckfield record there have been 46 such droughts; but 30-day absolute droughts are very rare. The following are the only previous instances:—

Year.	Began.	Ended.	Duration.
1842	June 30	August 9	41
1844	Nov. 18	Dec. 18	30
1846	May 21	June 22	32
1887	June 4	July 3	30

The partial drought this year has also been exceptional, as the following figures will show, they being all the partial droughts equal to or exceeding 1887:—

Year.	Began.	Ended.	Duration.	Fall during period. In.
1842	June 30	August 9	41	0·00
1844	April 13	May 28	45	0·15
1844	Nov. 15	Dec. 27	43	0·06
1847	June 24	August 4	42	0·25
1852	Feb. 10	March 28	48	0·16
1854	Feb. 16	April 21	35	0·25
1864	July 4	August 19	47	0·24
1865	August 24	Oct. 7	45	0·03
1869	June 16th	July 31	47	0·20
1887	June 4	July 15	42	0·25

It is, therefore 18 years since the above partial drought was equalled, and it is more than 40 years since the June absolute drought of 30 days in this part of Sussex was equalled.

The above letter induced Mr. R. Sheward, F.R.M.S., writing from Howard Square, Eastbourne, on August 24th, 1887, to give his distinction between a drought and a great drought as follows:—

In a recent letter in your *Hereford Times* from an eminent meteorologist, Mr. Symons, a gentleman who has indeed done good work in determining the British rainfall, he gave his opinion of a drought as a period when for 14 days no measurable quantity of rain has fallen. This was considered an absolute drought; but a drought was also further defined as a period when for 28 days only a quarter of an inch of rain had fallen. Being of opinion that neither of the above periods is acceptable as a satisfactory definition of a period of drought, but that there is a danger of their becoming an accepted standard as emanating from a most accomplished and distinguished meteorologist, it appears a question wherein other minds may have a word before any accepted definition of a drought is determined. To my mind a period of 14 days without rain in no wise can confer the term of absolute drought. This comparatively short rainless period may intervene between two wet periods, and hence its effect may be as naught over a district. While farmers and others may be astonished to hear of the period being spoken of as drought; while, upon the other hand, it is possible for us to have not only a 14 days, but a 40 days, of real drought, wherein there has never appeared a consecutive 14 days without rain, I am of opinion that both periods are far too short for the determining of a period of drought. I do not consider ten weeks any too long a period for the clearly defining a period of drought; and even then it would require adjective definition, as slight drought, drought, severe drought, and, finally, the great drought. The latter appears to apply at places to the drought of this summer during the ten weeks ending upon the 15th inst. The general characteristics of the great drought of this year are presentable in the following table, drawn up from the weekly reports of the Meteorological Office:—

THE GREAT DROUGHT.

	Rainfall. Inches.		Deficient Inches.
Aberdeen	3·42	Manchester... ..	6·35
Dublin	3·08	Cambridge	5·33
Isle of Man	2·41	Oxford	4·69
Pembroke	1·94	Yarmouth	4·60
Yarmouth	1·93	Liverpool	4·40
Llandudno	1·85	Scarborough	4·39
Cambridge	1·74	Isle of Man... ..	4·35
Jersey	1·73	Hereford	4·39
Scarborough	1·65	Jersey	3·98
Liverpool	1·60	Hastings	3·91
Manchester	1·58	Eastbourne... ..	3·77
Plymouth	1·41	Dublin	3·77
London	1·28	Llandudno	3·69
Hurst Castle	1·07	Hurst Castle	3·43
Southampton	0·99	Southampton	3·30
Hereford	0·98	London	3·24
Oxford	0·94	Plymouth	3·08
Hastings	0·46	Pembroke	3·01
Eastbourne	0·41	Aberdeen	1·81

The above table places the drought before the eye for over a period of ten weeks. It should be observed that the places range themselves very differently in the two tables. This is due to the great difference in the average. Thus we see that Manchester, where the drought is and has been serious, has received much more rain than either Hastings or Eastbourne, where the drought was most severe, but the deficiency at Manchester heads the list. We see in this strange presentment that while Manchester received four times the rainfall of Eastbourne, yet the deficiency at Manchester is double that of the latter place, this being due to the heavy average at Manchester for the period, and the light average at Eastbourne. I would therefore suggest that a period of ten weeks should be taken in order to determine a drought, and if in this period between three and four inches of rain fell it be called a light drought, if only between two and three inches fell to constitute a drought, but if between one and two inches a severe drought, and the words "the great drought" to apply only when the rainfall falls below one inch in ten weeks.

Woolhope Naturalists' Field Club.

AUGUST 25TH, 1887.

THE fourth Field Meeting this year was held at Craven Arms, on Thursday, August 25th. The party travelled by train from Barr's Court, and, upon mustering at Craven Arms Railway Station, was found to be constituted of the following members:—Rev. William Elliot, President; Mr. G. H. Piper, F.G.S., Vice-President; Rev. J. D. La Touche, President of Caradoc Field Club, accompanied by one of his sons; Sir Herbert Croft, Bart.; Revs. J. Barker, F. T. Havergal, W. H. Lambert, H. B. D. Marshall, F. S. Stooke-Vaughan, and F. H. Tatham; Messrs. R. Clarke, P. C. Cleasby, C. Fortey, J. Lambe, H. Southall, J. B. Pilley (Assistant Secretary), and H. C. Moore (Honorary Secretary), with additional visitors, as follows:—Rev. F. M. Higgins, and Rev. G. Powell, Rector of Munslow; Messrs. Samuel Carrington, Hugh Croft, A. C. Edwards, Alfred Harker, R. Ingham, and J. O'Leary. The business of the day included the proposal of Mr. Robert Ingham, of How Caple Rectory, as a member of the Club; and the resolution that a copy of the recent publication of the *Transactions* of the Woolhope Club for the years 1877, 1878, 1879, 1880, should be forwarded to the Bodleian Library, Oxford.—The Rev. William Elliot, President, placed before the members his views upon the subject of re-publishing the earlier numbers of these valuable and interesting *Transactions*, from the establishment of the Club in 1851 to the year 1865 inclusive, which appeared practicable, if 150 names would be forthcoming as subscribing members to the small amount of five shillings only for a single volume.

The party, on alighting at the Craven Arms Railway Station, proceeded at once to the business of the day. Taking the road which leads into Corve Dale, a halt was made near the bridge which spans the River Onny, while the President of the Caradoc Field Club, the Rev. J. D. La Touche, gave a short description of the geology of the surrounding district, and mentioned the chief points of interest which might be observed during the walk they had entered upon. His observations may be condensed in the following extract from page 24 of his "Handbook to the Geology of Shropshire":—

"One of the most instructive sections which the Geologist can explore may be examined by leaving Craven Arms by the Corvedale Road. Within about half-a-mile, near Halford Vicarage, he passes over an outcrop of Wenlock Limestone. Further on are large quarries of Aymestry Limestone, well displaying its thickness and characteristics. Turning to the right from the high road at Grinnel's Cross, the Aymestry may again be noticed in a quarry on the right-hand side. From this, the road leads to Norton farmhouse; opposite to

which, on the right, and up the lanes leading to Norton Camp, at the summit of the hill, are good exposures of Upper Ludlow, where some fine specimens of *Homalonotus Knightii and several other fossils have been collected.

“In a lane, behind a cottage to the south of the farmhouse, and but a few yards off the road, is to be found the finest exposure known of the Ludlow bone bed. It is here in some places six inches thick, and forms at one spot the bed of the lane itself. About a yard above it there is a bed of shale abounding in *Platyschisma* and *Modiolopsis lævis*. A few yards further towards the east the Downton Sandstone may be detected overlying the above strata and conformable with them.”

After the conclusion of Mr. La Touche's observations, the party again advanced, and at the distance of about a mile further on, the limestone quarries of Aymestry rock were entered, exhibiting a fine and instructive section of that formation. Although fossils are occasionally met with here in abundance, they appear to be confined to limited spots, and on this occasion the fossil hunters did not hit upon those that were most prolific, but the President, the Rev. W. Elliot, was fortunate in securing a very fine specimen of a *Pterinea* resembling the species *Danbyi*, but very much larger, and it is probably a new one. A move was next made up the hill to the village of Norton, which has become famous to geologists by the existence there of what is called the Ludlow Bone bed—a remarkable collection of the spines and scales of palaeozoic fishes. This deposit is found in other localities—Ludlow, Downton, and Linley near Bridgnorth,—and always at the very summit of the upper Ludlow rock, at its junction with the transition beds between the Silurian and the Old Red or Devonian system. In this spot it attains the thickness of nearly six inches, and consists of a compact mass of black shining fragments, among which, by the aid of a lens, are found pieces of spiny fish defences, similar to those found in the dorsal fins of the perch and other fishes, as well as portions of the skin of the cartilaginous fish *Pteraspis*. Professor Lapworth has given the following very probable explanation of how so enormous a collection of these fragments is found in one spot. He says that the accumulation must have been made under very peculiar circumstances. If we suppose a calm undisturbed sea, where little or no deposition of sediment has taken place for a great period of time, we should have exactly the conditions favourable to a formation like this. The remains—the bony and spiny portions of the fishes—existing in such a sea would, on the death of the creatures to which they belonged, sink to the bottom, and—allowing sufficient time for the operation—would accumulate in vast numbers, forming a stratum such as we here find.

From Norton the party ascended the hill to the fine British Camp which crowns it, an oval comprising 13 acres, with well-preserved ramparts and ditches, and on their way had an excellent opportunity of observing the geological succession of strata as high as the Coal Measures, displayed in the expanse of country stretching eastward and southward to the Clee Hills and Bringewood Chase. On arriving at the summit, the view that meets the eye is very fine. At the foot of the precipitous cliff on the west about 600 feet below, is seen the Castle

* For sketches of *Homalonotus* see *Woolhope Transactions* for 1868—Fossil Sketches, Nos. 5 and 6.

of Stokesay and the Church adjoining ; on the opposite side of the valley the bold escarpment of Weo Edge, and in the distance to the N.W. the long range of the Longmynd and the eruptive mass of Corndon, an example of what some geologists now call a Laccolite, or the intrusion of a quantity of molten basalt into the cavities of sedimentary strata produced in the course of their upheaval.

As regards the Botany of the district : In the neighbouring woods are to be found *Hypericum montanum*, *Geranium lucidum*, *Epipactis latifolia*, *Paris quadrifolia*, *Vicia sylvatica*: the rare Orchis *Cephalanthera ensifolia* has been found in the neighbourhood :—and on the opposite bluff of Stoke Wood is the famous habitat of *Astrantia major*. Permission to range these woods had been kindly given to the botanists by Mr. J. D. Allcroft, of Stokesay Court, Onibury.

The descent from the heights of Norton Camp having been successfully accomplished, the hospitable grounds of Stokesay Vicarage were visited *en route* to Stokesay Castle. This Castle is interesting from the fact of its being an almost unique instance of a domestic building of the thirteenth century, which was afterwards fortified. There is an excellent guide book by the Rev. J. D. La Touche, published by Adnitt and Naunton, of Shrewsbury, from which we learn that in *Domesday* this Castle is called Stokes, and that it was one of the many manors held "in capite" by the Lacys. About 1115 the De Sais, whose ancestor Picot de Sai, from Sez in Normandy, fought at Hastings under William the Conqueror, began to hold it under the De Lacys. In 1240 it came to John de Verdon, husband of a daughter of the last Lacy, and in 1281 it was in the hands of Lawrence de Ludlow, probably a merchant of that town, who built the southern tower in 1290. The Ludlows held this property for ten generations, when it came through an heiress to the Vernons. They sold it to the Mainwarings, who in 1616 parted with it to William Craven, afterwards Lord Craven. He let it on a long lease to the Baldwyns, during whose tenure it was held for the King, but surrendered to the Parliamentary army marching to besiege Ludlow. Sir William Croft was slain in an engagement in the neighbourhood ; he is described by John Vicars in his quaint work, *The Burning Bush not consumed*, as "the best head-piece and activest man in the County."

The Castle escaped destruction, and has been placed in a fitting state of repair since it came into the possession of Mr. J. D. Allcroft, of Stokesay Court, late M.P. for Worcester.

The entrance to the Castle is occupied by a fine example of a timbered Tudor building in an excellent state of preservation. A massive oak door, admits to the courtyard which was formerly surrounded by a loopholed wall, and a moat with an average breadth of twenty-two feet surrounds the whole fortified mansion. The Castle consists of three distinct parts. A tower at the north end, the lower portion of which, loopholed with very narrow loopholes, is probably the earliest portion of the building, but it was subsequently surmounted with a comparatively modern superstructure ; the hall with its solar or drawing-room occupies the intermediate portion of the building ; and on the south is the great tower, which, as appears from a Patent Roll of the nineteenth year of Edward the first, was

built about 1290—1291 by Lawrence de Ludlow. The hall is excellently proportioned with a length of 53 feet, a breadth of 31 feet, and height to the roof-tree of 31 feet. The arches of the massive open timber roof are supported upon brackets springing from stone corbels not more than seven feet from the flooring. Lofty and well proportioned windows, mullioned and transomed, finished with trefoils above are excellent specimens of Early English tracery. A brazier stood upon an octagonal pavement near the southern end, the roof above appearing blackened with smoke, for which there was no chimney.

A description of the building and its historical associations so far as can be ascertained are minutely detailed in the above mentioned guide book by the pen of the Rev. J. D. La Touche.

After the inspection of the Castle, the members having assembled in the hall, the following paper was read:—

SIR WILLIAM CROFT, OF CROFT CASTLE, HEREFORDSHIRE,
KNIGHT; AND THE BATTLE OF STOKESAY.

[By Sir HERBERT CROFT, Bart.]

Sir William Croft, of Croft Castle, was the eldest of the four sons of Sir Herbert Croft, of Croft Castle, Knight—M.P. 1592-1617 for County of Hereford—by Mary, daughter and heiress of Anthony Bourne, of Holt, county Worcester. Sir William's great grandsire, Sir James Croft, of Croft Castle, Knight, was Comptroller of the Household of Queen Elizabeth; also Lord-Deputy of Ireland in 1551-1552, and M.P. for county of Hereford in 1541. Members of the Croft family have represented the county of Hereford for centuries—from the end of thirteenth or beginning of fourteenth—when Hugo de Croft (1314) was in the Parliament at York, down to the year 1874, when the present Baronet retired from Parliamentary life, and declined to offer himself for re-election at that General Election. Sir William Croft's grandsire, Edward Croft, of Croft Castle, Esq., from 1571 to 1586, was M.P. for Leominster, which borough Sir Archer Croft, of Croft Castle, 2nd Baronet, had the honour of serving in Parliament in 1722, and Sir Archer in 1727 was elected for both Beeralston, in Devonshire, and Winchelsea, having been defeated at Leominster. Sir William Croft, however, was M.P. for a Wiltshire borough—Malmesbury—and the date of the return is 27th January, 1625, and his colleague was Sir William Moodye, Knight and Baronet, and Sir William Croft and his colleague were again elected for Malmesbury in 1627. Why Sir William was not—like many of his ancestors and successors—elected M.P. for county of Hereford or for Leominster borough is not clear; but places like Malmesbury, in those days of payment to members, were glad to get a gentleman to serve the borough in Parliament free of cost, which payment in a county amounted to 4s. a day, and in a borough to 2s. a day, which in those days was considered a large sum of money, and the daily stipend was payable during the whole of the Parliamentary Session, and until the return

home of the M.P. Sir William and his three brothers—Colonel Sir James Croft, Herbert Croft (Dean and Bishop of Hereford), and Colonel Robert Croft, of Yarpole—were all conspicuous for their loyalty to Charles I. and no family made greater sacrifices for the King than the house of Croft. Although Sir William had been temporarily banished from Court at the Duke of Buckingham's instance, yet it was only to be expected that the head of this family would be a strong loyalist, judging from what the Crofts had done for the Royal family in earlier times. In the thirteenth century his ancestor, Sir Roger de Croft, met Prince Edward on the top of Dinmore-hill with a re-mount, a white horse, after his escape from Hereford, and took him through Leominster amid great rejoicings to Croft Castle, where he had the honour of entertaining Prince Edward for the night ; and next day he accompanied the Prince to Wigmore Castle, and eventually Sir Roger de Croft, together with the Mortimers, took part in the battle of Evesham and defeat of Simon de Montfort and the Barons. Edward I. was not ungrateful, for, after his accession, he appointed Sir Roger de Croft Sub-Escheator of the county of Hereford in 1274, and a lion was added in the first quarter to the arms of the family, which had been up to that time a simple shield—quarterly per fess indented azure and argent. Again, in the Wars of the Roses another ancestor, Sir Richard Croft, was one of the most celebrated soldiers of his time, and was present on the side of the house of York at the battle of Mortimer's Cross on Candlemas Day, 2nd February, 1461, and also at the battle of Tewkesbury on 4th May, 1471, where Sir Richard took Prince Edward, son of Henry VI., prisoner and brought him before Edward IV.—in pursuance of that king's merciful proclamation—when the young prince was barbarously murdered, notwithstanding the assurance to Sir Richard Croft that his life should be preserved. After the battle of Stoke, 16th June, 1487, and defeat of Lambert Simnel, Sir Richard was made a Knight Banneret by King Henry VII., and he is said to have been created a Knight of the Bath on the Coronation of Elizabeth of York, Queen of Henry VII., which is not unlikely, as the Crofts were staunch adherents of the White Rose. Sir Richard was made by Edward IV. General Receiver of the Earldom of March in counties Hereford and Salop, and was also Treasurer to the household of Henry VII. and to Prince Arthur at Ludlow. To return to the immediate subject of this notice, viz., Sir William Croft. He was born in 1593, and was Gentleman of the Privy Chamber to King Charles I., but, having evinced his dislike to the Duke of Buckingham, he was suspended from his office for three years, and on the murder of that favourite in 1628, Sir William was banished from the Court and dismissed from his post. This treatment did not destroy his attachment to his Royal master (Charles I.), in whose army he held the rank of colonel, and Sir William particularly distinguished himself at the battle of Edgehill. Lloyd describes Sir William as "a man of very great ability," and states that "when King Charles I. saw him put on his armour at Edgehill he admired it first, and afterwards was very glad of it. 'Sir William Croft being (said King Charles) the only man in England he feared—being looked upon as able enough to be Secretary of State always, and as the fittest man at that time, being a man inured to great observation and constant business from his childhood.'"

In the following year, 1643, Sir William Croft was taken prisoner at the siege of Hereford on the 25th of April, but soon recovered his liberty, and he afterwards assembled a party of Royalists in the parish of Eyton, with the intention of recovering Leominster from the Oliverians, but they were defeated by Colonel Birch. A broken halbert bearing the initials of Sir William Croft was not long ago dug up at Eyton, and was presented by the late Mr. Weaver Evans, of Eyton Hall, to his friend Sir Herbert Croft, by whom it is greatly prized.

According to one account Sir William Croft, being deserted by his followers, was slain, gallantly fighting in the King's cause, near Hopton Castle in June, 1645, in his 52nd year. And this is, to a certain extent, confirmed by the original epitaph on Sir William Croft in Croft Church, which was :—

“Here lies the body of Sir William Croft,

Knight, eldest son of Sir Herbert Croft,

He was an eminent example of virtue in his life and of valour in his death,

Which he received in the 52nd year of his age, in the year of our Lord —,

And in the 21st year of King Charles 1st, against whose rebellious enemies,
leading the Luston men

Into a field near Hopton Castle, was there shamefully abandoned by them
and left a single victime to the enemy.”

This epitaph has been altered in recent days and the words “county troops” substituted for Luston men—a strange proceeding! But there is reason to think that Sir William Croft's epitaph was incorrect in two particulars, and many contemporary authorities agree that he was slain in 1645, fighting for the King at Stokesay Castle, in which we are now assembled, and this was certainly the opinion of my late friend, Mrs. Stackhouse Acton, who was no mean authority. In the account of the fight at Stokesay, sent to the House of Commons, it is stated that Sir William Croft, “the leading delinquent in that part of the kingdom,” was there slain. Moreover, Hopton Castle was taken two years before the fight of Stokesay, date being 1st March, 1643; and the captor, Sir Michael Woodhouse, who commanded in South Salop and in part of North Herefordshire.

“The King (says Mr. Webb in “Civil Wars of Herefordshire,” Vol. 2, page 193) sustained a greivous loss a little before the battle of Naseby. This was the death of his faithful adherent, Sir William Croft, than whom no man in Herefordshire had upheld his cause with greater resolution or consistency. A little before reaching the Craven Arms Railway Station the traveller on the railway from Hereford to Shrewsbury will pass at a short distance on the right a grey and antiquated tower, which, together with a large banqueting hall and other dependencies, constitute the Castle of Stokesay, then, and until recently, possessed by the noble family of Craven. This building, still especially noticeable from its picturesque aspect and careful preservation, was of sufficient strength to be an object of importance to either party, and had been garrisoned for the King in 1642; it had however, changed hands, and had just been occupied by a Parliamentary detachment of 500 foot and 300 horse, which had been sent out from Shrewsbury with the intention of planting garrisons so as to straiten Ludlow on that side. They had found Holgate Castle too much dismantled for occupation,

but having repaired the Castle of Broncroft, and committed it to the care of Lord Calvin, a Scottish nobleman, on the following day they summoned Stokesay to surrender, which, after a first refusal, was yielded up by the Governor, Captain Dauret, or Dannet, and perhaps one of the Dannets of Bosbury, county Hereford, in view of an impending storm. Woodhouse, the Governor of Ludlow, foreseeing the disadvantage that must result to his command, assembled a force from all the garrisons within forty miles, Monmouth, Hereford, Worcester, Hartlebury, and others, making up in all 1,500 or 2,000 men, and marched by Broncroft, which the Roundheads abandoned, to Stokesay."

In this neighbourhood the Royalists encountered the enemy, who were waiting at Wistanstow, on the high road between Ludlow and Shrewsbury, for reinforcements, and after an hour's fighting were entirely defeated, with the loss of nearly 60 officers, and 300 soldiers captured, as well as all the ordnance and baggage.

Walker attributes the overthrow to disagreement among the Commanders, a case of all captains and no corporals!—which is not improbable, as Woodhouse, Lunsford, Sandys, and Scudamore were all there with most of the gallantry of Herefordshire. Woodhouse and Lunsford escaped with difficulty, Woodhouse without his horse; but the loss, which threw the rest into insignificance, was that already mentioned in "the words of Vicars 'Sir William Croft the best head-piece and activest man in that county was slain in the place.'" But says my late friend, Mr. Webb (to whom I had the pleasure of giving such assistance as lay in my power in the compilation of his work "The Civil Wars of Herefordshire") in a note on page 195, Vol. 2. "Vicars must be wrong, for the tradition of the neighbourhood, not yet extinct, points out a spot in the boundary of Croft Park called Sir William's wicket, where he was shot by one or two pursuers, some say as he was getting over the park wall; and a very old tree called 'Sir William's Ash' three or four yards off was only blown down a few years ago. The keenness of the pursuit may be estimated from the fact that this wicket must be nearly ten miles in a straight line from the field of battle. Various sites have been assigned for the battle, which in Price's history of Leominster (published 1795) is placed near the forgotten town of Boitanc, under Richards' Castle, a few miles north of Leominster. The Royalists, under Sir Thomas Lundesford, Sir Michael Woodhouse, and others, were encamped on the declivity of the hill, near to Richards' Castle, which was then in ruins, and not having thrown up any works to secure themselves against any sudden attack, but confiding too much in their own force, near 2,000 men, drawn chiefly from the adjacent towns, were surprised during the night by the enemy, who had concealed themselves in the extensive woods, (of the Moor) which lie contiguous, and entirely defeated by a number far inferior to them. Sir William Croft, previous to the engagement, riding privately by night through the woods from his Castle of Croft with a few attendants was unfortunately surprised and barbarously murdered, but Vicars' statement, which is also that of Symonds and at least five of the journals, is established by the entry of burial in the register of Croft parish, where it runs 'near Stokesay Castle.'"

Sir William Croft is thus alluded to by the Rev. Clement Barksdale in the Cotswold Muse, who was rector of Sudeley, and also (says Wood) master of Hereford Free School, vicar choral, and vicar of Allhallows (All Saints), Hereford :—

Quoth I have forgot the Castle now
 Where Skydmore's men met such an overthrow.
 The wisest are not (as we see of late)
 Or valiantest ever the most fortunate.
 But perish may the place, perish the day,
 When sober Croft came to such a fray.
 Name me not Birch, or Morgan, there,
 When Croft was slain they conquered Herefordshire.
 There was more wit and valour in that one,
 And one more prisoner, than in all that ran.
 Thou wert preserved a prisoner* to tell
 How sadly Croft, how honourably fell !
 Let not the pair of virtuous sisters hear
 Till the good Dean his cordials prepare.

Of all the gentry of any note in Herefordshire, Sir William Croft is the only one who is found to have perished in the field of battle. Sir William Croft was never married, and after the death of his second brother, Colonel Sir James Croft, also unmarried, in 1669, the family estate of Croft Castle devolved on the third brother, Herbert Croft, then Dean and afterwards Lord Bishop of Hereford from 1662 to 1691, who charged his estate with a perpetual rent-charge payable out of the Croft Castle estate for providing pensions for widows of clergymen who have officiated in this county, and also for apprenticing the sons of clergymen requiring such assistance—which fund is still in existence and is managed by three of the Canons Residentiary of Hereford Cathedral. His son Herbert was created a Baronet November, 1671. And of the second son (Francis) of the first Baronet, the writer of this paper is a lineal descendant, and possesses the signature of Sir William Croft, of whom no picture is known to exist.

* Col. Wroughton was the prisoner alluded to.

Woolhope Naturalists' Field Club.

THE FUNGUS FORAYS, 1887.

ON Tuesday, October 4th, a party composed of the following members took the train at Hereford for Mitcheldean Road Station:—Rev. E. J. Holloway, Dr. J. H. Wood, Messrs. F. Bainbridge, W. H. Jones, T. C. Paris, H. C. Moore, Hon. Sec., and J. B. Pillev, Assistant Secretary, with the following visitors—Rev. E. G. Doughty, Messrs. F. Doughty, and W. Pilley. The Mycological visitors accompanying were:—Rev. Edward Cuninghame, Rev. Canon Du Port, Rev. J. E. Vize, Dr. Carlyle, and Messrs. Acton, Phillips, and Plowright. At Ross they were joined by Mr. G. H. Hadfield and Mr. H. Southall, who brought a friend, Mr. E. S. Cobbold.

Carriages from the Speech House met the party at Mitcheldean Road, and conveyed them to the place of rendezvous at the High Beeches. Although the day was fine, the atmosphere was hazy, so that the pretty views of the Severn soon after passing through Mitcheldean, and the views of the Welsh Hills from the more elevated ground, were obscured. But the main valuable resources of the Forest, such as its limestone quarries, iron and coal, were observed *en route*, and after leaving Cinderford to the left and ascending the Long-hill, some traces of the ancient Roman road were distinctly marked. Shortly after passing the sixth milestone from Mitcheldean Road Railway Station, which gave the information that the distance from London was 121 miles, on the left-hand side of the high road one of the oldest oak trees in the Forest, called "Jack of the Yat," was reached, which proved, upon measurement, to have a girth of 17ft. 9in., at a height of 5ft. from the ground. The "Crad Oak," on the same left-hand side, about one hundred yards further on, has such irregularities on its bole that it is difficult to measure its girth, but it is visibly smaller than the "Jack of the Yat." Proceeding onwards to the High Beeches, composed of five lofty beech trees, which, far surmounting in height all other trees in the vicinity, form a conspicuous landmark (the tallest and most handsome tree had a girth of 16ft. 6in., at 5ft. from the ground), Dr. Cooke, Dr. Wharton, with Messrs. Bucknall and Howse, who had come direct from London and Bristol to the Speech House Hotel, were espied: and, cordial greetings being interchanged, the conjoint party commenced their foray through Wimberry Slade eastwards towards the Speech House, a distance of two and a half miles. The ground was apparently favourable, but, owing to the long-continued drought, the finds were few and unimportant, and the selection of this locality for the foray would have proved disheartening had it not been for the encouraging remark of a veteran forager, "there are as many funguses here as I have seen anywhere else this year." But if there were no funguses the ground was dry, the air was temperate, and the sun shone warmly; placidity, contentment, and happiness reigned. It was remarked

that not a bird was to be seen ; nevertheless the silence was occasionally broken by the melody of the nutlatch, the shriek of the woodpecker, or the harsh cry of the jay, and most frequently by the jocund laughter of the mycologists.

Upon arrival at the Speech House Hotel some more traces of the old Roman Road were observed. Vestiges of these roads occur in many places in the forest, and exhibit a width of about eight feet, formed of cubes of conglomerate or millstone grit about eight or ten inches square, with a boundary of kerbstones five inches wide, varying from one foot to nearly two feet long, resting upon a foundation of large stones with which the kerbstones break the joints.

The Spruce Fir ride, situated about a quarter of a mile on the eastern side of the Speech House, and just beyond the archery and tennis ground, was next visited. The avenue of trees extends for more than a couple of miles over hill and dale, and forms a pleasant walk to "Danby Lodge," where are to be seen the fine "Danby Beeches," distant by this route about $3\frac{1}{2}$ miles from Speech House. A very lofty beech tree growing there on a slope of about 45° had been measured a few days previously by Dr. T. A. Chapman and Mr. Moore, and found to have a girth of 21 feet. Some ancient holly trees, growing in the vicinity of Speech House, gave the following girths at five feet from the ground :—a double-stemmed tree, 7ft. 5in. ; an old knotty tree, 6ft. 9in. ; a tree with a girth of 6ft. possessed a limb measuring 3ft. 5in. ; and another tree of 5ft. 9in. had a limb attaining a girth of 3ft. 10in. A hawthorn tree amongst them measured 4ft. 9in. The circumference of the largest beech tree here was 16ft. 4in.

Whilst considering the subject of trees in the forest, four splendidly grown oak trees must be mentioned. One grows on the side of the road leading from "Fancy Colliery" to Parkend, about two miles distant from Speech House ; it has a girth of 19ft. 8in. The other three are in the adjacent wood on the left ; they are known as "The Three Brothers" ; the largest has a girth of 19ft., and the central tree has a limb of enormous dimensions. The "Newland Oak," a pollard tree, represented in the transactions of the Club for 1878, and there stated to be "nearly 60ft. at the base," attains a girth of 41ft. 10in. free from any knotty excrescences at the height of 5ft. from the ground. A measurement at a spot a little lower, including the excrescences, gave a girth of 47ft. These measurements also were taken a few days previously by Dr. T. A. Chapman and Mr. Moore. The height of the bole is from 10 to 12ft.; externally it appears to be a solid cylinder retaining almost the same dimensions all the way up, but upon internal examination is found to be gradually becoming hollow with decay.

In the reign of Edward VI. the forest had an extent of more than 100,000 acres—the whole forest is now about 25,000 acres, the woodland portion, including the High Meadow Estate, being about 10,000 acres. In earlier days Gloucester Bridge, now twelve miles distant, was the boundary on the south, the forest occupying the triangular area included between the rivers Severn and Wye, and extending as far north as Ross and Newent. At present the greater part of the timber plantation is from 25 to 70 years of age, and is chiefly of oak, with a little beech ; and there are a few plantations about 130 years old. Commercially it has been considered more profitable (if we may venture to employ such a term when

Sir J. Campbell reports a loss instead of a profit in the management) to grow the timber for props in the galleries of the mines rather than for shipbuilding requirements of our Navy.

Dinner was partaken of in the Court Room of the Speech House, after which the Hereford members reluctantly took their departure homewards by carriage through Cinderford to Mitcheldean Road Station, finding some consolation in the reflection that they had left ten mycological visitors under the roof of the courteous custodian, Mr. J. W. Boyce, to whose intelligence and urbanity the members owed much of the success of their visit.

On the following day the foray, conducted in the neighbourhood of Parkend, a more damp locality, was much more successful. The list of fungi found is far too long for introduction here, but of the new or interesting species found during the two days' excursions may be named the ringless form of *Cortinarius biformis*, Fr., a singular *Cortinarius*, much resembling an *Inocybe*; a new species of *Cortinarius*, which has been named *C. bicolor*; a very fetid *Hebeloma*, with broad gills, which has been described in Grevillea as *Ag. Hebeloma nauseosus*.

On Thursday the excursion was devoted to Dinmore, but nothing of particular interest was found, unless we are to record, and for its beauty it is deserving of record, a very pretty specimen of wood stained by the diffused mycelium of *Helotium aruginosum*, Fries. This is the green-coloured wood employed in the manufacture of the inlaid Tunbridge ware. Upon this excursion our botanist, Rev. A. Ley, was accompanied by his friend, Mr. Henry Boswell, the eminent bryologist.

The exhibition of funguses was displayed, as usual, in the Woolhope Club room in the Free Library, and in the collection were observed two boxes from Northumberland sent by Mr. Cecil H. Sp. Perceval, from Longwitton Hall, Morpeth. A letter from Mr. Thomas Blashill, referring to a paper read by Mr. Bicknell at a previous meeting on the subject of "Edible Fungi of Italy," was laid upon the table. Writing of "*Boletus edulis*," Mr. Blashill says:—"I have several times had it in Milan and Verona towards the end of September; it is decidedly the best toadstool I ever tasted." Mr. Bicknell says, "One of the local names is 'Ferraresi.' My cook called it 'Funghi ferrati,' and in his own handwriting gave the following recipe:—'Rasparli—Una piccola cassernola, olio, burro, acciughe, limone, Scioglierli tutto assieme, e tagliarli a pezzi— $\frac{3}{4}$ d'ora devono essere pronti,' which, being somewhat amplified and corrected, may be rendered thus—'Clean, but do not peel the root (yet those in the market had their roots peeled), cut in thin slices, put in a stewpan with a little broth, oil, butter, a little anchovy, and lemon juice; give it three-quarters of an hour and it will be ready.' The fungus is sold by poulterers, it being eaten with chicken, hot or cold, or with chicken sausage. I had it with stewed chicken; it came up on a circular plate as a moist stew set round with little triangular sippets less than a quarter of an inch thick, fried in butter so as to be just yellow; the slices being about as large as a halfpenny or less. On September 23rd I saw heaps of *Boletus edulis* in the market at Brussels."

The Annual Dinner took place, as usual, at the Green Dragon Hotel, at which the following edible fungi were served:—*Coprinus comatus*, *Hydnum repandum*, and *Lactarius deliciosus*.

The Rev. William Elliot, president, referred in appropriate terms to the removal by death of the Rev. William S. Symonds, who had co-operated in the formation of the Woolhope Club, who was one of its earliest Presidents (1854), under whose teachings in the field of geology it was a privilege to have been a pupil, and to whose pleasant and vigorous manner of imparting his knowledge so many members owe their first acquisition of a desire to pursue that branch of knowledge of which he was so eminent a master. In his "Old Stones," and his "Records of the Rocks," he has taught us much of the natural history of "the dear old county of the Old Red Sandstones," as he termed it; and in "Malvern Chase" and "Hanley Castle" he has taught us many of its historical associations. Other works survive him, amongst them "Old Bones," "Stones of the Valley," etc., by which his memory will be cherished.

Several of the visitors having notified the completion of their arrangements for visiting the Mycological Congress in Paris, Mr. C. B. Plowright was commissioned by the President to convey, with their cordial greetings, a letter from the Woolhope Club to "La Société Botanique de France."

To this letter the following reply was subsequently received:—

"Société Botanique de France,

"Rue de Grenelle Saint-Germain, 84, à Paris.

"Paris, le 14 Decembre, 1887.

"Monsieur et honoré Président,

"Les membres de la Société Botanique de France ont été très reconnaissants des salutations fraternelles que les membres du Woolhope Club vous ont chargé de leur transmettre à l'occasion de la réunion du 16 Octobre dernier.

"Une assez longue absence que j'ai dû faire après le congrès mycologique, m'a empêché de vous écrire plutôt pour vous témoigner nos sentiments, et je vous prie d'en agréer toutes mes excuses.

"Nous avons éprouvé une vive satisfaction à voir le congrès honoré par la visite de Messieurs Plowright, Phillips, Du Port, Howse. La présence de vos savants collègues a augmenté l'intérêt et contribué au succès de notre session. Plusieurs d'entre nous avaient déjà formés avec ces messieurs d'excellentes relations aux congrès d'Hereford. Leur visite à Paris a encore reserré nos liens de confraternité Scientifique, et nous avons le plus vif désir de les voir persister par de nouvelles rencontres soit en France soit dans votre beau Comté d'Hereford.

"Nous souhaitons au Woolhope Club la plus longue et la plus complète prospérité.

"Veuillez agréer, Monsieur et honoré Président, l'expression des sentiments dévoués de

"Votre Serviteur,

"J. DE SEYNES.

"Président de la Société Botanique.

"15, Rue de Chanaleilles.

"A Monsieur Elliot et Messieurs les Membres du Woolhope Club."

After dinner the members adjourned to the house of Mr. Cam, where the Rev. A. Ley displayed a collection of freshly mounted Saxifrages, which he had recently gathered in County Kerry. The Rev. J. E. Vize read an interesting paper on "Land and fresh-water snails," accompanied by the exhibition of many species. Mr. Wm. Phillips was unable to stay to read the paper which he had prepared on "Methods of reproduction in Fungi."

On Friday the mycologists, travelling by train to Ledbury, took a carriage for Eastnor. The view of the Castle, with the autumnal tints on the shrubs running down to the margin of the pool in the foreground, presented a charming picture for an artist. Alighting at Eastnor Church, the return walk to Ledbury was by Conigre Wood through the grounds of Michael Biddulph, Esq., M.P. Looking backwards from the rising ground just above Eastnor Church upon the Church and Castle, the infinite gamut and gradation of autumnal colouring upon the various knolls, with the background of the Herefordshire Beacon and Malvern range of hills, left upon the spectators an impression which will not soon be forgotten.

The dearth of fungi was greater than ever: nevertheless the healthy weather and delightful scenery rendered some compensation. The pleasant day terminated with an excellent dinner at the house of Mr. G. H. Piper, which put everyone in an amiable temper, and brought the Fungus Foray of 1887 to a close, with the hope of re-visiting the Forest of Dean upon a future occasion.

LAND AND FRESH WATER SHELLS.

[By the Rev. J. E. VIZE.]

I do not remember ever to have seen records in the Woolhope Club of any land or fresh water shells. This is a little surprising if the facts are really such, that we do not own any one given to this branch of science amongst our local members, because we are so glad to hail any real student of any science as a welcome contributor to the vast fund of knowledge which has already been gathered together. It was my privilege some 35 years or more since to know some very good workers amongst the Land, Fluvialite, and Lacustrine shells, and it was a great treat, apart from severe study of another kind, to refresh my brain by walking along the roads with a view to finding shells, and getting spare time to rejoice over them with friends when collected. This principle is, I am sure, a right one for those who have to work hard at anything. A valued and recently dead friend once made a remark which, at the time, struck me forcibly, and the correctness of which is full of sound sense. He said, "I would not on any consideration have a doctor to attend me, who had not some hobby besides his practice, by means of which he might vary the ideas of his mind, and so intensify his thoughts for his regular practice." We all of us want something over and above our daily routine to invigorate us for general duties. I worked at shells with a hearty good will many years ago, and although they are decidedly difficult to find where I live now, yet the old fondness for them is inherent, and when I was asked to write a paper for our Club, it occurred to me that a few words might turn the thoughts of our members to the subject of shells, and so perhaps a list of local shells may by-and-bye be forthcoming from someone in Herefordshire. We speak of shells. A shell literally and truly means a hard covering, and in that sense is applied to the Mollusca, which you know is the term given to a very large class of creatures in the animal kingdom. The study of these hard coverings is called the study of Conchology, which is a totally different thing from the study of the animals living in the shells. The one is Conchology, the other is Malachology. Malachology we consider only in a slight degree. It is very interesting to examine it, however. The component parts of the body are instructive. These creatures are singular, because they carry their stomachs in their feet. Their blood is white with some green fluid in it. Their mantle is the skin, which is porous and glandular. Their flesh is soft, hence they are called Mollusca, from *mollis*, soft.

The study of Conchology has undergone a change from former times. Shells used to be classified from the form of the shell itself. Later arrangements take not the form of the shell only, but the creatures themselves as well.

It is a difficult thing to preserve the fleshy portion attached to the shells, hence it is rare to see more than the shell itself in collections. The shells, moreover, vary very much, and follow very considerably the shape of the creatures which inhabit them. People like to see the shells much more than they like the animals themselves. They are, when alive, considered to be unpleasant

things, and the wholesale destroyers of fruit and vegetable gardens. People are too fond of destroying them wantonly.

If the slugs be very numerous, and their work of destruction in gardens be very severe, several plans may be adopted to lessen their numbers. One way is to make use of a trap, for instance, a cabbage or a turnip leaf, after dusk. Water the ground under the cabbage, this will attract the slugs, and by early dawn they will have collected together; then destroy them, and the cabbage leaf. Another way would be to encourage the presence of small birds, especially thrushes; they consume a great many slugs as ordinary food. Also avoid edgings for garden walks, such as box or daisies; the slugs find them a very nice protection, and being night-feeders much more than day-feeders (unless the moisture by day be very great), they harbour in their hiding-places which they could not do if the borders of the walks were of tiles or slates.

It will not be very difficult to show that snails and slugs should be unmolested, as being really of immense benefit to society, so much so that, if they were extinct without the creation of some other beings to supply their place, fevers and pestilences would be much more frequent than they are now. They select (at least all the larger land ones do) damp places as the feeding grounds; they prefer dense coppices, walls and trees, where ivy and other parasitical plants grow; sometimes (and this is more especially the case with the smaller kinds) they are to be found under stones, decaying pieces of timber, at the roots of small shrubs, in the bulbs of tulips, &c.; indeed, as a rule, they choose decidedly moist spots, and why? Is the reason to destroy animal life wantonly? Certainly not. The object is to eat—not carrion, which is the food of certain birds, but just what in vegetable life corresponds to it—garbage of the lowest kind, which would soon render our woods and gardens anything but as pleasant as they are. This will account for the fact that in wet weather and gloomy autumnal days, snails are so much more easily found than before; they sally forth tempted by moisture, to find fresh food and residence. Of course no pretence is made to deny the fact that snails frequently do consume food which is not in a state of decomposition, but they do so principally in the spring and summer months of the year when the air is not³ favourable to decomposition; and then the very food they select is succulent, such as youthful sweet peas, lupins, &c., a fact which helps to prove what was to be shown, that snails and slugs *are* of service to us instead of being an injury.

There is another popular mistake with regard to snails, which is that they can with ease leave their own shell and crawl into another adapted to them. They no more can do so than any of us can get out of our own skin, find another about our size, and get into it. There is a very strong ligament which secures the animal to the shell, as may be proved by a large snail which has just been killed; considerable force will be necessary to detach it from its covering. The error, no doubt, has arisen from a supposed difficulty with regard to growth, how, in short, a small snail with a small skin could become a large one—moreover the mistake may have originated also from the idea that because caterpillars, spiders, lobsters, prawns, &c., cast their skins, therefore snails do so; but the analogy does

not hold good—soft-skinned creatures should not be compared with hard-skinned ; you would not judge of a silk-worm by a hippopotamus, nor a leech by an elephant. Snails have the power of discharging a fluid which eventually hardens into the shell ; thus it is formed, like ours, of continued re-additions from within. If ever a *Paludina vivipara* should be obtained, as it produces its young alive, and has them during the warm season at every stage, from the fully-developed young one down to the minute gelatinous globule, if a microscope be near, it would be very interesting to put the gummy masses between glasses in order to examine them ; a good glass, indeed a pocket magnifying lens, will be sufficient to show the beautiful structure of the embryo shell, and suggest many useful subjects for study. Whilst speaking of the production of young snails, it will be well now to leave the consideration of popular mistakes, and mention one or two remarkable facts not generally known. Some of them are *Monœcious*, that is to say, some snails are both male and female in one body ; others again are *Diœcious*, as would be expected ; that is, there are males properly so called, and there are females properly so called. A singular thing is said to occur in some water snails, they are born males and become females. It will be interesting also to state that some shells are oviparous ; that is, they lay eggs which eventually become of the same species as themselves, some even nurse them as a hen when sitting : whilst others are viviparous ; that is, they give birth to their young in a living state. It may also be said, that as in Botany certain plants receive their names from odours they discharge, so there are certain snails which obtain their names from smells emitted ; as, for instance, *Zonites alliarius*, the Garlic snail. It may be well to call attention to the beauty of a cabinet of land and fresh-water shells ; the variety of shapes assumed, the brilliancy of colour as well as transparency, the gradual process of development, and the minuteness of some species, all combine to render them extremely pretty. And if from ordinary observation as the shells lie empty a microscope be used in the examination, so as to view the dissected parts of the creatures (particularly with a good polariscope when the object will bear it), wonders upon wonders are revealed, none being more beautiful than the teeth. Our largest slug, incredible as it may seem, has no less than 28,800 teeth, one row of teeth numbering 180, whilst the transverse row has 160, which quantities multiplied together give the large number above. The old Roman snail (*Helix pomatia*) has 21,000. The common water snail, sold in London as the Scavenger Snail, has upwards of 12,000 ; these are all arranged in rows at right angles to each other, but this arrangement is not invariable : the *Testaella* has a most superb palate fringed with barbed teeth ; remarks will be made about this slug and the Roman snail presently. Some persons may feel anxious to be instructed as to the utensils necessary for collecting shells. My plan is very simple : for all water shells, I use an ordinary tin strainer or colander of small size, such as would be purchased for a few pence, and would be used for straining infants' food or pearl barley ; the handle of this is knocked out, and through the hole which will generally be found in it, or a hole purposely made, I fasten a string. This apparatus will very easily go into a coat pocket. I have also a walking stick, the bottom of which just fits the cavity caused by the handle

being knocked out of the colander: just above the ferrule of the stick is a hole made by a gimlet, through which the string fastened on the strainer is made to pass: the object, of course, will be seen at once: it is to fasten the colander so that it shall not be lost. Equipped then with these two articles, and plentifully supplied with wide-mouthed bottles, tin boxes, and, perhaps, a fishing can, I am ready to search in the ditches for the minute bivalves, and in the larger streams and canals for various creatures of various sorts. Another good plan is to have a walking stick with a ferrule composed of a male and female screw. When the lower screw is removed have another to insert in its place, to which is attached any instrument with meshes large enough to let all the water escape without any of the shells going with it.

For land shells boxes only are needed, combined with good use of eye-sight, climbing powers, good ability for walking, with some slight knowledge as to proper places to detect the habitats, a knowledge readily acquired by examining any work upon the subject, or even slightly gained by reading lists of localities.

When shells are obtained they can either be made of service for the cabinet or for an aquarium. If for the former let them be put in a vessel and pour boiling water upon them; but, pray take care, in order to secure the speedy death of your victims that the water is thoroughly boiling; it is well to use a little salt in addition for the larger sorts. When the creatures are dead they may be detached from their shell by means of a large pin, or such like instrument, care being taken not to injure the mouth of the shell. There is a small shell which no pin could make satisfactory, because the extreme end of the animal will break off. It is very transparent and very brittle. Its name is *Vitrina pellucida*. In company with this shell, some of the genus *Zonites* are sure to be found. Collect them both, and put them together, say in a tin box, for a few hours. The *Vitrina* shells will all be splendidly clean, not a fragment of the living animals will be left. The *Zonites* will have consumed them utterly, and so have saved you doing what otherwise you could never do satisfactorily.

If for the latter, let them be turned into an aquarium and run the risk of accommodating themselves to their new home. Nothing is simpler than the formation of an aquarium for snails. Purchase your glass or tank, get some mud from the bottom of a pool, let it be a couple of inches thick, then procure some stones, which may be placed artistically or flat, as preferred, then fill with water. But be sure to have some vegetable life, such as anacharis, chara, valisneria, &c., with the animal life; for success in an aquarium, coupled with the advantage of never changing the water, depends entirely upon a proper balance or proportion of these two things.

It may be well here perhaps to notice a few of our rarer Mollusks, which have been found in England, with a remark or two upon some singularities with regard to them.

Bulinus montanus is to be found sparingly, it is called by Dr. Gray in his edition of 1857, "*The Wilts Twist Shell*," but there is no reason assigned for the name of the county being attached to it. He nowhere else gives a similar distinction to any county. Its habits are most unusual when contrasted with

other species; it hibernates by burrowing into the ground at the roots of beech trees, it leaves its winter quarters in March, ascends the favoured tree (and by-the-by it chooses certain beech trees in preference to others), it enjoys itself at the top of the trees from March to August, and then descends to sleep for the remaining half-year. Through the advice of a friend, I went some years ago to some woods in August, and found the beech trees well stocked with equal quantities of *B. montanus*, *B. obscurus*, *Clausilia laminata*, *Helix lapicida*. If any one should ever find at the root of a tree a dead shell, he may be almost certain to obtain living specimens by visiting the spot in the months we have named. Very possibly *Helix obvoluta*, found in Ditcham Wood, Hampshire, on the tops of *Fagus sylvatica*, may have habits exactly corresponding with this animal.

Helix pomatia. Dr. Gray, speaking of these shells, asserts that "they have been said to be found as far north as *Devizes* in Wiltshire, and in Gloucestershire." This shell is the largest of the genus we have, and by some has been thought to have been in existence in England only since the middle of the 16th century: others claim for it the rank of being indigenous here; it certainly is interesting in its movements, and although we do not, with the Romans of old and the French of the present day, like snail soup, yet the whiteness of the flesh might render it purer to the sight and taste than a lump of ox tail, at least to those who like it. This creature seems to have degenerated very much, as in former days the shell is said to have been capable of holding "pints of water."

A few words about the *Testacella haliotide*, which is a slug, with a small shell on its back. A beautiful complication of teeth it has; if you hold its palate to the light you will, without any magnifying power, see some of its wonders; the *Testacella* itself is of rare occurrence, probably because it burrows in the ground in winter, and is only above ground at the close of the year; there need be little doubt that those who would hunt for them would very easily secure numbers, although they are considered scarce.

A singular habit of this slug is recorded in Reeve's "Mollusks," page 31; he obtained the information from M. Gassies, "When a *Testacella* has discovered the prey on which it wishes to make a repast, it moves stealthily to one side of the worm, with an indifference so complete that one would have supposed it had not observed it or disdained it; but suddenly it turns, and whilst the worm is twisting to the right and to the left, it lifts its head, withdraws its tentacles, dilates enormously its mouth, and throws itself upon its prey, enfing it by a kind of suction. Contortions of the worm are necessarily the result of the wounds from the palate spines; it wrestles, but in vain: retained by a multitude of barbs, its movements only serve to engage it more and hasten its passage into the stomach of its voracious enemy."

Helix carthusiana is a shell of great rarity; the habitats given for it are, I believe, only Kent and Sussex, and even there it is eccentric. I was staying some years since at a rectory in the latter county. The Rector took me to a field very close to his own home to obtain the shell. There were not many specimens obtainable. The peculiar thing about them was that they were only to be found in the compass of perhaps an acre of ground. The Rector told me he

had never known them stray from that spot. He had lived in the place for many years, and could always get a few specimens there, but nowhere else at hand.

Helix pisana.—This shell has certain narrow limits for its existence. At Tenby it flourishes, and there are one or two Irish habitats for it. It has also been found in Cornwall.

Then, again, how very local *Helix pomatia* is, and how impossible it is to acclimatize it elsewhere. Why are these three last-named shells so extremely difficult to grow elsewhere than where they are now found? Two workers tried to transport *Helix pisana* some years since, so as to make a new colony in a fresh spot. Twenty dozen of the finest and healthiest were placed in private grounds, as nearly as possible of the same geological formation and surroundings as the original home; they faded away very soon; they were an utter failure. There must be something to solve the difficulty, which as yet is not known to us.

On the other hand, however, many of our shells may have become colonized with us, which have been long considered truly British. This would apply more particularly to the water shells. The habit they have of forming a mouthpiece or membranous lid, by means of which all air is excluded, and so the animal is for weeks or months enabled to retain its moisture without drying up, until heavy dews or rain or water enables it so to do, would allow many a shell to be revived in our country from whatever part of the world it may have come. In this way roots of water plants, such as cotton, anacharis, &c., would be a very good medium for them.

One of our commonest shells, *Helix aspersa*, I have never seen alive in my rambles at home; and yet it grows in the neighbourhood not many miles away. Why should this be? It is said to be absent in the higher table lands of North Wales.

In former days some of the snails were used medicinally; they were thought to be very good in early stages of decline and consumption. They are used also for food. There is a snail market at Valencia. In Morocco and Algeria also, snails are largely consumed. *Helix pomatia* is eaten extensively by the Spaniards. They eat nearly all snails large enough to be consumed. The women who sell them crack them open with their teeth. If made into a broth they are cooked with onions so as to be made very savoury. In England, the Portland mutton is said to be very good, probably in consequence of the large quantity of small shells consumed by the sheep.

If you examine the structure of snail shells you will see that some of them have the coil or twist of the shell different from others. This is easily shown if you take an ordinary snail alive, then let it crawl, you will see that the coil twists from left to right perhaps, in other species the coil will be from right to left. These twists are very regular as a rule, so much so that it is considered a piece of good fortune to obtain a specimen which is abnormal; if procured, as necessarily is very unusual, one is reminded that a left-handed man is eccentric, so snails may be.

Do slugs and snails see? Truly enough they project horns from their heads, but most likely not for visionary powers, but for the sake of feeling their

way. These horns are highly sensitive to the touch, and shrink backwards when they come in contact with anything that is in their road. If they had powers of vision they would avoid touching the object before them, which they never seem to do, but blunder head foremost into it.

As to the shells of slugs, the *Testacella* has its shell at the part of the body farthest from the head, where it is attached in a very queer position, very much as though it could not stay on, but must slip off.

They, however, have shells which they carry within, as contrasted with outside, the creature itself. In some species they are very elementary, in others they attain a fair size. They are formed of crystals of lime, I believe, and act as protecting shields to the heart, lungs and very vital parts of the animal. On the back of the slugs you will notice a fleshy growth raised above the ordinary level of the creature when crawling, and which, when it is at rest, acts as a protection to the whole front part of the animal. Underneath this growth may be easily obtained, by dissection, the shield which defends it from injury, and corresponds to the shell of the snails.

With regard to the threads of slugs and of fresh water shells. Let us speak of the former first. Without a doubt some of them, but not all, have the power of suspending themselves by means of a mucous thread which they excrete from their bodies, and which is sufficiently strong to enable them to lower themselves from a height to a place not so lofty, say, for instance, the branch of a tree. This is a good device when they are in search of fresh food, and saves a great deal of time which otherwise would be spent in travelling to the trunk of the tree and then journeying along another branch. As to the threads of fresh water shells, I am unable to work out for you the question of the thread more than to record my recollection that the snails do travel most elegantly and with great precision with their heads downwards exactly at the level of the water in the aquarium. It has been disputed whether there can be a thread, and as strongly asserted that there is one. A microscope would settle the difference very soon. The arguments against the theory are that if a thread existed, it would be in the way of other snails, and entangle them. I have no means of solving the question. Also, as to the reasoning powers of snails. Have they any? Man, imperious man, says, No, certainly not. We are lords of creation. None can compete with us. Snails are very low in the scale of life. They cannot reason. Why then, we ask, do they congregate in such numbers—*Helix aspersa* for instance—in the cold time of winter as contrasted with warm weather? Why then do they act sometimes with such rational powers as they do. Take an instance. Several snails (*Helix aspersa*) were put into a box; a thunderstorm came; the snails all escaped from the box. They were re-captured, and put again in the box. Before long the cover was seen to move, and it moved regularly backwards so that a small crack caused by the warping of the wood became so wide that it was easy to see the creatures at work. There were several of them and they pushed the lid further and further from its place by first gaining space for their face, then their head, then their shoulders, until at last they were free. Here were a number of them all working with the same object before them, all

pushed the lid back with the same plan before them. Why did not some push one away? Some another? Why did they attempt to widen the breach they had made? Why were they not satisfied to remain prisoners in the box instead of toiling in concert to move the lid of the box out of their way. We may, I think, conclude that they reasoned the matter amongst themselves, and we may as well acknowledge at once that the lower orders of creatures have an amount of intelligence that vies with ours.

Mollusks, as is tolerably well known, have a power, like the bat and the dormouse and other animals, of suspending their animation during the winter and cold periods. They dispense with food, and live in a state of coma. As was mentioned just now, they form a mouthpiece for themselves, if nature has not given them one, and by this means await the time to come when the necessary conditions are fulfilled for their restoration to activity. Then they renew their life and get to work for food and their own perpetuation.

A few words here about what are termed the *Spicula amoris* or love darts of the *Helices*. There is a comprehensive paper about them in the Journal of Conchology of July, 1883, by a Mr. C. Ashford. I have not been able to see the same, and therefore venture to give the condensed summary of the paper word for word from the Journal of the Royal Microscopical Society, series ii., vol. iv., Part 2, p. 210, 1884:—"The dart is contained in a short ventricose pouch opening into the lower part of the vaginal tube, a little above the common vestibule, on the right side of the neck. There is usually one; if two are present, the second sac is on the opposite side of the tube from the first. The sac may be simple or bilobate. At the bottom of the cavity of the sac is a conical papilla, which serves as a basis for the dart, which is attached to it by its posterior end. The apparatus is a development of adult life, and especially of pairing time, but this is indifferently present or wanting in species otherwise closely allied. The dart itself is a tubular shaft, of carbonate of lime, tapering to a solid, transparent, sharp point, enlarging at or towards the base, where it assumes the form of a sub-conical cap. The sides of the shaft are sometimes furnished with blade-like longitudinal buttresses, which serve to strengthen it. They are rapidly formed, may be secreted in six days, and differ in form in different species. They are supposed to serve the purpose of inducing, by puncture, the excitement preparatory to pairing. They are too fragile to do more than prick the tough skin of these Mollusks, but sometimes penetrate the apertures of the body, and are found within. A new weapon is formed after the loss of the old one. It is best extracted for study by boiling the sac in caustic potash." Thus far I have transgressed a little from the text of the subject, on account of the interest attached to these peculiar darts.

I may here call attention to the interest which arises from recent and present shells, when compared with those which are truly antiquarian. One of the most devoted students of geology and kindred sciences—I mean an old acquaintance, Mr. Moore, of Bath—has given a list of shells which have been dug up in the city of Bath, in the pre-historic alluvium. They are not numerous, so I give the entire number:—

<i>Helix pulchella</i>	<i>Linnaeus stagnalis</i>
<i>Helix rotundata</i>	<i>Linnaeus pereger</i>
<i>Helix hortensis</i>	<i>Bithinia tentaculata</i>
<i>Helix hispida</i>	<i>Bulimus acutus</i>
<i>Clausilia nigricans</i>	<i>Azeca tridens</i>
<i>Planorbis spirorbis</i>	<i>Zua lubrica</i>
<i>Planorbis albus</i>	<i>Valvata piscinalis</i>
<i>Planorbis nautilus</i>	<i>Cyclas cornea</i>
<i>Cyclostoma elegans</i>	

making a total of 17 species.

A great deal more might be said about these interesting creatures. We might speak about the medium that some of them are in spreading the sheep fluke, which has proved so deadly a parasite to numbers of sheep; or enlarge upon the teeth—odontophores as they are called, agents in reality for rasping food—or many subjects. Like all the Great Creator's works, mollusks show an immense, an overpowering amount of skill. The study of them is a source of great pleasure. They perform the part allotted to them in keeping up the balance of life.

METHODS OF REPRODUCTION IN FUNGI.

[By WM. PHILLIPS, F.L.S.]

I have thought it may not be out of place to ask your attention for a few minutes this evening to some of the methods of reproduction amongst fungi, a class of plants the life-history of which presents to us many curious phenomena, which have only quite lately—that is within the last half century—received from botanists the attention they deserve. Fungi are distinguished from nearly all other plants by the total absence of chlorophyll in their composition. One or two species are of a dark-green colour, as, for example, *Agaricus æruginosus* and *Peziza æruginosa*, but they owe their green colour to a substance entirely unexplained up to the present time and totally different from chlorophyll. Another character of fungi is that they are for the most part saprophytes or parasites, *i.e.*, they either live on the decaying tissues of other plants, or they live at the expense of living plants. It is to this last-named group that some of the most dreadful pests belong which cause such destruction in our fields and gardens, as the mildew of wheat, the vine mildew, and the potato disease. The origin and growth of fungi were at one time regarded as inscrutable mysteries into which it was vain and even presumptuous to inquire, and most of them were supposed to originate from spontaneous generation. Indeed this last doctrine died an exceedingly hard death, Dr. Bastian having been its latest champion. Every vegetable organism is now believed to arise from a germ or spore, either of sexual or asexual origin, although the exact method of the production of such germ or spore may not yet have been in all species discovered. In the great domain of Fungi considerable advances have been made of late in our knowledge of their structure and life history, but still only the very fringe of the great continent has been explored, and even that fringe only partially. The large division *Hymenomyces*, to which the mushroom belongs, is represented in this country by about 850 species, or, in the whole of Europe, by more than 1,800 species. What we know of their mode of reproduction may be summarised in a few words. If we take a full-grown mushroom we see it is composed of a stem, and a cap or pileus; under the pileus we see a number of thin lamellæ or gills radiating from the centre to the circumference, which are at first white, then pink, and at length purple-brown. It is on the surface of these gills that the reproductive bodies are produced in enormous numbers after this fashion:—Growing out from the surface, and perpendicular to it, are a number of club-shaped cells, called basidia, arranged in close order, forming a continuous layer, called the hymenial layer. On the summit of each basidium are two short spikes, called sterigmata, on the points of which are produced the spores, each sterigma bearing a spore. The spores are elliptic, purplish-black in a mass, and produced in enormous numbers. (Let any one place the cap of a mushroom on a sheet of white paper, with the gills downwards, and he will find after a few hours that innumerable spores have fallen, and imprinted on the paper the outline of every gill. Should these spores fall on a congenial

substratum, under favourable conditions they will germinate and reproduce the species. They throw out minute mycelial threads, which extend and branch abundantly, and form the "spawn," as it is called by gardeners, from particular parts of which little tufts arise which are the beginning of new plants in all respects like the parent from which they sprang. This cycle of growth is very simple, and may be continued indefinitely without, as far as is known, any sexual process intervening, such as that which has been observed in a few species of the fungi. It has been maintained by some that the basidia which produce spores—for great numbers remain barren—are fertilised by minute granular bodies produced on the summits of specialised male cells, called cystidia, which appear in the hymenium of some of the allied hymenomycetes; but this view is not accepted generally, and needs further confirmation. There are several species of *Agaricina*, which depart from the method of reproduction observed in the mushroom as just described. *Agaricus tuberosus* and *Coprinus stereorarius* may be taken as examples, in which instead of being produced from the mycelium direct, as in the mushroom, a body called a *sclerotium* is produced on the mycelium, which is a hard, compact black body, capable of resisting decay, and enduring for a whole year in a dormant state, producing the next year one or more perfect parent plants. They are condensed mycelium, forming a reservoir of reserve material to be employed in forming new individuals. Analogous bodies are known to occur in the course of the reproduction of other fungi, an example of which appears in the common Ergot of rye, giving rise to *Claviceps purpurea*, and in *Peziza furkeliana* presently to be noticed, *Typhula phacorrhiza* and other fungi. Turning now to the *Discomycetes*, which form an extensive division of fungi, represented by the well-known *Peziza aurantia*, so frequently found about old stumps of trees in woodland districts, and wherever found to be admired, we will select an example of a much more complicated and curious method of reproduction than we have alluded to. The *Discomycetes* are mostly cup-shaped, of a fleshy or waxy consistence, varying in size from that of an ordinary teacup to that of a pin's head or even smaller. They are either attached to the substratum by the base or supported on a more or less elongated stem; their colour is generally sober brown, grey, or yellow, but not unfrequently bright yellow or red. They produce their spores within a mother cell, which cell may be cylindrical or clubshaped, and normally contain eight sporidia. The mother cells are called asci, and are placed side by side in an upright position so as to form a continuous layer over the upper surface of the cup, which is always more or less open. Between the interstices of the asci slender filiform cells called paraphyses are present. The layer formed by the asci and paraphyses is the hymenial surface. The sporidia when mature are ejected through an opening at the summit of the asci and then commence an independent existence. *Peziza furkeliana* is a species in which the development has been carefully observed throughout its whole course. It is found on decayed vine leaves, but has not yet been recorded in this country. It arises from a small black sclerotium about $\frac{1}{4}$ — $\frac{1}{2}$ a line in diameter, sometimes singly, at other times in groups of two, three, or more; its stem is about $\frac{1}{4}$ of an inch high and very slender, not thicker than a bit of sewing cotton, and the cup supported by the

stem is not more than $\frac{1}{16}$ th of an inch broad, quite circular, and nearly flat. If sporidia are taken from the hymenium of this plant and placed on decayed vine leaves in a moist chamber the process is as follows :—They throw out a fine white mycelium from which sclerotia arise which are capable of enduring in a dormant state for twelve months, when they produce new cups. This is the simplest cycle of reproduction. But a course may be taken different to this ; the mycelium, instead of producing sclerotia, may give rise to a growth called *Botrytis cinerea*, which consists of tufts of fine grey filaments bearing on their points globose spores termed *conidia* in great abundance. The *conidia* are capable of germination when they produce either *Botrytis cinerea* or sclerotia ; if sclerotia then the sclerotia may produce either *Botrytis cinerea* or cups. Thus the cycle of reproduction becomes very complicated, the first and simplest being sporidia forming sclerotia, sclerotia producing cups, sporidia from cups producing sclerotia ; the second may be sporidia producing *Botrytis*, *Botrytis* producing sclerotia, and sclerotia producing cups ; the third may be sporidia producing sclerotia, sclerotia producing *Botrytis*, *Botrytis* producing *Botrytis* again, even for several generations ; the fourth sporidia producing sclerotia, sclerotia producing cups. It must not be inferred, however, that this process takes place in all the allied species, it having been satisfactorily proved only in this one. Some of the *Discomycetes* are reproduced by a widely different method, which it is not our purpose on this occasion to notice. I will now proceed to describe the course of reproduction in one more fungus with which I must conclude, namely, the Mildew of Wheat. This fungus is a true parasite, attacking its host while in a living state, and living at the expense of the sap and vitality of the plant, ultimately killing it. The economic aspect of the question as to the loss every year to the farmer caused by this fungus is one into which I shall not enter, but simply give a brief sketch of its life history. It passes through three forms, each of which has been placed in a different genus and regarded as autonomous species, *Uredo linearis*, *Puccinia graminis*, *Aecidium berberidis*. Beginning with the *Uredo*, we find it on the leaves and other parts of wheat in elongated masses of orange-coloured spores, known to farmers as “rust.” Under the microscope these spores are elliptic and covered with minute asperities. They are produced from mycelium, which occupies a position beneath the cuticle of the wheat, and when mature they rupture the cuticle, and become exposed and disseminated. Each spore is capable of reproducing others in the following manner :—It alights on an unaffected leaf, and, if moisture and other conditions are favourable, it pushes out a mycelial thread from about the middle of its longer axis, which, after making several revolutions, corkscrew fashion, enters through a stoma into the tissue of the wheat and so forms new masses. Now, inasmuch as the host plant dies in the autumn, how does the *Uredo* survive to attack the wheat of the following year ? Towards the end of the summer these *Uredo* spores produce resting spores in the form of *Puccinia graminis*, known as mildew. This appears as linear black masses pushing through the epidermis, and must have been seen by every one passing through a wheat field. Under the microscope the spores are elliptic, dark brown seen by transmitted light, but black by reflected light, divided transversely

by a septum near the middle into two compartments, and furnished with a longish, slender, colourless stem. These are called resting spores, because they survive the death of the host plant. Now occurs a very curious episode in the process of reproduction. If the puccinia spores are caused to germinate they produce from one or both divisions of the spore fine slender germ-tubes, called promycelium, and after attaining a definite length of about three or four times the length of the spore, they give off three simple branches which taper from base to apex where each bears a single oval or kidney-shaped hyaline spore, called the promycelium spore. If one of these be placed on a young leaf of the common barberry under proper conditions of moisture, it throws out a slender germ-tube which pierces through the epidermis of the barberry leaf, and in the course of about eight days gives rise to a well-known fungus *Æcidium berberidis*, or barberry cluster-cups. These cups, which are filled with golden yellow spores, and grow in clusters, are a favourite object with *dilettante* microscopists, who delight in a pretty object. The spores are smooth golden-yellow, and nearly globose, and are produced from the mycelium in chains, the oldest and ripest spore being at the top of the chain. These spores will not reproduce the cluster cups directly, but if they alight upon wheat they will at once produce a mycelial tube that enters by the stomata into the tissue of the wheat and produce "rust," or *Uredo linearis*. This proves beyond doubt that the very ancient belief amongst agriculturists that a barberry tree near a field of wheat produced the rust, rested on a strictly scientific basis, but arrived at by simple observation. I have thus in a very hurried and imperfect manner sketched out some amongst many of the methods by which Fungi are reproduced, and I trust that with the aid of the diagrams I have exhibited the subject has been made clear to you.

LIST OF THE FUNGI FOUND IN THE FOREST OF DEAN,
OCTOBER, 1887.

[Supplied by Mr. CEDRIC BUCKNALL].

- AGARICUS (*Amanita*)—
 mappa, *Fr.*
 muscarius, *Linn.*
 pantherinus, *Fr.*
 phalloides, *Fr.*
 rubescens, *Fr.*
 strangulatus, *Fr.*
 vaginatus, *Fr.*
- AGARICUS (*Lepiota*)—
 carcharias, *Pers.*
 cristatus, *A. & S.*
 granulatus, *Batsch.*
 procerus, *Scop.*
 rachodes, *Vitt.*
 „ var. puellaris, *Fr.*
- AGARICUS (*Armillaria*)—
 melleus, *Fl. Dan.*
 mucidus, *Saund. & Sm.*
- AGARICUS (*Tricholoma*)—
 albus, *Schaeff.*
 flavo-brunneus, *Fr.*
 humilis, *Fr.*
 nudus, *Bull.*
 rutilans, *Schaeff.*
 saponaceus, *Fr.*
 sejunctus, *Sow.*
- AGARICUS (*Clitocybe*)—
 clavipes, *Pers.*
 fumosus, *Pers.*
 fragrans, *Sow.*
 infundibuliformis, *Schaeff.*
 laccatus, *Scop.*
 metachrous, *Fr.*
 nebularis, *Fr.*
 odorus, *Bull.*
- AGARICUS (*Collybia*)—
 atratus, *Fr.*
 butyraceus, *Bull.*
 dryophilus, *Bull.*
 platyphyllus, *Fr.*
 radicans, *Relh.*
 vertirugis, *Cooke.*
- AGARICUS (*Mycena*)—
 alcalinus, *Fr.*
 ammoniacus, *Fr.*
 galericulatus, *Scop.*
 purus, *Pers.*
- AGARICUS (*Omphalia*)—
 fibula, *Bull.*
- AGARICUS (*Pluteus*)—
 cervinus, *Schaeff.*
- AGARICUS (*Entoloma*)—
 lividus, *Bull.*
 nidorosus, *Fr.*
 prunuloides, *Fr.*
- AGARICUS (*Clitopilus*)—
 prunulus, *Scop.*
- AGARICUS (*Pholiota*)—
 erebius, *Fr.*
 spectabilis, *Fr.*
 squarrosus, *Müll.*
 togularis, *Bull.*
- AGARICUS (*Inocybe*)—
 asterosporus, *Quel.*
 Curreyi, *Berk.*
 haemactus, *Berk. & Cke.*
 incarnatus, *Bres.*
 muticus, *Fr.*
 obscurus, *Pers.*
 pyriodorus, *Pers.*
 rimosus, *Bull.*
 scaber, *Müll.*
- AGARICUS (*Hebeloma*)—
 crustuliniformis, *Bull.*
 glutinosus, *Lind.*
 nauseosus, *Cooke.*
 sinapizans, *Fr.*
- AGARICUS (*Flammula*)—
 flavidus, *Schaeff.*
 inopus, *Fr.*
- AGARICUS (*Galera*)—
 tener, *Schaeff.*
- AGARICUS (*Tubaria*)—
 furfuraceus, *Pers.*
- AGARICUS (*Crepidotus*)—
 mollis, *Schaeff.*
- AGARICUS (*Psaliota*)—
 campestris, *Linn.*
 haemorrhoidarius, *Kalchbr.*
- AGARICUS (*Stropharia*)—
 aeruginosus, *Curt.*
 inunctus, *Fr.*
 semiglobatus, *Batsch.*
 squamosus, *Fr.*
- AGARICUS (*Hypholoma*)—
 appendiculatus, *Bull.*
 capnoides, *Fr.*
 fascicularis, *Huds.*

- AGARICUS (*Hypholoma*)—
 pyrotichus, *Holmsk.*
 storea, *Fr.* (?)
 sublateritius, *Schaeff.*
 velutinus, *Pers.*
 AGARICUS (*Psilocybe*)—
 ericaeus, *Pers.*
 semilanceatus, *Fr.*
 subericaeus, *Fr.*
 AGARICUS (*Psathyra*)—
 corrugis, *Pers.*
 AGARICUS (*Panacolus*)—
 fimiputris, *Bull.*
 COPRINUS—
 atramentarius, *Fr.*
 plicatilis, *Fr.*
 CORTINARIUS (*Phlegmaecium*)—
 purpurascens, *Fr.*
 varicolor, *Fr.*
 CORTINARIUS (*Myzocium*)—
 mucifluus, *Fr.*
 vibratilis, *Fr.*
 CORTINARIUS (*Dermocybe*)—
 anomalus, *Fr.*
 cinnanomeus, *Fr.*
 ochrolencus, *Fr.*
 sanguineus, *Fr.*
 CORTINARIUS (*Telamonia*)—
 biformis, *Fr.*
 hinnuleus, *Fr.*
 hemitrichus, *Fr.*
 iliopodius, *Fr.*
 paleaceus, *Fr.*
 psanmocephalus, *Fr.*
 bicolor, *Cooke.*
 torvus, *Fr.*
 CORTINARIUS (*Hygrocybe*)—
 decipiens, *Fr.*
 erythrinus, *Fr.*
 GOMPHIDIUS—
 glutinosus, *Fr.*
 PAXILLUS—
 involutus, *Fr.*
 HYGROPHORUS—
 chlorophanus, *Fr.*
 conicus, *Fr.*
 linacinus, *Fr.*
 LACTARIUS—
 blennius, *Fr.*
 chrysorheus, *Fr.*
 exsuccus, *Sm.*
 mitissimus, *Fr.*
 pallidus, *Fr.*
 pyrogalus, *Fr.*
 quietus, *Fr.*
 subdulcis, *Fr.*
 LACTARIUS—
 subdulcis var. *cimicarius?* *Batsch.*
 terminosus, *Fr.*
 turpis, *Fr.*
 avidus, *Fr.*
 vellerens, *Fr.*
 RUSSULA—
 cyanoxantha, *Fr.*
 emetica, *Fr.*
 fellea, *Fr.*
 fætens, *Fr.*
 fragilis, *Fr.*
 lutea, *Fr.*
 nigricans, *Fr.*
 rubra, *Fr.*
 virescens, *Fr.*
 CANTHARELLUS—
 aurantiacus, *Fr.*
 MARASMIUS—
 peronatus, *Fr.*
 LENTINUS—
 cochleatus, *Fr.*
 PANUS—
 torulosus, *Fr.*
 BOLETUS—
 chrysenteron, *Fr.*
 edulís, *Bull.*
 luridus, *Schaeff.*
 piperatus, *Bull.*
 scaber, *Fr.*
 subtomentosus, *Lin.*
 tenuipes, *Cooke.*
 POLYPORUS—
 caesius, *Fr.*
 perennis, *Fr.*
 versicolor, *Fr.*
 vulgaris, *Fr.*
 DEDALIA—
 quercina, *Pers.*
 MERULIUS—
 aurantiacus, *Klotzsch.*
 STEREUM—
 hirsutum, *Fr.*
 CLAVARIA—
 cinerea, *Bull.*
 CALOCERA—
 viscosa, *Schaeff.*
 HELVELLA—
 crispa, *Fr.*
 infula, *Schaeff.*
 PEZIZA—
 aurantia, *Oed.*
 badia, *Pers.*
 fugiens, *Phil.*
 ampliata, *Pers.*
 polytrichi, *Schum.*
 fructigena, *Bull.*
 melaloma, *A. & S.*

Woolhope Naturalists' Field Club.

1888.

THE first Meeting this year took place on Tuesday, April 17th, in the Woolhope Club Room. The following members attended:—The President (Rev. William Elliot), Vice-Presidents (Mr. F. Bainbridge and Mr. Geo. H. Piper, F.G.S.), Sir Herbert Croft, Revs. W. Bowell, F. T. Havergal, W. H. Lambert, H. B. D. Marshall, P. H. S. Strong, M. G. Watkins, and H. T. Williamson; Drs. T. A. Chapman and J. B. Fitzsimons; Messrs. T. Cam, J. Carless, R. Clarke, James Davies, G. Davies, J. Docking, A. Purchas, O. Shellard, with Mr. James B. Pilley, Assistant Secretary, and Mr. H. C. Moore, Honorary Secretary. The financial statement was read, and the bill for the publication of the Volume of the *Transactions* of 1881—1882 was directed to be paid. Copies of the volume were issued to members present at the meeting. The following books, pamphlets, &c., have been presented either as gifts or by interchange with other societies:—“A Clinometer,” received from the widow of the late Rev. William S. Symonds, F.G.S., &c., who died September 15th, 1887, with the following memorandum made by him on January 26th, 1887: “I wish the Clinometer which belonged to Sir Charles Lyell, which he carried for years, and which was presented to me on his death, to be placed in the Museum of the Woolhope Club at Hereford”; “Notes on the Birds of Herefordshire,” presented by Mrs. Bull; “La Flore des Vosges Champignons”—par le docteur Antoine Mougeot; “Index Seminum in hortis Musæi Parisiensis anno 1887 collectorum.” Pamphlets from Dr. H. B. Geinitz, of Dresden, as follows:—“Ueber Palmacites” Reiche Gein. “Die Meteoriten des Königlichen Mineralogischen Museums in Dresden.” “Zur Dyas in Hessen.” “A preliminary inquiry into the genesis of the Crystalline Schists of the Malvern Hills,” by Charles Callaway, D. Sc., F.G.S. “On a second Precambrian group in the Malvern Hills,” by Charles Callaway, D. Sc., F.G.S. Bristol Naturalists' Society, Vol. v., Part 2, 1886, 1887. Flora of Cardiff. Cardiff Naturalists' Society; various numbers, making up some of the deficiencies in our library to Vol. ix., Part 1, 1887. Cotteswold Naturalists' Field Club; proceedings of 1885, 1886, and of 1886 to 1887. Essex Naturalist; monthly numbers, commencing January, 1887. Geologists' Association, proceedings of; Vol. ix., No. 8, for November, 1886; Vol. x., No. 1, for February, 1887; Vol. x., No. 2, for May, 1887; Vol. x., No. 3, for August, 1887. Hampshire Field Club, proceedings of; No. 1, 1887. Warwickshire Naturalists' and Archæologists' Field Club, proceedings of; 1886.

The dates and places fixed for the Field Meetings for the year were as follows:—

Tuesday, May 22nd.—Kington, Old Radnor.

Thursday, June 28th.—Snodhill Castle, and Dorstone.

Thursday, July 19th.—Church Stretton.

Tuesday, August 28th.—The district of Woolhope, or wherever the Committee may ultimately determine.

ADDRESS BY THE PRESIDENT, REV. WM. ELLIOT.

Gentlemen,—In following the example of my predecessors in the chair, which, through your kind favour, I have had the honour of occupying for the past twelve months, and offering you a brief address on the occasion of your Annual Meeting, and the expiry of my year of office, I am afraid that I shall fall very far short indeed of awakening that interest which they were always able to excite. I could wish indeed that my scientific knowledge were other than it is, a too meagre offering to lay on the Woolhopean shrine, so that I might endeavour to enlist your attention in the discussion of some of those problems that are propounded to us in the great book of Nature. Being what it is, however, rather than seem to shrink from my duty, I must content myself with somewhat slavishly following the directions of your eighth rule, “reviewing” succinctly “the proceedings of the year past,” and submitting to you one or two such observations as may seem likely to be “conducive to the welfare of the Club, and the promotion of its objects.” And in the prosecution of the former part of my task I conceive it to be my first duty to ask for the tribute of your respectful regret to the memory of those honorary members, very closely connected with us as they happen to have been, who have been called away by death since our last annual meeting in this room. Foremost in this category the loyalty of the Woolhope Club must place the name of William Samuel Symonds. For to the exertions of that gifted gentleman and man of science, in connection with those of the late Mr. Scobie, the Club owes its having been called into existence 37 years ago: and from that time till, in recent years, failing health compelled the relinquishment of his favourite pursuits, the Club had few warmer friends, few more instructive guides. His remembrance must remain green and honoured for long time to come in the hearts of very many who have been stimulated by the example of his labours and his enthusiasm, by the books of which he was the author, by the papers which he read at field meetings, or by the impromptu addresses which they were fortunate enough to hear him deliver. I may perhaps mention here that my friend, Mr. La Touche, has been engaged in the preparation of a memoir of Mr. Symonds, which I had hoped might by this time have reached publication. Than Mr. La Touche none could be better qualified for such a task, not only on account of the close intimacy which subsisted between Mr. Symonds and himself, but on that too of his own keen sympathy with Mr. Symonds’ love for nature, and of his own distinction in that branch of natural science, geology, in which Mr. Symonds was so peculiarly distinguished. I am sure that the memoir in question will be looked forward to with no little interest by the large circle of those who esteemed Mr. Symonds’ friendship, by the scientific world that appreciated the depth of his learning, by the county that was proud to reckon him

one of her sons, and not least by the members of this Club. By sad and curious coincidence Mr. Symonds's old friend and fellow worker, Sir William Guise, followed him to the grave within the space of a very few days. Sir William Guise was elected an honorary member of our Club in the year 1854. Our transactions do not indeed bear much written testimony to his widely spread scientific attainments. But he was not an infrequent, and at all times a most useful and very welcome, attendant at our meetings. I do not know for what exact number of years he was the President of our sister Club, the Cotteswold; but it exceeded twenty; and I should like to take this opportunity of offering that body, in your name, our condolence on the loss which they have sustained by his removal from their head. Very distinguished too both with the pen and in the field was that eminent naturalist, the late Mr. Edwin Lees, of Worcester. He was admitted to our honorary membership in 1861, and there are many among us who recall with pleasure his society, and the instruction which he was so well qualified to give, especially in that branch of science of which he had made himself a thorough master. Gentlemen, these were all men of mark. They were ornaments of any society of intellectual men in which they found themselves. Their connection with our Club reflects honour on the Club itself, and the memory of what they did in patient investigation of what nature had to tell them should be a valued legacy to us who survive them. If I might venture to point the moral of their lives for the benefit of the members of a Natural History Society it would be in the lines which, save for one word's alteration, ran above the honour boards on the walls of my old class room in Shrewsbury School,

“Vos exemplaria tanta
Nocturnâ versate manu, versate diurnâ.”

Continued ill-health unhappily deprived the Club at the commencement of last year of those services as Secretary which Mr. Lane had so punctually and so efficiently rendered for nine previous years. However inadequate to express its full appreciation of those services, yet it was as some slight and grateful recognition of them that the Club enrolled him among her honorary members. His place as Secretary has been supplied by Mr. James Pilley, and the office of Honorary Secretary, for some while suspended, has been revived in favour of Mr. Moore. I may, perhaps, be permitted to say, speaking as I do from the peculiar knowledge which my position has allowed me to have, that the Club is to be heartily congratulated on the willingness of these gentlemen to assume office. I do not know how any Field Club could be more admirably served by its officials than the Woolhope is by them; and what I am pleased to think has been the success of the first season's voyage of a new crew has been entirely due to their assiduity and zeal. Mr. Moore's first year of office has been signalized by the compilation and publication of some of the arrears of our records which had begun to make itself what is called “a felt want.” One volume, as you know, was issued in 1887, and another, bringing the transactions down to the year 1882, is now in your hands. It is not too much to hope that, before the close of another year, we may have the series continued down to nearly the present date. The trouble and pains, and the discriminating judgment, which have marked

Mr. Moore's prosecution of this work are worthy of our warmest praise. Still further to enhance the value of what is admittedly a most valuable treasury of local history, archæology, and science, the Rev. Preb. Havergal has added a classified index of the whole of the Transactions of the Club from the year of its formation. The great importance of this does not need any pointing out; and the thanks of his fellow members are most deservedly due to Mr. Havergal for the suggestion of the idea and the no slight labour involved in its realisation. Here I would draw your attention to the proposal which has been laid before you to republish the earlier *Transactions*, few original copies of which are at the present moment remaining, and are almost impossible of acquisition by the general purchaser. I should hope that the obvious desirability of having a work of so much importance, and one which will increase yearly in value, in a complete form, will very soon enable the Editorial Committee to proceed with the republication in question.

Beyond putting on record the fact that we were on each occasion of our Field Meetings in 1887 favoured with fine weather, I shall not enter into details of what took place at them. The Thornbury day enabled the Club to extend its already wide acquaintance with those camps of British or Roman occupation of which Herefordshire has so many. An instructive work on these fortified places might be extracted from the pages of the *Woolhope Transactions*. The three other days of meeting permitted us to pass in hasty review the whole history of the Old Red Sandstone formation, from its appearance, overlying the upper rocks of the Silurian system, near Craven Arms, to its passage under the Carboniferous near Mitcheldean. At the former place we had the advantage of the guidance of the Rev. J. D. La Touche, the President of the Caradoc Field Club, and the fine exposures of Carboniferous strata near Mitcheldean were pointed out and explained to us by Mr. Wethered, Secretary of the Cotteswold. Each gentleman, from his intimate acquaintance with the locality in which he spoke, was an invaluable interpreter of the story of the rocks contained in them. Nor should I omit to record papers of much interest kindly read, one by Sir Herbert Croft, on our visit to Stokesay Castle, on the battle of Stokesay; another by Mr. Hutchinson as an appendix to a descriptive catalogue of Herefordshire Lepidoptera previously communicated by members of his family, and a third by Mr. Fowler, Fellow of Lincoln College, Oxford, on the family of Motacillæ, or Wagtails. I was unable, in consequence of an engagement of some standing, to do more than welcome at the annual dinner the distinguished mycologists who, as so often on former occasions, honoured us with their presence at the Fungus Foray of the year. I was most glad, however, to learn that the locality chosen, that of the Forest of Dean, had proved so favourable a one for the purposes of their quest as to induce them to express a hope that it might be selected for the Foray of the present season. Upon the whole, it is pleasant to believe that our excursions of the year now ended were found to be by those who shared them both enjoyable and useful, and that so far one great object of a Field Club's existence was attained. Important, however, as one holds it, that we should be successful from this point of view in organizing meetings at which

agreeable society should aid the charm of rural scenery in producing a pleasant day's outing, not without some such intellectual gratification as may be gained from the acquisition of a little knowledge, the observation of certain natural phenomena, the sight of this or that memorial of antiquity, or the partial verification of some student's labours in this or that branch of natural science, yet the Woolhope Club will be untrue to the traditions of an illustrious past, if, as a body, it does not keep alive within it the generous aspiration towards something more severe than this. We number in our ranks gentlemen conspicuous as workers in Nature's field: conspicuous by their knowledge, by their carefully trained powers of observation, by the results they have displayed of years of patient study. It should be for every member of our Society each in his way, albeit the way may be a small one, to emulate them; at least to hand on to the future the trust they have won for us, in constituting the Club no mean educational agency, unimpaired. Membership of the Woolhope Club should connote, as it has always done, not a mere æsthetic admiration alone of the beauties of Nature, but some honest endeavour to employ the faculties of thought and observation with which everyone is gifted in the fascinating task of reading her secrets. In connection with this thought I hope I may be pardoned for remarking that it seems a matter both for surprise and regret that the study of Geology fails so much at this moment to attract the attention of many of our members. Recollecting how large a space it occupied in the field of intellectual vision of the original members of the Club—a fact, indeed, to which the very title of the Club bears witness—and recalling the names of Lewis, Lightbody, Symonds, Scobie, Banks, McCullough, and that of our accomplished ex-president, Mr. Piper, I would encourage the hope that it may yet find a place among those cognate subjects of study which are so worthily represented among us. The equipment necessary is not an elaborate one; I forget who it is that has said "a hammer and a little common-sense" comprise it; to which, perhaps, I might add patience, and attention to minutiae. Handbooks of elementary instruction are plentiful enough at this time of day. Those of Page, Lyell, and Geikie, at once suggest themselves. It is true that the Formation which occupies a great part of the area over which the Woolhope Club travels (the Old Red Sandstone) is not eminently prolific in those fossils, search for which interests and leads on the student. But not to say, as I have observed on another occasion, that, even in this particular, research may at any time be unexpectedly and agreeably rewarded, it should be borne in mind that fossil collecting does not exhaust the wonders of the pursuit. There remain wide questions of physical geology to be solved; correlation of beds, the assignment to them of their proper place in the system; investigation of the causes that have conspired to produce the present condition of the earth's surface, and the like: and here particularly the study of the more recent beds that overlie the ancient rocks offers very great scope. Much work has yet to be done, and not least in this county of Hereford, in regard to glacial and other drifts, work which may not only help in determining the forces that resulted in the existing configuration of hill and valley and their direction, but which may possibly throw light on that most interesting subject, the antiquity of man. And it is the aggregate of individual observations that

supplies the evidence on which the resolution of such great questions must rest. Sir Roderick Murchison's world-famed work in Siluria was built in no small degree on the data furnished by unnamed observers. Apart, however, from any consideration of original discovery, there is so much that is engaging in the study for its own sake—as indeed of what branch of natural history may this not be said?—such pleasure to be drawn from any old stone wall, or heap of road metal, such endless marvels to be noted, such grandeur of conception, such healthy exercise of the reasoning powers, to be gained from it, that I may well find my warrant for urging the subject on the attention of members.

I remark what appears to be a great loss in some of the later numbers of our *Transactions*, that, I mean, of the meteorological notes which used to be published in them. The papers on this subject communicated by the late Mr. Isbell and by Mr. Southall, seem to me to have been contributions of very much value indeed. The science of Meteorology is one that has made, we all know, very marked progress in recent years, and one too which will probably be continually still further developed, and invite still more close attention to deduce if it may be from ascertained phenomena the laws which govern atmospheric movements. Something may be done to further such a result by reducing to system observations, the weak point of which at present is that they are desultory, isolated, and without a plan. To acquire a set of such instruments as would entitle an observer to the consideration of the British Association would be an expensive affair, even if many had the leisure or the persistency to use them when acquired. But it has occurred to me that the Club might be doing a work of some utility if it could systematize, over the district with which it is connected, so simple an operation as registering the daily rainfall. The sparse efforts of individuals who register rainfall already, though not without their value as their records are tabulated by Mr. Symons, need to be largely supplemented before they can be considered very efficient aids to science. But would it not be possible to organize a network of such observations, more or less close, over the county? Suppose that the district were mapped out, and members of the Club, or those whom they might be able to secure the co-operation of, were to undertake the charge of rain-gauges along the courses of the principal rivers and streams, over plains such as the valley of the Lugg at stated intervals, within defined areas of the more hilly parts of the country, the comparison of the results arrived at in the course of years might, I conceive, prove of much use. They might bear their part in the composition of the story, which should tell more decidedly of the path of storms, of the prevailing currents of winds, their force and what occasions them, of the circumstances which accompany or determine the succession of fine and bad weather. Nor do I think it is wholly imaginary to foresee some economic benefit arising from the adoption of such a plan as I have alluded to; if, that is, it be so, as many, myself among the number, are disposed to think it will be so, that the storage of water will come in process of no very long time to be thought worthy of more serious consideration by the people of this country than it meets with now. I submit the idea to you, and for my own part should be happy to do anything I could to reduce it to practice, if it were thought feasible.

One more point I should like to be allowed briefly to advert to ; it is this. Can the Woolhope Club do anything to promote the establishment of Science Classes in this city? The importance of technical education, including, of course, instruction in science and scientific processes, is assuming a greater prominence in the public eye every day, and no long time will probably elapse before practical steps are taken to put it within the reach of the artizan population, if not to enforce it. To teach science badly is worse than not to teach it at all, and we have unfortunate proof of how false and hollow so-called scientific teaching can be, how little it can do to develop the intelligence, or to fit the reasoning powers to grapple with scientific problems, in the present treatment of Science as a specific subject in the curriculum of our National Schools. It would be, I cannot but think, a great advantage if anything could be done in the direction I have indicated, and opportunity could be given in such classes as are held elsewhere, for the attainment of true scientific method, and sound principle. The question is, can anything be so done? My slight acquaintance with the late Canon Kingsley gave me some opportunity of knowing what a remarkable work he did in developing in the city of Chester a love for, and the pursuit of, science. True, and unhappily so, Kingsleys are scarce. Something might be done by humbler men notwithstanding, and I should be truly glad if we could see our way to lead the van. For this purpose it will give me the greatest pleasure to confer with any members of more experience than myself if what I have said appears in any way worthy of their reflection.

And now, gentlemen, I shall trespass on your patience but one minute longer while I offer you my sincere thanks for the indulgence you have shown towards me, and for the very high compliment which you have once more paid me. The invitation to be your President in the first instance was as unexpected on my part, as I am sure it was undeserved by me. Still less was I prepared for the additional, and, I may add, somewhat unusual, honour you have conferred upon me in electing me to the Presidency for the second time. Believe me that, though I am profoundly conscious of my own demerit, a consciousness which is accentuated as I look over the list of the illustrious men whom I succeed, I am equally conscious, as I told you a year ago, of an honest desire to do my best.

My endeavours
Have ever come too short of my desires ;
Yet, filled with my abilities.

The recollection of the kindness with which you accept those efforts, so little as they are, shall never cease to actuate me, as long as my connection with you and your Society shall last, and in whatever capacity, in constant purpose with the utmost of my power to add to its usefulness and to maintain its prosperity.

Woolhope Naturalists' Field Club.

MAY 24th 1888.

IN real Queen's weather, on this our Gracious Majesty's sixty-ninth birthday, the first Field-meeting this year was held on Thursday, May 24th, in the neighbourhood of Kington, a district especially interesting to botanists and geologists. A large muster of members assembled at Barr's Court railway station; it increased in numbers by the addition of members picked up at intermediate stations, until upon arrival at Dolyhir station the muster roll was composed of the following strength:—Rev. Wm. Elliot, President; Mr. Charles Fortey, Vice-President; Mr. Thomas Blashill, a former President; Sir Herbert Croft, Bart., Drs. T. A. Chapman, J. H. Wood, Revs. T. M. Beavan, F. T. Havergal, E. J. Holloway, A. W. Horton, W. H. Lambert, A. Ley, F. H. Tatham, F. S. Stooke Vaughan, R. W. Warner, M. G. Watkins, and H. T. Williamson, Messrs. J. Carless, R. Clarke, W. J. Grant, S. W. E. Gilliat, G. H. Hadfield, W. H. Harrison, J. W. Lloyd, J. G. Martin, T. C. Paris, J. Riley, H. Wilson, with Mr. James B. Pilley, Assistant Secretary, and H. C. Moore, Honorary Secretary. The following visitors accompanied:—Revs. E. R. Firmstone, H. Gascoigne, A. Lee, and — Williams, Surgeon Peak, Lieutenant Jones, Messrs. E. W. Bowell, W. Carless, Hugh Croft, A. E. Edwards, P. Horton, W. Howell, C. W. Lloyd, A. Parker, — Wishlade.

The Rev. Wm. Bamford, Curate of Old Radnor, received the members at Dolyhir station, and introduced Mr. C. W. Lloyd, the manager of the Old Radnor quarries, which are contiguous to the station, who at once conducted the party first to the quarry facing the entrance to the railway station, which exhibited limestone metamorphosed by igneous action, thence to the neighbouring quarry of the more valuable Wenlock limestone, where he exhibited, amongst other fossils, a very perfect specimen of an *euomphalus* two inches in diameter. Mr. Lloyd then persuaded some of the party to cross the railway line to the quarries of Messrs. Field and Co., to inspect the laying of a charge of "Gelatine-dynamite" or "blasting gelatine." The superintendent of the blasting operations brought out of his portable magazine a cartridge enveloped in paper, about the length and size of the middle finger. Having broken it, he passed round for inspection the innocent-looking substance, gelatinous to the sight, and to the touch yielding on pressure. Applying a detonator upon the end of a fuse, dropping one or more cartridges into the borings in proportion to their depths, or to the amount of demolition required, in a few minutes, and so soon as the members had taken up their positions in safety, several demolitions were successfully accomplished. In comparison with demolition by gunpowder, the bulk, the caution and experience

required in the process of tamping, and niceties of calculation as to the position of the charge with the object of producing a result in the line of least resistance, all their desiderata are considerably reduced, which enables those experienced in blasting operations to sum up the advantages of gelatine-dynamite in one of great importance in these days of economy, viz., greater results with a diminution of labour.

The Rev. W. Bainford now assuming charge of the party, conducted it up the Yat Hill to Old Radnor Church, distant about half a mile, commandingly situated upon a rocky spur of Old Radnor Hill, and from its churchyard affording extensive views of the fertile valley of Radnor with New Radnor and the Radnor Forest in the background. Old Radnor Church, dedicated to St. Stephen, is among the most interesting edifices in the Diocese of Hereford. It has a well-built battlemented old tower at the west-end with six bells and a clock. The stone porch on the south side contains the remains of a stoup, also the upper portion of the ancient oak door, a central trefoil surrounded by quatre-foils. The nave is of four bays, 22 feet broad, south aisle 16 feet, and north aisle 10 feet, with chancel and aisle of same width, the whole having flat oak roofs ornamented with innumerable bosses and shields, said to be those of the ancient Lords of Radnor; the beams in the north aisle being specially massive, all being boarded over and covered with lead outside. The pillars are lofty, being octagon, with plain moulded caps and bases, pointed arches. There is a recess in the west wall with a stone seat, said to be a confessional, but this is very doubtful. A light carved oak screen (partly old or renewed in present century), runs across the whole Church, with projecting fan tracery on either side, terminating with a flowing pattern representing grapes and foliage, the modern design being mechanical and monotonous, but having a generally rich effect. In the chancel, four old stall desks remain, two of them facing eastward; an old book chain remains on the north desk. The four arches in the chancel are also filled with open carved screens. The very curious organ case fills one of the northern archways; it has richly carved linen panels on its front and sides; it has been judiciously repaired, and the interior well stored with a very sweet selection of 15 stops, by Walker, the London builder, in 1872. There is no doubt that the organ dates from the period of Henry VIII., and it is admitted to be the best and most complete example of an ancient organ remaining in England. The east window of five lights is filled with modern glass—five scenes in the life of our Lord, and five relating to St. Stephen, the gift of Miss Miles in 1882. In the vestry window there is a XV. Century representation of St. Catherine. There are Piscinas and aumbries in several parts of the Church, especially one on the south side of the altar four feet above the pavement, proving that the original altar must have been on a higher level than at present. Very interesting encaustic tiles are preserved in the south aisle, the vestry, and north-west corner of aisle. A fine early incised stone, with foliated ends to cross, is laid in the centre of the nave under the screen. An early arched tomb with a flat slab is placed in the north wall behind the organ. There are several good mural tablets around the Church, also three hatchments. The late Sir G. Cornwall Lewis is buried in the south aisle,

the eastern wall being occupied with a large marble monument, medallion and female figure seated, to memory of Thomas Lewis, of Harpton, A.D. 1777. The pulpit is an octagon, finely carved in oak. The seats throughout are stained with a dark colour, with carved poppy heads. The pavement consists of modern red and buff tiles. In the vestry two paintings of Moses and Aaron are preserved; also a Norman capital, the sole remnant of an earlier Church. The font is a very large and rude block, about 46 inches in diameter, somewhat oval, with a bowl amply sufficient for total immersion. It stands on four short and massive legs, and has a modern oak cover. The registers commence in 1682. The following may be consulted for further information:—Notes and Queries, Series 6, August 5th, 1882. Hist. of Radnorshire, by Rev. Jonathan Williams, 1859, which gives an illustration of the screen, page 135. Diocesan Calendar, 1878-83. Arch. Camb., Vol. ix., 3 Series, p. 366.

Leaving the Church, the members ascended Old Radnor Hill, on the summit of which the Honorary Secretary, Mr. Moore, in the much-regretted absence of the author, Mr. Richard W. Banks, President of the Club in the year 1860, read a paper on "The Four Stones," four boulders of volcanic rock situated in the valley, near the Knap farmhouse, about a mile north of Old Radnor Church, and of the same character as many other boulders scattered about the neighbouring hills. Their heights above the ground average from five to six feet, and their distances apart from five to eight feet. Although the stones were not visible from Old Radnor Hill, in consequence of an intervening small clump of trees, their size and respective positions were rendered evident by various excellent photographs exhibited by Mr. James W. Lloyd. These stones may have formed, in pre-historic times, the supports of a large sepulchral chamber or cromlech. Local history traces no record of them previous to their presentation by a jury at a court held for the manor of Burlinjob and Ploughfield in 1767, as one of the bounds of that manor.

The descent from Old Radnor Hill was made by the Gore Quarry, with its altered Caradoc Sandstone; thence by Gore Chapel and Bilmore, where Mr. James W. Lloyd, by his local acquaintance, again rendered good service, obtaining permission for the party to traverse one field only, directly leading to the most easy ascent of Stanner Hill.

From Stanner Hill, the heights of Knill Garraway, distant about two miles north-east, as the arrow flies, were observed, with Herrock Hill in the foreground. The tracing of Offa's Dyke, built eleven hundred years ago, of which a small portion had been observed from the windows of the railway carriage upon the right hand, immediately after leaving Titley Railway Station, was conspicuous in the distance. Leaving Lyonshall, visible again at Flintsham and at Titley, it is again found in a very perfect condition passing under Knill Garraway, and, as now was witnessed, following the natural features of the hill round Herrock, whence it descends at its north end. After this circuitous route it proceeds for many miles in a northerly direction, and always on the Welsh side of the hill. Upon Stanner Hill the business of the Club was transacted. Rev. Augustus C. Lee and Rev. H. Gascoigne, also Messrs. A. C. Edwards (junior) and

Alfred Watkins were elected members. Rev. R. Remington was proposed as a new member.

Upon the western end of Stanner Hill, the President gave an address, rendered the more interesting and instructive from its treating of the structure of the ground upon which the members were standing, and of whose geological wonders they were witnessing so remarkable an example in the charming diversity of the surrounding hills and valleys formed by eruptions, and by centuries of denudation. Those who have not experienced the pleasures of studying the convulsions of nature in this neighbourhood are referred to Murchison's *Siluria*, and also to their description illustrated upon page 161 of "The Records of the Rocks," by the late Rev. William Symonds, who was President of the Woolhope Club in 1854. The western end of Stanner Hill overhangs the Stanner Rocks, forming a bold feature from Stanner Railway Station, luxuriating in an abundance of wild plants, in many places inaccessible, and so, fortunately, they have been allowed to escape extermination. The locality is known in the neighbourhood as "The Devil's Garden." The botanists and entomologists of the party could not resist the temptation of exploring this wilderness, and were missing until dinner time, but were rewarded for their adventurous climbing, as the result of the Rev. Augustin Ley's observations, hereafter to be published, will show.

The remainder of the party descended by easier paths, thence through the grounds of the mansion called Downfield, charmingly situated, with its gardens in terraces, and an extensive avenue of *Araucarias*, perhaps 40 years old; one which was selected for measurement was found at four feet from the ground to have a girth of 5ft. 4in. One was 30ft. high when the Club visited them in June, 1866 (see *Trans.* 1866, p. 168). The way home was now directed through Bradnor Wood past one or two excavations of Lower Ludlow, and skirting the Kington slope of Bradnor Hill to Bradnor Quarry—Downton Sandstone—where Mr. Richard Banks' hammer has rendered such service to Silurian and Old Red geology by the detection of a series of fossils in the Passage beds, where such characteristic specimens were unexpected. Thence retracing steps for a short distance down Newton Lane, where some outcrops of bone beds were occasionally visible, over the Black Brook, and by the side of the ancient fortified elevation, Kington was reached.

Upon emerging from Bradnor Wood, the upper portion of which was previously turf land, and about 40 years ago was planted with Larch and Scotch Fir, of which no vestiges now remain beyond a line of Scotch Firs marking its boundary, the attention of the members was attracted by a mound surrounded by a trench which had every appearance of having been used, perhaps at a remote period, as a roadway, being fully four feet or more wide at the bottom. The earth excavated from this trench formed the mound, ten to twelve feet high upon the lower slope of the hill. The appearance and dimensions of this Dyke correspond to those of Offa's Dyke. It is obvious that such a work would entail too vast an amount of labour to have been formed in recent times as an enclosure to the wood. While it is a matter of regret that time did not permit a more extended exploration of this trench and mound in both directions, it is to be hoped that members, local members especially, will soon be able to throw more

light upon its history. Mr. Banks suggests that as the almost adjoining farm is called Wall Stitch, it *may* have derived its name from the Dyke—Anglo-Saxon—(*Weal dich*).

Descending the hill from Kington Church into the town, upon each side of the road grow some very fine specimens of the Sycamore tree; one especially upon the left has several enormous arms proceeding from a bole which seemed scarcely calculated to bear so massive a superincumbent weight.

After dinner, held at "The Burton," Mr. Blashill read a paper "A Romance of Beetle Life," followed by the exhibition of photographic illustrations of "Earth pyramids formed by rain." Thanks having been accorded to our local guides, Mr. James W. Lloyd called the attention of the President and members to the ruthless carrying away of roots of the *Osmunda regalis* (Flowering fern) from the bogs of Rhosgoch (see Transactions, August 29th, 1879, page 181), in such a wholesale manner as to forebode its complete extermination. It has, unfortunately, become a marketable commodity much in demand; the supply, however, will shortly be exhausted, unless some measures be at once adopted prohibiting its removal. Upon this matter a representation will be forwarded to the proper authorities.

A pleasant field day was added to those already recorded, and the opinion was freely expressed that the neighbourhood of the more northern district—namely, that of the Nash Lime district—should be visited upon an early occasion.

GEOLOGICAL ADDRESS.

[By the President, Rev. WM. ELLIOT].

GENTLEMEN,—Twelve years ago I had the privilege, as Secretary of the Caradoc Club, of accompanying that body in a joint Field Meeting with the Woolhope over the same ground which we are traversing to-day: and here perhaps I may say that, as there appears to be only the very briefest announcement of that meeting in the *Transactions* of our Club—in marked contrast to the ordinarily very full notices of the kind—we (the Secretaries and myself) may find an excuse, if we want one, for electing to follow the traces of our previous footsteps on this occasion. On the day to which I refer we were happy in having Mr. Banks, of Ridgebourne, among our company, and in hearing from him, who is so well able, from his acquaintance with the locality and from his scientific knowledge, to give it, an address on the chief features of the interesting geology of this district. I wish much that we had Mr. Banks with us now, and might once again have the benefit of his instruction. In his absence, however, I have taken it upon myself to offer you a few words, begging at the same time your indulgence for what I fear may prove to be their weakness and want of interest. I would begin by saying that we stand at a point of the earth's surface which owes its peculiar configuration and the nature of some of its more striking rocks to the action of those mighty fire-forces which from time to time have burst through the enveloping crust from the central chambers of the globe. Stanner Rocks and Hanter Hill form links in an axial chain which runs from the Wrekin in Shropshire down to the neighbourhood of St. David's, and which includes the hills of the Caradoc and Lawley near Church Stretton, and the less conspicuous eminence of Wartle Knoll near the Craven Arms. The process by which volcanic eruption at the bottom of more or less deep seas forced upwards large molten masses through the deposits that formed the ocean bed is so obvious as not to need any enlarging upon. You can conceive the disturbance that would take place; you may see for yourselves the traces of that disturbance. These eruptions were accompanied by long cracks in the solidified, or partly solidified, beds, which were crumbled and bent by the pressure from beneath. Such cracks are called faults, and the result of them was to destroy the surface uniformity of the beds in question, raising some above their previous level, and depressing others. At the same time the rock material which came in contact with the molten flow would undergo naturally a process of roasting, or alteration in its constituent molecules. Now, you may see instances of both these phenomena arising from the protrusion of Stanner and Hanter here where you are. Following the direction of the upheaved axis, that is from N.E. to S.W., there are two such cracks or faults between here and the hill on which Old Radnor Church stands, and which we have just crossed. To the west of the one at the foot of Old Radnor Hill the Wenlock beds are thrown up, while on this side of it the Ludlow beds are brought down to meet them. The other fault, parallel to the former, and whose line may

be observed immediately below us, has (at Nash, to the N.E. of us) Wenlock beds on its eastern side brought up to meet the downthrow of Ludlow on the western. On the hill of Old Radnor, then, we were standing on beds of the age prior to the Wenlock, being to the westward of the fault first spoken of. These are the Upper Llandovery, or May Hill Sandstone and Conglomerate, above which lies the Woolhope, or Lower Wenlock Limestone. Some notes sent by Mr. Banks to Mr. Moore speak of altered Caradoc Sandstone in the quarry just opposite us at the north-east end of Old Radnor Hill. I was not aware of any exposure of Caradoc beds in this locality. But these are, of course, where you might expect to find them—*i.e.*, below the Llandovery. As this latter approaches the eruptive rocks of Stanner it loses its stratification, and acquires a crystalline character. You saw this in the quarry first visited at Dol-y-hir. Beyond Old Radnor the Wenlock shales succeed as far as the town of New Radnor, to the westward of which Ludlow Rocks occupy the district of Radnor Forest, onwards towards the volcanic district that extends from Llandeigley to Builth, with its rocks of Llandeilo and Lower Silurian age. Turning eastward we shall pass, on our way to Kington, over beds of the Ludlow formation till we come to those of the passage between the Old Red Sandstone and the Ludlow at Bradnor quarry: Downton Sandstones and tile-stones. Here portions of the large crustacean, *Pterygotus*, were found some years ago by Mr. Banks. To concentrate our attention, however, on the particular chain of eruption on which we are standing at this moment. Two inquiries suggest themselves in the consideration of any igneous protrusion; first, of course, what is the rock composed of, and next, at what period of the globe's history, dating by the appearance of different geologic formations, did the eruption which upheaved it take place? Taking this latter point first, it seems almost quite clear, at least highly probable, that the same subterranean action which uplifted the Caradoc and Lawley caused the volcanic outburst at Stanner and Hanter, and that this occurred when the Passage beds were in process of deposition. Here we have, as we have seen, the lower beds of the Upper Silurian—the Woolhope Limestone—disturbed and altered by the outburst. At the Caradoc range in Shropshire the equivalents of this Woolhope Limestone do not occur until you get some four or five miles to the eastward, the intervening space being occupied by strata of Caradoc, and anterior, formations. But (mark this), on the western side of the Caradoc Hill, and wedged in between it and the great fault that runs along the valley of Church Stretton, there is a small vertical outlier of Wenlock Limestone. It was through rocks therefore of at least as late an age as these that the Caradoc and its neighbour the Lawley were upheaved—through such rocks, in fact, as Stanner and Hanter burst through. Mr. Banks defines the period of eruption a little more closely. He judges, from the broken and compressed state in which the fossils of the larger mollusca of the Ludlow are found, near Kington, that the volcanic activity took place when as yet the Ludlow rocks were not completely solidified; and, from the character of the water-worn pebbles and other fragments that are found in the Downton Sandstones of Bradnor, that these Downton beds were then being laid down. Then, as regards the material of which these hills of Stanner and Hanter are composed.

If you look at the Ordnance map, you will see that the former of these is coloured crimson and the latter scarlet, signifying that the former is a mass of green-stone, and the latter of felspathic trap. Sir Roderic Murchison speaks of them as composed of greenstone and syenite; syenite being a rock in which the mineral hornblende takes the place that mica occupies in the composition of granite. Subsequent knowledge, however, seems to show that these eruptive masses are not composed of such purely volcanic material alone. Dr. Callaway has included them in the patient investigation which he bestowed on the Wrekin and the other Shropshire rocks of the same apparent date of outburst as these. In a paper read before the Geological Society in 1879, he describes the structure of these rocks thus:—"Hanter Hill is composed of gabbro on the east side, dolerite—or greenstone—at the summit. On its north-east slope is a small exposure of grey granitoid rocks." Professor Bonney having examined this granitoid microscopically, pronounces it an altered rock, and in general appearance similar to rocks of the same character near St. David's. "Stanner rock," Dr. Callaway proceeds, "contains similar gabbro and dolerite. In about the centre of the ridge is a grey compact felstone. At the north-east end is a dark grey grit, with obscure east and west bedding, and near it, to the south, is a quartzose breccia. In the same locality is seen a grey granitoid rock, similar to the specimen at Hanter Hill." Now in his examination of the Wrekin and Caradoc rocks, Dr. Callaway has become persuaded that these rocks are composed of deposits of a pre-Cambrian age—that is to say, of an age preceding that when the old rocks of the Longmynd were formed—which have been thrust through the surface of later overlying rock by the eruption of the molten greenstone. On each side of this igneous axis, as he has observed it in Shropshire, he finds lines of fault. And he finds, too, that the bedded tuffs and felspathic rocks which are on the surfaces of the hills strike transversely to the general strike of the strata which are thrown off from the sides of the erupted masses. Hence he concludes that there underlay all the series of rocks which we reckon from the Cambrian upwards, a regular formation of earth crust of which the strike that the beds assumed was transverse at varying angles to the strike of these latter. And that when the volcanic force began to operate, the greenstone produced drove up wedges of this underlying bedding through the cracks made by the faults above mentioned. Now he has hesitation, he admits, in referring the composition of Stanner and Hanter Hill to these pre-Cambrian times; in other words, in expressing a definite conviction that the Granitoids and Felstones and Breccia which I have spoken of as existing here are the metamorphosed representatives of the old pre-Cambrian earth crust shoved up from beneath, which he has identified to his own satisfaction and that of others as appearing at the Wrekin and the Caradoc range. But you will observe that in his description of the structure of this rock of Stanner, he speaks of a certain "grey grit at the north-east end, with obscure E. and W. bedding," as if he detected the phenomenon of that transverse strike of upheaved beds which are indeed plainly to be seen at the other localities he mentions. I suppose that if further research in this neighbourhood should prove the existence of definite faulting on the eastern side of Stanner as well as on the western it would go far to

strengthen his hypothesis that these rocks, too, are of the same pre-Cambrian age as the other rocks in the axial chain of which they form links. Any way large modification of the conclusions to which both Sir R. Murchison and the Ordnance Surveyors came as to the purely volcanic character of these rocks seems necessary here as it has been found to be elsewhere. Any way, too, the speculation as to their origin (containing as it does a high degree of probability), is an exceedingly interesting one. We may be, and I cannot help but think that it is very likely that we are, standing on what, in its unaltered condition, formed the surface of hills and valleys of a dry ground ages before the slates and shales and sandstones of the old Longmynd were being laid down at the bottom of Cambrian seas; we are taken back in thought to a period when, so far as the record of the rocks can guide us, life had not as yet dawned upon this planet, to a dim distance separated probably from the age of the lowly Trilobites of the Silurians by an interval of time as vast as divides that long past day from our own.

THE FOUR STONES, OLD RADNOR.

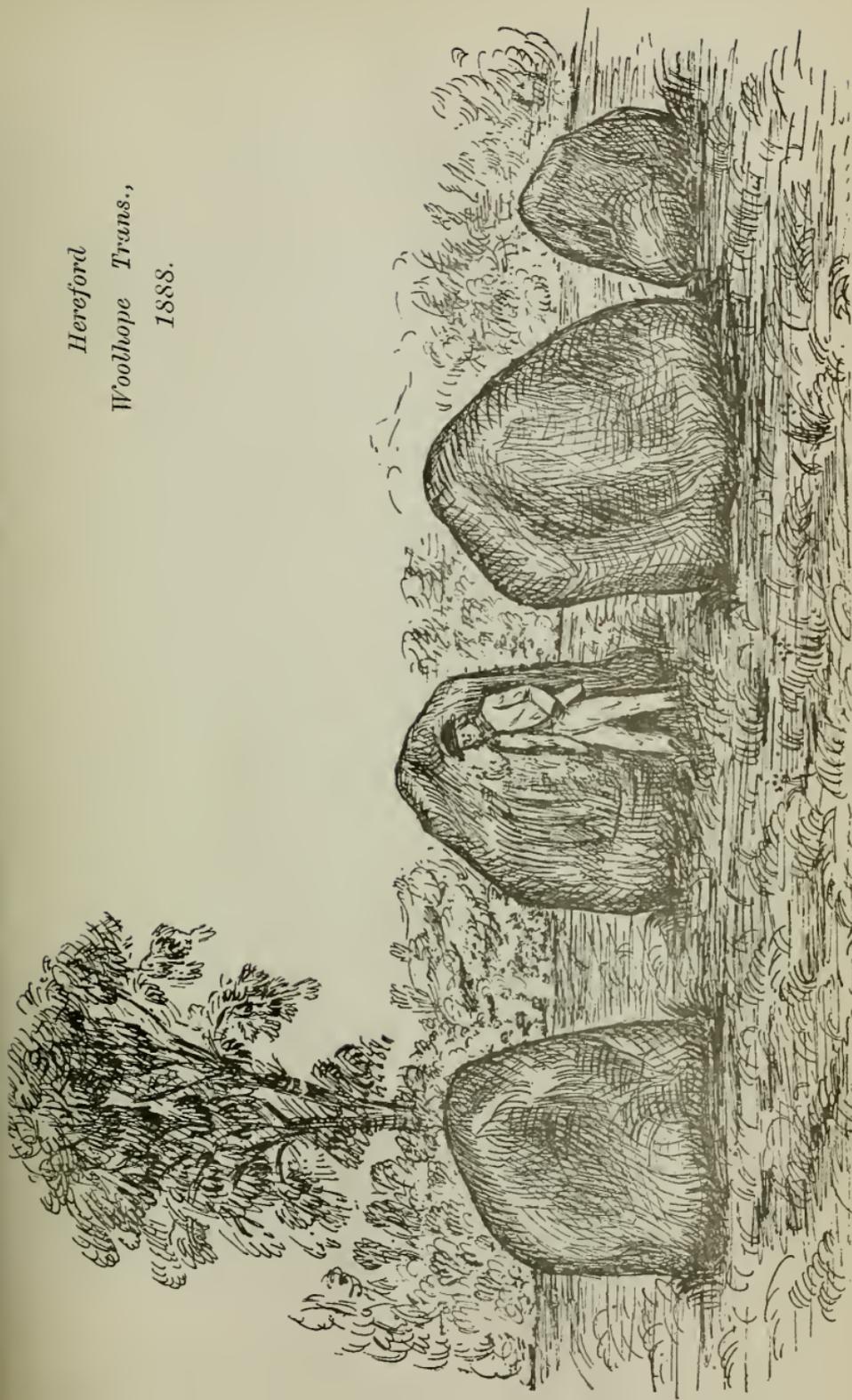
[By Mr. RICHARD W. BANKS].

AMONG the objects visited by the members of the Cambrian Archæological Association, on the occasion of the Kington Meeting in 1863, were the Four Stones, probably the only existing remains of a cromlech in Radnorshire. A good account is given of them in the summary of the excursion (3rd Series, Vol. ix.), but no drawing was made, and the dimensions of the stones were not ascertained; there is, therefore, room for further particulars. The stones are placed at the corner of a large arable field in the midst of the fertile level plain, which occupies a great part of the parish of Old Radnor, and are approached by a road which branches off from the turnpike road to New Radnor at a farm house called the Knap; on the north side of the farm buildings is a large and elevated round tumulus, covered with trees, and on the opposite side of the turnpike road, nearer to Harpton Court, are two other circular mounds, much depressed, with a large boulder lying by the side of one of them. The four stones are about half a mile distant from the Knap. Their position will be better understood by a reference to the drawing, which is taken from the south-west; to the north the high land of Radnor Forest bounds the view. The notion of the writer of the former account, that the stones once formed some of the supports of a covering stone of a large sepulchral chamber, appears probable. The prevalent local tradition which he and the author of the *History of Radnorshire* record, that the font in Old Radnor Church was hewn out of one of the missing stones, shows that the supposed removal took place at a remote period, and is so far valuable; but an examination of the four stones does not support the tradition of the use which was made of one of their missing fellows, for they are clearly erratic boulders from the adjacent volcanic rocks of Hanter or Stanner, of which a very truthful and picturesque sketch is given in *Murchison's Silurian System*. Any local stone mason would, on examination, at once say that the four stones could not be dressed or hewn into a regular form, as they would shatter into irregular fragments when broken or dressed. The volcanic rocks referred to are about two miles to the south of the four stones. The boulders which have proceeded from them are plentifully strewn, intermixed with rocks of Old Radnor Hill, on Bradnor Hill, and Hergest Ridge; the current of the drift having set towards the south-east. Notwithstanding the constant use of these boulders for road materials, many of the larger ones remain; boulders of a large size may still be met with in the Whetstone, near the race-course on Hergest Ridge, and on the Beasty, Grove, and Bage Farms on the northern and southern sides of the Ridge. The builders may, therefore, have gone only a short distance to the south of the site for their materials. How long they have borne their present name is uncertain; but it appears that a jury, at a Court held for the Manor of Burlinjob and Ploughfield in 1767, presented the four stones as one of the bounds of that

Manor. It may, therefore, be reasonably inferred that this was the name handed down to that time by tradition, and that the steward and the jury in their use of the name were perpetuating a previous record of the boundary of the Manor.

It only remains to give an account of the dimensions and position of the stones as they now are : the space within them is about 13ft. wide, the south-west stone is 5ft. high, and 13ft. 9in. in circumference; that to the south-east is 4ft. 10in. by 12ft. 3in. round; an excavation showed that this stone is embedded 2ft. in the ground. The north-west stone is 6ft. high, and 15ft. 3in. round, and the north-east stone 4ft. high and 11ft. round. The relative distances at which they are placed are :—North-west to north-east, 8ft. 4in. ; north-east to south-east, 5ft. 6in. ; south-east to south-west, 7ft. 6in. ; south-west to north-west, 7ft.

Hereford
Woolhope Trans.,
1888.



THE FOUR STONES, OLD RADNOR.

R. CLARKE, DEL.



“A ROMANCE OF BEETLE LIFE.”

[By Mr. THOMAS BLASHILL.]

A few years ago, being at Naples with my wife, we went out to wander for a day among the ruins of Pompeii. Whether you like it or not (and as it happened we did not need it) you must be guided and guarded there by a Government official, responsible that no mischief is done by you to the contents of the exhumed city. The guide allotted to us spoke a sort of French, but we found that he had increased the difficulties of communication between us by getting under the influence of liquor, though the day was still young. He was shocked when this was pointed out to him, and entered into such ingenious explanations of the peculiarities in his gait, speech, and countenance, that I was in danger of losing my case against him, and perhaps my temper too. Our discussion was, however, cut short by an attack of illness that compelled him to recline under the shade of a large monument in the Street of the Tombs, where he soon fell fast asleep. A condition so unusual with these sober Italians surprised us, and we could only conjecture that he had learnt this bad habit where he learnt his French—our opinion of the French nation falling a little in consequence. However that might be, we were, through no fault of our own, left free to roam about the city as we would; and yet, I will say, that my collection of Pompeian antiquities is smaller than that of any other visitor whom I know.

It was a brilliant day towards the end of April; the sun brought out everything in bright light and black shadow. Passing over a paved space, once the atrium of a large house, we noticed something moving among the fragments of brick thinly scattered about the surface. It proved to be a dirty-looking, whitish brown, irregularly round ball that was being pushed along by a pair of large-sized black beetles. It was, perhaps, an inch and a half in diameter, and had the appearance of a small potato, but was, evidently, rather light. What struck us particularly was the intense expression of energy and haste in the movements of the beetles. They stood well up to their ball, much as a pair of boys might do against a snowball half as high again as themselves. They seemed to push with intelligence and in concert. One of us thought they applied their shoulders to it. When it swerved aside, or was checked by an obstacle, or shot ahead more freely than they had foreseen, one, if not both, would fall down, or be even overturned, and then the struggles he would make to right himself, and the scrambling to make up lost ground, were a sight to witness. Upon the same paved space three or four solitary beetles were seen, each engaged in the same task, and looking like a pigmy Sisyphus rolling his stone. Indeed we could imagine that we had come upon a race of Lilliputians, and could almost fancy we heard the panting and the words of mutual encouragement that with human beings would have accompanied such exertions. So, when the inevitable impulse to capture and kill came upon me—the desire to exhibit the beetles and their burdens to the members of this Club—I was checked by a sentiment of brotherhood,

and felt it would be a crime to raise my hand against them. Whether they were laying up food against the winter, or, as seemed more likely, were making arrangements for the next generation of their race, they were far beyond my wisdom, and sacred at least for me. I would as soon have killed the mother bird upon her nest.

We were surrounded by scenes of grandeur and beauty and historic interest that men traverse the world to look upon, evidences of man's life and labour more than eighteen centuries ago. On the one hand Sorrento and Capri standing out from the blue waters of the bay; on the other Vesuvius solemnly smoking high up over all. We were not entomologists. The dazzling glare was unfavourable to exact observation. Time was short. I had therefore to leave the spot consoled with the hope of finding somewhere an account of these interesting creatures, perhaps their life-history. Other occupations have, however, stood in the way of careful search. One desires to find in books on natural history something more than quotations from old writers and such descriptions as might be taken from a specimen transfixed by a pin. Descriptions of this beetle in the books that bear the names of Kirby and Spence, of Cuvier, and Sir William Jardine, do not convey the notion that the writers had themselves seen what we saw. Therefore, in telling my story, I feel I am in a measure offering my own ignorance diluted with that of these stale though respectable authorities.

My beetle seems to be *Ateuchus sacer* (the *Scarabæus sacer*, of Linnæus) the same as, or very nearly related to, the *Scarabæus* so freely illustrated in Egyptian art, though this is shown in Cuvier as a smaller and brightly coloured insect. There seems, however, to be no difference in instinctive habits. They are common throughout Africa and the south of Europe. The two sexes look precisely alike, which is uncommon with beetles. Their practice is to enclose the egg or eggs in a pill or pellet (which, from its size, I should call a ball) of dung, usually that of the horse or ass, which they employ in a moist state and allow to become partially dry before moving it. They then *turn their backs to it* and roll it along with their hind legs, pushing also with the extremity of the abdomen while they walk on their two pairs of legs that are free. This position is exceedingly curious, and we had failed to detect it. It perhaps accounts for the impression that the pair we saw were applying their shoulders to their ball. When they have got it rolled off the hard ground on which their materials are usually found and feel themselves on soft earth, they dig a hole and bury their treasure so that the offspring may, upon entering into life, find a supply of savoury food around it. One account says that they have previously prepared the hole, sinking it to a depth of three feet. One would like to know which of these guesses is correct. Each beetle is primarily responsible for its own ball, but it has no power of distinguishing its own from that of another, so that if you change the balls their owners go on equally happily with those that are substituted. If one beetle meets with an insurmountable obstacle, or trundles its ball into a crack, another will come to its aid; thus two and even three may be seen working in concert, and the difficulty is usually overcome. Perhaps the truth is that the second beetle has either lost or been beaten with its own ball, and, its instinctive tendency being unexhausted, takes up the

rolling with the next beetle it sees so engaged. Beetles of similar habits are common in America, where they have earned the name of Tumble-bugs. They increase so fast that they will clear away all the droppings upon the hard spaces in their neighbourhood, and are thus a sort of volunteer scavengers, purifying both earth and air. The material is the same as that which other kinds of beetles store up in a different way for the use of their young. This is about all that I have found which professes to be modern description.

It is not surprising that a creature so interesting should occupy a prominent place in both ancient and mediæval thought. The older Egyptians held the Scarabæus sacred to Osiris, the Sun-god. In their view the spikes that stand out from its head were rays. Its six legs had thirty joints amongst them—equal to the number of days which the sun spends in each sign of the zodiac. The ball was typical of the round earth, and was rolled always from east to west, the way of the sun. After rolling it for twenty-eight days, the duration of the lunar revolution, its owner buried it. Perhaps the better opinion as to the ancient belief is that the ball lay buried during the twenty-eight days. On the twenty-ninth day the beetle took it up, broke it, and threw it into water, when, through the union of heat and moisture, the young scarabæi were generated, and the process was complete. The individuals of this sacred race were thought to be all males, so that their young had to be generated in the dung during the interment. This power of self-generation was an item of very grand importance in their reverence for the scarabæus. Figures of it, made in gold and all precious as well as cheaper materials, were worn as amulets, and enclosed with the dead in tombs where they are found in vast quantities. I understand they are now manufactured largely at Birmingham to supply the demand for Egyptian curios! It was even carved of gigantic size out of masses of granite. To the modern Egyptians it is an emblem of fertility, and as such is believed to be efficacious taken inwardly.

In the earliest entomological work published in Britain, "Moufeti Insectorum sive minimorum Theatrum, London, 1634," the virtues and uses of the scarabæus are displayed at great length. It is said to invite to modesty, temperance, labour, magnanimity, justice, and prudence. While writing this paper, I have endeavoured to cultivate such of these most useful virtues as would aid me; and, having regard to its deficiencies, I can only hope that those who listen to it are in possession of the rest. In order that we may study it, and, if necessary, invoke its aid, our past President, Dr. T. A. Chapman, has brought a specimen of *Ateuchus sacer*, together with two other allied species of similar habits, *Cuvieri* and *laticollis*.

I do not bring this subject before the Club as one that has any distinct bearing on the natural history of the county of Hereford, but rather with the view of suggesting that entomology has received but scant attention from our members. Perhaps a careful study of insects that are common here may yield results approaching those obtainable from this scarabæus with its mixed history of fact and fable. We have good practical entomologists amongst us, in proof of which I would instance Dr. Chapman's most interesting life history of the dung

beetle—*Geotrupes stercorarius*—in our *Transactions* for 1873. But, as a rule, I will say of writers upon this, as most other branches of natural history, they generally leave off just where one would wish them to begin. It is most necessary, and in a degree interesting, to know as to such a beetle as this, the number of joints in its limbs, and the kind of hairs that clothe or protect its under surface, and these are given pretty fully in the ordinary books. But this is but work for clerks. What one wants to have is trustworthy details as to its habits of life, so as to arrive at some better understanding of that mysterious force which impels it, blindly and motiveless, as it seems, to actions which conduce to its preservation or to the continuance of its race. One wants to know more about the degree in which our own actions are prompted by similar impulses, and how far reason is limited to ourselves. We are not, I think, at this day, exactly in the position which the great philosopher described—that of children gathering stones on the seashore, while the ocean of truth is unexplored, nor are we like one who stands on his threshold peering out into the dark, helped only by such light as he may hold out and aloft. We look out into brilliant day some with keener perceptions, better instruments, greater enthusiasm, more patience, than the rest; but each one, as he sees farther and clearer into the distance, helping and encouraging his fellows to still farther and clearer views.

Thinking of reason reminds me of our delinquent guide. Rather late in the day he was, as we knew from distant peeps, in anxious search of us. We heard from other guides that if he failed to find us, or if we complained of him, he would be severely punished, probably dismissed. I shall never be a Justice of the Peace, but it is a fine thing to train oneself for an unattainable position, as a preparation for any lower one that may be within reach. Here was a fine opportunity for practice. I felt very stern towards him, but must not forget to be merciful, remembering that the culprit had probably his own ball of domestic responsibility to roll like the rest of us. When we allowed him to find us he was prepared to make forgiveness easy, in a way that may be worth the attention of any criminous person who may read this paper.

Having provided himself with one of the rich ripe oranges of the country, fresh plucked, the green leaf still upon the stalk, he presented it to my wife to distract her attention. Then, begging many pardons, he asked me if we came from Inghilterra, and seemed delighted to find that that was so. "For," said he, "now I will confess to the Signor I *was* drunk this morning. The wine was bad, but I had had too much of it. Your excellency will not mention it against me down yonder? As an Englishman, the Signor will understand my weakness and overlook it!" I do not know what you would have done, but a touch of nature—an appeal to a fellow-feeling is with me irresistible—the man was pardoned. La Signora, who, under the influence of the fragrant orange, had been seeking excuses for him, was a little shocked at first to find the nature of that which had prevailed with me. But time, the great consoler, has wiped out all that: we now only remember the incident as a sort of frame that encloses the recollection of the grander scenes, the older associations, the deeper and perhaps unfathomable mysteries that rendered this day at Pompeii so bright and memorable.

This paper elicited the following observations from Mr. J. Hutchinson, London, June 27th, 1888, in a letter to the *Hereford Times* of June 30th, which shews that my new friend is even more important than I had thought:—

“A ROMANCE OF BEETLE LIFE.”

May I be permitted to point out that it is not quite correct to say, as Mr. Blashill does in his paper on Beetle Life, that “the earliest entomological work published in Britain” was Thomas Muffet’s “*Theatrum Insectorum?*” I am aware that James Duncan (following, perhaps, Swainson) in his volume on “Beetles” in the “Naturalist’s Library” (from which popular work Mr. Blashill seems to have derived this and most of his information), says so. But he was mistaken. Not to mention works like Bacon’s *Natural History*, in which the subject of Insects is treated incidentally, I have before me a treatise entitled “*Hieroglyphica Insectorum . . . que in Scripturis sacris inveniuntur,*” etc., by Archibald Simson, printed in Edinburgh in 1624 (ten years before Muffet’s work was published), in which most of the Insects mentioned by Muffet are treated of, though from a somewhat different point of view. Amongst others there is a chapter devoted to the “Scarabeus,” containing the principal references to this sacred insect in the writings of the Fathers. These writings confirm the statements of the ancient naturalists concerning it, respecting its appearance, mode of propagating its species, etc., etc., and add also some curious particulars. For instance, Clemens Alexandrinus tells us that if the insect be anointed with ointment of roses it will die; and in like manner the wicked, being anointed with the oil of the Word of God, are destroyed, it being the “savour of death unto death” (unto them). *Nam fetidum animal (he continues) ex stercore nascens, suaves verbi divini odores ferre non potest.* The same writer further relates that, after Capua, a shield was proposed for Hannibal on which was a Scarabeus surrounded by Roses, to signify the effeminating of that warlike commander by the pleasures of that town. But the most remarkable reference to the insect is by St. Augustine, who calls Christ his Scarabeus—“*ille Scarabeus meus*”—not (he explains) because he was “unigenitus,” or that, being the Author of His own Being, He put on the form of mortality, but that in this our corruption He became involved, and from it by His own will became man. [*Quod in hac face nostrâ se volutarit, et ex ipsâ nasci homo voluerit.*] No translation can quite give the force of the original.

NOTES ON THE PLANTS OBSERVED ON THE
FIELD-DAY OF THE CLUB AT OLD RADNOR
AND STANNER, MAY 24TH, 1888.

[By Rev. A. LEY.]

THE season was late, and few flowering plants were observed. The ground covered lay almost entirely in Radnorshire; but a few notes of Herefordshire species gathered in the neighbourhood three days previously are added.

At Dolyhir, the Meadow Saxifrage (*S. granulata*, L.) was in flower upon the dry limestone rocks; and afterwards in similar situations at Stanner. This plant, in Herefordshire, is confined to damp meadows and woods.

Upon Stanner rocks most of the well known and characteristic species were seen. *Teesdalia nudicaulis*, *Mönchia crecta*, and *Cerastium semidecandrum* were in full flower; the first of them also on Old Radnor Hill. The rare Campion, *Lychnis viscaria*, L. was seen abundantly, and was just opening its flowers. It grows in the most precipitous parts of the cliff in company with *Rosa spinosissima*, the Bloody Crane's Bill *Geranium sanguineum*, the Stanner Stonecrop *Sedum Forsterianum*, and the showy *Veronica hybrida*, all of which were observed, but the visit was too early to allow of their being picked in flower. These rare plants are likely, we are glad to say, to hold their own against collectors for many years to come; occupying as they do a tolerably large space of inaccessible cliff; and there is no sign that they are now less plentiful than they used to be. Not so, the other Stanner rarity, *Solcranthus perennis*, L. which was hunted for to-day in vain. It may, however, still exist there, as it is an inconspicuous plant easily escaping observation. Among the less rare species which attracted attention during the day, chiefly at Stanner, the pretty little Tuberos Moschatel (*Adoxa moschatellina*, L.), the Sweet Cicely (*Myrrhis odorata*, Scop.), the Stork's Bill (*Erodium cicutarium*, Sm.), the pretty Bitter Vetch (*Orobis tuberosus*, L.), and Woodruffe (*Asperula odorata*, L.), the little Parsley Piert (*Alchemilla arvensis*, Scop.), and its more conspicuous relative the Lady's Mantle (*A. vulgaris*), the curious Herb Paris (*P. quadrifolia* L.), with *Cardamine impatiens* and *sylvatica* may be mentioned. Most of these are more or less rare, and are species which a naturalist is glad to see in a day's ramble.

Several rare Mosses were noted, at Dolyhir and Stanner, though the dry and hard east wind made the day unfavourable for their observation. Among these, *Funaria calcarea*, *Grimmia subsquarrosa* and *trichophylla*, *Trichostomum nitidum* and *Tortula intermedia*, *Fissidens decipiens*, and *Brachythecium albicans*, may be mentioned as rare or local species.

Very little botanical work was done in Herefordshire during the day; but one or two plants were noted in the Kington neighbourhood a few days before, which are thought worth mention.

Myosotis sylvatica, Ehrh., one of the species commonly cultivated in gardens, is at present growing along the banks of the Arrow, at intervals, for

nearly a mile, between Titley and Staunton. This species is a native in the midland and north-midland counties of England, but has never been observed in Herefordshire except as an outcast from cultivation. It is not likely to be anything more on the Arrow, especially as so conspicuous a plant could not well have escaped detection before. Still it would be well for some Kington naturalist to find out whether it occurs at other stations by rivers and brooks in this neighbourhood. If native, it would be an interesting addition to our Flora.

With the *Myosotis*, *Cardamine impatiens* grows in small quantities along the banks of the Arrow, as it does also on the Beastry farm, between Kington and Stanner. *Stellaria glauca*, *With*, was discovered somewhere in this neighbourhood a few years since, by Mr. Billiald, of Kington; as was also *Cardamine amara*, *L.*, both of them plants of extreme rarity in Herefordshire. A little further down the Arrow, but still in the Kington district, *Polygonum minus*, *Huds.* has its only known Herefordshire station; and in rich meadow land lying between Staunton and Milton Court, the Adder's tongue fern (*Ophioglossum vulgatum L.*), was noticed in two spots.

Uoolhope Naturalists' Field Club.

JUNE 28TH, 1888.

THE second Field Meeting this year was held on Thursday, June 28th. The members of the Malvern Field Club joined upon this occasion for an excursion into the Golden Valley. Although this district had been visited by the Club so recently as May 25th, 1882, there remained many objects of interest in the Valley deserving to be better known, and sufficiently attractive to draw together a large muster. Those members who had not already possession of the small book "The Golden Valley," by the late Rev. Thomas Powell, were enabled to make up this deficiency in their library upon their arrival at Pontrilas Railway Station, before entering the Valley by this, its southern opening.

Upon arriving at Peterchurch, the members were met by the Rev. Thos. P. Powell, who acted as guide throughout the day. He introduced the Rev. W. F. A. Lambert, the Vicar of the parish, who lost no time in conducting the members over his ancient Church. The very early history of this Church cannot be traced, but from its style of architecture it is apparently coeval with Kilpeck and Moccas. In "Liber Landavensis" there is no mention of any Church in the district of Eryng (Archenfield), which can correspond to Peterchurch, unless possibly it might be Llan Peter; for, in recounting many neighbouring Churches whose identity can be established, consecrated* by Bishop Herwald during his long tenure of nearly 50 years' jurisdiction over Eryng in the time of the Kings of England—Edward, Harold, and William the Conqueror—the following occurs:—"In the time of King Harold (Harold II. became king in 1066, and was slain the same year at the battle of Hastings) he consecrated Llansanffreit, and therein ordained Collwyn a priest, and after him his son Jenan. In the time of King Harold he consecrated *Llan Peter* under the heir of Ceidrych, son of Gwngu and Cadgen, and his sons Gwnna and Eutydy, and his sons Merchiawn and Cystennyn, and committed the care of the Church to the said priest Collwyn."

In a manuscript of Mr. James Hill, which, by the courtesy of the Very Rev. Prior Raynal, of St. Michael's Priory, Belmont, we have been allowed permission to peruse, we find a pen and ink picture dated Peterchurch, 7th July,

*See, on page 546 of "Liber Landavensis," a list of numerous altars re-consecrated. It must be borne in mind that at that period many Churches had been devastated, for instance, Llandaff was in ruins, probably the work of pirates. Amongst many Churches we can identify may be mentioned:—Sellack; Marstow a chapel to Sellack; Llansantffraid—Bridstow, near Ross; Llanbudgual, probably Ballingbam, see pages 410 and 418; Henllan Dyfrig—Hentland; Llanfihangel Caluch—Callow, near Dewchurch Magna; Llanbedr—Peterstow; Llan Junabin—Llandinabo; Langwern Teilo a Dyfrig—Llanwarne; Llandewi Rhos y Cerion—Much Dewchurch; Llandewi Cilpedec—Kilpeck; Llan Sant Gwainerth—St. Weonards; Llangynog or Llangunnoch about 1½ miles from Tretire, and 11½ miles south of Hereford; Llanfihangel or Mynwy, probably Garway, see page 503; Llanrothal on banks of Mynwy about 4½ miles N.W.W. from Monmouth.

1718. The Church is viewed from the north—the northern porch is represented—a cross in the churchyard—and a dial, with the following notes:—“About centre of churchyard are ruins of a cross, the top of which is preserved in the chancel of the Church.” “Ruines of a dial.” The site of the cross is apparently north of the porch, the site of the dial would be at the north-eastern angle of churchyard. At the present time, 1888, no trace is to be found of either cross or dial: the latter, however, existed in the memory of one of the workmen at the time of our visit employed in making preparations for the foundation stone of the restoration of the northern porch, which was to be laid on the following day. The earliest monumental record found by Mr. Hill, was of Ann, wife of John Smith, senr., of Wellbrook, ob. 25, Nov., 1636; and amongst about twenty others, the names of the Prossers, of Snowdle, or of Snowdhill, are most prominent. At present the earliest record deciphered in the churchyard—on a horizontal stone not far from the Norman arch in the south wall—is dated 1665. The tablet in the vestry under the tower, in memory of Eliza Leyghton, who married Rowland Vaughan, is dated 1640. The history of the restoration of this Church in 1869—1870, was recently read to the Club, and may be found on page 169 of the *Transactions* for the year 1882; nevertheless, our thanks are due to the Vicar, Mr. Lambert, for pointing out several overlooked interesting features in connection with that event, and with the history of the noble edifice itself. He had caused the altar slab to be uncovered, thus exposing to view the five incised crosses at the four corners and in the centre; the keen eyes of Mr. Piper also espied one of the dedication crosses on the left-hand side of the south doorway.

On the morrow, St. Peter's Day, June 29th, the foundation stone of the new porch was to be laid by Mrs. Percy Davies, of Porthmawr, Crickhowell, in commemoration of the 50th year of Her Majesty Queen Victoria's reign. The porch is to be erected at a cost of £180, outside the doorway on the northern side of the nave, opening into the churchyard in front of a grand old yew tree, which although it is difficult to measure on account of irregularities in the growth, may honestly be stated to have a girth of 30 feet around its hollowed stem.

The “Forge” was next visited. This building, like two similar structures on the Kentchurch property near Pontrilas, bearing the same name, must have been used for smelting furnaces, judging from the débris of imperfectly smelted iron ore which is exposed on the banks of the adjoining river Dore, and from the embankment enclosing the two acre piece behind the “Forge” being found, upon digging into it, to be partly composed of similar débris. The occurrence of these Forges indicates that the ore was brought—probably on backs of beasts of burden—from the distant iron districts to these timber-abounding spots. Although the distance appears, at first sight, astoundingly great, it sinks into insignificance when compared with what has been going on in the present day. The iron ore smelted in the furnaces of the Rhondda Valley and Dowlais works is transported 600 to 700 miles, by sea from Bilbao in Spain to Cardiff, and thence by rail to the works, nor was it until this present year, 1888, that some of the proprietors, having learned to their cost that it is not profitable to work for ore in the very deep workings of their own neighbourhood, instituted the removal of their works

to Cardiff, thus saving the railway transport thence of the ore which has already travelled so many miles by sea. Before quitting this subject, it may be mentioned, as affording an insight into the imperfection of the smelting furnaces of a few centuries ago, that a tenant within the last half century demanded and obtained permission of the proprietor to remove some of the heaps of débris at one of the Forges on the Kentchurch estate. The result of re-smelting the scoriæ proved profitable. At that period such refuse was worth 30s. per ton, whereas now it would not be worth more than 8s. or 10s., and would hardly pay its transport for a long distance, when the ore from Spain containing as much as 80 per cent. of iron is so readily obtained. During the seventeenth and eighteenth centuries the Roman iron scoriæ in Dean Forest were similarly re-smelted on an extensive scale.

It would be interesting to carry out extensive excavations at this Peterchurch Forge, as possibly, by the discovery of pottery and coins some clue might be afforded as to its history, as has been the case in other localities not very far distant. At Ariconium near Weston-under-Penyard, close to the old mansion of Bollitree, have been found Roman forges and smelting furnaces, probably employed for smelting the iron ore from the Forest of Dean,* which abounds in traces of Roman occupation, whence ore was transported from Lydney, over the Severn to Aust, and thence to a fabrica or smithery for making weapons at Bath, which was established by the Emperor Adrian. Forges were established by the Romans at Monmouth. Proceeding to latter times, in Appendix 1 to the Volume of the *Transactions* of our Club for 1868, page 270, we find notice of a paper dated "Wormeloe Hundred, Herefordshire, January 29th, 1695," wherein is stated that "there are several furnaces and forges for the spending of woods in Herefordshire; as Peterchurch Forge, Strangwood Forge, Llancillo Forge, Pontrilas Forge, St. Wannard Furnace, Bringwood Forge and Furnace," and reference is also made to some others. We have a place called Kilforge in the parish of Ballingham, on the boundary of Little Dewchurch parish, but we have not yet learnt the locality of the Forge there. A map of the sites of old forges in our county, "Gloomerys" or "Bloomerics" as they are called, forms a subject deserving the attention of any member who could find interest, time, and opportunity for collecting them.

Snodhill Castle, in the parish of Peterchurch, distant about two miles, was now visited, where, sheltered by its ruins, and by the shade of six old yew trees growing around its ancient Keep, the members assembled had the pleasure of listening to a paper (given in *extenso* below), by the Rev. Thos. P. Powell, who from his knowledge of the locality was so well fitted to give its history, so far as it can be learnt; any record left unmentioned in the handbook of his father was now sure not to escape notice.

Snodhill Court, an interesting example of a country mansion, now used as a farm-house, was next visited. It was rebuilt by William Prosser whose initials and date, W. P. 1665, occur in three places on the stone work outside. The house has a fine hall, with stone corbels supporting an oak ceiling, and a fine oak

*For old Roman workings of iron ore see "the Celt, the Roman, and the Saxon," by Thomas Wright, 5th edition, chapter viii., page 291, recently published, 1892.

staircase, richly moulded, leading to the rooms above. Some of the old oak doors remain with the original iron hinges and locks. There are two stone corbels over the entrance doorway which may probably have been taken from the old castle. In the front hall there is, on the left-hand side of the fire-place, one corbel richly moulded and carved with ball flowers and pateras, fifteenth century work. This, if in its original place, may have carried the sloping hood to the old hall fire-place; if not, it was probably brought from the Castle. There is no doubt that an earlier mansion existed here, judging from the masonry foundations of the house, and also from a room on the right-hand side of the entrance hall, which has a small stone staircase built within the wall leading to the room above, and lighted by a small slit in the wall. In this room was formerly the old armour described by Mr. Powell as having existed there up to within the last forty-five years. In the farm-building adjoining some of the quoins are chamfered throughout, showing that the stones were brought from some other building.

The walk was now directed through the outskirts of the village of Dorstone to Arthur's stone, though it must be confessed that a little *détour* was made, which, however contrary it might be to any part of the printed programme of the day, formed a very entertaining and refreshing quart d'heure. Our guide conducted the members to Dorstone Rectory, where Mrs. Powell gave them a reception most hospitable. Here were exhibited the ancient key of Snodhill Castle, rusty iron relics of ancient days and specimens of the botanical plants of the district; a spray of *Vicia sylvatica*; a Columbine (*Aquilegia vulgaris*); and amongst other specimens the rare *Doronicum plantagineum*, or Plantain-leaved Leopard's Bane. To please the taste of the ornithologist, there were birds and birds' eggs from the locality. Conspicuous amongst the birds was a young specimen in its early plumage, of a Gannet, which was not only caught in an exhausted condition in the neighbourhood, but was maintained for six weeks on meat and herrings.

The members thus gratifying their senses in this naturalists' paradise, were summarily called to attention by the sound of the bugle, and the advance was made upon Arthur's Stone on Dorstone Hill. Upon arrival there, Mr. Piper read a paper upon the subject of this pre-historic cromlech,* and after thanks had been accorded to him, the party proceeded to the summit of this hill, which goes by the name of Merbach Hill, whence a magnificent prospect opened to their view, embracing the hills of all the adjacent counties, with the double horse-shoe bend of the Wye in the valley immediately below. The quarry here is that of the Old Red Sandstone, and a cairn of stones formed therewith denotes the position of the Ordnance Survey Pole, at whose base the height of Merbach Hill is given in the recent survey of this year 1044·9 feet. The approximate calculation of 1050 feet made by Mr. H. Southall's aneroid barometer must be mentioned here in order to denote the usefulness of a good instrument of this character in the hands of a careful observer. We all know that variations in the barometer are produced in a few hours by atmospheric

*This paper is published in *Transactions*, 1882, page 175, and drawings of Arthur's Stone accompany it.

changes; therefore it is necessary to make allowances for such changes by comparison with a fixed barometer; and it so happened to-day that the barometer at Hereford remained throughout the day persistent at 29.7 inches. Under Merbach Hill have been found, says a writer in *Quarterly Review*, July, 1879, page 154, relics of a rough type of ancient local pottery.

The descent from Merbach and return to Dorstone was made by "Scotland bank," the name given to a dingle at the Bage, a hamlet at the northern opening of the Golden Valley into the broader valley of the Wye, a sheltered spot whose picturesque representation of wood, hill, dale, and rivulet in epitome, has not been improved by modern civilization, for now a precisely straight, lofty, and steep embankment bearing the Dorstone to Hay extension of the Golden Valley Railway traverses the dingle, just slicing off one extremity of an ancient large tumulus upon the opposite bank. This locality is one of the spots, of which there are several extant in Herefordshire, which retains its name in memory of the advent of the Scots under Lord Leven in 1645—for an account of which see Appendix xxvii. of Webb's *Memorials of the Civil War in Herefordshire*.

About half a mile from Dorstone, upon the right hand side of the main road from Hay, and almost touching the right hand post of a gate at the corner of a field, the members were halted by Mr. Powell in order to examine what was known as "the standing stone." When Mr. Piper had completed his examination, so far as it could be conducted, of the stone overgrown as it is with many years' growth of ivy, he could only come to the conclusion that so far as being "an old coarse stone about eight feet above the ground, and about a foot and a half broad," it coincided with the stone seen by Salmon 180 years ago, referred to in Mr. Piper's paper,* but as to "the figure of a cross made by cutting into the stone an inch or two, as we see them sometimes in churches," this could only be determined by investigation after the removal of the ivy and other overgrowth.

Dinner was the next business, served *al fresco* by the landlady of Pandly Inn, Dorstone, under the trees growing upon the adjacent ancient mound, misnamed Dorstone Castle. This is an earthen circular mound, elevated more than twenty feet above the natural surface of the ground, measuring ninety feet across the summit, and surrounded by a (now dry) moat. It bears more the character of a military post than of a tumulus: situated as it is in a line with the chain of defences extending from Clifford Castle, Scotland Bank, to Snodhill Castle, the fortified farm building at Urishay, and further southwards through Ewyas Harold to the important equilateral defence of Skenfrith, Grosmont, and Whitecastle beyond the valley, it may possibly have served as a post of observation in that chain. Mr. Geo. T. Clarke, in his *Medieval Military Architecture*, page 109, whilst enumerating no less than 38 sites of Castles in Herefordshire, disposes of the one now under consideration in the following short notice:—"Dorston, a Soler's Castle."

This mound is probably of remote antiquity. With the early invaders of our country, after the departure of the Romans, says Mr. G. T. Clarke, self-government prevailed: each family held and gave name to its special allotment.

* *Transactions*, 1882, page 178, line 29

This is the key to the plan of the later English earthworks : they were intended for the defence of a private estate, and not of a tribe or territory for the accommodation of fighting men. "These works, thrown up in England in the ninth and tenth century, are seldom if ever rectangular, nor are they governed to any great extent by the character of the ground. First was cast up a truncated cone of earth, standing at its natural slope, from twelve to even fifty or sixty feet in height. This mound, motte, or burgh, the mota of our records, was formed from the contents of a broad and deep circumscribing ditch." Whatever circular moated mounds may have been erected and used by the British in addition to their larger camps, the Saxons and the Danes have unquestionably left many behind, with names terminating in *ton*. Mounds, surrounded by timber palisades, were raised in the Saxon period by Edward the Elder, and his sister Æthelfred. A stockade of wood, like a New Zealand pah, such as is figured in the Bayeux Tapestry, was the form of this old English, and by no means un-Norman fastness ; Teutonic, not Celtic in its type.—*Quarterly Review*, July, 1879, page 153.

Dorstone Church was visited, but the alterations carried out about sixty years ago (1827) have swept away many beauties of the Mediæval and earlier periods of architecture. A small chantry chapel, on the north side of the Church, supposed to have been erected by Richard de Brito, one of the murderers of Thomas à Becket, was taken down in the course of alterations ; a stone in the shape of a window-sill was then discovered, with the following inscription :— "Hanc capellam ex voto ad Mariam Virginem, Ricardus de Brito dedicavit." Unfortunately, this stone has been lost. On this north side a very fine double piscina and corbel, probably belonging to this chapel, remain, built into the wall at its eastern end. They very much resemble, both in style and material, the beautiful piscina in the chapel of Grosmont Church. An arched recess on the south side of the chancel formerly contained a wooden effigy, also unfortunately gone. The gallery at the west end of the Church, into the erection of which the lower portion of the old Rood Screen, 15th Century work, has been introduced, has the usual richly-carved and perforated pattern of that period. The Benefaction Tables are interesting. One of them at the west end intimates that the donor has not left his gift "for dogs and swine," by which he meant "lazy, drunken fellows, but for deserving people."

There still remained the business of the Club to be transacted, and some papers to be read. For this purpose the Rev. T. P. Powell very kindly placed the commodious rooms of the School at the disposal of the Club. The Rev. R. Remington was elected a member, and the following gentlemen were proposed for election :—Rev. J. O. Bevan, of Vowchurch ; Rev. Willis F. A. Lambert, of Peterchurch ; Mr. E. L. G. Robinson, of Poston, in the parish of Vowchurch ; and Dr. Oswald Lane and Mr. Thomas Meadows, both of Hereford. The President reported for the information of members—firstly—that "The Herefordshire Flora" might be expected to be in the hands of subscribers at 10s. per copy by the ensuing autumn. Secondly, with reference to the republication of the very earliest numbers of the *Transactions* of the Club, viz., the *Transactions* of the years 1852 to 1865 inclusive, which were issued in the form of pamphlets, of

which perhaps only one or two complete copies are now in existence, that the names of eighteen more subscribers were required to reach the total of one hundred, before the work could be commenced, the cost of republication, as previously and frequently notified, being at 8s. 6d. per volume if only one hundred copies were subscribed for; 6s. if two hundred copies, and 5s. if two hundred and fifty copies were subscribed for. Thirdly, that he had represented to Major the Hon. Geoffrey Hill, as requested at the last field meeting of this Club at Kington, the threatened extermination of "The Flowering Fern" from the locality of Rhosgoch; and he had now the pleasure of informing the members that steps had been promised to be taken in order to prevent its wholesale extermination.

Papers were read, one by Mr. Thomas Hutchinson, on "The capture and preservation of Lepidoptera," followed by another by Mr. E. W. Colt Williams, who described the beauties of the chalice at Bacton.

So soon as the papers were finished, the train was due for returning to Hereford, scarcely giving time for the President to request the Rev. Thomas P. Powell to convey to Mrs. Powell and her family, on behalf of the Club, their thanks for the hospitality accorded in the earlier part of the day, and to express to the reverend gentleman himself a sense of their gratitude for the light thrown upon the Archæological history of the locality by the contribution to the *Transactions* of the Club of his paper on "Snodhill Castle."

A very interesting collection of specimens of Roman pottery, discovered in the neighbourhood of Vowchurch, collected by the late Mr. H. Jenkins, a surgeon, formerly resident in this neighbourhood, was exhibited by Mr. Walter Pilley, of Hereford. The hand lamps and hanging lamp were in a very good state of preservation. The collection included objects of domestic use in metal, such as rings, scissors, the well-known buckles and brooches termed *fibule*, and about a dozen of the bronze cutting instruments termed *celts*.

Appended is a list of the members who attended the meeting:—Rev. W. Elliot, President; Mr. George H. Piper, F.G.S., a former President; vice-Presidents, Mr. H. Southall and Mr. F. Bainbridge. Members—Revs. W. Bowell, E. J. Holloway, H. B. D. Marshall, Wm. Bagnall-Oakcley, Thomas P. Powell, D. Price, J. Stooke-Vaughan, and H. T. Williamson; Drs. T. A. Chapman and J. H. Wood, Major Doughty, Messrs. H. C. Beddoe, J. Carless, jun., R. Clarke, E. W. Colt Williams, Luther Davis, A. C. Edwards, S. Gilliat, W. Grant, G. H. Hadfield, W. H. Harrison, T. Hutchinson, J. W. Lloyd, T. C. Paris, H. Wilson, Mr. James B. Pilley, Assistant Secretary, and Mr. H. C. Moore, Honorary Secretary. Members of Malvern Club—Rev. J. H. Thompson (Vicar of Cradley), Messrs. Tom Bates, Sheppard, Hays; and the following visitors: Rev. J. O. Bevan, of Vowchurch; Rev. Willis F. A. Lambert, Rev. R. Remington, Messrs. Jenkins, T. Meadows, W. Pilley, J. Reynolds, W. Sharland, and A. J. Steples.

SNODHILL CASTLE.

[By the Rev. THOMAS PROSSER POWELL.]

“HEREFORD, Herefordshire, and the Wye,” a book by this title published a few years ago, was presented to me, and as a Herefordshire man I hoped to obtain some information and instruction from it, more especially about my own locality, the Golden Valley. What was my dismay when under the heading, “Golden Valley,” I came across the following observation:—“This from an artist’s view does not fulfil the promise held out by its name, the scenery being below the average.” “The remains of Snodhill are devoid of artistic merit.” “Peterchurch is utterly uninteresting.” The old story it seemed, “Dan to Beersheba, all is barren.” The man must indeed be of a mind void of imagination, handmaid of art, who can stand here on the ruin of this old Border Castle, where Lords of the Marches fought and sported, and loved, and say such a spot is utterly uninteresting. If such a place is devoid of interest, it can only be because we know so little about it. How difficult it is to sweep aside the cobwebs of ages and look into the dark corners of the story of these border chiefs! How seldom do we come across the record of the death of any one of them; how seldom do we find a stone to mark the place of their burial! Only here and there in a history of 500 years do we light upon a name out of all those that “when their time was come were not loth to give their bodies to the family mould;” and of the castles that they kept so bravely nothing but a few crumbling walls remain.

Now from its very situation, commanding the entrance to the Golden Valley, a district once far more populous and important than it is now, this Castle of Snodhill, Snothill, or Snodhull must have held no mean position amongst the fortresses of the Marches. It is thus described by Leland as he saw it somewhere about 1540. “There is a castell a mile and more benethe Dorston upon the right Ripe of Dour. It is called Snothill and there is a parke wallyd and a castle in it on an hill.” Look on that stretch of land lying opposite to us and south of the castle, woods, and rough land, here and there interspersed with pasture and plough and farm buildings, and you see what in Leland’s time was “a Parke wallyd.” That wood below you with its luxuriant foliage, and divided by deep dingles and running streams, some 40 acres in extent, is still called Snodhill Park, and to this day the legend exists, passed on from generation to generation, that in that wood lies buried a vast treasure not deeper than a hen could scratch. That whitewashed house upon the hill is called the New Lodge, a cottage to the right Old Lodge, again to the right the Park Farm,—names which all tell of the situation of “The Wallyd Parke.” On the top of yonder hill there is a stretch some two miles long of dilapidated walling, no doubt the remains of of the south boundary of the Park.

Return to the extract from Leland, and I find this remarkable statement—“And thereby is under the castle a Quarrey of Marble.” The meaning of these words I am quite unable to explain. There are no traces of any extensive quarrying in the neighbourhood, and certainly to-day the existence of marble is

unknown. But there is one thing that may perhaps be worthy of note. Camden writing of Snodhill uses these words, "Where there is a quarry of excellent marble." Camden, we know, was accused of being a plagiarist. Is this small matter simply a copy of Leland, or had he other grounds for his statement about this marble at Snodhill? "The castle is somewhat in ruine." That is Leland's sentence, and I will refer to it later on. "There is a Fre Chappell." The site of this chapel has been pointed out to me as being situated where yonder cottage now stands, and I have been told on good authority that at the beginning of this century some of the stone of the chapel, as also a portion of the castle wall, was used for the erection of farm buildings. It has been suggested that the string course on the wall, just below where we are standing, points to that portion of the castle as the site of this chapel. Blount of Orleton's MSS., 1675, has a reference to it thus:—*Nuper liberæ capelle fundatæ infra castrum de Snodhill dudum spectan.*" The same MSS. "Within this castle was a free chapel, but by whom founded I have not seen, howbeit Queen Elizabeth granted to Cecily Pickerell certain of her tythes in Snodhill, Fownhope, and Peterchurch." I would call your attention to a raised mound in the centre of the valley north of the castle surrounded by a ditch; this mound stood in the centre of a swamp or morass, not many years ago the home of large flocks of wild fowl. This morass is now converted by drainage into rich meadow land, but it still bears the name of The Splashes. It has been suggested that this mound was the site of the free chapel. It has also been suggested that it was a refuge for cattle in flood time—"Who shall decide when doctors disagree?" Between The Splashes and village of Peterchurch is some fine pasture land, which at the beginning of this century was unenclosed and went by the name of the Common Meadow, but long before its enclosure and sub-division, the right of depasturage had been absorbed by a few of the neighbouring landowners.

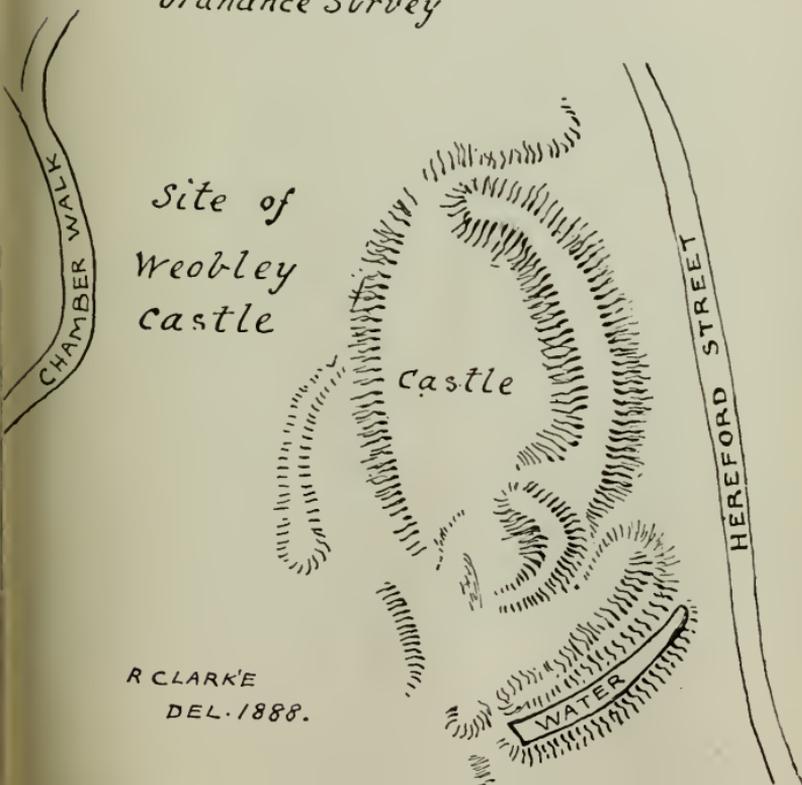
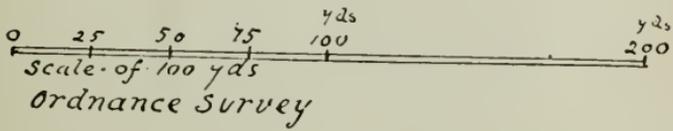
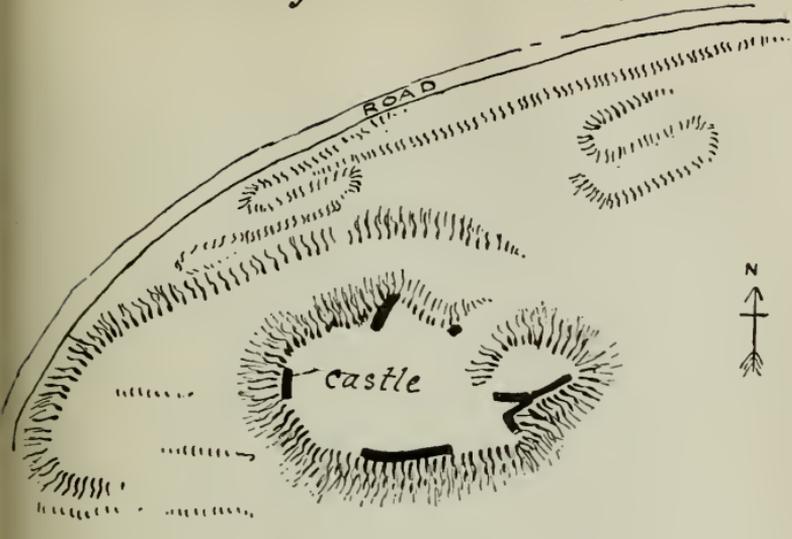
Having pointed out to you the surroundings of the castle and those objects which seem to be of any interest, as far as I can I will try and give you a sketch of its history. Mr. Robinson, in that excellent work "The Castles of Herefordshire and their Lords," says that the possessor of Snodhill at Domesday survey was Hugh l'Asne; I know that Mr. Robinson must have good authority for his statement, but neither in Domesday book nor in Duncumb's reference to it can I find any name resembling Snodhill. I should feel very grateful to one better informed than myself for an opinion or statement on this point. I find Hugh l'Asne in the list of proprietors of land in Herefordshire, that is all. Robert de Chandos came with William the Conqueror, and the Castle of Snodhill, with many other manors, was held for many generations by the family that he founded. In the year 1221 the King (Henry III.) granted the wardship of the lands, and of the heir of one Robert Chandos, to William de Cantilupe, whereupon Sarra, Chandos's widow, received command that she should forthwith give him possession of the Castle at Snodhill. Later on in this king's reign, this heir Roger, as one of the Barons Marchers, received command from the King to assist the Earl of Hereford in guarding the same. In the reign of Edward we find the son of this man Robert de Chandos taking part in an expedition into Wales as holding the

Remains of Snodhill Castle

Hereford

Woolhope Trans.

1888.



R CLARKE
DEL. 1888.



Barony of Snodhill. Roger, son of this Robert, received the honour of Knighthood, battling with Prince Edward, whom he attended into Scotland. In Edward III.'s reign, in 1354, Roger de Chandos *die quo obiit tenuit man de Snodhull, Wellington, et Fownhope*. In Edward III.'s reign, in 1376, Thomas de Chandos died without wife or issue, and with him terminated the Barony of Snodhull. The connection of the name Chandos with Snodhill did not then cease, for in 1404 we find Sir John Chandos, of Lugwardine, held the castle against Owen Glendower. This Sir John died without issue, and his lands passed to his sisters Alice Brugges and Margaret Mattesdon.

In the reign of Henry VI., that uncertain and little authentic period of English history, the great Earl of Warwick was possessed of the castle and manor of Snodhill. No less than thirty thousand persons are said to have daily lived at his board in the different manors and castles which he possessed in England; he was, as Hume says, "The greatest as well as the last of those mighty barons who formerly overawed the Crown." His gallant death at Barnet was the last blow to the House of Lancaster. He left two daughters, Isabel married to the Duke of Clarence, and Anne subsequently married to Richard III. Remembering the fate of the Earl and his sons-in-law, you will understand how by process of attainder Snodhill amongst other castles, passed to the Crown in the reign of Henry VII.

The castle and manor remained for many years in the hands of the Crown. From the Patent Roll 23 Henry VIII. it appears the King granted to Walter Devereux, Lord Ferrers of Chartley, Snodhill and all its rights and appurtenances for a term of twenty-one years at a fixed rent, "*Undecim librās, sex solidos et octo denarios.*" The same deed sets forth that the castle and land so granted were lately held by Richardus Herbert. In the month of June, in the fifth year of her reign, Queen Elizabeth granted as part of Warwick's and Spencer's lands, the Castle, Lordship, and Manor of Snodhill, to Sir Robert Dudley, Earl of Leicester. On the 19th October in the same year the Earl parted with the possessions in Snodhill to Hugh ap Harry of Aconbury, and George ap Harry of Poston. The retention of these lands by Lord Leicester for so short a period as four months shows that the grant by the Queen to her favourite was more to enable him to raise money than retain enjoyment of her gift. In the ninth year of Elizabeth, the ap Harrys sold the estate to William Vaughan of Hinton, in whose family it remained till, pressed by the necessitous times of the civil wars, they sold it to Nicholas Philpot, a lawyer in Hereford.

In 1653, the castle, manor, and a portion of Snodhill estate was purchased by William Prosser, of London; the other portions were purchased by different people, and again sub-divided into various small farms. I can find no evidence of military operations, either by siege or battle, connected with Snodhill during the Parliamentary wars; most probably the castle was in too ruinous a condition to be of any importance as a fortress. As the decayed bones of some Mastodon or Glyptodon, I have picked up these fragments of the history of Snodhill, its castle, and its Barony, but like an unskilled naturalist I am unable to put the complete framework together.

NOTES ON THE BACTON CHALICE.

[By E. W. COLT [WILLIAMS], M.A., CH. CH., OXFORD].

INASMUCH as up to four years ago only seven mediæval chalices of English workmanship were known to exist in Great Britain, the beautiful specimen of 15th Century art, which is so carefully preserved at Bacton, deserves more than passing mention. Since 1884 the researches of Messrs. Cripps, Fallow, and St. John Hope have brought to light some 24 additional Chalices and 50 to 60 Patens, and so well has the kingdom been searched that it is doubtful if another half-dozen Chalices can be found.

The existence of the Bacton Chalice as a mediæval one was unknown previously to 1886, when, with the kind permission of the Vicar, Mr. Harrison, I exhibited it at a meeting of the Archæological Institute in London. The other Herefordshire Chalice, that of Leominster, had been fully described years ago by Mr. Octavius Morgan. The rarity of these sacred vessels is so great that in most counties not a single specimen remains; Herefordshire is, therefore, singularly fortunate in possessing two Chalices and Patens in excellent preservation. The Leominster Chalice has been repaired most tenderly by and at the expense of Mr. George Lambert, F.S.A., of Coventry-street, London. The Bacton one is untouched. This silver-gilt Chalice is 5½ in. in height, 4 in. wide at the bottom from side to side of the hexagon foot, and 5 in. from "toe" to "toe." It consists of three pieces, bowl, stem, and foot. The bowl is secured in the hexagonal stem by a pin, the stem in the foot by solder. Midway the stem swells into a knop, pierced in its upper and under sides, and having a head in relief six times repeated, which, I have little doubt, is that of Our Lord. From the base of the stem the foot gradually slopes in hexagonal form ending at the union of each compartment with the next in a peculiar trefoil foot or "toe." It is this peculiarity, confined to a very few Chalices, which has enabled me to assign the date of its manufacture with some degree of precision, for neither Chalice nor Paten bear Hall marks. The Paten, also silver gilt, is 5 in. in diameter. The head of Our Lord, surrounded by the *nimbus*, and enclosed within a double circle, is engraved in the centre.

The Chalice of Old Hutton, in Westmoreland, an engraving of which I have brought with me, is almost a counterpart of that of Bacton, but it, too, is unmarked, and all that could be done was to assign the two Chalices to the end of the 15th or beginning of the 16th Century; but in September, 1886, the present Dean of Chester, Dr. Darby, was good enough to show me a little Chalice of 5 in. high, which he had acquired by purchase. This, to my delight, had the Bacton and Old Hutton "toes," and was Hall marked, the annual letter, though faint, being undoubtedly that of 1496. The maker's mark, as Mr. Cripps, whose work on Old English plate it is hardly necessary to say is the standard one, kindly informed me, was the same as that on the Nettlecombe Chalice,

co. Somerset, which Chalice bears the annual letter for 1479. It is, therefore, not unreasonable to suppose that the same maker who made the Nettlecombe Chalice in 1479, and Dean Darby's in 1496, also made the Bacton and Old Hutton Chalice, somewhere in or between those years, for be it remarked that Old Hutton, Dean Darby's, and Bacton Chalice have identically the same "toes." For reasons which it would take too long to state here, I prefer to consider the Bacton Chalice to be of the latter rather than of the former date, that is, to have been made between 1490 and 1500.

The next questions are: how did it get to Bacton? and how came it to remain there when scarcely a piece of mediæval plate remains elsewhere? Upon this point I would direct your attention to the engraved words which may be seen on the Chalice. The engraving of Our Blessed Saviour on the Cross with hands drawn up over the head to fit the shape of the hexagon is found on most mediæval Chalice, but the two words engraved on two hexagons are not so easy to understand. One is obviously John, the other was suggested in London to be Caputt or Capell: *i.e.*, the head of St. John; or the Capella, Chapelry of St. John. The first would have no obvious meaning; by the second we might understand that the Chalice once belonged to a Chapelry of St. John. I may say *passim* that Bacton Church is dedicated to St. Faith.

The fourth letter is, however, almost certainly "u" not "e," and to Mr. Fallow, of Redcar, I am indebted for the hint that the name was probably John Capull or Capell, the donor of the Chalice. In the Inventories of Winchester College he had found that there was once a Chalice inscribed with the name of "Johannes Bedill," a benefactor to the College, and again at Lincoln Minster that Dugdale had recorded a Chalice "having a scripture in the bottom Johannes Cynwell."

Here then were two Chalice—both long ago destroyed—inscribed with the donors' names, but the Bacton Chalice is probably the only one now existing in England, having the name of the giver engraved on it. I followed up Mr. Fallow's kind hint, and knowing that the family of Capels, of How Caple, had been an influential one, sought the aid of Prior Raynal, of Belmont, when he most kindly searched the valuable MSS. of the late Mr. Robert B. Phillipps. Here, he informs me, he finds record of John Capulle or Capell of the How Caple family, Mayor of Gloucester in 1484. This date might well fit the period of the Bacton Chalice, but it may be asked, what has the Mayor of Gloucester to do with Bacton? In answer to this question, with much diffidence, I venture to suggest that John Capulle, Mayor of Gloucester, gave the Chalice to the Fraternity at New Llanthony near Gloucester, that it was by them transferred to their brethren at Old Llanthony, and that the priests of Llanthony either gave it to Bacton or left it there for sacramental use. Bacton in common with most of the adjacent parishes, was, I believe, dependent on Llanthony Abbey, as regards both civil and ecclesiastical rights. But the Chalice may have been given to Bacton by a member of a family of Capel, apparently an influential one at Peterchurch in Henry VIII.'s reign. I find in the late Mr. Bird's MSS., Vol. iii., p. 73, an extract from Mr. Berrington's memoranda to the effect that Sir Richard Cornwall, Knight, sold lands at Halton [Howton?] and Didley, in the parish of St.

Devereux in 36 Henry VIII.—1545, to "James a Capel, of Peterchurch, gent," but I have failed to find any earlier connection between the Capels and Peterchurch than this date, or any settlement of Capels nearer to Bacton than Peterchurch. I should be grateful for any information establishing this connection. It is certain that the Chalice was at Bacton before 1553, since it was found there in that year by Lord Northampton's Commissioners.

After the Dissolution of the Monasteries a spoliation of the Churches also took place. Churchwardens and others seem to have made away with the Church plate freely. Even those occupying high positions were not ashamed to annex some of the Church goods. Sir Thomas Pope, an officer of King Henry's household, is credited with having "conveyed" one of the Chalices of St. Alban's Abbey. This he gave to Trinity College, Oxford, his own foundation, and there it happily yet remains. This spoliation having gone on for some years, King Edward VI. in 1553, the last year of his reign, issued instructions to the Marquis of Northampton and others to make inventories of "all manner of goods, plate, jewels, bells, and ornaments as yet remaining or any wise forthcoming, and belonging to any Churches, Chapels, Fraternities, or Guilds." The instructions run on, "leaving nevertheless in every parish Church or Chapel of common resort one, two, or more Chalices or cups according to the multitude of the people in every such Church or Chapel." [Cardwell's Documentary Annals, Vol. i., p. 110]. The rest was to be recovered to the King's use, and to go to the Treasury.

The Commissioners for Herefordshire were Sir John Pryse, Knight, Sir George Cornewall, Knight, and Thomas Dantzey, Esq. Their inventory is extant in the Record office, for an extract from which aunt Bacton I am indebted to Canon Phillott. They find at Bacton "one Chalice with Paten, gilt, 11 oz." and they note "Reserved, Chalice and Paten; cope of velvet coloured." Here then is our Chalice with Paten, silver gilt. I had them weighed in London, and their weight differs but one pennyweight from that of the Commissioners in 1553. But though "reserved" for the use of the parish by the Commissioners, the Chalice was now in great danger from Protestant zeal. During Edward's reign his injunctions had been published that "all monuments of feigned miracles, pilgrimages, idolatry, and superstition," were to be utterly extinguished and destroyed." [Cripps O.E.P., p. 155]. The Chalice would be such a "monument of superstition," inasmuch as adoration was considered to be offered by the priest to the Crucifixion engraved on the hexagon, while he elevated it in celebrating the Mass. There is a tradition at Leominster that their splendid Chalice escaped destruction in these critical times, by the Crucifixion having been cut out, and a plate of silver bearing I.H.S. having been inserted in its place. The loose piece of silver was in existence up to a few years ago.

In Queen Elizabeth's reign, the Archbishop of Canterbury (Matthew Parker) in 1569 asks in his Visitation Questions whether they [the curates or ministers] "do minister in any prophane cuppes, bowles, dishes, or chalices heretofore used at masse, or els in a decent communion cuppe provided and kept for the same purpose only." His successor (Grindal) in 1576 inquires at his Visitation, "whether you have in your parish churches and chapels a fair and



Woodburytype.

Eye & Spottiswoode, London.

BAGTON CHALICE AND PATEN.

Presented by Mr. E. COLT, M.A.



comely communion cup of silver, and a cover of silver for the same, which may serve also for the administration of the Communion bread." [Cardwell, Vol. 1, p. 356]. One of the Prebendaries of Canterbury, George Gardiner, in his reply to Parker's "Articles to be enquired of" in Canterbury Cathedral, says in 1567, "He would have their Chalice turned into a decent communion cup." [Fuller Russell in Arch. Journal, Vol. xxxv., p. 48]. Parker's suffragans were equally zealous in their Dioceses, with the result that nine hundred and ninety-nine out of every thousand of these beautiful chalices were converted into "communion cups." Entries are found in sundry Churchwardens' accounts giving minute particulars as to the weight of the old Chalice and new cup, the charge for fashioning, &c.

Whether the remoteness of Bacton in any way contributed to the preservation of this Chalice while all its neighbours disappeared I know not. At all events the only pieces of Pre-Reformation plate remaining in the county are the Leominster and Bacton Chalices with their patens, and a Paten at Norton Canon. The Elizabethan Paten cover of the cup at Little Birch was fashioned out of the mediæval Paten.

Or did Blanche Parry, Queen Elizabeth's favourite Maid of Honour use her influence to save it from destruction? We know that she was a staunch Church-woman. She is reputed to have worked the altar cloth and to have given it to the Church. She may have worked the curious designs on the cloth of silver which is the fabric, but they were certainly worked on a dress, not an altar cloth. Anyone may see this who looks at the uneven joinings of the pieces and who observes the caterpillars, frog, snails, dog, deer, &c., depicted with the needle upon the groundwork. The altar cloth is undoubtedly made out of parts of a Court dress of Anne Parry or some other period of Elizabeth or James I. She was a benefactor to the parish and lies buried in the Church. But did her Church views incline towards Rome or towards Geneva? If towards the former, it may be to her that the Chalice owes its present existence; if the latter could claim her, then it is owing to a series of lucky escapes that the Chalice remains here.

Anyhow; perfect in condition, this beautiful relic has during four centuries survived Edwardian spoliation; Elizabethan iconoclasm; Cromwellian desecration, and Hanoverian neglect. Let us hope that all future Vicars will follow the good example of the present one in taking excellent care of this, the most precious treasure that Bacton Church possesses.

Woolhope Naturalists' Field Club.

LADIES' DAY, JULY 17TH, 1888.

THE neighbourhood of Church Stretton (Stratum, a street), situated upon the old Roman Road, Watling Street, leading from Wroxeter (Uriconium) through Leintwardine (Bravinium) to Kenchester (Magna Castra), was selected for this day's excursion. Both the principal roads in Shropshire bear the name of Watling Street, one of which crosses the country from east to west, the other from north to south. As regards the etymology of the word, Bishop Butler says it is uncertain, but it may be corrupted from the name of Vitellianus into Vitelin or Watling Street. There is, however, no name for the road in the Itinerary of Antoninus. Mr. Wright says: "The Saxons, who planted their own local traditions wherever they settled, connected this wonderful work with one of their own mythic traditions, and called it Wætlinga Street, the road of the Wætlings or sons of Wætla, and it was celebrated down to recent times as the Watling Street, a name still retained by the portion of it which ran through London. King Wætla was, no doubt, a personage of the Anglo-Saxon mythology. The milky-way was also popularly called Watling Street, and it is mentioned under this name by Chaucer."

In Herefordshire we have examples of the retention of the name Stretton, or of one or other of its synonyms, in Stretton Grandison; in Stretton Sugwas near the ancient Roman camp of Kenchester, and in Stone Street on the opposite side of the Wye, in the parish of Madley, leading to this camp. We have also New Street between Dore and Dulas; Whitechurch Street between Goodrich Cross and Ganarew; Street Lane near Shuckenhill; Street Court and Stretford Bridge near Leominster, etc.

Carriages met the members at Church Stretton Railway Station, and conveyed them through the parishes of Hope Bowdler and Cardington to Plaish Hall, an interesting old Manor House, restored in the sixteenth century by brickwork incorporated into the earlier stonework, which was, by the kind permission of Mr. Edward Sayer, left open for inspection. After hearing a paper delivered by the President in the oak-pannelled parlour, seats were resumed in the carriages for the return journey through the village of Cardington.

Upon arrival at the base of Caer Caradoc at its northern extremity, the Rev. J. D. La Touche halted the party in order to point out in the lane an exposure of Hollybush Sandstone, a formation containing fossils earlier than any in the Silurian Rocks. The ascent of Caer Caradoc was made by the majority of the party upon its western slope, but, for the benefit of future

pedestrians, the ascent by the eastern side is recommended. A wide and deep vallum was crossed before reaching the oblong camp situated upon the summit, 1200 feet above sea level. The so-called cave of Caractacus is situated upon the west side, overlooking Church Stretton. Here also is collected in a natural hollow the drainage of the rainfall which assures at least a limited supply of water. As seven cities of Greece have all laid claim to the birthplace of Homer, so has Caer Caradoc contested with other localities the historical honour of being the site of the final defeat of Caractacus by the Roman Proprætor Ostorius Scapula; amongst these localities may be mentioned:—The Breidden Hills at the north-west base of which the river Severn flows. Cefn Carnedd, near Caersws in Montgomeryshire, and the three contiguous camps of Brandon, Coxwall Knoll, and Caer Caradoc, locally known as Gaer Ditches, near Knighton. That Caer Caradoc, near Stretton, should withdraw all claim is evident to any student of the account of the battle referred to in the “Annals of Tacitus,” Book xii., p. 32, 33, *seq.* which has been so clearly elucidated in the paper by the Rev. C. Burrough (see *Transactions* for June 29th, 1882, p. 182, *et seq.*). The existence of the old Roman road, “The Portway,” running in a north-easterly direction along the crest of the Longmynd, of the many castle rings and tumuli in the neighbourhood, and the discovery, as reported by Dr. Griffith H. Griffiths, of cairns and relics indicating that cremation was employed with other rites of ancient sepulture, prove a very early occupation of this locality, which render it worthy of a deeper research and excavations than have been expended upon it.

When the whole of the party had assembled within the intrenchment of Caer Caradoc the business of the Club was transacted, which consisted in the election of the following five members:—Rev. J. O. Bevan, F.G.S., F.R. Met. Soc., &c., Rev. Willis F. A. Lambert, F.L.S., F.R.G.S., Dr. Oswald Lane, Messrs. Edward G. Robinson, and Thomas Meadows, J.P., and the proposal for election of the Rev. J. Dunn, Vicar of Much Marcle, and Mr. G. Cresswell, J.P., of Stretton Sugwas. Upon the conclusion of this business, the Rev. J. D. La Touche read a short paper by Professor Lapworth, LL.D., F.R.S., F.G.S., upon the geology of the district. The introduction of the Ordovician system, the “Age of Fire” of the Proterozoic period, between the Cambrian system below and the Silurian above, of which the Caradoc beds, so called from their considerable development in the immediate proximity of Caer Caradoc, represent the Upper Ordovician fossiliferous strata, is clearly described in the excellent “Introductory Text Book of Geology,” by D. Page, revised and in great part re-written by C. Lapworth, in its twelfth edition, dated 1888, published by William Blackwood and Sons, to be purchased in this period of “franchise” of books for 3s. 6d. After having read Professor Lapworth’s paper, the Rev. J. D. La Touche exhibited a very good specimen of Amygdaloid Basalt, picked up upon the ascent of the hill, affording evidence of the intense and extensive volcanic agencies which had once been in operation under our feet. He explained the composition of the whole of the Caradoc Hill as being of the most ancient rock—Archæan—divided by Sir William Logan in America into Laurentian and Huronian. He took his hearers gradually through the solidified Magma

or surface of the earth's crust, pointing out the fact of a rise of temperature of one degree for every sixty feet vertically downwards, to the melting of iron at a depth of nine miles, and to a molten condition of everything at a depth of nineteen miles, and was growing warm upon the subject of the Glacial Period, demonstrating its influence upon the table lands of the Longmynds opposite with their undulated valley intersections, when the sudden approach of a threatening storm recalled to the minds of his hearers the adventures of the Rev. Donald J. Carr during "A night in the snow" upon these hills, and urged them to commence a deliberate retreat and secure shelter at Church Stretton, thus unhappily putting a stop to the spirited address.

The approaching storm prevented the devotion of time to the study of the Flora of this district, diversified as it is by each region of sheltered valley, marsh land, lowland, and highland producing its characteristic specimens. Upon the summit of Caer Caradoc were found the Yellow Violet (*Viola lutea*), the Bilberry or Whortleberry, locally called Whinberry (*Vaccinium myrtillus*). The pretty delicate Bog Pimpernel (*Anagallis tenella*), and the Sundew (*Drosera rotundifolia*) enjoy a habitat here. The red-berried Cranberry (*Vaccinium oxycoccus*), and the smooth, shining, bright-red-berried common Bearberry (*Arctostaphylos Uva-ursi*) both grow upon Stiperstones. A specimen of the Fir club-moss (*Lycopodium selago*) was brought from the Longmynds, where it is abundant. A few birds seen rarely in Herefordshire were met with such as the Curlew, King-ouzel, Wheatear, and Red Grouse.

The following is a list of members and visitors:—Rev. William Elliot, President; Messrs. F. Bainbridge, Charles Fortey, and H. Southall, Vice-Presidents; Rev. J. D. La Touche, President of the Caradoc Club; Major Doughty; Revs. C. Burrough, J. E. Grasett, W. H. Lambert, H. B. D. Marshall; Messrs. R. Clarke, P. C. Cleasby, Luther Davis, T. C. Paris, James B. Pilley, Assistant Secretary, and H. C. Moore, Hon. Secretary. Visitors: Mrs. R. Clarke, Mrs. Marshall, Mrs. W. Pilley, Miss Bainbridge, and Miss Davis; Captain Elliot, R.A., and Messrs. E. S. Cobbold and Davis.

PLAISH HALL.

[By the REV. WILLIAM ELLIOT, President].

It may not unreasonably be conjectured that the name "Plaish" is an altered form of the British word "plas," signifying "palace" or "place," many instances of which occur in the neighbouring Principality. In Domesday Book the manor is called that of Pleshe, the trace of which pronunciation is to be seen in the spelling of the name to-day. At the date of the Domesday Survey it was held by Roger de Lacy. Godwin was the Saxon Lord, Earl Roger the Domesday Suzerain, De Lacy the Domesday tenant, under whom one Berner occupied the sub-tenancy. From the occurrence of the same names in the description of the manor of Higford, in the parish of Stockton, some twenty miles from this spot, it would appear likely that this latter manor was held concurrently with the manor of Pleshe. In 1175 the seignery passed from De Lacy to Fitz-Alan, the descendants of Berner, the original sub-tenant, still retaining their tenancy, and having by this time assumed the surname of Higford. By one of these, as we learn from the roll of the hundred of Munslow of the year 1255, the manor was sub-infeoffed to a family of the name of Sprengcheaux, variously known in subsequent years by the Anglicised appellations of Sprengchouse, Sprenghose, and Sprenthose. Sprengcheaux, or Sprenghose, of Plaish, was, doubtless, a member of the family of Sprengcheaux of Longnor, who seem to have been important people at that day. They were Lords of the Manor of Longnor at the end of the 12th century, held those of Bayston and Conover in the reign of Henry III., and two of them, Roger and Edward, were respectively sheriffs of Shropshire in 1279 and 1411. Plaish remained in possession of the Sprengcheaux down to the reign of Henry VII., and the hall was occupied as their residence until the death of the last male of the line, Fulk Sprengchouse, in 1447. He left behind him four co-heiresses, the youngest of whom, Margery, married William Leighton, son of John Leighton, of Wattlesborough—a branch of the family whose present representative is Sir Baldwyn Leighton, of Loton Park. The son of this William Leighton and Margery Sprengchouse was one William Leighton, who was one of the Council of the Marches of Wales and Chief Justice of North Wales, "which places he occupied," as the inscription on his monument in Cardington Church informs us, "by the space of above 40 years with great sinceritie and without complaint." To this Chief Justice Leighton is ascribed by tradition the building of the existing dwelling-house. Portions of the original stone mansion at the back of it appear to have been incorporated into the brick building erected by him. You will notice the highly ornamental chimneys of moulded brick, unusual in this part of England, though I am told they are more common in the home counties. The story goes that the builder of them was arraigned before the Chief Justice for one of the many crimes which then entailed capital punishment, and was sentenced to death, but as he was known to be a skilful artificer in the chimney

way, he was respited until the Chief Justice's chimneys were finished, after which he was hung duly.

Mr. Parker, in his work on domestic architecture, ascribes the building of the hall to the time of Henry VIII., subsequent alterations having been made in that of Elizabeth. He says that the house, on a smaller scale, follows the design of that of Compton Wynyeate, in Warwickshire, the licence for erecting which latter was granted in 1520. It would seem not improbable, therefore, that the building was begun by William Leighton the elder on his wife's accession to the property, and completed by the Chief Justice, his son. I do not know whether the following fact observed by me may throw any light on the question of date of building, but it is not an uninteresting one. In his book on the four abbeys of Shropshire, the late Prebendary Mackenzie Waleott, describing the Abbey of Buildwas, situated about nine or ten miles hence, says that the rooms over the infirmary were occupied as the Abbot's chambers. The ceilings of these rooms, he goes on to say, were of the 15th century, were in fretwork, and "one bore the porteullis, three ostrich feathers, and a heart inscribed 'Jesu.'" You will notice this identical ornament on the ceiling of the present dining-room, and it has occurred to me to surmise that, at the dissolution of the Monastery of Buildwas (which took place in 1539), or soon after that time, the cornice work in question might have been brought from thence to adorn the mansion which Mr. Leighton was then engaged in raising. Saxton's map, published about 1575-80, shows a park surrounding the hall, trace of which, however, does not now remain; and there appears from the following record to have been a chapel here in the middle of the 16th century, attached, I suppose, to the mansion. Where this chapel exactly stood it is difficult to point out, but the meadow adjacent bears the name of the Chapel-yard, and the Parish Clerk of Cardington says that his father assisted to remove the ruins of it some 70 or 80 years ago from somewhere at the back of the hall.

One Sir Thomas Botelar was the last of the mitred Abbots of the Benedictine Monastery of SS. Peter and Paul of Buildwas, to which I have already referred. After the surrender of the house to the King's Commissioners in 1539, the said Sir Thomas retired to the Vicarage of Much Wenlock with a pension of £80 a year—equivalent to about £600 of our money. From this post he exercised over the parishes which now constitute the Rural Deanery of Wenlock, some shadow of the authority which he had wielded as Abbot over these same parishes then under the jurisdiction of the Abbey, and he has left behind him a very detailed register of ecclesiastical events and doings in them. In this register there is the following, under date of July 2nd, 1542:—"Tho. son of Wm Taylor and Margt. daur of Jno. Byll of this town were mard. at Plaish in Cardinton parish in the Chapell of St Margaret there by licence of Sr. Wm. Hall, Vicar of Cardinton, and me Sr. Tho. Butlar, of Wenlock, forasmuch as by reason of sickness the sd. Tho. Taylor was not able to come to Wenlock. Sr. Rogr. Dyke Priest Stipendiari of the Church of S. James, Cardinton, mard. them."—(*Transactions of Shropshire Archaeological Society, 1883*). I take it as not by any means improbable that the dispersion of the Monastic orders may have resulted in

instances elsewhere similar to that of St. Margaret's Chapel in which Churches have been disused and demolished without leaving any memorial of their previous existence, and that the multiplicity of small parishes, which a glance at the Diocesan map will show you is to be found in the neighbourhood of Hereford, and in some less degree in that of Ludlow, may be accounted for by the retention of clerical establishments at those places which rendered it more easy to maintain the services of religion in them.

Plaish remained in the hands of the Leightons for two generations only after the death of the Chief Justice. Harcourt Leighton, his grandson, who took the side of the Parliament, and was outlawed about the year 1633, sold it to Colonel Hunt, a commander in the army of the Parliamentarians, and mentioned in the history of the times as having taken Shrawardine Castle from the forces of the king in 1645. Harcourt Leighton died childless, and was buried in Cardington Church in 1658. The family of Hunt, whose chief seat is Boreatton, near Shrewsbury, continued to own Plaish until 1883, when it was purchased by Edward Sayer, Esq., to whose courtesy we are indebted for the present opportunity of inspecting the mansion.

Such is the short and uneventful story of this Manor and Manor-house. There is nothing in it to stimulate the imagination ; it tells you of no great events of political history ; no battles, no sieges, marked the spot ; the old walls never, so far as we know, gave shelter or welcome to any royal, or otherwise distinguished, visitors. The house does not even, so far as I ever heard, own its proper and familiar ghost. Although it is true a legend remains of some murder having been committed in it, in witness whereof are certain stains and finger marks, said to be of blood, which are to be seen upon a door upstairs, and which, it is averred, no amount of paint or scrubbing is sufficient to obliterate. All that you can do is to let your fancy, if you choose, recall the successive generations of those who, through seven hundred years, played out here each the short drama of his quiet life in the fulfilment of the duties of their station amongst their rural neighbours, and who did their parts as English country gentlemen towards making England what she is.

A few words respecting the most notable of these may be permitted in conclusion. Chief Justice Leighton died in 1607, bequeathing certain moneys to the poor and Church of Cardington. In that church he lies buried, and an alabaster monument in the chancel stands over his remains. On my succeeding to the Vicarage this was in an exceedingly dilapidated condition ; but when, shortly after, the Church was restored, it was repaired and re-embellished in its original colours at the cost of Mr. Stanley Leighton, the present M.P. for one of the divisions of Shropshire. Though somewhat shorn of its first splendour and proportions it is still a striking structure, and indicates how handsome as well as costly it must have been. The Judge is represented in a recumbent posture, lying on his left side, clad in scarlet gown, black cassock, cap, and ruffs. On the back of the recess in which the figure thus lies are carved flowers, together with such emblems of mortality as a skull, an hour glass, a scythe, and a spade, with this brief motto, "*Qualis vita, finis ita,*"

which—as this is a ladies' day—I may be allowed to translate—“Such as the life is so will the end of it be.” Below the figure are two panels; on the right-hand one are shown four females kneeling, and the body of an infant wrapped in a chrysom cloth with its head resting on a skull. On the other panel and facing the females are figures of three young men, also kneeling. These represent respectively the five daughters—one of whom died in infancy—and the three sons, the offspring of the Judge's two marriages. The inscription which is on a tablet at the back of the monument records the names of his two wives and of the children of each, and the date of the Chief Justice's death, December 20th, 1607, when he would be 74 years of age. It contains also the statement of his offices, which I have already quoted, and the following quaint description of his character:—“He was humble in prosperitie, in hospitalitie genial, loving to his familie, and to his friendes, tenants, and neighbours comfortable, and to all courteous and affable, contented with competence wherewith God blessed him sufficiently for his calling.”

In further connection with this worthy I may mention a somewhat curious circumstance. There was found some years ago among the ruins of Haughmond Abbey, near Shrewsbury, a massive gold signet ring. From the fact that it was incised on the face with a skull, a thigh bone, an hour glass, a pickaxe, and a shovel, round which ran the same Latin motto that I mentioned just now, and that inside the ring were cut the initials “W.L.,” there would appear little doubt that it belonged to this very person of whom we have been speaking. The Rev. W. Allport Leighton, whose knowledge of the antiquities of Shropshire has supplied me with a great deal of the information that I have been retailing to you, considers it to have been one of the rings which barristers of that day, when raised to the dignity of serjeants-at-law, were in the habit of giving to each of the judges, and that this particular ring was given by William Leighton to his contemporary and connection by marriage, Richard Barker, whose family then lived at Haughmond Abbey, and who was Recorder of Shrewsbury and a Judge of North Wales. The ring was presented to one of the lodges of Freemasons in Shrewsbury to be worn by its Master for the time being. Unfortunately it was lost by one of these, and only a copy, taken from a wax impression which Mr. Leighton had obtained of it, now remains in the Shrewsbury Museum.

SKETCH OF THE GEOLOGY OF THE CARADOC AND ITS NEIGHBOURHOOD.

[By PROFESSOR C. LAPWORTH, LL.D., F.R.S., F.G.S.]

THE Caradoc is part of a long wedge of very ancient rocks lying between two mighty faults which stretch along on opposite sides of the Caradoc range from the neighbourhood of Old Radnor, away past Horderley, Ragleth, Lawley, the Wrekin, and Lilleshall towards the Peak in Derbyshire. This long wedge, of which the Caradoc hill itself forms a part, has been thrust up between the two faults from a great depth in the earth's crust, throwing off on the west side the Cambrian formation of the Longmynd, and, on the east, the newest Ordovician formation, known as the Bala, or Caradoc. Between these two great faults along the Caradoc range, we find patches of the oldest volcanic rock of Britain, namely, the mighty masses of ashes and lavas of which the Caradoc, Lawley, and Wrekin are built up. These form the so-called Uriconian rocks of Callaway, and are believed by many to be of Archæan age, much older than the Cambrian and the Lingula rocks, and to be of the same age as the Huronian system of America, even if they do not include representatives of the Laurentian itself, as at Primrose Hill near the Wrekin. That these ancient volcanic rocks are older than Upper Cambrian is quite clear; but their Archæan age remains, as yet, totally undemonstrated. They are well shown in the great pink and pinkish yellow rocks south-west of the Caradoc summit, and form all the main mass of the Cardington Hills. On the Caradoc itself they are cut through by dykes and veins of dark basalt, of very much later age. On the top of these Uriconian ashes and lavas (Rhyolites, as they are called) lie the Upper Cambrian rocks of Little Caradoc. The lowest of these is a quartzite, which runs nearly to the summit of Caradoc itself, and forms the main mass of Little Caradoc. In the quarries at Comley a green sandstone rests on this quartzite, containing fossils, and believed to be the same rock as the Holly-bush Sandstone of the Malvern Hills. In the deep hollow east of Comley are seen the thin bedded shales known as the Shineton Shales, which have afforded Upper Cambrian fossils. On the west side of the Caradoc, where we should naturally expect these Upper Cambrian rocks again, we find no traces of them whatever. The great fault at the base of the hill has there split in two, and let down a long wedge of the Silurian rocks, proving that these Silurian beds must once have covered the whole region, and showing that the rocks of that wedge must (according to Professor Ramsay) have been dropped down by the fault a depth of at least 2,000 feet. West of the great fault, we find the valley of Church Stretton dug out of soft lower Cambrian shales, and the Longmynd itself made out of the ancient barren Cambrian rocks, in which no true fossil has yet been detected. Far off to the west near Pontesbury we find the Shineton shales again, and on them rest the Quartzite beds of the Stiper Stones, which lie at the base of the great Ordovician

or so-called Lower Silurian system of Shelve and Meadowtown. The great double fault bounding the Caradoc range can be followed by the eye far to the north-east and south-west of Caradoc itself, for between its jaws lie all the main hills of the country, Wartle, Knowle, Ragleth, Caradoc, the Lawley, the Wrekin, and many others. Looking eastwards from the Caradoc, towards the Clee Hills, we have a much simpler structure of country. The Ordovician, the Silurian, the Old Red Sandstone, the Coal formation repose one over the other, bed over bed, turning the weather worn edges of their component sheets, like the steps of a giant stairway, towards the observer on the Caradoc itself. The bottom bed of the Ordovician of the Caradoc, or the so-called Caradoc formation, is the Hoar Edge Grit which forms the great mass of the Hoar Edge itself. As we come southwards towards the Caradoc it is cut off by the great faults in the valley. On the Hoar Edge Grit rests the group of beds which are known as the Harnage Shales, which form most of the deep valley between the Hoar Edge and the Enchmarsh scarp, and slope down the valley to the farmhouse of the Cwm. The Enchmarsh and Chatwall ridge is formed of the Chatwall or Horderley Sandstone, and can be followed by the eye continuously from Enchmarsh to Cardington Heights and the Battle Stone. On the Chatwall Sandstone rest the Longville Flags, which fill up all the country east to Cardington village. Beyond the village we find the Trinucleus Shales, coming out from under the Llandoverly beds which lie at the base of the Wenlock Shale, and constitute the lowest formation of the overlying Silurian System.

Woolhope Naturalists' Field Club.

AUGUST 28th, 1888.

ON Tuesday, August 28th, for the fourth Field Meeting of this year, 1888, more than fifty members accepted the invitation set forth in the programme, and the majority attended the meeting, notwithstanding the depression of the barometer, and the unfavourable forecast of the weather. Leaving Hereford in brakes, the first halt was made at Brinsop Court, where the members were received by Mr. Dearman Edwards, the occupier of the house. The remains of this ancient fortified mansion are very interesting. Portions of the moat now form useful and ornamental water, partly surrounding the building, except where a permanent roadway is substituted for the drawbridge. At the entrance a mutilated sculpture of a monkey playing a fiddle surmounts one of the piers. The walls and windows of the old chapel, of the Decorated style of architecture, still exist; but most interesting of all is the beautiful specimen of the 14th century timber work represented in the grand roof of the building opposite the chapel, called "The Hall," which is now used as a granary. The windows are of the Decorated style, the massive oak beams supporting the floor of the hall remain *in situ*; the fireplace of the Hall, and of the room on the ground floor below it, clearly indicate that the ceiling of the lower apartment was only nine feet high.

Whilst partaking of refreshment in the Court, the full length portrait was observed of the poet Wordsworth, a copy in oils from Pickersgill, presented by the late Lord Saye and Sele to Brinsop Court in perpetuity, in remembrance of the visits of the poet to this residence, then occupied by his wife's brother, Mr. Thomas Hutchinson. The members were thence summoned to assemble underneath a cedar tree upon the lawn, under the spreading boughs of which Mr. Thomas Hutchinson read a paper, which was an interesting record, collated from the family archives, of the various visits of the poet and his family to this residence of his (Mr. Hutchinson's) grandfather.

This cedar was planted by the Poet just 50 years ago; it is a well grown specimen, with a girth of 11ft. 1in. at 5ft. high, and compares favourably with others of similar age. The cedar in the Vicarage garden at Bredwardine, 55 years old, yields 12ft. The cedar in the King's Acre Nurseries was planted by Mr. J. Cranston's grandfather in the year 1785, when the Nurseries were established: it is, therefore, now 103 years old. It is impossible to take its circumference at the height of 5ft. from the ground, because of a large arm, 5ft. in circumference, issuing from the bole at that elevation. At 4ft. from the ground the girth is 14ft., and at 7ft. from the ground as much as 13ft. 11in.

After leaving Brinsop Court, the journey was continued to Wormesley church—situated upon a knoll on the left at a distance of about three hundred yards from the main road, after passing the seventh milestone from Hereford. About half way upon this route from the road to the Church, traces of the long-disused old British road proceeding down the hill to the left were observed.

Wormesley Church, a small structure, rebuilt in 1876, consists of nave, chancel, with chancel arch, south porch, and an ancient bell-turret on the west-end for two bells. Several of the small Norman and Early English deeply splayed windows remain. The south door to the porch is Norman, with a plain square headed tympanum under a semi-circular arch. The north door of the nave is walled up. Another walled up door, near to the chancel arch, evidently formed an entrance to a side chapel or vestry now entirely demolished; near this is a stone bracket built into the wall, having the ball-flower ornament carved on its surface; it was probably one of the brackets placed at each side of the altar. On the chancel floor is an early 14th century coffin slab, with a simple incised floriated cross on its surface. The font is Norman, a plain bowl in the form of an inverted truncated cone upon a plain base. On the south side of the churchyard are the remains of the old cross, consisting of an octagonal base and square plinth, the shaft and cross absent. The Vicar, the Rev. R. Remington, informed the members that in digging upon the south-east side of the churchyard, foundations are met with—probably the house for the priest.

The Priory is situated one mile west of the Church, close to and adjoining the present house called The Grange; no remains of the ancient building are now in existence. The Priory was founded during the reign of King John, chiefly by Gilbert Talbot aided by various property owners, amongst whom was Walter Mapes, of Wormesley, who was a friend of Henry II., and incumbent of Westbury in the Forest of Dean; he attacks clergy and monks in Latin verse. The last Prior, Stratty, was pensioned at £20, a goodly sum in those days. The Vicar exhibited the cover of the chalice; the chalice itself is not now in the Church. During the episcopacy of Bishop Scory (1559—85) in the year 1562 Archbishop Parker recommended that “chalices be altered into decent cups”; this cover is perfectly plain, free from any ornamentation or engraving with the exception of the date 1571. The parish registers commence in 1749. In the churchyard are some massive tombs to the family of Thomas Andrew Knight, President of the Royal Horticultural Society,” author of “*Pomona Herefordensis*,” &c.

Time did not permit to visit Wormesley Grange, situated more than a mile distant from the Church. This is reserved for a future occasion, when it is hoped that the Buttas Farm and Dovecot, the Churches of King’s Pyon and Canon Pyon, may be included in the day’s excursion, terminating with a more careful examination of the beautiful specimens of architectural taste and skill in timber-building existing in the ancient borough of Weobley.

Proceeding upon their journey towards Weobley, the carriages halted at the site of the ancient Castle so as to allow the members to examine the various mounds and surrounding moat which alone remain to testify to its contour and its

area. Afterwards the destination was The Ley, about half a mile distant from Weobley, a well-preserved specimen of timber architecture of the sixteenth century. The Rev. Canon Phillott read a paper upon its history. The members, after refreshing themselves under the hospitable roof of its occupier, Mr. Benjamin Rogers, heroically took their seats in carriages under torrents of rain, through which they drove to Weobley Church where they were met by the Vicar, the Rev. J. S. Crook. The description of the Church was given by the Rev. Canon Phillott.

As the rain continued to fall without intermission the members, on leaving the Church, were glad to obtain shelter anywhere they could find it. The proposed ascent of Garnstone Hill and Lady Lift had been abandoned long ago. The examination of the interesting old borough town was only attempted by a few of the most determined; yet notwithstanding the persistence of the rain, the seats were again resumed in carriages most punctually, and a Mark Tapley spirit pervaded their respective occupants as they drove through a drenching rain to the hotel at Moorhampton, upon reaching which they were ultimately rewarded by a temporary glimpse of sunshine, and an excellent dinner well served—concluding with the course of the following entertaining papers: "The Pied Flycatcher," by Mr. W. Warde Fowler; "Climate in relation to Life," by Mr. F. Bainbridge, Vice-President; and "The Migration of Birds," by the Rev. M. G. Watkins.

The business of the day was transacted. The Rev. J. Dunn, of Much Marcle Vicarage, and Mr. G. Cresswell, were elected members. The following is a list of the members and visitors who attended the meeting: Rev. William Elliot (President), Revs. J. Barker, J. O. Bevan, W. Bowell, Charles Burrough, H. B. D. Marshall, Canon Phillott, R. Remington, M. G. Watkins, and H. T. Williamson; Drs. T. A. Chapman and J. H. Wood; Messrs. F. Bainbridge, J. Carless, jun., R. Clarke, James Davies, Luther Davis, E. H. Greenly, Thomas Hutchinson, T. C. Paris, G. Hadfield, and H. Southall; Mr. H. C. Moore, Honorary Secretary, and Mr. James B. Pilley, Assistant Secretary; and the following visitors: Captain Elliot, R.A., Messrs. J. Barker, S. Blackmore, P. Blackmore, C. J. Burrough, Wm. Davis, senr., W. Warde Fowler, W. Hutchinson, — Smith, Lacon Lambe, and Walter Pilley.

WORDSWORTH AT BRINSOP COURT.

[By MR. THOMAS HUTCHINSON].

WORDSWORTH'S first visit to Brinsop was in the year 1827, when he was accompanied by his wife and Miss Southey, the eldest daughter of the Poet Southey. In 1835 he and his wife were again here, and on this occasion he wrote three sonnets connected with the district—(1) Roman Antiquities at Bishopstone; (2) St. Catherine's, Ledbury; (3) To ——. No name is given to whom this last sonnet was addressed; but it was to Miss Loveday Walker, daughter of the late rector of Bishopstone, who in the sonnet is called Lesbia. It relates an incident which took place at Bishopstone Rectory. Miss Walker was seated in the drawing-room playing the piano, which in the sonnet by poetic licence is called a harp, when a pet dove she had let out of its cage came and flapped its wings against the window, and before she could let it in a hawk pounced down and carried off the bird. The sonnet begins, "Wait, prithee, wait." Miss Walker died only a year or two ago in Hereford. In 1837 the poet and Mrs. Wordsworth again visited Brinsop with their daughter Dora, but on this occasion he had to hasten his departure on account of illness and inflammation in his eyes, which frequently gave him trouble when composing. The next visit he paid was in 1841, when he was accompanied by his wife, and on this occasion he assisted in laying out the garden at Brinsop Vicarage, for which he had great taste, as is shown by the beautiful winter garden still in existence at Coleorton, Leicestershire (the residence of his friend the late Sir George Beaumont, the celebrated landscape painter), which he entirely designed and laid out. On this occasion he also visited my father at the neighbouring parish of Hentland. In 1845, his last visit, he was accompanied by his wife and an old servant, who died while here, and is buried in Brinsop churchyard. He and his wife also visited Grantsfield, and spent a night at Bockleton Vicarage with the Rev. J. and T. E. Miller. There is a large stone on the road between the Church House, Laysters, and Wilden, marking a spot where he sat and admired the view, and on which the Millers had his initials "W. W." cut. I had almost forgotten to say that on one of his visits he planted the cedar tree at Brinsop Court. The Poet Southey visited Brinsop on one occasion, and Edward Quillinan, another of the Lake Poets, who afterwards married Dora Wordsworth, the Poet's daughter, came there constantly for the shooting. The Court was at this period visited by Dorothy Wordsworth, the Poet's sister, and Sara Hutchinson, his wife's sister, to both of whom he was indebted for much assistance in his poetical works. Sara Hutchinson was at one time Southey's amanuensis. Henry Crabb Robinson was also another celebrated man of that time who visited Brinsop. He was a great friend of Wordsworth, Southey, Coleridge, and Lamb. In the January number of *Temple Bar*, 1877, is a paper written by Miss Anne Beale entitled "The Wordsworths at Brinsop Court," and I will conclude this paper by relating, for the most part in her language, two anecdotes of a favourite dog, which are interesting from their

connection with Dorothy Wordsworth and Edward Quillinan. Dorothy was not naturally fond of dogs, but this one, a spaniel, Prince by name, attached himself to her and accompanied her unheeded during her long solitary walks. On the eve of one of her departures from the Court he discovered what was about to happen, and lay at her bedroom door all night. The following morning he secreted himself in the cart that conveyed her luggage to Hereford, and finally met her at the coach. It was with difficulty that they prevented the animal from following her, and got him to go home. Some time after, when poor Prince was stricken in years, he became sadly infirm, and a burden not only to those about him, but also to himself. However, his young master, George Hutchinson, did not find the old dog a burden, and when the command to get rid of him was repeatedly issued, he begged him off with entreaties and tears. At last, however, the fiat went forth that Prince must die, so the faithful dog was hanged by a servant named Jerry Preece during the temporary absence of his friend George. Quillinan was staying at the Court at the time, and was engaged in laying night-lines across the moat. When the boy returned he unadvisedly sent him to search for worms in "the ducks' nest," a spot referred to by Wordsworth in his fifteenth miscellaneous sonnet. When George, in high spirits at his quest, drew near this retired place he chanced to look up at a neighbouring willow tree. There he saw his beloved Prince ignominiously hanging by the neck. The shock was so great that the boy went half mad with grief, and would not be consoled. Quillinan, who had not known of the place of execution, was much distressed. Retiring to his room, he hastily wrote the following impromptu lines by way of consolation, which he threw out of the window facing the cedar and moat to the boy wailing beneath, with the words, "Look, George; here's an epitaph":—

"EPITAPH ON A FAVOURITE DOG."

"Stop! passenger, and drop a tear,
 A most ill-fated Prince lies here;
 His reign in youth was wild and pleasant,
 He hunted rabbit, hare, and pheasant.
 Grown old he bid adieu to sport,
 And mildly ruled at Brinsop Court;
 But shame on these reforming times*
 Of revolutionary crimes!
 This harmless old and good Prince-royal,
 Was vilely used by hands disloyal;
 His noble neck was hempen-collared,
 And stretched upon a willow pollard.
 Oh! wicked traitor, Jerry Preece,
 Repent if you would die in peace."

These lines were engraven on a stone and placed at the head of Prince's grave. The remains of the good dog still rest at Brinsop Court, but the tombstone has been removed to Miss Hutchinson's garden at West Malvern.

It is a singular coincidence that on the very day of the above-recorded excursion of the Woolhope Club, the widow of the youngest son of the Poet Wordsworth died—viz., Mrs. Fanny E. Wordsworth, of The Stepping Stones, Rydal, relict of Mr. William Wordsworth, J.P., D.L. The deceased lady was in her 68th year.

WORMESLEY.

[By the Rev. CANON H. W. PHILLOTT.]

BLOUNT in his "Collections" says of Wormesley that it is remarkable chiefly for its Priory of Canons regular of S. Augustine, founded about the beginning of the reign of Henry III., but by whom, appears not even by their own Register. Anciently, he goes on to say, William de Caple held lands here of the Honour of Weobley. In the time of Henry III. Sir Walter Map was lord of this manor. Nicholas, son of Walter Map, changed his name to Wormesley. In the time of Edward I. Gilbert Talbot gave lands in Wormesley, Eardisley, King's Pyon, Weobley, and Lyonshall, to the Priory of Wormesley. Among the benefactors were Elizabeth de Brugge and Roger Pychard.

A MS. (Harl, 3586) says that Walter Map gave to the Priory of Wormesley, to God, and to B.V.M., and to the Church of S. Leonard of Pyon, otherwise called S. Leonard of Wormesley, twenty acres of wood and other lands.

Nicholas (mentioned above) of Wormesley gave to the Priory Church of Wormesley seven "buttes" of his land lying under the meadow of Wormesley between the lands of the Priory on the north, of which one head extends to the land of the Priory, and another to the stream running to the mill of Wormesley, and they shall have these "buttes"* as far as the *filum aquæ* and may make them if they please *unam exclusam*.

A later document says—Robert Boter gave to God, and S. Mary and the Church of S. Leonard of Pyon, and to Arthur Edwyn, the first hermit there, for the health of himself, and his wife, and his forefathers, all his land lying between *schirnhustc* (churn-house?) and a stream.

The Priory was granted by Queen Elizabeth to Edward, Earl of Lincoln, the Lord Admiral, having been granted by Henry VIII. to Edward, Lord Clinton.

* "Buttes," the ends of short pieces of land in arable ridges and furrows, Kennett, *Par. Antiq.* Gloss.—*Filum aquæ*, the mid-stream of running water, *Du Cange*. *Exclusam*, a sluice or weir, *Du Cange*.

WEOBLEY.

[By the Rev. CANON H. W. PHILLOTT.]

THE LEY.

THE inscription on the porch of the house records the initials of its builder, James Bridges, A.D. 1589. The earliest mention of this family that I have been able to discover is in A.D. 1385, in which year the name of Simon de Brugge, of Bridge Sollers, occurs as the maker of a will, of which a copy exists in the Register of the Diocese of Hereford. In the next century, A.D. 1428, Simon, probably great grandson of Simon just mentioned, purchased of the daughters of Richard of The Ley, in whose family the property had been for some time, their interest in that estate. His nephew, or great nephew, Sir John Bridges, was Lord Mayor of London A.D. 1521, and died 1530. Sir John's daughter married John Watkin Garway, who is said to have "laid the mansion" house of his family to that of Bridges. The marriage of James, son of Simon Bridges, and Ann Atwood, is recorded in 1480, and Rowland, great grandson of the same Simon, lies buried, together with his wife, in Weobley Church, in the place which was once the Chapel of St. Nicholas, on the south side of the nave. It was perhaps the son of this Rowland, James, who married Jane Tomkins, who built the porch and probably the whole house at The Ley in 1589. This period was the culminating one of the fortune of the family. In less than one hundred years after this, A.D. 1682, Thomas Bridges, the infant and only son of William Bridges, died, and in 1685 his father also died, leaving his property to his brother, and failing issue from him to his three sisters, of whom the last died unmarried in 1707. The arms of the Bridges family appear on the roof of the nave of the Church, and appeared formerly on the screen work of the south chapel, but Mr. Simon Bridges was buried on the north side of the Church.

THE CHURCH.

Before the Conquest the Manor of Wibelai was held by Edwin, son of Elfgar, the son of Leofric, Earl of Mercia, who died A.D. 1057. It was granted by the Conqueror to Walter de Lacy, who built St. Peter's Church at Hereford, and was killed by a fall from its battlements A.D. 1085. He had three sons, Roger, Hugh, and Walter, of whom Walter became Abbat of St. Peter's, Gloucester; Roger took the side of Robert Courthose, and was banished by William Rufus; Hugh received his brother's lands, assisted to found Llanthony Abbey, died without issue, and, no doubt, lies buried in the chancel of Weobley Church, where, in 1655, was to be seen "a very ancient stone, of a very ancient make," bearing the following words: "Hugis, *i.e.*, Hugonis Lascii Cœnobium Llanthoni." This stone, which bore witness to his foundation of Llanthony Abbey, probably exists beneath another monument, of which something will be said presently, but the inscription is no longer visible. The foundation of Llanthony took place about 1085, A.D., and in 1101 Hugh de Lacy made a gift

to the Abbey of Gloucester of the Church of St. Peter, founded by his father. He also presented the tithes of the parish of Weobley to the Abbey of Llanthony as part of its endowment, in virtue of which present the Chapter of that Abbey became patrons of the Vicarage, which was held by them down to the time of the dissolution of the Monasteries, A.D. 1535. I may, perhaps, be allowed to point out in passing that this gift bears witness to the contradiction of the statement, often refuted but industriously repeated, that tithes were originally an endowment bestowed upon the Church by the State. You will observe that in this case the tithes of a parish were given by its proprietor to endow, not the benefice, but a religious house to which in virtue of this gift the patronage of the benefice devolved. As Hugh de Lacy chose Weobley Church as his place of burial early in the twelfth century, we can have little doubt that he was in a great measure, if not altogether, its builder, and, of his work the porch, and a piscina, of the 11th century, on the south side of the nave are the existing remains.

The chancel of the Church is 54 feet 8 inches in length and 22 feet in width. The nave measures 65 feet 5 inches in length, and 25 feet 1 inch in width, besides the aisles, of which the north aisle is 23 feet $\frac{1}{3}$ inch, and the south aisle 20 feet $\frac{1}{2}$ inch wide.

There are portions of 13th century work both in the nave and the chancel, but the greater part of the Church belongs to the 14th century with some later additions, especially the east window and the oaken roof of the nave. We are able to point almost with certainty to the date of the re-building of the nave, for we find in the Register of Bishop Orleton that on April 14th, 1325, that Bishop dedicated the Church of Webbelye and three altars therein; and the ball-flower moulding in the east arch of the nave agrees with work of Bishop Orleton's date in the Cathedral at Hereford. The tower stands at the north-west angle of the nave, is partially isolated, and projects obliquely into the north aisle. It belongs to the 14th or early 15th century, and is surmounted by a spire of the same date, of which the top was blown down about 1640, but was repaired in 1682 at the expense of Colonel Birch, then M.P. for the borough. The tower contains six bells. There were formerly two chantry chapels, one on the north side of the nave dedicated to B.V.M., which went by the name of the Monington Chapel, as appears by an order made by Bishop Croft, A.D. 1684, and bore it because lands belonging to its foundation were held of Mr. Monington, of Sarnesfield. It existed before A.D. 1430. The one on the south side was dedicated to St. Nicholas, having been founded not long before the dissolution of monasteries, and subsequent abolition of chantry chapels. It belonged to the family of Bridges, of The Ley, and contained a monument bearing the arms of that family. The screen work of both of these chapels was in excellent preservation until 1868, when the whole of it, except one post belonging to the north chapel, on which was carved the usual emblem of the Trinity, was removed, entirely without leave or authority of any kind, by the proprietor at that time of Garnstone, an act of needless demolition which can now only be regretted, but without possibility of reparation. The post now mentioned has been removed to the south side of the nave. Near it is a flat stone bearing a floriated cross of beautiful workmanship of the 13th

century, and the inscription, "Hic jacet Hugo Bissop," also the figures of a mitre and a pastoral staff, probably intended to symbolise the name of the deceased, which appears frequently in charters relating to the Cathedral of Hereford.

There are in the windows of the north aisle some pieces of glass much mutilated, but very beautiful, of the 15th century.

There was formerly, no doubt, a rood screen between the nave and chancel, but it has been destroyed, though the door and staircase still remain.

In the chancel the most conspicuous monument is the one in memory of Col. Birch, a fine figure of white marble, standing in a niche supported by Corinthian columns. The inscription gives the year of his birth 1626, which, no doubt, is a mistake for 1616. There are also two other remarkable monuments of a much better class, and very noble in character, one on the north side, which I have reason to think represents Sir Walter Devereux, who died A.D. 1402, and the other on the south side consisting of two figures, of which one in my opinion represents Sir John Marbury, who died A.D. 1437, and the other his wife Agnes, who died A.D. 1433, having been formerly wife to Sir W. Devereux. It is this monument which probably covers and conceals the tombstone of Hugh de Lacy, already mentioned. On one of two boards in the shape of shields, which are still to be seen in the chancel, the arms of Marbury might be traced without much difficulty. The boards formerly hung as heraldic funeral emblems above the tombs to which they respectively belonged, and Silas Taylor, who saw them in 1655, says that the Marbury shield, whose bearings he describes, though he did not know the name nor could he discern the colours, hung on the south side. Both the shields have since been re-painted with their armorial bearings. The Church some years ago underwent alteration, which was intended for restoration, but which did not always deserve that well-meaning but not always appropriate title. Among objects which it concealed from sight was a tombstone in memory of one Tomkins, who was said in a sonnet written in his honour to have been the father of "32 children, all born in one chamber in Weobley," and the Parish Clerk informs me that he has seen the inscription.

Our notice of Weobley can scarcely be called complete without some mention of Colonel Birch, whose pretentious monument we saw in the chancel of the Church. The gallant Colonel, who came of a Cheshire family, displayed, as is well known, great ability as a military officer on many occasions, of which the last was the capture of Goodrich Castle, and he showed no less skill and judgment in his use of opportunities for enriching himself at the expense of the discomfited Royalists, and establishing for himself, and, as he fondly intended, for his family, a permanent position in the county of Hereford. He purchased the estate of Garnstone in 1661, and by judicious improvements made a "gentile habitation" of its mansion. But his hopes of long duration for his family were not crowned with success. He had four sons and three daughters, but his sons all died either unmarried or childless. By his will he made it a condition of leaving his property to his youngest daughter that she should marry her first cousin, John, Serjeant Birch, which she did, but no child was born to them, and having been afterwards possessed by Samuel, the Serjeant's brother, until 1752, the property

ultimately passed away from the direct line by the marriage of his youngest sister Elizabeth to Dr. Samuel Peploe, Archdeacon of Richmond, and Warden of Manchester, from whom it has descended to its present possessor.

In connection with Weobley we may mention—

1. That it was formerly famous for its *cwrv*, or ale, and not very long since for some trade in gloves.

2. That having returned representatives to Parliament during the reign of Edward I., this custom, having been discontinued for many years, was revived in 1640 and continued until 1831, when the Reform Act abolished the rights of this and many other decayed boroughs.

3. Attempts appear to have been made at various times to establish a fair as well as a market at Weobley, but without much success, though a house called the Market-house was in existence till not very long ago.

4. King Charles I. having come to Hereford after the Battle of Naseby, came to Weobley on September 5th, 1645, and had supper at the Unicorn Inn. On the following day he returned to Hereford. On Thursday, September 18th, having left Hom Lacy in the morning, he marched with a party of horsemen to Weobley, and thence to Presteign.

The Unicorn Inn is believed to have been situate at the south end of the town on the way to the Castle.

THE CASTLE.

Of the objects which claim our attention in connection with the ancient town of Weobley, the last to be visited is the site, for it is no more than a site, of the Castle. It was probably built soon after the Conquest, but it is not mentioned in Domesday, and no record exists concerning its foundation or the name of its founder, but the earliest mention of it is made in the troublous reign of Stephen, during which it was either taken by Geoffrey Talbot or by Fitz-Scroope on the part of the Empress Maud, but soon re-taken by Stephen, who fortified it as well as the Castle of Hereford, A.D. 1129. In 1210 W. de Braose, father of Margery, wife of Walter de Lacy, and founder of Aconbury Priory, a determined opponent of King John, on his way to attack Leominster, attacked also and took Weobley Castle. The Castle and its chaplain are mentioned in the second year of Edward III., A.D. 1329, in which year Margery Verdon, descended in the fourth degree from Walter de Lacy, being then, as it seems, but not certainly, a widow, became the wife of Walter Blount, and afterwards of Sir John Crophull, who died A.D. 1382. Her grand-daughter Agnes married (1) Sir Walter Devereux, and (2) Sir John Marbury, whose daughter Elizabeth married the grand-son of Sir Walter and Agnes Devereux. Their son became Lord Ferrers, to whose family the Castle belonged when it was visited by Leland between 1533—1540, who describes it as “a goodly castle, but somewhat in decay.” At some time in the reign of Richard II. Sir Simon Burley, K.G., is mentioned as Governor of the Castle. In 1483, Henry Stafford, Duke of Buckingham, connected with Lord Ferrers, whose son John Devereux was husband to Ciceley Bourchier, descended, as was also the Duke, from Thomas of Woodstock, Duke of Gloucester, and Eleanor Bohun, revolted against Richard III., but being hindered in his attempt by the

floods of the Severn, came from Brecon to Weobley Castle, the abode of Lord Ferrers, with his wife and two sons. He remained there a week, having endeavoured in vain to raise the gentlemen of the county in his favour. He then departed in disguise, having "made him a frieze coat," leaving there his wife and children. The eldest son, Lord Stafford, was conveyed in disguise to Kinnersley, where ineffectual search was made for him. The Duchess remained at Weobley, but was soon arrested and taken to London.

No mention is made of the Castle during the time of the Great Rebellion, perhaps because the decay, of which we heard just now, had made so much progress that the building had become useless as a fortification. Enough, however, remained in 1655 to enable Silas Taylor, to obtain a plan, from which the original design may be clearly traced, which may be described as a quadrangular building, of which the north side is much narrower than the south. There were six towers, three on the east, and three on the west. The entrance was on the north by a drawbridge over the fosse, by which it was surrounded. The keep was quadrangular, narrower on the east and west sides than on the north and south. It had four towers, and was approached by steps on the north side. Its walls were 12 feet in thickness. Some ancient buildings intended for dwelling houses existed in Taylor's time, but the whole is now completely destroyed.

“CLIMATE IN ITS RELATION TO LIFE.”

[By Mr. F. BAINBRIDGE].

WHEN friends meet, after the usual hand-shaking and the familiar “How do?” it is very general to make some cursory allusion to that grim spectre ever haunting the British mind—the weather; and no wonder, as upon its favourable state so much of our comfort, convenience, health, and even our existence, depends. Placed as are the British Isles in the midst of an ever-moving element, their climate, owing to the warm oceanic currents, is rendered much more temperate than Continental districts of similar latitudes; from our island position also our climate is more variable, hence it is that the topic of the weather is of so much interest and is so frequently discussed. Without entering into the details of what causes the variations of climate, it is enough for our present purpose to remark that we cannot judge of the temperature of a country or district by the degree of latitude on which it is situated. Upon the knowledge of this fact has been founded a system of Isothermal lines, or lines of equal heat, on which depends very largely the distribution of animal and vegetable life; moreover, as heat and moisture are the all producers, we need not wonder at finding, on approaching the tropics, not only a greater profusion of animals and plants, but also an absolute increase in the actual number of different kinds, and although peculiarities of soil modify the nature of its products, yet, as a rule, under the same conditions of heat and moisture a similar vegetation appears; moreover, as the animal world depends upon the plants directly, as in the vegetable feeders, and indirectly in the carnivora, so must these follow them, being in fact inseparably connected with the determinate forms of vegetables, so that heat and cold are not the only consequences of the position of the sun in relation to the earth, but also the whole life existent thereon. Thus in the far off regions where the sun sheds its rays so obliquely as to leave the land ever bound in ice, where vegetation cannot exist, simulating its native snows in the whiteness of its fleece, appears the solitary polar bear, dividing the products of the ocean with the few human beings who even there find pleasure in life. Leaving this ice-bound region, we proceed to Lapland, where rye and barley make their appearance; these herald an existence for the rat, then follows the cat, the low whisper of the graceful birch (the most northern of our trees) speaks to the squirrel of a scanty meal; the Moose-deer, the Reindeer, and even the smoke-dried toad-coloured Laplanders themselves, find their bread in the Lichens growing from the very stones, and thank God in the simplicity of their hearts for a contenting meal. Happy, thrice happy, people to whom Ovid’s description of the silver age is still applicable—“Their soil is not wounded by the plough, nor is the iron din of arms to be heard; neither have mankind found their way to the bowels of the earth: nor do they engage in wars to define its boundaries.” This people perpetually change their abode, and live in tents or rude huts, following a pastoral life, just like the patriarchs of old. But to continue our journey southwards. As pine

forests become more extensive, affording shelter, and grassy plains spread forth their attractive green, affording food to different kinds of oxen and deer, so follows their destroyer, the wolf; the skilful beaver and the gossiping prairie dog invite man to their social village. Here with the bison, naked and wild runs the scalp-loving savage; proceeding still southwards, the beech and the sugar maple attract the bee, and the bee the honey-loving bear. As warmth increases, men begin to mass together. Instead of scattered animals and migratory tribes of hunters, the picture teems with busy life, toiling, scratching, panting, puffing, to produce from mother earth the dust we are doomed to eat, like our remote cousin, the renowned serpent. Here, in the zone of changeable weather, which might be supposed to be the least favourable to human development, is the stage upon which the grand drama of life is most spiritually enacted; so much energy in fact is concentrated in the culture of the intellect, that men seem to forget that they have bodies at all. It is in this zone embracing mid-Asia, the north of Africa, Europe, and N. America, that the advancement of man is to be looked for; it is here that his history is essentially unfolded page by page as he proceeds ever westwards from the point of his historic creation; it is here that man, making use of natural laws, bends them to his will, adapting by his intellect and accumulated experience the raw materials of Nature either to his necessities, his amusements, or his aspirations; it is here that Christianity was first revealed, and here yet remains its strongest hold, and yet, in ribald mockery of the principles which it teaches, those principles of love and forbearance, we find it the scene of the most forbidding crimes, the theatre of wholesale slaughters. But, to proceed. After passing over this busy zone, as we approach in our imaginary journey the equator, the appearance of Nature becomes gradually but perceptibly altered; from white, men's complexion is changed to that of olive, from olive to that of copper colour, and from this again to black; and, as though they had swallowed some drowsy drug somniferous, men become less inclined to exertion. Here kindly Nature, bountiful to profusion, yields man all his wants with the minimum of toil; the icy breath of the north no longer congeals upon the hoary pendent lichens and needle-leaved firs; rhododendrons, pines, beech, oak, elm and lime have disappeared; evergreen trees and shrubs have displaced them; myrtles, and laurels, and olive, the refreshing orange, figs, and the luscious grape instead of holly, and palms begin to appear in the latitude of Rome. I will quote from that philosopher poet Goëthe, who appears thus early to have sketched out a geography of plants, when in allusion to the custom of palm-bearing he wrote:—

In Rome on Palm Sunday they bear true palms,
The Cardinals bow reverently and sing old psalms;
Elsewhere those psalms are sung 'mid olive branches,
The holly supplies their place among the avalanches,
More northern climes must be content with sad willow.

Now we lose sight of green fields, for the short, crisp, tender grasses are displaced by lofty reeds and canes, so flinty as to turn the edge of the axe, while tree ferns, figs, palms, and bananas form the characteristic features of this steamy clime. So profuse is Nature in this zone that below, above, around, is one tangled mass of prolific vegetation.

In air, in water, and on earth
 A thousand germs come struggling forth,
 In drought and damp, and heat and cold.

Nor is animal life less numerous, for this grand storehouse of food exists for no idle purpose; redundant Nature teems with life, birds and butterflies swarm among the trees, harmonizing in colour and varied plumage with the numerous tints and forms of the foliage. Forth among the Acacia groves treads the ponderous elephant, crushing his path through the tangled mass; on the plain with timid step herd the towering giraffes and the painted zebra, the malevolent and stately buffalo, with fiery eyes and angry roar, and feet that stamp and horns that gore, and various deer in countless thousands spread their branching antlers or curve their ringed horns in graceful arch along their backs; these point to the crouching panther, the disgusting hyæna, the terrible lion, and the howling jackal. All these derive their sustenance from the glowing savannas of Africa, but were I to do more than touch upon these matters as instances of how the distribution of life is influenced by climate it would lead me too far; everywhere, wherever we turn, Nature is pregnant with life, but within the tropics it is most abundant: for on the sun depend not only vitality and motion, but also the primary arrangement of life, and its shining rays serve to paint with consummate taste and delicate hand the light and shade of the earth's carpet; here, the cool green of the moist meadows, there the glowing tints of the arid sands; here, the leaden gray of the triste north, there the rich Kaleidoscopic colouring of the luxurious south, and thus by its means are plants and animals limited to certain zones of heat and cold, and even man, adaptative though he be, is in a measure rivetted to the zone to which his parents have been used, for he will not bear any great change without his life being curtailed thereby. Thus have I briefly shown the powerful influence which heat and moisture have in the production and distribution of animal and vegetable life, thereby fulfilling in a sketchy manner the title of my paper—Climate in its relation to life.

THE PIED FLY CATCHER.

[By Mr. W. WARDE FOWLER.]

I was a little astonished, when lately turning over the pages of the late Dr. Bull's "Birds of Herefordshire," to find that the Pied Flycatcher is not a tolerably common bird in this county. Even if he does not choose to stop and spend the summer here, I should have expected him to call on its way into Wales. And I am, in fact, considerably puzzled to know how the birds of this species, which are beyond doubt as abundant in Breconshire and Radnorshire as they are anywhere in this island, find their way there and back again, if it is not through the most natural and tempting route—the valley of the Wye.

And here I should like to make a remark, in which I hope I shall not be anticipating anything that will be said by the next reader. I have often been struck by the comparative meagreness of our knowledge of the movements of birds *in our own country*.

We know in a general way that certain birds move north and south at certain times of the year, and we know at what time they reach or pass our own particular haunts. But of the course they take in their journeys we know very little, yet we may be pretty sure, on the analogy of more distant migrations, that that course is regular and for the most part unvaried. Take the case of the Common Sandpiper. We know in Oxfordshire that we may look for this bird about the first week in May; and I doubt if it ever disappoints us. But it only stays a week or so; and what journey does it make when it leaves us? That it is on its way to its breeding-quarters is clear enough; but its route ought to be known well enough to be marked out on a map. How again do the Swallows and Sandmartins reach the West and North of England after arriving from the Continent, and how do they find their way back again to the sea? Do they come "anyhow," as one may say, and regardless of the features of the country, or do they follow regular routes? Last September I made the discovery (if I may use the word, for what I saw was published in *Nature* and in *The Field*, and called forth no remark from any previous observers) that the Swallows and Martins of Devon and Cornwall pass on their autumn migration in countless numbers along the coast of Dorset eastwards and before they cross the sea. Depend upon it there is much to be learnt of migration under our very eyes; and to this every one can contribute something which a little organization might turn to good account. It is, in fact, organization which is the great thing needed to make County Societies useful, so far as ornithology is concerned. Counties are purely artificial divisions, and the ornithology of a county has as a rule only the same kind of interest on a larger scale as the ornithology of a parish or a union. What county observers should aim at, if I may venture to say so, is some kind of organization which should include the observers of all such neighbouring counties as form, in a greater or less degree, a natural division of the island. Such as is the basin of the Thames or Severn, or the sea counties of the Southern Coast.

But to return to the Pied Flycatcher which I shall not venture to leave again, after having been enticed into so long a digression at the very outset of my paper. By whatever route this little bird travels, there is at least no doubt that it reaches the neighbouring counties of Wales in considerable numbers. It is a regular summer resident in the grounds of a house belonging to a cousin of mine near Builth. Mr. Cambridge Phillips, of Brecon, who has compiled a list of the Birds of Breconshire, in the *Zoologist*, says that it builds every summer in his own garden, and is common in his neighbourhood. And in the north of the same county, near the borders of Cardiganshire, I had the pleasure of constantly seeing it during a short stay there last June.

It is, in fact, a bird which seems to have a curious preference for the more mountainous parts of our island, without being itself in any real sense a mountain bird. It is especially fond of the Lake country; and the best description we have of its habits may be read in an excellent little book on the "Birds of Cumberland," by my friend the Rev. H. A. Macpherson. It is met with sometimes in the flatter counties of England, but rarely stays to pass the summer there. Last spring I was told that a pair had appeared near Oxford, in such a spot as might well have tempted them to remain; but it was in vain that I looked for the conspicuous little black and white birds—the miniature Magpies, as they have been very aptly called. One Sunday morning in April, 1886, as I was taking a stroll before church in the precincts of my Oxfordshire village, I descried a white object on a willow-bough some hundred yards away. As my sight is not good, you may imagine that it would need to be a very white object that could catch my eye at that distance. As usual, I had a binocular with me, and at once discovered that bit of brilliant snowy white to be the breast of a Pied Flycatcher. Its mate was at hand—for these birds seem to come to us ready paired—and they spent the whole of that day catching flies from railings, apple trees, and stone walls in the seclusion of the Rector's glebe land, where I found them; but even the protection of Mother Church could not induce them to stay, and they departed the very next day, probably in the direction of Wales. Since then I have always done them the honour of looking for them on any sunny morning in my Easter vacations; but for some reason best known to themselves they have never, to my knowledge, made another call on us. The truth seems to be, that they like a wilder country than our English lowlands can offer them. When I come to think of the various places in which I have seen them in the breeding season, I cannot but be struck by the similarity of their surroundings in each case. I well remember the spot in which I saw the bird for the first time. It was in the Valley of Engelberg, just as you begin to mount the path to the Joch pass through a steep wooded slope, at the foot of which are some sycamores of singular size and beauty, whose stems, thickly clad with green moss and grey lichen, and showing a russet patch here and there where the bark has peeled off, dwell always in my mind as peerless specimens of Nature's colouring. It was on the lower boughs of one of these trees, at the foot of the slope and just over a swift stream, that I found the Pied Flycatchers in June, 1884. In June, 1888, while strolling at the foot of a wooded slope in Breconshire, with a stream running below me, I

once more found my path set with sycamores, whose stems, though not so great in girth, were clad in the very same exquisite harmony of tints that had so delighted me at Engelberg; and there too, as if no less delighting in the colours, the water, and the shade, were again the Pied Flycatchers!

Nor is it only in Switzerland and in Wales that I have seen the Pied Flycatcher in beautiful scenery. In April last I was walking one sunny morning in the forest near Wiesbaden, when I came to the edge of a steep sunny slope, crowned by old gnarled oaks, as well as by the beeches which there abound. In the trees above me I heard a song which I did not recognise; I had, of course, to desert my companions, and at all costs to discover the singer. This was no easy matter, for though I could see a bird rapidly flitting about the upper branches of the trees, it took me a long time of painful staring upwards to fix him even for a moment with my glass. Sometimes he would pop into a certain hole high up in an oak—on which hole my glass would be ready fixed to catch him popping out again; but in vain, for his movements were so rapid that I could only see a momentary glimpse of brown and white. At last, however, I secured a better look, and no doubt I ought to have recognised him as a Pied Flycatcher; but there were two points which puzzled me, which I shall take leave to mention, as showing how much there always is to be learnt, even by an ornithologist of some little experience, and how liable even the experienced eye is to delusion as regards colour. Here is my note, made within half an hour after seeing the bird:—"Length perhaps about that of a Willow-wren. Tail rather broad and forked. Head like a Flycatcher's in *pose*, but *red* or *reddish brown* on the crown. Upper parts *brown*, as far as I could see. Much black in tail and wing quills; the latter were long, and sat swallow-like when folded. Neck, breast, and all under parts bright, pure white; legs, black; flight, very quick and fluttering. Song, something of the robin and redstart kind, fragmentary rather than warbling, and ending a little like the chaffinch." The next day I was to leave for England; but you may be sure I was off early in the morning to try for another look at the mysterious birds. I soon heard the song, and this time found a pair; both let me this time have a good look at them. They were settling on the hole in the oak for a nesting place, and while one was inside the other would cling to the mouth of the hole like a swift, showing me every feather in his back and tail. The long wings and the white patch on them made me pretty sure that they were Pied Flycatchers, but there were two puzzling points, as I said just now—(1) the reddish head; (2) the fact that both birds, *i.e.*, both sexes, were almost exactly alike; and I had always supposed that it was only in the female that for the full-dress of magpie-like black and white, was substituted a more modest suit of white and *brown*. Now as regards the reddish head, I am convinced that it was nothing in the world but an ocular delusion, caused perhaps by the strong sunlight falling upon brown feathers through the branches of the trees, which were just beginning to *redden* into bud. The effects of sunlight under various conditions are somewhat startling, and may perhaps account not only for this illusion but for some of the many extraordinary descriptions of birds which have from time to time been given me by persons unaccustomed to observe them carefully. The other difficulty, the

similarity of the sexes, was resolved as soon as I returned to Oxford and was able to consult Dresser's "Birds of Europe." It seems that the male of the first year does not, as a rule, put on the full nuptial plumage, but remains in his juvenile dress of brown and white until after his second spring change of plumage. Dresser also, if I remember right, states that in some cases, even with older birds, the full male plumage is only assumed for a very short time. These statements are confirmed by Macpherson's account of the bird in the book I have already alluded to. Four males were shot for the Carlisle Museum on May 19th, 1884. Two of these were in full black and white. The third was very nearly so, but had the feathers of the crown and nape fringed with brown, but black at the base, which black would in a few days have extended itself over the whole of each feather, for in this case it would seem that the change is not effected by a moult, but by an alteration in the tint of each feather. But the fourth bird, which was in full song (alas !) when shot, and was also proved by dissection to be a male, was hardly distinguishable from the female. I had read this account of Mr. Macpherson's before I saw the birds at Wiesbaden, but had quite forgotten it ; and after all, there is a certain pleasure, and also a certain efficacy, in getting well puzzled and then finding out the answer to one's riddle, for which the most patient study of books can never quite be a substitute.

In these rather rambling personal reminiscences, I think I have incidentally mentioned some, at least, of the peculiarities of the Pied Flycatcher ; and I will now only detain you with a few hasty words—first about its eggs, secondly about its relations.

The nest of this bird is always in a hole or covered place of some kind ; and we should expect it to follow the rule that eggs laid in such places are white or but slightly speckled with some other colour. Anyone who is not aware of the rule may call to mind the white eggs of the Woodpeckers, Wryneck, Kingfisher, Sandmartin, Swift, and many others. When eggs are thus hidden away in holes, they do not need to be protected by assimilating in colour to the grass, foliage, sand, or rock on which they are placed. Why then is it that the eggs of this Flycatcher, instead of being white, are a beautiful pale greenish-blue ? I do not think that as yet we know enough about the causes of the colouring of eggs to answer questions like these with much confidence. We may be able to discern a few leading rules, such as the one I have just mentioned, which can hardly as yet be elevated into the dignity of *laws* ; but to all such rules there are exceptions of which no convincing explanation seems possible. The only one that occurs to me of the blue eggs in question, is this:—that the blue was adopted at some former period when the bird did *not* build in holes, and that it still retained it, though perhaps fainter than it used to be, under altered conditions. It is certainly a very pale blue, sometimes almost white ; and it may possibly be that, as the colour seems to serve no immediate object, it is passing away by imperceptible degrees. But whether this explanation is right or wrong, the matter is worth the attention of anyone who is in the way of meeting with these birds in places where they breed. I must add a very few words, without which this paper would not be complete (though indeed completeness is not my aim to-day), on the kinsfolk of this bird,

and the relation it stands in to the world of small birds generally. In the list of the "Birds of Europe" it stands at the very tail of that immense series of tooth-bill birds (*oscines dentiostres*), which includes the Thrushes, the Robins, the Chats, the Warblers, Wagtails, and many others, the great majority of which feed on grubs and insects, and not on seed. The Flycatchers stand at the tail of this long list; then come the wide-billed insect eaters, the Swallows and Martins, before we reach the great host of hard-billed birds—Sparrows, Finches, and the like, which are armed with a powerful engine for crushing grain. The Flycatchers then and the Swallows are next-door neighbours in classification, and this is chiefly because, of all the birds which have the tooth-shaped bill, they are the ones which have it *widest* at the base, and therefore most approaching in shape to the broad, short bill of the swallows. It is, in fact, a cavity for the reception of cargoes of flies. And not only the bill, but the long wings, and in some degree even the flight of the Flycatchers, reminds us a little of the swallow. Repeatedly this summer, in which the endless rain has kept the swallows flying low for many days together, I have stood under the trees and watched the swallows and martins gliding up and down close to the grass, when no other bird was visible but the little spotted Flycatcher, modestly taking his share of the abundant insect-life open to him. The European list contains only four species of Flycatchers, and one of these so exactly resembles our Pied bird, that it would be hard to distinguish it from its cousin without special knowledge. All the other three are British birds; though one, the little Red-breasted Flycatcher of Northern Europe, has only occurred two or three times by accident in Cornwall and the Scilly Islands. Travelling on the Continent will not, in fact, teach us much more about the Flycatcher family than we can learn in our own gardens and fields, where the commoner bird abounds, or in the hill regions of Wales and Cumberland, which the subject of this paper has chosen as his favourite summer haunt. It is a good study to compare the two, both in habits and appearance. They both leave us in September, and pass the winter, as far as we know, in Africa; both have long wings, short legs, and wide beaks thickly furnished with hairs, to enable them to keep their captured flies safe while they hunt for others. Yet to the inexperienced eye they are as different as they can well be—the one greyish brown, and quite insignificant looking; the other apt to catch the eye at once by his brilliant contrast of black and white. The one is to be found in every county and in every parish; the other is so choice in his tastes as apparently not to have selected the richest of counties as a breeding haunt. But I should not be surprised to hear, after all, that this is not quite true, and that the woods and hills of Herefordshire are not wholly destitute of such a living ornament as the Pied Flycatcher.

THE MIGRATION OF BIRDS.

[By the REV. M. G. WATKINS.]

THIS subject is best divided into two parts; first, the history of, and the views which have been held on, migration; secondly, the phenomena of migration, and the general laws connected with it.

I. The least observation showed men from the earliest times that certain birds arrived and departed at certain seasons; "yea, the stork in the heaven knoweth her appointed times; and the turtle, and the crane, and the swallow observe the time of their coming"; and again, says Holy Writ, "the time of the singing of birds is come, and the voice of the turtle is heard in our land." (1). The first writer to take a scientific interest in migration, whose speculations indeed were not superseded for more than 2,000 years, was Aristotle. He notes the analogy between the migration of fish and of birds, and is the earliest writer to name the double migration of birds, from the autumnal cold into warmer regions, and from summer warmth again to colder countries. Cranes, he says, fly facing the wind, which is now found to be more or less the case with all birds. He has discernment enough to pronounce that the fable of their carrying a stone with them for ballast is untrue. Quails cannot fly with ease in showery weather, hence they utter their call to each other as they fly, being in difficulties. On their outward journey they have no leaders, but on their return they take with them the Quail-mother (probably the Landrail), the long-tongued bird (perhaps the Greenshank), the night Owl and the Oortolan. The latter calls to them through the night. Cranes too choose a leader and rest all night on the ground during their migrations, with their heads under their wings and standing on one leg in turns, while the leader with eager neck listens and looks out and gives notice in case of alarm. These are his chief statements on migration, but singularly enough he dwells upon the hibernation of Swallows, affirming that "ere now many have been seen entirely void of feathers in deep glens"; precisely the stories which found favour even with Gilbert White, and on which Johnson founded his statement of Swallows "conglobulating together by flying round and round and sinking in a heap" for the winter into deep rivers (2).

The Roman Pliny, 300 years afterwards, is much more credulous. He repeats these stories of the Crane. Some birds, he states, "make voyages over sea and land to see strange countries." Quails settle at times in great numbers on sails and masts, thus bearing down the ships and sinking and drowning the sailors. They choose companions to go with them, especially the "Glottis." "This bird," says Pliny, in his quaint fashion, "is very forward at the 'first setting-out' (as being desirous to be a traveller, to see far countries and to change the aire), and the first daies journey he undertaketh with pleasure, but soone

(1) Jer. viii., 7, Cant. ii., 12.

(2) Ar. Hist. Animalium viii. 14, Sec. 3; Sec. 5; 18, Sec. 1; ix, Sec. 11. Boswell's Johnson (Ed. 1816) ii p. 56.

finding the tediousness and pains in flying, he repents that ever he enterprised the voiage. To go backe again without company he is ashamed, and to come lag behind he is as loth; howbeit for that day he holdeth out so so, and never goeth further; for at the next resting place that they come unto, he faire leaveth the company and staieth there, where lightly he meeteth with such another as himselfe, who the yere before was left behind. And thus they do from time to time, yere by yere" (3). The classical poets only viewed bird migration as enabling them to lend a fresh charm to their verse, much as the Rhodian children yearly welcomed the coming of the Swallow with a song. Virgil speaks of the birds bringing back summer to their sweet nests and dear offspring, and how "vere rubenti Candida venit avis, longis invisâ colubris" (4).

Our own poets are equally vague and often equally beautiful. Thus Thomson writes, speaking of the departure of the birds, where

"The Atlantic surge
Pours in among the stormy Hebrides.
Who can recount what transmigrations there
Are annual made? What nations come and go?
And hew the living clouds on clouds arise,
Infinite wings! till all the plume-dark air
And rude resounding shore are one wild cry" (5).

And Pope says:—

"Who bid the Stork, Columbus-like, explore
Heavens not his own and worlds unknown before?"
—(*Essay on Man*, ep. 3).

The first author to examine bird migration with a scientific eye was undoubtedly Gilbert White, just a century ago. He gives lists of summer and winter migrants, with the times when the birds arrive or depart, shows that food supplies are not the only cause of migration, and that birds cross usually at the points which gives the shortest sea-voyage. But his sight was clouded by the tenacity with which he clung to his belief in the hibernation of birds. Many theories have since his time been enunciated by Weissman, Palmén, and others, but the first requisite on which to found a safe judgment, abundance of varied observations on migration, was wanting. The influence of Darwinism, too, has rendered it almost necessary for his disciples to assume that not instinct, but experience, not indeed the experience of the individual but of the species, compelled and guided migration (6). Ten years ago, therefore, it might be said that our scientific horizon with respect to migration was almost where it was in the time of White, of Selborne; that is, our knowledge of the subject had practically not advanced for a century.

II. A conviction had in 1879 entered the minds of many bird students that without more accurate observations and abundance of them from all quarters of Great Britain, no definite conclusions respecting the phenomena of migration could be reached. A Committee was in that year appointed by the British

(3) Pliny, "Natural History." Translated by Dr. Philemon Holland (London, 1634).

(4) Virg., *Georg.* II., 319.

(5) *Autumn*, 862.

(6) See a paper on "Bird Migration," by Weissman in the *Contemporary Review*, Feb., 1879

Association (which soon obtained the aid of the Trinity Board) to investigate and register the phenomena of migration round our coasts (7). The plan adopted was to issue circulars inviting lighthouse-keepers to note and forward to the Committee any particulars of birds coming or going by day or night, and especially of any which accidentally killed themselves by striking against the lanterns. Sometimes as many as 200 birds in a night are killed on a lighthouse, chiefly land birds; marine birds seem to have acquired more experience. Starlings strike in the greatest numbers, Woodcocks usually one at a time. I have seen a thick glass window at the Spurn lighthouse which had been shivered by a Woodcock flying against it ("Migration Reports," 1884, p. 103). Many of the lighthouse men have now become expert in identifying birds, and enjoy registering them. At the close of the year the schedules are sent back to the Committee, who then proceed to tabulate, and, if possible, draw conclusions from them. The annually published volumes containing these deductions are of deep interest to all lovers of birds. It will be my endeavour to select from them what, when laid before you, will furnish a useful conspectus of all known at present on migration.*

Birds, as a rule it is found, follow the coast-lines in their migrations. One common route is across the Straits of Gibraltar, thence along the western shores of the European continent. Another route leads by Malta and Sicily to the shores of Italy and thence by the Riviera. A third leads over the Alps into Austria and Germany. Birds come across to England either from the North Sea or by the shortest way across the Channel. In the former case they generally fly over and sometimes halt at our own little island of Heligoland,† and there some of the most unexpected captures have taken place, while careful watch has been kept upon all birds which pass over. In a favourable season the number of these is very great. A competent ornithologist, Herr Gätke, fortunately lives there, and science owes much to his observations. Almost all the birds of Europe and Northern Asia migrate more or less, and, says Mr. Seebohm, "we may lay it down as a law to which there is probably no exception that every bird breeds in the coldest regions of its migrations" (8). He too regards migration as "a fact in the history of birds of comparatively modern date." It has often been debated what is the true home of migratory birds, whether the country in which they breed or the land they adopt as their winter quarters. The preponderance of evidence is, Mr. Seebohm thinks, largely on the side of the former theory; and he adds, "the cause of migration is want of food, not want of warmth. The feathers of a Siberian Jay or a Lapp Tit are proof against any cold" (9). Yet the autumnal emigration from us depends partly on temperature, partly on the period when young birds are able to shift for themselves. Migration usually

(7). In 1883 the American Ornithologists' Union appointed a similar Committee on Migration.
 (8). Seebohm's "Siberia in Europe," 1880, p. 224. Chapter xx. in this book contains an excellent account of migration at Heligoland.

(9). Seebohm *ut sup.*, p. 247.

*These annual volumes have now ceased to be issued, as sufficient observations, it is supposed, have been recorded. A competent ornithologist, Mr. W. Eagle Clarke, is busy in tabulating the facts and drawing deductions from them. Much useful knowledge, it is hoped, will thus be obtained on bird-migration.

†Since these words were written, on August 9th, 1890, Heligoland was transferred to Germany, under the terms of the Anglo-German agreement respecting Africa (M. G. W., 1892.)

takes place at night, but Larks have been seen over the Channel migrating by day, and I have myself watched birds coming in fatigued during an autumn day at Flamborough Head from the Continent. Heligoland is probably not a hundred acres in extent, and its resident birds do not appear to exceed a dozen species, but its value to migratory birds as a resting place is so great that 15,000 Larks have been caught there in a single night. "On the night between October 28th and 29th, 1882," Mr. Gätke remarks, "we have had a perfect storm of Goldcrests, poor little souls, perching on the ledges of the window-panes of the lighthouse, preening their feathers in the glare of the lamps. On the 29th, all the island swarmed with them, filling the gardens and over all the cliffs—hundreds of thousands; by 9 a.m. most of them had passed on again ('Migration Report,' 1882, p. 49)." The number of rare birds that have been obtained here is marvellous. Birds when migrating dislike a favouring as much as an absolutely contrary wind, preferring a wind from the side. They appear to fly at a high elevation, and when they arrive at Heligoland, their great half-way home between England and the Continent, to drop down as it were from the clouds. Mr. Seebohm supposes that they migrate by sight and not by instinct, but the gravest difficulties appear to me to beset the former theory. In the spring migration (of course I take for granted a knowledge of our spring and autumnal migrations) the adult males usually come first, then the adult females, next the birds of the year, then wounded or crippled birds. On their return various stragglers first come, then the young birds, and finally the old birds. "The conclusion I came to," says Mr. Seebohm, "was that desire to migrate was an hereditary impulse to which the descendants of migratory birds were subject in spring and autumn, and which has during the lapse of ages acquired a force almost, if not quite, as irresistible as the instinct to breed in spring" (10). Here again allowance must be made for the prepossessions in the writer's mind. "Among true migratory birds," he continues, "it appears to be a general rule that the farther north a species goes to breed the farther south it goes to winter" (11).

During the land migration, the same author thinks that birds travel slowly during unfavourable weather, and rest at night, but for a sea journey they wait for a favourable wind and then come there *en masse*. Mr. Cordcaux, a member of the Migration Committee, agrees with this. "In the Cheviots," he says, "I have observed for two years in succession that the streams of small migrants from Scotland follow those main valleys which run nearest north and south, sticking closely to the lowest levels, where the brushwood and bracken beds offer greater privacy and security than the bare fell sides. Birds also, when migrating, follow from choice low-lying tracks of land and river-courses in preference to elevated plateaus and the summit-line of mountain ranges" ("Migration Report," 1886, p. 52). When birds cross the German ocean, if fine, they fly at a great height; if wet and cloudy, they keep but a little distance above the waves. There is doubtless much mortality in bad weather, even among the larger birds during their migration. The Lincolnshire coast during a gale has been found strewn

(10). Seebohm, p. 259.

(11). Seebohm, p. 260.

with the dead bodies of the Hooded Crow. When countries are over-crowded with birds some appear (like human beings in similar circumstances) to migrate for good and all into distant lands. The curious irruptions of the Sand Grouse into England in 1863, and again in the present summer, appear to be migrations of this nature (12).

Migration, then, among British birds may be considered as of three kinds. First the regular stream of birds which comes here in spring to breed and which leaves us again in autumn, and again that similar stream which appears in October and leaves in February or March; next, the continuous migration of our common birds, Blackbirds, Jays, &c.; and thirdly, exceptional immigrations, such as that of the Sand Grouse just named.

As for the continuous migration of common birds, it may be noticed that this movement has only been discovered of late years, and that the reports from the different lighthouses show constant examples of it. Thus a migration of the same kind of birds frequently occurs, but in opposite directions, across the North Sea. Crows, Rooks, Jackdaws, Starlings, Larks, Sparrows, Buntings, and Finches, have been noticed there crossing each other. Indeed Professor Newton says: "Hence we are led to the conclusion that every bird of the Northern Hemisphere is to a greater or less degree migratory in some part or other of its range." Mr. Cordeaux takes Blackbirds as an example of this tendency, and says: "In the autumn, during September, the young of the year leave their summer quarters, and their place is shortly taken by others, likewise young birds, coming in October and November from districts which lie directly east or south-east of Great Britain. Should an English winter prove severe, or even partially so, our old birds will also leave, and in their place we have an influx of old Blackbirds from the Continent, pushed forward by similar causes. In the Spring the Continental visitors disappear, and our so-called resident Blackbirds come back to their nesting quarters. As far as our knowledge extends the normal conditions of locality and climate over the whole area are such as do not necessitate a regular interchange of the members of their respective *avi-faunas*. There is apparently no reason why our Rooks, Starlings, Skylarks, and Blackbirds should not be able to winter in England just as well as abroad;" and he adds: "Such are the ordinary phenomena of migration; a movement which is as regular and persistent as the flow and ebb of the tide" (13). And once more: "Practically such birds as the Lark and the Starling are migrating all the year round" (14). The Robin, too, seems almost always moving from woods to the vicinity of houses and back again, and even to far distant countries such as Africa.

With regard to the third kind of bird migration—that which is local, occasional, and exceptional—it must be remembered that it is only so because we do not as yet see the full purpose which thus stirs so many birds at once. Doubtless, want of food is one great cause, or abundance of food in an unusual locality. Thus in 1885 the abundance of Arctic ice brought down mollusca, entomostraca,

(12). Seebohm's "Siberia in Asia," p. 193—206.

(13). "Migration Report," 1884, p. 69, 70.

(14). Report, 1880.

&c., to more temperate seas, and so vast quantities of Gulls were observed in the Frith of Forth feeding on them. Again the Sand Grouse (*Syrnhaptes paradoxus*), which visited our shores this summer, "from the short time necessary for incubation," says Mr. Tegetmeier, "and the rapid growth of the young, increases so rapidly that it may have been compelled to seek new pastures and to extend its range. It could not traverse northward for climatic reasons; eastwards its range is limited by the Pacific, southward is the largest bird of the same genus (*S. Thibetanus*), and it therefore proceeded westward" (15). Cold is another cause of abnormal migration. Birds are pushed on as it were by it from a bleaker into a more sheltered district (16). A large and unusual influx of Ring-Ousels appeared at Spurn Point, Yorkshire, in May this year, and at the time of writing an abnormal migration of Crossbills (*Loxia curvirostra*) is taking place from Germany. Some have appeared on the coast of Holderness, in Yorkshire, and one was captured and kept on board the light-ship at the Spurn for a week before it escaped. In a letter to Mr. Cordeaux dated July 1st, 1888, Mr. Gätke sends the following interesting notes of the occurrence of the Crossbill on migration in Heligoland: "Have you seen any Crossbills (*Loxia curvirostra*)? We are swarming here with them. Since the 16th of June there have been flights from 10, 20, 50—and sometimes all the Hawthorns in my garden you know so well are crammed with them. There must during some days have been hundreds dispersed amongst the foliage. When they are feeding they remain quite dumb, and only when taking wing the whole chorus begins, calling 'ciit, ciit, ciit.' I have just mounted an old male, almost as red all over as a male *Fringilla erythrurus*; a few with white bars have been reported, but I have not seen one. They are of all shades, from lemon rump to orange scarlet, and almost carmine, but the greater number, as you may fancy, are grey birds, but not a single striped young one amongst them. These birds are rather out of date; they are not regular visitors to this island, years intervene without any being seen, and when they do appear it has almost invariably been in August, with boisterous north-westerly winds and rain; this year flight has been two months too early, and came with fine sunny weather. All are in excellent plumage—wings, tail, and all."

In conclusion, it may be noticed that what I have said refers merely to the phenomena of bird migration. The motives in the little wanderers' minds are still, and are long likely to be, an inscrutable mystery. We can only affirm that they proceed from a divinely-planted impulse, an *ἐνέργεια*, which, in truth, must underlie both use and wont or long experience in directing these hidden irresistible journeys over wide Continents and waste seas—

Quia sit divinitus illis
Ingenium, aut rerum fato prudentia major.

How this instinct or impulse works is a proper question for investigation by naturalists. Thus Darwin supposes, as I have said, that migration is due to long

(15) W. B. Tegetmeier, "Pallas's Sand Grouse," 1888, p. 18.

(16) This process has been excellently described by Mr. W. W. Fowler in his "Tales of the Birds," just published (Tale I).

habits, originally awakened by the need of a distant search for food. Mr. A. R. Wallace's view, however, holds that migration is one of the means of getting rid of the enormous surplus of bird population, as only a small number, he thinks, survives out of the vast crowds which seek to pass from one region to another. What this instinct in itself is as fruitless a question as similar enquiries in human psychology. The more a lover of birds attempts to understand the motives which bids them change their skies or pass from the ken of man to the comparative obscurity of the woods, the more is he foiled. But the attempt to penetrate this great secret of bird life will assuredly fill him with ever increasing wonder as he reflects on the resolution shown by even the feeblest birds in carrying out this law of their being—how such feathered atoms as the Golden-crested Wren brave the rough nights and severe weather of the North Sea in October to reach our shores; how the Sand-martins, the smallest of the British Swallows, do not scruple to commit their delicate forms at the same time to wastes of sea and leagues of land, in order to arrive at their winter homes. These considerations, I say, may well fill us with thankful wonder at the marvellous workmanship and infinite contrivances of the Creator; "great things doeth He, which we cannot comprehend" (Job xxxvii., v.)

Woolhope Naturalists' Field Club.

THE FUNGUS FORAYS, 1888.

ON Monday evening, October 1st, the visitors slowly concentrated themselves at the Speech House, in the Forest of Dean, and were met on the following morning in the Forest, or afterwards at the Hotel, by the Hereford contingent. Cold it might be, for some of the party swept the snow from the grass into their hands at about 10 a.m.: but it was clear and bright. As for the fungi, truly they were few and far between, the oldest excursionist venturing the opinion that it was the worst prospect of a fungus foray which the Woolhope Club ever experienced, bad as it was in the previous year. The ground was moist enough, it is true, but so cold, that only on the sunniest slopes could the commonest species be found, and even these were scarce and scattered. Whether in anticipation of such a result, or from a combination of various circumstances, the company was much smaller than usual. It included Messrs. T. B. Acton, C. Bucknall, Dr. Carlyle, M. C. Cooke, T. Howse, W. Phillips, Rev. J. E. Vize, H. T. Wharton, in addition to the President, the President elect, and a few old Woolhopeans, who, under the guidance of the indefatigable H. C. Moore, had travelled by train from Hereford to Newnham-on-Severn, where they were met by carriages from the Speech House which deposited them at Danby Beeches. From Danby Beeches they walked to Blackpool Bridge, examined there the traces of the paving of the old Roman road, thence past Moseley Green Turnpike through the Spruce Fir Drive, finally, after a delightful walk of four miles, met the visitors at the Speech House Hotel, which party had made their excursion in a circuit at some distance from the Hotel.

No record was kept of the species observed, but nearly everything in moderately good condition found its way into the collecting baskets, and yet they were not full. Rarities and novelties were out of the question, and never, perhaps, were common species treated with so much care and consideration. Even *Agaricus melleus* and *A. fascicularis* were treated with respect; one gentleman actually took off his hat in the presence of almost the only specimen of *A. rubescens* encountered in the Forest. Last year *Cantharellus aurantiacus* was one of the commonest species, sometimes growing by hundreds, but this year not a single one could be found. There was no dearth of walking—naught but walking “on, on, for ever”—to stoop and pick up a fungus was an event, but, alas! it was seldom worth the trouble of stooping for. It was worthy of note, that although the large genus *Agaricus* contains some 700 British species, the number

seen was singularly few, the proportion being very far less than in most other genera, whilst, in the number of individuals, *Lactarius* and *Russula* exceeded it. *Coprinus* was seen but once or twice, and all the species of *Cortinarius* were extremely rare. Dinner at the Speech House Hotel, and a careful scrutiny of all the baskets, with the inevitable "nightcaps," ended the first day.

On the Wednesday the members proceeded by train to Park End, which proved so satisfactory last year; but here again they were doomed to disappointment, for although more prolific than any spot visited on the Tuesday, yet the best was very bad, nothing of interest being found except some very fine specimens of *Russula integra*, and a few *Hygrophori*. Strolling slowly back through devious ways to Speech House, soon after two o'clock, light refreshment and waggonettes carried the party a drive of eight miles to Newnham Station for Hereford, and completed the two memorable days of fungus hunting in the Forest of Dean. Like bears of the forest, in another corner of Europe, the fungi had retreated to the mountains, and would not be found.

Thursday, being the Club day, was devoted to a little excursion in the woods and lawns of Holme Lacy, where *Bracken* flourished in luxuriant profusion, but fungi were more scarce than in the Forest of Dean, although that was a contingency never anticipated. How it could be possible in October for any wooded locality to be worse than the Forest was not credited, but such was the summary of results. Dinner, as usual, at the "Green Dragon" Hotel, was followed by some remarks by Dr. M. C. Cooke on "The Mycology of 1887-1888," with a summary of the books, and local lists published during the year, with new species which had for the first time been found in this country, including *Lactarius aurantiacus* in Epping Forest, *Agaricus (Omphalia) chrysophyllus* in Scotland, *Russula puellaris* and *R. roseipes* near Morpeth, *Russula barlae* and *R. granulosa* at Kew, *Russula maculata* and *R. armeniaca* at Epping, with *Hygrophorus spadiceus* from Crum Forest, and *Agaricus (Hypholoma) catarius* from Kew and the Forest of Dean, and lastly, the singular appearance of *Mutinus bambusinus* at Sunningdale. A comparison was also instituted between the meagre results of the present year's Woolhope excursions and the unusually successful excursion recently made in Epping Forest, but no clue could be given to the causes of such divergence, which, like some other phenomena associated with fungi, "no fellow can understand." The usual *soirée* at the residence of Mr. Cam was largely attended in the evening, the papers read being "On Dr. Bull's Birds of Herefordshire," by H. T. Wharton, M.A., F.Z.S.; "Notes and Queries on *Russula*," by M. C. Cooke; and "On Spiders," by the Rev. J. E. Vize, M.A.

The final excursion on Friday, October 5th, was made by train to Pontrilas, thence by carriages to Kentchurch Park, returning to luncheon at 3 p.m. with Mr. and Mrs. Attwood Mathews at Pontrilas. This latter experiment gave immense satisfaction at the close of a barren week; the genial hospitality extended to the excursionists compelling them to forget the immediate past in the enjoyment of the present. The lawn was decorated by clever models of various fungi, painted by the hostess in such excellent style that one of the excursionists rushed upon them with his basket, and until he touched them did not discover his mistake.

The social aspect of the week was a pleasant reminiscence, but the scientific phase undoubtedly a deplorable failure. M. C. C.—*Gard. Chron.*, Oct. 27th.

The party from Hereford consisted of the Rev. Wm. Elliot, President; Rev. E. J. Holloway, Rev. A. G. Jones, Rev. J. E. Vize, Dr. Carlyle, Messrs. T. B. Acton, Walter Pilley, A. J. Purchas and his brother, H. Southall, James B. Pilley, Assistant Secretary, and H. C. Moore, Honorary Secretary. Dr. Crespi, who had spent some hours in the Forest in the vain endeavour to find his way to Danby Beeches, was met with near Blackpool Bridge.

LIST OF FUNGI FOUND IN THE FOREST OF DEAN.

[Supplied by Mr. CEDRIO BUCKNALL.]

- AGARICUS (*Amanita*)—
 phalloides, *Fr.*
 muscaria, *Linn.*
 rubescens, *Fr.*
 vaginatus, *Fr.*
 AGARICUS (*Lepiota*)—
 granulosus, *Batsch.*
 AGARICUS (*Armillaria*)—
 melleus, *Fl. Dan.*
 mucidus, *Schrad.*
 AGARICUS (*Tricholoma*)—
 rutilans, *Schacff.*
 columbetta, *Fr.*
 terreus, *Schacff.*
 saponaceus, *Fr.*
 cuneifolius, *Fr.*
 carneus, *Bull.*
 AGARICUS (*Clitocybe*)—
 nebularis, *Fr.*
 clavipes, *Pers.*
 dealbatus, *Sow.*
 funosus, *Pers.*
 infundibuliformis, *Schacff.*
 sinopicus, *Fr.*
 geotropus, *Bull.*
 fragrans, *Sow.*
 laccatus, *Scop.*
 AGARICUS (*Collybia*)—
 radicatus, *Reh.*
 platyphyllus, *Fr.*
 maculatus, *A. & S.*
 butyraceus, *Bull.*
 vertirugis, *Cooke.*
 cirrhatus, *Schum.*
 dryophilus, *Bull.*
 AGARICUS (*Mycena*)—
 rugosus, *Fr.*
 galericulatus, *Scop.*
 ammoniacus, *Fr.*
 AGARICUS (*Omphalia*)—
 hydrogrammus, *Fr.*
 rusticus, *Fr.*
 fibula, *Bull.*
 AGARICUS (*Pluteus*)—
 phlebophorus, *Ditm.*
 AGARICUS (*Entoloma*)—
 nidorosus, *Fr.*
 AGARICUS (*Pholiota*)—
 spectabilis, *Fr.*
 mutabilis, *Schacff.*
 AGARICUS (*Inocybe*)—
 geophyllus, *Sow.*
 AGARICUS (*Hebeloma*)—
 glutinosus, *Lind.*
 AGARICUS (*Galera*)—
 hypnorum, *Batsch.*
 AGARICUS (*Tubaria*)—
 furfuraceus, *Pers.*
 AGARICUS (*Stropharia*)—
 æreginosus, *Curt.*
 squamosus, *Fr.*
 Worthingtonii, *Fr.*
 semiglobatus, *Batsch.*
 AGARICUS (*Hypholoma*)—
 sublateritius, *Schacff.*
 epixanthus, *Fr.*
 fascicularis, *Huds.*
 udus, *Pers.*
 velutinus, *Pers.*
 catarius, *Fr.*
 AGARICUS (*Psilocybe*)—
 A. semilanceatus, *Fr.*
 spadiceus, *Fr.*
 AGARICUS (*Panacolus*)—
 separatus, *Linn.*
 fimiputris, *Bull.*
 COPRINUS—
 comatus, *Fr.*
 micaceus, *Fr.*
 CORTINARIUS (*Phlegmacium*)—
 largus, *Fr.*
 CORTINARIUS (*Inoloma*)—
 violaceus, *Fr.*
 CORTINARIUS (*Dermocybe*)—
 ochroleucus, *Fr.*
 caninus, *Fr.*
 anomalus, *Fr.*
 sanguineus, *Fr.*

- CORTINARIUS** (*Telamonia*)—
 macropus, *Fr.*
 torvus, *Fr.*
 bicolor, *Cooke.*
 hinnuleus, *Fr.*
 rigidus, *Fr.*
- CORTINARIUS** (*Hydrocybe*)—
 colus, *Fr.*
 decipiens, *Fr.*
- GOMPHIDIUS**—
 glutinosus, *Fr.*
- PAXILLUS**—
 involutus, *Fr.*
- HYGROPHORUS**—
 pratensis, *Fr.*
 virgineus, *Fr.*
 niveus, *Fr.*
 colemannianus, *Blox.*
 laetus, *Fr.*
 turundus, *Fr.*
 conicus, *Fr.*
 chlorophanus, *Fr.*
 psittanicus, *Fr.*
 unguinosus, *Fr.*
- LACTARIUS**—
 torminosus, *Fr.*
 turpis, *Fr.*
 blennius, *Fr.*
 hysginus, *Fr.*
 uvidus, *Fr.*
 pyrogalus, *Fr.*
 vellereus, *Fr.*
 quietus, *Fr.*
 rufus, *Fr.*
 glyciosmus, *Fr.*
 fuliginosus, *Fr.*
 nitissimus, *Fr.*
 subdulcis, *Fr.*
 cimicarius, *Batsch.*
- RUSSULA**—
 nigricans, *Fr.*
 furcata, *Fr.*
 depallens, *Fr.*
 lepida, *Fr.*
 rubra, *Fr.*
 vesca, *Fr.*
 cyanoxantha, *Fr.*
 foetens, *Fr.*
 fellea, *Fr.*
 emetica, *Fr.*
- RUSSULA**—
 fallax, *Schaeff.*
 ochrolenca, *Fr.*
 fragilis, *Fr.*
 integra, *Fr.*
- CANTHARELLUS**—
 cibarius, *Fr.*
- MARASMIUS**—
 peronatus, *Fr.*
- LENTINUS**—
 cochleatus, *Fr.*
- PANUS**—
 stypticus, *Fr.*
- BOLETUS**—
 elegans, *Schum.*
 chrysenteron, *Fr.*
 subtomentosus, *Linn.*
 parasiticus, *Bull.*
 olivaceus, *Schaeff.*
 edulis, *Bull.*
 luridus, *Schaeff.*
 scaber, *Fr.*
- POLYPORUS**—
 dryadeus, *Fr.*
 vaporarius, *Fr.*
- HYDNUM**—
 repandum, *Linn.*
- CRATERELLUS**—
 cornucopioides, *Pers.*
- AURICULARIA**—
 mesenterica, *Fr.*
- CLAVARIA**—
 fastigiata, *Linn.*
 inaequalis, *Fl. Dan.*
 fumosa, *Pers.*
- CALOCERA**—
 viscosa, *Fr.*
- HELVELLA**—
 crispa, *Fr.*
 elastica, *Bull.*
- GEOGLOSSUM**—
 difforme, *Fr.*
- PEZIZA**—
 cochleata forma umbrina, *Pers.*
 rutilans, *Fr.*
 leucoloma, *Hcdw.*
- HELOTIUM**—
 fagineum, *Pers.*
- CALLORIA**—
 vinosa, *A. & S.*

NOTES AND QUERIES ON RUSSULÆ.

[By Dr. M. C. COOKE.]

APOLOGY of some kind seems necessary for the introduction of technical papers at unseasonable times, but opportunity has for the past two years been exceptionally rare for the consideration of technical subjects at the Woolhope Foray, and although dinners and *soirées* may, in a sense, be degraded from their high office by such an interpolation, it is a deed of necessity which excuses the demoralization.

Opportunities for the discussion, face to face, amongst mycologists of points of difficulty are exceedingly rare, and indeed the present is almost the only chance from year to year of "settling up;" so that it is almost too great a sacrifice to expect us to abandon it without a struggle. Into whatever branch of Natural History a person plunges, it is inevitable that the deeper he goes the more subtle will be the difficulties he encounters, and probably, at the same time, the keener will be his sense of the reconciliations which may be effected. Experience is a much more efficient guide than books, but this source of knowledge has no efficiency except for the individual, if driven to isolation, or condemned to a persistent monopoly of the results. It matters not that one has struggled with difficulties for years, until perhaps he sees bright glimpses of light through the darkness, if he is to die and make no sign. Labour will have been useless, save to him, if he fails to communicate to others his hopes and fears, his interpretations of dimly discerned facts, or his suspicions of accepted tradition. This may be received as the best apology which can be offered for an unwelcome intrusion, and, with such a prospect before us for the succeeding ten minutes, we can only advise the uninterested to close their eyes for that brief period, and sink into the oblivion of profound repose. It will be admitted, without proof, that the study of the genus of *Russula* amongst Fungi of the Mushroom type is one which has been regarded as about the most difficult. Of course there are difficulties everywhere, especially when no effort is made to surmount them, but the difficulties in the way of the determination of species, with any degree of personal satisfaction, in this peculiar genus must be tried to be appreciated. *Cortinarius* has its difficulties, for example, but they appear to dwindle in the face of those which beset *Russula*. This genus, nearly all the species of which were in the remote past lumped together under the one name of *Agaricus integer*, is remarkable in many particulars, but in none more than in the general sameness of habit, home, and structure, and the great variety of their coloration. None of the Agaricini present more brilliant colours, or in greater variety, and none perhaps less diversity in form. This seems to be an initial difficulty, for if form varies so little, and colour is not to be relied upon, how is determination to be accomplished? It may be affirmed that, at the outset, there is less difficulty in fixing the genus than in almost any other, for the merest tyro is soon able to declare this or that to be a *Russula*, when he would be puzzled over a *Marasmius* or a *Cortinarius*. With a *Russula*, then, pure and simple, there is no difficulty. No one

ever encounters a difficulty of that sort, but when you ask "What *Russula*?" then you are face to face with the "cardinal sin." It is the determination of the species of *Russula* that puzzles the best of us. And why? Because of the absence of broad distinctive features which assist so much in other groups. There are no caespitose species, for all are solitary. There are no lignicolous species, for all are terrestrial. There are no squamose or scaly species, for all are more or less smooth. Hence the characters by which one species may be distinguished from another in other groups are in this reduced to a minimum, so that they have to be supplemented by other and new distinctions which prevail here, but are not recognized, or but faintly elsewhere. Another cause of difficulty, to my mind, exists in the undue limitation of species or varieties. It is of no consequence whether one regards them as species, and another as varieties, the thing needed is a definite isolation of distinct forms, so that any species or individual met with can, without difficulty, be set in its proper place. The species recognized by Fries may all be good enough species as he understood them, but his diagnoses are often too general and embrace too much for ordinary use. The average mycologist requires more than the diagnoses of Fries will give. In some instances, perhaps, the species will cover only a reasonable range, such as *Russula fellea*, *Russula sanguinea*, *Russula lutca*, *Russula nigricans*, and *Russula depallens*, with some others, but constantly individuals are met with, such as those named recently, as *Russula Barlae*, *Russula punctata*, *Russula granulosa*, *Russula drimeia*, which would puzzle anyone who attempted to place them under the species of Fries. No alternative exists, as it seems to us, but to increase the number of recognized forms if the identification of *Russulae* is to be accomplished with anything like success by the average mycologist. Let it not be understood that we advocate an indiscriminate manufacture of new species, we would recommend that only such individuals should be referred to a species as the description will fairly cover, and that forms aberrant from these should be clearly recognized and indicated by definite names.

Here it may be inquired: what are the features to be taken into account in the characterization of species in the genus *Russula*? Perhaps on the answer to this question the gist of the subject depends. There could be no objection to take one of the *diagnoses* of Fries and accept that as sufficient indication of the characters to be recognized. Bear in mind that we state expressly one of the "diagnoses" of Fries, leaving out all question as to the individuals which those diagnoses have hitherto been made to cover, because they have been made to cover at least twenty fairly good species, which have lately been separated, and may possibly include as many more. The characters seem to be the following, as they stand in Fries:—Taste—pileus, form and character (Fries always has excluded colour from the diagnosis of the pileus)—cuticle—margin—stem, without and within—gills—form, attachment, and colour—and in some instances odour. Taking first for comment *taste, and odour*. It may be urged that these should be regarded as *accessory*, rather than *principal*, or at least applied with judgment, and not absolutely. Because there is no more foetid a species than *R. foetens*, and no species so unmistakable, it remains without dispute that *R. foetens* would

never be confounded by even a young mycologist, without smelling it, to anything else. Within the past ten years we have occasionally had specimens of *R. fetens* which had no *fastid* odour (a fact which might be accounted for), but on the contrary were positively fragrant, as strong and as pleasant as the odour of *Agaricus odoratus*, from which the odour could not be distinguished. This was corroborated this year in Epping Forest by Mr. Masee, where he remarked the same phenomenon. *Apropos* of odour, we encountered on one occasion a specimen of *Phallus impudicus* from which all the slimy green matter had disappeared, and all that was left was nearly as white as ivory and of a most pleasant odour, reminding one strongly of violets. Exception has been taken to this fact, when the circumstance has been alluded to, and although we have suffered under the imputation of "drawing the long bow" for fifteen years at least (when this experience was encountered), it will perhaps one day be admitted, by those who think they know everything that is possible for Nature to accomplish, that there really was once such a miracle performed as a *Phallus* with the odour of violets, as well as *Russula fetens* resembling anise.

Odour must, therefore, always have some latitude, more especially those odours, the appreciation of which, like that of female beauty, resides so much in the nose and eyes of the spectator. There is hardly any odour associated with fungi, good, bad, or indifferent, in which more than two persons can be found at the same time to agree. Nearly all will admit the odour, but not the same odour. For example, there is an odour prevalent amongst *Laetarii*. Let anyone put it to the test. No. 1 says "odour of bugs," No. 2 says "fenugrec," No. 3 says "Ligusticum," No. 4 says "empyreumatic," No. 5 says "camphor," No. 6 diluted "assafætida," and so on through a considerable range of obscure odours, but never more than about two will accord in ascribing to them the same odour. If in odour, so also in taste, even more than odour, there must be catholicity. *Russula rubra* is very acrid, no doubt about it, when in a really prime condition. Then even the most inveterate smoker will confess it a thorough "pick me up" for its pungency. How, then, can we explain the fact that at Breinton some years since, and at Epping Forest this year, a *Russula* precisely identical in all external features, and those of a remarkable character, should to the taste prove as mild and pleasant as a new filbert. It improves the case very little to say that the mild *Russula* was figured by Krombholz, and called *Russula atropurpurea*, which Fries included as a variety of *Russula integra* at one time, and at another hinted at as a mild aberrant *Russula emetica*. Must taste go for nothing? Certainly that is *not* our opinion. But it should hardly supersede every and all other features. Here is a case in point. Is *Russula atropurpurea* only a mild form of the acrid *Russula rubra*, with which it appears to accord in everything but taste, or are the two to be maintained as *distinct* upon the faith of one sole and single character? Let each be persuaded in his own mind, all we desire to contend for is this, that for the sake of the inexperienced mycologist, both of the present and future, such anomalies should *not* be ignored, but placed upon record, either as forms or varieties. As a general rule the distinctions "mild" and "acrid" hold fairly well both in *Luctarius* and *Russula*, and, we think, are as

reasonably permanent as any other character, for absolute permanency is a dream of the past; "slowly acrid," "mild then acrid," will always suffer some interpretation akin to non-recognition, a sort of neutral character, of no intrinsic value. Faint odours and uncertain tastes are valueless, except to mislead, and this implies condemnation of the method adopted by some persons in making it to form part of their characteristic diagnosis of new species that its "odour reminds one of the rose," or "faintly aromatic," or "calling to mind the perfume of melilot." These are all very well to put in a foot note, but they are too volatile and uncertain for a diagnosis, and certainly are out of place in such a genus as *Russula*, where, with the single exception of *Russula fatens*, decided odours, except the fishy odour associated with decay, are generally conspicuous by their absence.

Unfortunately, throughout *Russula*, spore character is of the most limited value in specific identification. There is such a close similarity that the minute distinction of one or two micromillimetres is practically useless. The common type of a rough sub-globose spore of about $10\ \mu$ prevails, seldom, perhaps, completely globose, but seldom exceeding more than 1 to $2\ \mu$ in one direction over the other. The occasional occurrence of a species with entirely smooth spores, if confirmed at all ages, would be exceptional, and add to the value of the character.

Colours of gills and spores require more careful consideration than some of us have given to them. The decided gills of *Russula lutea*, *Russula armeniaca*, and *Russula drimeia*, with some others, could not be overlooked, but there are species, several of them, including some forms of *Russula integra*, in which living and vigorous plants show no tinge of yellow when gathered, but after resting all night and drying, the gills and the deposited spores will exhibit too decided an ochraceous tint to be disregarded. It scarcely need be said that we hold no doubt on this point, that the colour of the spores, if a decided colour and not a faint tinge, can never be disregarded. The same species, however similar in other respects, cannot be accepted with white and with ochraceous spores; perhaps each section of the genus, as recognized by Fries, would be much better, for working purposes, if divided, as the *Fragiles* section is divided, into sub-sections *Leucospori* and *Xanthospori*. In passing, it may be urged that it does not follow that because the gills have, or seem to have, a tinge of colour, the spores are necessarily coloured. There are instances in which the gills are tinted more or less, but the spores are as white as in species which have permanently white gills.

The colour of the pileus deserves some remark. It has been considered hitherto that colour in the pileus is so very variable in this genus that it is absolutely valueless. No doubt this idea originated in the days when all *Russule* came under one or two species. Ultimately we venture to think that colour will be accepted to be as permanent in *Russula* as in *Amanita* or *Hygrophorus*: taking "permanent" to mean persistency in the same tones of colour in the different species. Many of the colours are very bright, and in some instances are confined to a thin cuticle, so that decoloration, more than usual, may be looked for, but this is a discharge of colour, and not an alteration of colour. And to a limited extent the turning yellow or the darkening of tints by age, moisture, or

decay, would be regarded as natural changes, the original tone being preserved, and not a variation of colouring in the general acceptation of that term.*

Some of the high-coloured, and over-coloured, figures of *Russula* in the books of the early part of the present century, helped to keep alive the notion of the very great variability of colour in this genus, whereas the undoubted fact is that a great deal of the variability existed in the minds of the several authors, and the paint boxes of their artists. No figures of "Champignons" have been so exaggerated and overdone as *Russula*; in fact, many of them are only caricatures. Impossible greens, cærulean blues, and reds gone mad characterize the majority. There is no more hopeless task than the attempt to classify under their respective species the legion of figures of *Russula*, which have dazzled the world. Illustrating our thesis that coloration in *Russula* is not such an indefinite and intangible thing as some have alleged, we will take one or two of the worst species.

First and foremost one of the most protean in colour, as understood by Fries, was *Russula fragilis*. Judging from the figures, it is green, green and pink, pink, scarlet, crimson, purple, violet, red-brown, yellow, ochraceous, and white, and perhaps something more. First of all we strike out *green*, as no ingredient, wholly or in part, of any form of *Russula fragilis*. What it was intended for we do not attempt to determine. *Yellow* is now represented by *Russula citrina* of Gillet. *Violet* by *Russula violascens* of Secretan, the *ochraceous* form, which seems to have been mild, and, therefore, not *Russula fragilis* at all, by *R. fimbilis*, Britz. The *white* is, of course, the *Russula niveus* of Persoon, and may be only an etiolate form, and then we have still left only the different shades of red, which now are held to constitute the species *Russula fragilis*. In its deepest tints it may verge on rosy scarlet, or crimson, but through all gradations of tints the tone remains the same, now and then spotted with bleached places, where exposed to strong light, and as decay commences the bleached cuticle turns yellowish, or foxy, not resulting from mutation of colour, but decay in the cells. Here, then, we have that variable species *Russula fragilis* simply reduced to a red species, subject to blanching and spotting by exposure to light, as all the other bright species are liable to similar accidental change.

Of *Russula integra* and *Russula alutacea* we will venture to say nothing at present, because up to now our opportunities have been few, and those chiefly in the direction of finding a well defined limit between two such similar species.

Russula cyanoxantha appears to be one of our commonest species, and *R. heterophylla* one of the most uncommon, if the diagnosis of Fries is to be relied upon, and not tradition. Doubtless *Russula cyanoxantha* does present in its extremes of intensity and size strange contrasts, but were the most sceptical to

* It was our intention to have remarked upon the loose application sometimes made of the two words "decoloration" and "discoloration," and must do so in a foot note. We would contend that they did not imply the same thing, and should be recognized at their true value. "Discoloration" may be an alteration of colour, from one colour to another, as a purple disc may be discoloured brown, or a pink edge turn foxy, but we contend that this is not "decoloration," which is a process of blanching, or discharge of colour like that which takes place in *Russula depallens*. Hence "discoloration" may be a change of colour, but "decoloration" an absolute loss of colour. It is by a clear definition of terms that something will be done to facilitate study, and even this remark need not to have been made, but that some persons who have written books appear to interpret both words alike.

collect all the specimens possible during a whole day, until they numbered at least one hundred good sound specimens, as we have done in this current year, it is doubtful if their mind would ever be troubled with scepticism again in respect of this species. With a pileus from 1½ in. to near 6 in. in size, from the faintest blush of colour to the deepest tints, and yet unity in all such seeming variety. Intrinsically a margin with a rosy tone, more or less sobered with purple, a pale disc, and between the two a dark zone of dull indefinable mixture of neutral green with purple, and that is the type for all the specimens we can meet with of *R. cyanoxantha*. The infinite variety being made up, not of any change of colours or their position, but simply of their greater or less intensity, the part occupied by the median zone being streaked in a radiate manner by darker lines, either quite smooth or palpably rugose.

Some may remark that there is no difficulty in that species, but it is otherwise with *R. heterophylla*. And here it may only be individual opinion, and so must be rated just at what it is worth, but we think two forms of *R. heterophylla* may be recognized, keeping in mind the strict limit imposed by Fries of "Lamellis angustissimis, confertissimis." These two forms, both of which are uncommon, correspond to the *Russula heterophylla*, Fries, for the greenish forms, and *Russula heterophylla*, Bulliard (t. 509, f. O.), for the brown forms, each characterized by very much crowded and very narrow white gills.

We presume that there always will be, with the most carefully arranged classification of species, instances occurring in the experience of all, of isolated individuals which it is difficult to place. It is a common occurrence, perhaps, with the most experienced, but, even in such cases, wherever careful drawings have been kept, time may provide the missing link. As a rule, it is doubtful whether these isolated individuals are worth the labour they entail, because they are mostly isolated, and the result of some accidental variation. Whereas it is with constantly recurring, and reasonably permanent, types that our best time will be spent.

The only other species to which we shall now allude is *R. xerampelina*, not at all a common one, and perhaps sometimes carelessly referred to *R. integra*. As to the colour of the pileus, all the variability seems to be in the intensity of the marginal colour; the disc holds its character of tawny yellow, verging on reddish brown, broken up into little punctiform scales. The marginal tint is purple, with more or less admixture of red or brown, but differing, as in other species, more in the intensity of the colour than in any variation in the elemental colours. There need be no hesitation with such a well defined species, when sufficiently mature to see the characteristic features of the disc, combined with the form and tint of the gills.

Of the coloration of the stem little can be said of any of the species in which it occurs. It is rarely constant, especially where the colour is red; species, such as *R. Queletii*, in which it is purple, are more invariable, and those in which the stem becomes grey, *R. depallens*, *R. ochroleuca*, etc., the stem is at first white, and the grey colour is acquired by age, and is always faint, but indisputable.

Before leaving the stem, it may be pertinent to observe that in the diagnosis

of some species considerable emphasis is placed on the rugosity of the stem. It is not infrequent to read that the stem is reticulately rugose. Admitted that it is more strongly marked in some species than in others, yet it appears to us that if a lens is employed, as it often is by an enthusiastic mycologist, he will probably grow sceptical as to whether there is such a thing as a species of *Russula* with a perfectly even stem, free from striæ in all ages and conditions. If so, they are, at least, more rare than absolutely rugose stems.

Internal changes of colour, or discoloration of the flesh, seems to be a valuable character, where it assumes a positive and definite tone, and does not bear the impress of caprice, as often appears to be the case in externally coloured stems. *Russula nigricans*, *R. densifolia*, *R. semicrema*, *R. decolorans*, *R. rhytipes*, and some others seem to depend almost for their strongest features on the colour or discoloration of the flesh. This is the most redeeming feature in *R. du Portii*. It seems to be characteristic of *R. Barlae*, and also of a species as yet undescribed, but which we call provisionally *R. ochroviridis*. Whether it takes a positive and definite form in *R. vesca* is not yet determined. It is not so liable to mutation, according to a wet or dry season, as taste or odour, and hence, all things considered, is more reliable.

The colour of the flesh under the cuticle appears to have the confidence of some mycologists who have little or no faith in the external coloration of *Agaricini* at all. This seems rather anomalous, but it may be true. It is generally considered a good test of *R. cmatica*, *R. consobrina*, *R. cyanoxantha*, and perhaps to a certain extent of *R. furcata*, as well as *R. cutefracta*. This subcuticular colour is not always the same as that of the cuticle, and then perhaps even more to be trusted, as in *R. cutefracta*, *R. furcata*, and *R. rhytipes*.

Considerable emphasis is often placed upon a separable or adnate cuticle, but we doubt much if this is not relative rather than absolute, and very much fluctuates with a wet or dry season. True, the cuticle may always be raised with much greater facility in some species than in others, and always most freely at the margin. Here is a little work still left for the microscope to determine whether there is in all cases a distinct outer layer of cuticular cells, or whether they are represented in the adnate pellicle by a cell structure continuous with the subcuticular cells. If the distinct cuticular cells are in all cases a superimposed layer, parting away with more or less facility, than the reliance to be placed upon a separable pellicle must be very small, fluctuating according to external circumstances.

Relative again, and not absolute, must be regarded the viscosity of the pellicle. Granted that in some instances it is most decided under any, and almost every, condition of humidity, as we presume it must be in *Russula cruentata*, Quel., where it is said to resemble *Hygrophorus limacinus*, but this is an extreme case. In damp situations, and persistently wet weather, it can be imagined that the cuticle of the species in the section *Rigidie* will in any of them exhibit fragments of grass and leaves adhering to them with some tenacity, as if they had experienced their soft moments. A distinguished and esteemed Woolhopean not infrequently has been known to experiment on the conversion of a dry cuticle to a viscid one,

by damping and pressing fragments of grass thereon, as a trap to catch the unwary. Nevertheless, for all this, the section *Rigidæ* is a good one, and, comparatively, the cuticle is dry, but not absolutely so, especially when young, that persistently damp weather has no influence upon them. Even that most characteristic, and characteristically dry, species *Russula virescens* may be gathered with fragments of grass closely agglutinated to the pileus, and yet the wood nymphs carry no fairy gum pot, for the delusion of corporeal fungus hunters.

Apropos of the cuticle, a curious phenomenon may be observed in two or three species—and we have observed it only in two or three—in which the cuticle of the pileus is continued for some distance from the margin along the edge of the gills in a coloured line. This may often be seen in *Russula lepida*, especially when the cuticle remains red or pink. This fact is alluded to by Fries (“Mon,” p. 191), where he says :—“Acie vero, præcipue marginem versus, sæpe rubræ ob marginem pilei cum lamellis contiguum, ut etiam in sequente,” that is in *Russula rubra*. Not only in these two species, but also in another, which we have called *R. granulosa*, an ochraceous species, the darker line is continuous from the margin of the pileus along the edge of the gills, for a considerable distance, like a coloured edge. As a sort of collateral evidence this fact may sometimes be useful in determination.

The final reference we have to make to the cuticle is to remind you that the tomentose cuticle is a rarity almost unknown in *Russula*. We have the viscid and comparatively dry cuticle, opaque or shining, bright or dull, but not the really tomentose pileus. There is a near approach to it in *R. punctata*, Gillet, at times, but a kind of pulverulence is the closest approach we commonly obtain to a tomentose cuticle. *Russula amana*, Quélet, is affirmed to have a pulverulent pileus; and so pulverulent is that of *R. mariae*, Peck, a North American species, that the red powder comes off on paper, or may be washed into water, to which latter it gives a pink tinge. On the other hand we have a variation from the absolutely smooth pileus, in those species in which the cuticle breaks up into small areolæ, or even into minute adherent granules. The best examples are those of *R. virescens*, *R. cutefracta*, *R. xcrampelina*, *R. punctata*, and *R. granulosa*. It may be added that we regard this character as a very strong and useful one, and, for aught we know or believe, constant.

This brings our “Notes and Queries” almost to a close. Any comparison of species, or critical observations on the limits of species, or the direction of their variability, must be postponed to some period when figures of all the British species can be turned to in illustration. As this time is, we hope, not many months distant, the subject may soon be resumed. It will be well worthy of the labour if we can succeed in rendering the *Russulæ* more intelligible, and this we shall still endeavour to accomplish. The number of available characters is greatly reduced in this genus, and we are compelled to fall back on minute distinctions which are little regarded in other groups, but by making good use of our eyes, it may be possible to initiate an improvement.

Our final note must relate to the general classification of the genus. Admitting something like 100 species into the fraternity, it is evident that an order of grouping must be adopted for facility of reference and determination. Fries attempted this by the recognition of five tribes, and no one has ventured to supersede them. Take them for all in all, we do not think, with our present knowledge, that any better can be offered ; at any rate, no better arrangement has been proposed. The *Compactæ* is the first, and at the same time the most perfect, of the five groups or tribes. This requires no comment. The second, or *Furcata*, seems at certain points to melt into the fourth, or *Heterophyllæ*. It requires considerable care sometimes to *put* them, in practice. The third, or *Rigidæ*, should be, and we think is, a natural and satisfactory tribe, although not a large one. Whilst the last, or *Fragiles*, if strictly maintained within the limits of the diagnosis, is a good workable tribe, although we fail to see a good reason for two groups of the yellow-spored forms when one group would answer the purpose. The same division of yellow-spored from white-spored pieces would be advisable in all the other tribes. A further subdivision of each section, according to some prominent feature, so as to reduce the size of each final group to some six or ten species, would probably be the most complete classification, and the most workable one that could be proposed. This is the only direction in which we imagine that any reform in the classification could be taken.

Some there are who have been rash enough to suggest the amalgamation of *Lactarius* and *Russula* in one large genus. These enthusiasts could hardly be practical men, or they would know that in proportion as you *diminish*, and not *increase* the size of the genus—all other conditions being equal—so do you facilitate its comprehension, and render it more practically applicable. *Requiescat in pace.*

A VISIT TO THE BIRD ROCK ("CRAIG-Y-DERYN"), TOWYN, NORTH WALES.

[By E. CAMBRIDGE PHILLIPS, F.L.S., M.B.O.U., M.P.I.O.C.]

It was the 26th of July, in the Jubilee year; an accident had temporarily laid me up, but a fortnight at that healthy, but quiet little village of Borth, Cardiganshire, with its comfortable hotel, and best of all, its pure sea-breezes wafted straight over the Atlantic, had nearly made me all right again. Borth itself is singularly destitute of bird-life, the sea being usually very rough, and there is no feeding-ground—nothing but beautiful sands three miles in length. On our right we approach Ynyslas and the estuary of the Dovey, the muddy flats of which teem with shore-birds, and run nearly up to the prettily-situated town of Machynlleth. On the opposite side of the mouth of the estuary is Aberdovey, an excellent place for anyone wishing to explore that long extent of muddy flats I have before alluded to. Past the mouth of the Dovey, in Cardigan Bay, is Towyn, easily distinguishable from Borth, and as in the evening I could often see small strings of Cormorants (*Graculus carbo*), heading towards Towyn, and, on enquiry, found they were returning to Craig-y-Deryn, their breeding-place, I determined to pay it a visit.

Starting by train from Borth, we ran along the estuary of the Dovey until we came to Aberdovey Junction. The tide being out, there were plenty of birds on the flats, principally Curlews, Gulls, and Plovers, the Black-headed Gull being especially numerous; and on nearing the Junction, a couple of Sheldrakes, with five or six little ones, were calmly waddling along the mud. Changing at Aberdovey Junction, and crossing the Dovey, a pleasant ride on the opposite, but more rocky, side of the estuary, past Aberdovey, landed us at last at Towyn, where, however, we were still a long way from the object of our journey.

Acting on advice given us before starting, we took the little slate-railway from Towyn to Abergwynolwyn, a distance of about five miles through most charming scenery, and on alighting at Abergwynolwyn we found some difficulty in getting a trap of any sort, but a few words in Welsh from my wife soon procured us an excellent tea in the small but clean village inn, and a capital pony and trap, and at last we were nearing the Bird Rock. To anyone without nerves the drive would have been delightful, but with two wheels and a most dangerous road, after many twistings, I was thankful when we reached a large valley opening to the sea, at the mouth of which is Towyn, and turning to the left we pulled up close under a large rock, "Craig-y-Deryn" (the Bird Rock). This rock stands boldly out, a most conspicuous object on the left-hand side of the valley looking down towards Towyn, and is precipitous on the two sides jutting out into the valley: but its top may be reached by walking over the hill from the valley behind it. These two sides, like a miniature Gibraltar, are nearly perpendicular, and it is on the ledges of the side facing towards Cader Idris that the Cormorant

builds and rears its young in safety. The guide-books do not give the height of the rock, but I should say it would be about 400ft., more or less.* I know the Cormorants looked very small from where we stood. A road skirts the bottom, and the nests, with the young, for the most part about three-parts grown, were easily distinguishable from the quantity of white droppings that fall beneath the nests and stain the surface of the rock.

We watched the old birds, particularly the hens, feeding their young, and the flight of the parent birds as they circled and soared round the face of the rock; and particularly the powerful flight of the large dark cock birds was grand in the extreme. The young, during the time they were being fed, made a continual querulous crying. Every now and then a Sparrowhawk would sweep round the face of the rock; instantly the old cock Cormorants would trumpet out their hoarse note of alarm and defiance, to be answered, in their turn, by the cries of the hens and young, making a babel of noise that must be heard to be understood. These sounds would ultimately die away, and perfect silence would reign until the appearance of another hawk would start afresh the trumpeting, and set the echo in reply. It was impossible for me to count the nests from where I was on the road, but at a rough guess I should say there were about thirty there then, but whether any young had flown I am unable to say.

The fishermen say that there are Cormorants on the rock blind from age, and that they never leave the rock, but are fed by the younger birds; but I am assured by a naturalist, living at Aberystwith, who knows the rock well, that he has many times seen it without a single Cormorant on it. They also say that the younger birds conduct the blind old birds to the sea, which I think is more likely to be true.

At the foot of the rock were two dead birds that seemed to have been shot when away, and to have flown home to die. There were also several small rabbits feeding directly under the rock of which the Cormorants seemed to take no notice. The nests, as far as I could see, never seemed to contain more than three birds, and these must be able to fly well before they could get from the rock to reach the sea, about four miles.

I watched the busy scene for more than an hour, and left about half-past six, when fresh arrivals kept coming in from the sea in little strings of four, five, and six. Instead of returning to Abergwylwyn we drove about two miles and a half down the valley towards Towyn, where we dismissed our driver, and walked the remaining distance into Towyn, which is a route I should advise any ornithologist visiting the rock to take. Charmed beyond measure at a sight which to me was so novel, I have here attempted to describe it.—*The Zoologist*, October, 1888.

* A friend of mine has since, by means of an aneroid barometer, determined the highest point to be 650 feet, and the precipitous sides about 550 feet.—E.C.P., 1892.

A PLEA FOR THE OWL.

[By E. CAMBRIDGE PHILLIPS, F.L.S., M.B.O.U., M.P.I.O.C.]

My friend Mr. Bishop has ably advocated in his letter to the *Hereford Times* the cause of this useful bird. In doing so, however, he has committed the grave mistake of considering the Night-jar, Goat-sucker, or Fern-owl (*Caprimulgus europæus*) an owl, and placing it in that family; and, as doubtless his letter has by this time been read by many young naturalists, I hope, in the interests of science, he will forgive me for correcting him.

The Night-jar, properly so-called, is not an Owl at all, and belongs to a totally different order—that of the Insectivores or perching birds, and to the family of Caprimulgidæ or Goat-suckers. It is a summer migrant, dispersed generally throughout the whole of the British Islands. It is also called the Goat-sucker, from the absurd idea that it sucks goats; and Fern-Owl, from its flying and feeding at night on our fern-clad hills. But here all likeness to the Owl family ceases. It is well known to naturalists in Wales, and is a beautiful bird, feeding exclusively on night insects, such as moths, beetles, cockchafers, &c., and is, in fact, the swallow of the night. Its evolutions in its flight when it is hawking, if I may use the expression, for its food, are perfectly wonderful; turning, gliding, and circling in the most graceful manner, and in the utmost silence, except when uttering its weird, jarring cry, that, once heard, can never be forgotten. This cry is usually uttered as the bird sits lengthways on a branch, and it is said that it never sits crossways.

Nature, in her never-erring bounty, has provided the Night-jar with a very large mouth with which to take its food. Several strong bristles project downwards from the edge of the upper mandible, forming, when the bird opens its mouth, a perfect insect trap; and, in order to clear its mouth and its bristles from the various portions of insects that may adhere to them, it has its middle toe furnished with a pectinated (not a serrated) claw. Anyone seeing this perfect little comb-like appendage cannot, I think, fail to come to the above conclusion concerning this claw, although some naturalists have advanced other theories. I may state also that the heron (*Ardea cinerea*) has a serrated claw, used, no doubt, for the same purpose in removing fish scales.

The good that the Night-jar must do as an insect killer is incalculable, and, as such, it deserves the utmost protection. It is common in this county, Breconshire, and many times have I had it brought to me as a great rarity, and have had the greatest trouble in convincing the bringer that he might see it any calm summer night, particularly in heathy places, if he only had the patience to look for it. I cannot, however, understand its being taken for a woodcock, its flight and shape being very unlike that of the long-billed bird.

I omitted to state that some have supposed that it captures its prey with its claws, but in my opinion it does so on the wing, flying along with its open

trap-like mouth, with which it takes the night moths and other insects; and this is, I think, now the generally accepted theory.

The Owls, on the other hand, belong to the order of Raptores, *i.e.*, rapacious birds, or snatchers (so called from the manner in which they strike their prey with the foot), and to the family of *Strigidae* or Owls. Of these our county can boast of but four—viz., the White, or Barn Owl (*Strix flammca*); the Brown, or Tawny Owl (*Syrnium aluco*); the Long-eared Owl (*Otus vulgaris*); and the Short-eared Owl (*Otus brachyotus*). The first two are common, the Brown Owl being far more so than the White; the two latter, however, are very scarce. Whilst on the subject of Owls, I would refer Mr. Bishop and any other lover of them to Dr. Kaup's "Monographs of the Owls," published in Vol. IV. of the *Transactions* of the Zoological Society, as recommended by Mr. Harting in his excellent "Handbook of British Birds."

All Owls are great destroyers of mice, which are their principal food, and which alone should free them from the persecution of the gamekeeper, who thinks that the poor Owl makes a fine show in his Museum of Natural History—viz., the keeper's tree, where, nailed among cats, hawks, and crows, its numerous remains help to swell the grand total. Let me, however, hope that Mr. Bishop's letter may have the effect of preventing the continued destruction of his friends the Owls, and that he will not relax his well-intentioned efforts; and may the day be far distant ere we have to lament the extinction of the Owl in this county as we are now doing that of the Crane (*Grus cinera*), the Bustard, the Peregrine, and the Bittern.

Brecon, June 23rd, 1885.

ON DR. BULL'S "NOTES ON THE BIRDS OF HEREFORDSHIRE."

[By HENRY T. WHARTON, M.A., OXON., M.R.C.S., F.Z.S., M.B.O.U., ETC.]

Since our last autumnal gathering, to the recurrence of which each year all of us who are lovers of fungi look forward with such keen anticipation, a wider world than ours has been enriched by the publication of "The Birds of Herefordshire," to give the book the abbreviated title which the binder has put upon its cover. The compilation of the volume was one of the pet by-works—*πάρεργα* a Greek would have called such—of our loved and lamented master, the late Dr. Bull. But he was not spared to see it set up in type. It has occurred to me that the issue of this book ought not to be passed over lightly in the annals of the Woolhope Club, and that a few notes about it would not be unwelcome to those—and that category, I fancy, comprises all of us here present to night—who hold Dr. Bull, in some niche of their hearts, as one of the most lovable of all the men they may have met. To think that he, had he lived to see his book through the press, would willingly have left the outside world opportunity to imagine that he had appropriated the work and the observations of others and called them his own, is so repugnant to those who knew his large-heartedness and his humility as to be hardly worthy of repudiation. But every one who knew him loved him, and those who knew him most are the best qualified to understand how he appreciated and was grateful to those labourers whose combined work enabled him to piece together the "Notes on the Birds of Herefordshire." Dr. Bull, as we knew him while the charm and candour of his personality enlightened our re-unions, was the last person in the world to give as his own the work of others. Far rather would he have ascribed to some less conspicuous person what was really the result of their joint observations. Self-assertiveness was about the very last vice of which those who knew him could accuse him.

The first duty of a critic is obviously to learn the limitations to the scope of an author's work with which the title-page in brief acquaints him. But yet how often even a bibliographer is puzzled when he knows a book by nothing but the inscription which the binder has put upon its cover. Every librarian has examples by the hundred at his fingers' ends of the pitfalls into which the binder has led the unwary. Even titles themselves often lead to strange mistakes, and if a plain title can be misleading, what can we not expect from an abbreviated one?

Let us now, therefore, before considering the posthumous work of our dear friend, take note of what it promises upon its title-page. The full title runs thus: "Notes on the Birds of Herefordshire, contributed by Members of the Woolhope Club, collected and arranged by the late Henry Graves Bull, M.D." How could a disclaimer have been made more clear? In the first place, the book professes to be nothing but notes; in the second, Dr. Bull arrogates nothing to himself but the collection and arrangement of observations made by others. He was much too modest to propound that even a single observation was independently his own. The publication, from time to time, of his papers, which form the foundation of the

book as we have it now in our hands, in the local journal, is enough to show that he never wished to issue as original that which only others had seen. Every paper, as it was printed in the *Hereford Times*, he kindly sent to me, on the printers' galley-slips; and many a laugh we have had over the feebleness of some of his poetical quotations: of which more anon. It seems to me that nothing can be more ungenerous than for anyone to come forward now and say that what Dr. Bull states they alone said, when he cannot, in his charming, genial way, ascribe everything related in his book to the actual observer. The book is fat enough, and full enough of personal references, in all conscience, to satisfy the pride of the numerous observers to whom he refers. I feel sure that every member of the Woolhope Club is grateful to its moving spirit for everything which he has done; and that no one can conscientiously follow in Dr. Bull's footsteps without realising how he has cleared the way for them. It would, indeed, be a disheartening prospect if the faunist of even a single county had left nothing for his successors to notice and record. That which we wish to signalise to-night is that our dear friend has made an epoch, by his being the first to publish in a self-standing volume—as the Germans say—every item regarding the birds of Herefordshire which his opportunities enabled him to collect together; and that he would have been the first to desire to ascribe individually to all every single fact which has gone to make his book what it is. How he could have done much more I, as an old *littérateur*, am at a loss to suggest. Upon his title-page, which he himself indited, he renounces his individuality, and expresses his indebtedness to all our *confrères*.

But enough of this. Let us try to get into the atmosphere where our dear master felt at home. In the first place, let me laugh again at his poetical allusions. Evidently birds do not lend themselves to poetry, save in a few instances. If they had, his pages had been richer. Poets seem to think that skylarks and nightingales, eagles and ravens, and such like, are the only birds worthy of their thoughts—sweet although so many of their thoughts on them have been. To the humble poetaster they leave the story of how the chaffinch weaves her marvellous nest, and how the bottle-tit casts her into the shade for ingenuity. The masonry of the song-thrush is as unsung as the heroes before Agamemnon. No poet of the first rank ever saw the wondrous construction of a Carrion Crow's, or even of a Rook's nest. None was ever carried away by the life in the eyes of a summer warbler hiding in the tangled hedge. How a naturalist's heart beats when he thinks what it all meant to him—when he last saw it! But all that they, poets and poetasters, have seen and recorded—so far as they thought was worth recording, and that is often little—enlightens, and delights us, in Dr. Bull's pages. He leaned towards local describers with a loving care, as if he and they alike had loved the same things, but that each realised that it was beyond the power of either to show in perfectly fitting words what each one evidently felt. And so it must be, always. One man thinks that there can be no such bliss as that of being kept awake by the singing of nightingales—and of such am I; while another, who has gone through what he appraises as the torture, curses their insistence.

Herefordshire is not, at the first blush, a county in which we should expect much strange bird-life. It has not the advantage, like Cornwall, of drawing to its

confines birds wheeled by the warmth of the Gulf-stream ; it has not the prospect of the eastern coast, whither storms may drive strange migrants overtaken by a change in the wind or by the darkness of the night ; it is far away from the seaboard, so that the fishers of the ocean are but waifs and strays ; it has no wild lakes and meres like Norfolk, wherein the great shy inhabitants of such localities can find even a temporary home. It is mainly a cultivated land, where no unexpected guest can be seen in any likelihood, save by the merest accident. There are few wild fastnesses where may breed or be sheltered Peregrine or Chough ; no apparently limitless moors, such as those of Scotland or Yorkshire, untraversed by any save the shepherd or the sportsman. Still the Red Grouse finds a home on the Black Mountains, and Dr. Bull tells that the birds bred there are larger in size, and lighter in colour, than those of the Scottish hills.

Nevertheless, Herefordshire is almost a typical midland county, and its avifauna is well worth a survey. Bird-men, like all other scientists, are sticklers for their own pet classification ; and few have ever been, or perhaps ever will be, satisfied with the same. But in his "Notes," Dr. Bull has followed the arrangement of the *Ibis List* ; and I, upon whom most of the labour spent in its compilation fell, trust that his reliance upon it may not be the least of its results in attaining something like uniformity. Names really matter so little, so long as we know to which species they refer, and that the less they are disturbed the better.

In the *Ibis List* there are enumerated 452 species, but of these only 376 are allowed to be really, and strictly speaking, British birds ; and many even of these are but accidental and local visitors to our shores. In the table which follows the preface in the *List*, no fewer than 165 species are put down as "occasional visitors" only. So that the total number of properly British birds is reduced to 211. In Dr. Bull's "Notes" we have 202 species recorded as having occurred in Herefordshire. Although in this local list many species obtain a place which the editors of the *British Ornithological Union List* describe as "occasional visitors," still this is a very fair, if not a high, average, for a county situated as Herefordshire is. Few inland counties, unless they have exceptional good fortune, can show a better record.

In his Introduction, Dr. Bull acknowledges the latest edition of Yarrell's "History of British Birds" as the basis of the "Notes on the Birds of Herefordshire ;" so we naturally expect that he should have, in the labour of compilation, disjointed as we know that was by the professional calls upon his time, taken many a stray note which touched him as peculiarly worthy of emphasis, and incorporated them in a work which he especially prepared as a conspectus of the observations of others. Never during his lifetime did he assume that his "Notes" were anything but a compilation, enriched by the contributions of his fellow Woolhopeans. The book would have been weary reading, if he had given references to, or stated the source of, every separate statement that he made. He doubtless thought it sufficient, as most of his predecessors have, to name the authority for those records which, without some such authority, would have been worthless. So long as a statement is true, it does not matter much to future generations who it was that first discovered the fact. But it is a matter of great importance

when an occurrence of such a doubtful species as the Great Black Woodpecker in Britain is noted; and in such a case the world must needs be told upon whom the responsibility of the observation rests. A simple *on dit* is so much waste of type. And even when Dr. Bull has given his authority, and that of a name well-known to us, some critics carp at it, and make merry—over their own ignorance. The case I refer to is where Mr. Clement Ley states (p. 97) that he “has known as many as forty eggs taken one by one from a single nest of the Wryneck.” The wise critic does not know, what every egg-collector knows, that the Wryneck is one of those birds whose power of enumeration is a kind of craze. You have only to take out, day by day, the egg regularly laid after the first, and poor Mrs. Wryneck goes on trying to complete the tale (seven or eight being her usual number) until her powers of oviposition are exhausted; she is never satisfied that she has laid the proper number of eggs, unless she has them there to count, until her fecundity fails her. It is, of course, to this peculiarity that Mr. Ley refers; he knew so much that he never thought how many people, wise in their own conceit, know so little. But we may take some comfort, on the other hand, that not one alone of Dr. Bull’s critics has complained that he has quoted too much. He never professed to be a second Gilbert White. Happier would he have been if he had not had to repeat so much at second hand, and had had himself the delight of observing everything which he chronicled so lovingly. He is a poor naturalist who is content with knowing and recording nothing but what his own eyes have seen; just as he is a dishonest one who says, in so many words, with whatever circumlocution, that the original observations of others were his own. The “I” of conversation, and the “we” of literature, are alike conspicuously absent from Dr. Bull’s posthumous “Notes.” To himself he arrogates nothing but the piecing and the padding. If no one of us ever takes pleasure in any occupation on a lower ethical basis than this, we shall not do much harm in this world, nor have much to answer for in the next.

But now I must delay you no longer. Let me, however, express one fervent wish. Rise in the morning filled with an honest desire to correct, so far as each of you can, whatever Dr Bull has stated amiss. Gather facts together so fast, and so well authenticated as to make a third avifaunist of Herefordshire an impossibility in our generation. You cannot please him better, if his ghost still revisits the places which he loved so much, and where he was loved so well. He was your pioneer, although he never held himself more than your recorder, to make the way easier for those who should come after him. Had he been longer spared to us, and had he had the opportunity of showing his work to those who had enriched it, before its final stage, there is no one who would have taken greater pleasure in recording, for the sake of posterity, as well as in justice to those whose observations he collected together with a childlike inoffensiveness, how much he was indebted to those whose love of bird-life, and of all life, was akin to his own. If I could have the opportunity, in any arraignment, of appearing as his counsel, I think I could show to those who failed to understand him, whatever they might adduce, that our friend Dr. Bull was as honest and straightforward a naturalist as it has ever been the glory of Great Britain to foster and admire.

SPIDERS, BRITISH AND FOREIGN.

[By the REV. J. E. VIZE, M.A., F.R.M.S.]

IN undertaking to read a paper on the subject of spiders to the Woolhope Club, I confess to have been utterly ignorant at the time of the fact that already our members had received a paper from Mr. Lane upon "British Spiders," published in the year 1874 *Transactions*, p. 80. Both papers are utterly independent of each other, and I have purposely avoided reading what Mr. Lane says, so that the same ground may be avoided as much as possible.

As regards the subjects to be treated in the paper, they are numerous, of course, and may be arranged under the different parts of the body of the animal itself, and the means adopted to keep themselves alive. We must have a little to say about spiders which are not British, and their preservation for examination for the cabinet, &c., and their classification. Let us begin with their breathing apparatus. The breathing apparatus of spiders is very well adapted to its purpose. Ours is in a compound form, through the nose by the two nostrils: we have also another arrangement by the mouth for admitting air to the lungs, and so aerating the blood. Insects, many of them, such as flies, bees, wasps, caterpillars, maggots, &c., have them down both sides of their bodies. Air is admitted by means of openings, called spiracles, to the tracheal system, which system is most complicated and beautiful, as may be seen in the water beetles and silkworm larvæ. By this means the whole body is pervaded with just the quantity of air necessary for it, although, be it remembered, spiracles are not found in the heads of insects. This is the reason why, if you cut off the head of a fly or wasp, it does not cease breathing as we should do. It breathes almost as well as ever, and suffers from inability to get food, and also from blindness. Plants breathe also through their stomata, which are openings on the cuticle of the leaf, sometimes only above, sometimes only below, as in the cherry laurel, sometimes both above and below, as in the yucca, which has 40,000 on the upper side and 40,000 on the under side, thus giving 80,000 stomates on a square inch. The lilac has 160,000 on the lower surface alone. The spiders breathe by means of membranous plates, placed within the abdomen in two clusters. They are something like the gills of fishes, or plates closed together like the leaves of a book with irregular openings.

The eyes of the spiders are very wonderful things, and certainly not what we should expect. Most creatures, you know, have two eyes and most useful they are. They are placed in the head in a tolerably prominent part, beautifully shielded from dust by the eyebrows above, and by a pair of eye-lids tipped with a number of eye-lashes below. The eye-lids, as you are aware, are during the time of our using our eyes, that is to say when we are not asleep, constantly meeting each other and separating from each other, so that the eyes may be lubricated and kept moist, otherwise they would become dry and contract, and we should soon be in great pain from the agony of blindness coming on. But about the spider's eyes. If they were placed like ours are, they would be damaged and wounded

whenever he was attacking his prey. He is really one of the most formidable creatures on earth when we understand the forefront of his body. It is a mass of offensive and defensive weapons. He has mandibles of fearful strength for his size. They are very large and very deadly weapons, as we explain elsewhere, and, supposing that his eyes were close to the mandibles, they would be sadly in the way. God Almighty has made a different place for them. They are some little distance down the back, and so well placed that there is little fear of their being injured. The first eyes I ever saw were unusually interesting to me, because four out of the eight were perfectly flat, whereas the other four were to be seen from the side view, looking down, as it were, upon the pupils which stood out, well dilated. The specimen was from a skeleton. Besides, the spider has more than two eyes as a rule. Some have two. I believe no spider—no true spider—has four, unless you call the harvest man a spider. Many spiders have six, but the most extensive are the eight-eyed. And these eyes are in all sorts of places as to their relative positions on the different animals. Those that are six-eyed may have six, equal and oval; there may be a pair on each side and a pair in the middle; there may be three pairs formed of two each, close together, or they may be isolated. Then in the eight-eyed there may be four large and four small—or two large and six small; or in three rows—two large, two small, four equal, or four slightly larger than the rest, or all eight nearly equal, or two larger than the rest. There may be six equal, two oblong, or nearly all equal in two rows. You may have them with two end eyes on each side on tubercles—in a transverse curved row, or in two nearly straight parallel rows. The side eyes may be on tubercles or all of them on a prominence. You may find them nearly all on black spots. These distinctions are regular in the spiders; so much so that Mr. Blackwall distinguishes the different families of spiders solely from their eyes. He looks at the position and number of eyes on a spider, and then classifies it accordingly. He has done so with our British spiders. But how many spiders have we in Great Britain? We recognise a few, but as for there being many different sorts in and near England, those who have not investigated them would say there were very few. Well, already there are between 500 and 600 species, classified, arranged, and named distinctly one from another. There are, indeed, good reasons for those who have not examined much into the minute forms to be surprised that life in such varied ways is in our very midst and yet we know it not. The most giant mind that ever was given to us ordinary mortals, cannot grasp, except in the very faintest way, the wonders that exist in this world.

But before we leave the eyes of spiders we may observe that their sense of sight cannot be very exquisite. They do not seem able to accommodate themselves much for vision. You may easily delude a spider and make him believe he has a fly to be captured, when in reality you are deceiving him by something of the size of a fly. He does not detect the deception by sight. But then another sense comes into operation, namely, touch. His web is very sensitive to motion, and he can feel the least movement whilst hiding in his home. This firmness of touch is more useful to him than sight. There is a spider living in the southern part of Europe which is very interesting as to its eyes. It is the *Tarantula*

narbonensis (Lat.). It has phosphorescent eyes, the use of which we can easily see when we know its habits. It makes a hole in a slanting position into the ground, the depth of it being something under a foot. Down this hole the animal lives, having prepared for himself what in railway language would be called a siding or hole in the side of his nest. There he places himself, with the greater part of his body except the front part being concealed. His eyes, which, of course, are brightly light in his house, are always turned upwards. No doubt they attract the creatures which are food for him. As soon as a creature gets into the nest, which is lined with web throughout, it gets nearer and nearer the bottom, and of course is easily mastered and overpowered by the spider. Our spiders are said to have the power of shining in the dark, as well as being able to see by day. In this respect they are very like the eyes of a cat. This shining power must be of great service to them, for we must not forget that animal life in the way of insects, birds, and other things, is very animated when we are in bed and fast asleep.

The mandibles of spiders, corresponding to the claws of lobsters and crabs, are very formidable weapons. If any creature, on which the spider can feed, once gets between them, there is certainty of something corresponding to what would be, with us, broken bones. You have an arrangement very like the claws of a crab and just as dangerous. The two extreme ends of the claw or fang are moveable; they move in a socket a very little distance from this point. But they cannot move sideways—only backwards and forwards—only to or from each other. Fancy a small insect getting between these ends of the fangs; they have hold of the poor little thing, and in coming towards each other pin it tighter and tighter down into a set of upright horny points, and impale the thing at once. Escape is impossible. A cat or dog, in common with most animals (man included) has eye teeth which are longer than the others, and therefore hold the food permanently at will. A cat could not hold a mouse in her mouth and run along with it as she does, unless she had these teeth, without the mouse dropping down. But a cat's teeth are nothing like as formidable as those of the spider. A fly spiked on those points and being pressed on to them more and more by the fang, instances one of the most terrible weapons for death that we know. But there is a little more to be said about the mandible; it carries along it the poison. This can be traced, at least the passage where it goes can, in transparent slides where the mounting permits it, and as there is a small opening or hole very near the end of the fang, the spider can not only hug fearfully on the pinnacles, but also use its poison on its prey and so, in the case of a horny beetle, ensure death either in one of two ways, or in both ways. The poison of spiders is of a very strong kind; it irritates mankind, but of course is too small in quantity to do more than worry men. Still, to show its strength, let a spider sting another spider, and in about five minutes it will be dead. Spiders do fight—they fight with a rancour that no human being can surpass, if he can equal it. They fight, too, with little provocation. A wife does not hesitate to fight her partner to death and then to eat him up. The fangs of these creatures, it is scarcely necessary to mention, can be used at pleasure in injecting the poison

or not. It would be of no advantage at all for the spider to inject poison into a creature he was going to feed upon, except for the quick despatch of his prey. Probably, however, even if he did, the poison taken internally by the spider would do him no harm, although injected into the blood and system it would be fatal. This we glean from poison generally when taken by ourselves. Poison causing death when taken inside us, may most safely be applied externally, and be of benefit.

A word or two as to the position of the fangs of the spider, in respect to the mandibles. To a casual observer they would appear all to be of one uniform flatness, but such is not really the case. The level of the fangs is very nearly the same as the level of the lower part of the mandibles, but the mandibles in their centre are considerably elevated above the lower part, by which means they get much extra strength in the way of muscle, flesh, fibre, &c. Hence a great addition of power in using the fangs is gained, and a most useful help it must be to the spider in holding his prey. They remind one very much of garden shears, flat towards the grass when being used, but not flat above. The poison glands are contained some distance below the fangs. I have not tried to extract them, but imagine they would be easily drawn out if you took the mandible after steeping some time in caustic soda or potash, and then, after breaking it below the joint, drew it from the animal. My reason for this is that near the end of the fang an opening exists through which the poison passes, which poison moreover runs also along a channel in the fang itself, thus becoming scattered. The glands are beautifully striated in many instances, whilst in other cases these markings are with difficulty detected. These markings are fibres, and there is much muscular power close to them, so as to draw out the poison when needed.

The legs and claws of spiders are admirably adapted for their purpose. They vary considerably in length, the amount of hair upon them, their slenderness, and other particulars. Perhaps the most beautiful part of them is in the termination of the legs; we may call them claws. There may be two or more of these claws, toothed more or less. Often, these claws are two of the same length parallel to each other, and then below them you have a smaller one, with few teeth compared with the upper ones. They are beautiful microscopical specimens, and certain to attract the attention of embryo microscopists. I find that by far the best way to obtain perfect specimens is to go in search of dead spiders, which, in the months of December and January, are sure to be found in the old webs. Manipulate them very carefully in detaching them from the old web, drop them into spirit of wine, let them saturate for days, if need be, in the spirit until all the air is gone between the joints of the leg, then mount in the usual way. I have several thus prepared, and always enjoy an examination of them. That the toothed claws are splendidly made and adapted to their end there can be no doubt. We might imagine they would do nicely for climbing up a wall; nothing of the kind; they do it most bunglingly, and are about as awkward as a novice beginning to learn to skate. I do not say this is the case with all the spiders. The travellers, for instance, journey well up rough places, standing

upright, but the ordinary web-making spiders are not intended for climbing up bricks and walls. They want their beautifully made toothed claws for cleaning themselves and their webs, which they do admirably. You will not find much dirt on the webs; no, the spider would rather make a new web, or cut off a few dirty threads and replace them with clean ones, than be as filthy in his house as many a Christian is.

When spiders make their webs they dart the threads immense distances, thus making the long web they do, and thus attaching them to places some distance apart. If you ask, why are they not often seen in the act of making their webs? the answers are not difficult. In the first place it is not easy to see a newly-made web—then again, the spiders much prefer working by night, probably because the night air is more humid than the air of the day. The length of the thread of a spider is at times very great, measuring several feet. These single threads are often troublesome as we walk in our gardens, because being invisible, we know nothing of their presence until we feel them interfering with our personal comfort, such as eyesight, or breathing. They must be of great service, however, to the spider itself, because when they are spun from the insect and wafted in the air by the passing current, the spider at once gets into a new region and moves over fresh territories. You may find these creatures in most extraordinary places—they may send forth their first thread from almost any place they may happen to be—say, for instance, the top of a shrub, or tree, or even a door, or roof of a house. The thread being once discharged must attach itself somewhere, and so find a cord for passage for the spider to go to the opposite place of attachment to where he is. This process reminds us very much of the rocket system in cases of shipwreck; once attach the rope from the shore to the ship, as the spider does his web from one place to another, and there is at once a means of communication opened for transit. Spiders, you know, do build their nests in places we should scarcely imagine they would. As an instance, you may detect them, with the spider in their centre waiting for his prey, right across a stream of water. When this is the case, there is much wisdom shown by the animal in choosing so good a spot. It is not likely he will die of hunger, because as flies and various insects emerge from the larvæ state and rise from the water to fly, the spider invites them into his parlour, so that he may feed upon them and fatten himself. A web across water must, during the summer season, be as good a feeding ground as a shoal of herrings, or sprats, or mackerel, at sea must be to the creatures that feed on them. The webs of all the spiders are very beautiful. Amongst the best of them in this respect we find that of the English garden spider. Its geometrical arrangement is very fine, especially when you meet with a small one just made and quite free from damage. In general appearance it reminds us of a cart wheel, the central part being where the spoke should be, and which is sometimes occupied by the spider himself. From this centre rays proceed, as you know. These we may call radii, which of course get wider and wider from each other as they increase in length. Then between these radii we have what may be called the cross-bars. The radii are rigid, very firm and strong, the cross-bars are nothing like so rigid. Their structure in the primary formation is, I believe, identical with the radii,

because it proceeds from the same place when being spun. The cross-bars, too, are much more elastic and gummy than the others, because when the creature makes the web, he wants firmness for the radii, so that they may bear his weight as he runs along them to seize his prey; but in the cross-bars he wants them very gummy so that the object captured may be held firmly until he comes, when he will do his best to poison it or weave more web about it. In other words the one set of rays (radii) are strong for weight. The other set, cross-bars, are very glutinous and elastic, so made by the addition of a saline mucus, expressly emitted from them in the making of the web, and which continues moist even for years, although the other threads are dry as soon as exposed to the air. This is a wondrous device, and shows God Almighty's skill in adapting things to their several functions and uses.

A few more words about these threads in the web. They appear to be one single thread—look at them ever so often, examine them ever so closely even under the microscope—but are they only one? At the extreme end of the body of the spider there are what are called spinnerets. These spinnerets vary in number; say there are four or six. In each of them there are a number of minute holes, from which the viscid fluid comes which makes the webs. You have this number therefore, say 100, 300, 400, 1,000 and more apertures to make the thread from one single spinneret. But there may be six spinnerets—always six in the (*Epëira*) garden spider. Hence the apertures, call them 1,000, have to be multiplied by the spinnerets before you can get the number of threads which make the coil, or single thread as we call it. In other words, the spider's web seems to us to be made of one thread—it is really made of hundreds upon hundreds of threads united together to make the one. This is the cause of the web being so very strong. If it were not for this arrangement it would be very weak, and could by no means support the weight it does.

Then again there is a difference between the garden spider (*Epëira diadema*) and the house spider (*Tegenaria domestica*) in this respect, that there are gum tubes in the former but not in the latter. These gum tubes supply the viscid fluid from the body of the spider to the threads, and can be closed at will. Hence we get the cross-bar threads with the gummy globules, but not in the radii or long bars, because the spider wants them in one case, but not in the other. The cellar spider has no gummy globules on the web—its web is very complicated, and has strength enough and viscosity enough to secure the creatures, *poduræ*, &c., which get into it. One of the spiders which frequents the inside of trees has a very singular web, different in some points from those which have been noticed. It is the *Ciniflo atrox*. The gummy globules are arranged in most uncertain patches, and may be found singly. The effect, however, is the same—that, for the kind of prey it feeds on, the web answers its purpose splendidly.

In "Cassell's Family Paper" we find the following account:—"The Spider's Web.—How wonderful is the tenuity of these fairy-like lines, yet strong enough to enable the aerial voyager to run through the air, and catch the prey which ventures within his domain. It is so fine that, in the web of the *gossamer spider*, the smallest of the tribe, there are twenty tubes, through which are drawn

the viscid globules, the gummy matter it employs in spinning, each of the thickness of about 1-10th of an inch.* It takes 140 of these globules to form a single spiral line; it has 24 circumvolutions to go through, which gives the number of 3,360. We have thus got the average total number of lines between two radii of the circle; multiplying that number by 26, the number of radii which the untiring insect springs, gives the total amount of 87,360 viscid globules before the net is complete. The dimension of the net, of course, varies with the species. Some will be composed of as many as 120,000 lines; yet even to form this net the spider will only take 40 minutes. Wonderful indeed is the process by which the spider draws the thread from its body—more wonderful than any rope or silk spinning. Each of these spinnerets is covered with rows of bristle-like points, so very fine that a space about the size of a pin's head will cover a thousand of them. From each of these points or tubes issues a small but slender thread, which unites with the other threads, forming one compound whole; these are situated about 1-10th of an inch from the apex of the spinnerets; they also unite and form one thread, 624 of which are used by the spider in forming his net. With the instrument which nature has given him, the claws of his feet, the spider guides and arranges the glutinous thread as this seemingly inexhaustible fibre is drawn from his body, and interweaves them with each other until the net is complete. In this way spiders are the weavers of a supple line, whose touch, for quickness and fineness, surpasses that of any spinning jenny."

To get a cast or exact copy of a spider's web is not a difficult thing. My plan, as originally undertaken, was to mount a microscopical slide of the web itself, and this when done on slips of larger size than the usual 3 by 1 inch—say 3 by 2 inches—is very satisfactory, because it shows the web so very truly. Of course, this way is very advantageous in the case of the garden spider, because when you mount in a cell, you simply suspend the web in air—by this means getting, under the microscope, the correct view as to the thickness of thread, exact and relative position and size of gum globules when present, besides other minute pieces of information which could scarcely be obtainable any other way. And, even in this plan, caution is necessary, as also is a steady hand as well as good eyesight, because if you allow the web to touch the glass of your slide, your web is almost useless.

But it is not given to everyone to use a microscope, or even if they had one, to be able to get a slide of web to their own satisfaction. Hence, another plan may with fair success be adopted. Get a sheet of paper perfectly flat, a bottle of aniline dye, a spray such as would be used for Eau-de-Cologne or other agreeable scents if you wanted to vaporize a room. Spray the web and, whilst the web is still wet, apply the paper very carefully to the web. The aniline dye on the web leaves its mark on the paper, thus giving an exact counterpart of the web, with all its perfections and imperfections. Those of us who live in the country may very

*This quotation is not very clear. We find that Mr. Blackwall writes as follows:—"The mean distance between *two radii* is 7-10th of an inch; if we multiply this number 7 by 20 (the mean number of viscid globules occurring on *one-tenth* of an inch of the spiral line) the product is 140, which will be the number of globules on 7-10th of an inch; this product, multiplied by 24 (the mean number of turns made by the spiral line) give 3,360 as the mean number of globules contained *between two radii*," &c.—EDIT., 1892.

well get these copies of the web, especially if, in the frosty mornings of spring and autumn, we notice the best webs glistening in the dew as the sun shines on them. We can then select the most perfect and the easiest to take. An interesting experiment was made some time since, and is recorded in the journal of the R.M.S. for 1882, in which a Dr. Anthony succeeded in getting the threads of the web of the garden spider, each of them separate from the other, so that they did not form themselves into the one cable we see when looking at a web. In the example he took, he managed to get some 200 threads in continuous regularity from the creature. This is a small number, as is well known, and proved that the spinnerets give out many more hundreds; and the conclusion necessarily arrived at is that the spider can, at will, use as many as he wishes, to the non-use of others. However, the idea on which the experiment was made arose from the knowledge that when a spider begins making its web, it must begin without these hundreds of threads uniting and forming the one cable. To intercept him, therefore, at this identical and critical time was to hope to be successful. It was successful. The spider began his web on one of the ordinary glass slips used by microscopists, 3 by 1 in. Having begun, there was no great difficulty in continuing the work of winding on the slip, because the spider, always careful not to use much web, was so high in the air that he dare not nip off his thread, but as he lowered himself towards the ground, anxious for his own safety, his web was given out, retaining the threads intact one from the other on the slip of glass. These threads are compared by Dr. Anthony to harp-strings, and he says that, view them under the microscope in any way you will, they are very splendid, but especially so under dark ground illumination, when the hundreds of silver-like wires of exquisite delicacy are glorious to behold. Another experiment was made with equally satisfactory results with the common little "money spider."

In the month of May, 1888, I was asked to remove a spider which was considered as being more furniture than was required for a bedroom, and not being disposed to kill it, I captured it in an ordinary wineglass inverted. The next morning I found the spider had spun its web most beautifully in the glass, and, upon examination, wherever the creature had begun his web there was an evident proof thereof, because the start was very foggy in appearance, caused by the spinnerets being pressed upon the glass, and that from every nipple in each spinneret a separate attachment was made to the glass. Very likely you may have seen the end of a string or rope—I mean the very end; uncoiled and soaked in water, it would occupy much more space than the circumference of the rope; just so the web is not coiled at the end, but much wider than elsewhere. This demonstration was very interesting.

Before leaving the subject of the threads in the webs of spiders, let me give you the measurement, as far as I can, so that we may form an estimate of what they are, and are capable of doing. I take that of a cellar spider. For extreme accuracy, I have not an object glass higher than 1-16th of an inch immersion, and yet even under this power, only a measurement very near perfection is obtained. After the most correct drawing, the micrometer gives a width for the thread, showing that 20,000 would be placed side by side in an inch. Each thread, therefore,

is the twenty-thousandth part of an inch. No wonder that these fine lines are so often invisible to us as we walk in the garden, and that we want a peculiar angle of light at times to detect them, or a hoar-frost to deposit the dew upon them, so that their existence may be very easily made out. Then, you know, in addition to the 20,000 to the inch, to ascertain the measurement of each thread composing the one thread—the cable thread—we have to multiply that number by the number of threads forming it, say 200, 300, 500, 1,000, or more. Well may we say with the Psalmist, “Marvellous are Thy works, Lord God Almighty!”

Spiders, like other creatures, have natural enemies ready to destroy them. Supremely may be placed spiders themselves. As is mentioned elsewhere in this paper, they are most pugnacious amongst one another. Murder is common crime. They rather revel in it. Then again, they find many of the creatures caught in their webs ready to do battle with them and fight for their lives. Generally, however, they escape if they can; it is the better part of bravery. I have sometimes seen a spider very doubtful as to whether he would dare to attack a captured insect or not, and, if he did, intensely anxious to be mightily careful of himself. But to keep the spider tribe in check, that they should not increase too rapidly, there are flies which find some of them good food for themselves and their progeny. The ichneumon flies do this, and in a most satisfactory way too. They have stings—they approach the spider and, whilst flying, sting him. The sting benumbs the spider—in fact, paralyses him—he loses all power over himself. Arriving at this state, the ichneumon fly carries him off as food for his family, just as birds carry food to their little ones in the nest. Then again, mankind has no inherent love for spiders. Housekeepers want the corners of their rooms, and their walls, to be free from webs, forgetful very often that through destroying the webs, they are invaded with a host of small poduræ, flies, woodlice, and other things which worry them and their household more than spiders and their beautifully made houses, which are placed in spots where creeping things are most liable to travel over. Then again, they do not like their long legs, nor the look of them. Their lengthy hairs, too, are objectionable. A friend once said to me “She considered that spiders were not the work of Almighty God; she thought Satan must have had something to do with their creation as they seemed so objectionable.” Let them live. In hot climates they may be objectionable and injure us, and therefore be put out of the way. But in England they do keep down numberless small things which otherwise would worry us.

In a few of the spiders—only a very few—there is a singular arrangement called calamistrum. It is situated in the last joint but one of the animal's hind legs, and consists of two parallel rows of moveable spines so arranged that they make a curling apparatus, used in making the web. *Ciniflo atrox* furnishes us with an example of this. His web is a singular one, and made as it is by using this calamistrum. I have as yet only seen a drawing of it, which drawing, although peculiar, does not convey a good idea of the curling process.

There must be a very great dread in spiders lest they should be attacked by some of their own species and be stung with the poison wherewith they enervate and destroy their prey. A small spider once fell upon the web of a larger spider.

The larger spider at once rushed to the spot where the little spider was, imagining that a feast awaited him. The little one, knowing his danger, stung the owner of the web, and took no further notice, as he felt himself safe. The big fellow rushed upstairs and at once bit his wounded leg off. It was a ease with him of life and death, and he had wisdom enough to know wherein safety lay. If you catch a few spiders and put them into a wide-mouthed bottle, so pugnacious are they that they will fight each other desperately ; and their intensity of anger seems to arise very much from the conviction they have that, if bitten with the poison that exudes from their mandibles, they must die. I remember reading of one having been thus placed with three others. The three fought desperately at the bottom of the bottle ; the fourth kept at the top of the bottle, only descending at very rapid speed when he could give an envenomed bite at one of the others, which having done, he retreated with consummate speed, so as to avoid being bitten himself. He survived the others, they were soon dead. Speaking of the death of spiders, let us ask—how long do they live? I gather, from an observation made in the *Royal Microscopical Journal* lately, that it has not yet been decided. But surely a tolerably good guess may be made. Three times the age when animals attain the height of maturity is the time of their decay. Man is maturely grown at 23 years of age. Three times 23 make 69—69 is very nearly the threescore years and ten mentioned by the Psalmist as the extent of strength. This rule, as far as I know, is regular. When the palpi of spiders are right, they have nearly attained their fullest powers. Multiply that time threefold, and I should imagine you have the full length of life a spider attains. Spiders undoubtedly live through the winter, and will endure a very great amount of cold. They vivify and become very active as soon as warmth is felt by them.

The changing of skins, and the growth of limbs which have been damaged or destroyed, is interesting. Some never change their skins, whereas many of them pass through the moulting process. They vary, however, in different species, some of them casting their skins as many as eight or nine times. Supposing a limb to have been lost, say a leg or part of a leg, that part comes again at the change next following the infliction of the injury, not perhaps so symmetrical a leg as before, but a really good one. What a good thing if we could substitute a cork or wooden leg for another of flesh and blood. But we do not moult or cast our skins.

Spiders are oviparous ; that is to say, they lay eggs. Before they deposit them, they generally form silken cocoons in which they are placed. House-keepers know well when they see spiders' eggs in the corners of their rooms, or where the ceiling and top of the wall join. The colour in which they find them is often yellow, but other tints are also frequent, such as brown or pink. In addition to this laying of the eggs, it is to be noticed that the eggs are sometimes deposited singly, or in numbers, and not only disunited, but also compacted together. Some species of spiders leave their eggs to take care of themselves, whilst there are others which display care and anxiety for their young, just as much as any old hen could do with her brood of chickens. When the egg is hatched, the young spiders are nearly helpless ; they, however, undergo the first

cast of skin, and soon become tolerably active. Their power of making a web for themselves, as well as beginning life on their own responsibility, comes naturally to them, and you will find a cocoon of eggs, which had contained many spiders, not only soon empty, but the inmates scattered far and wide in a very short space of time, because they may form their webs by the single thread, and soon are off in very opposite directions. Before we leave the subject of eggs, it may be well to record the advancement in knowledge which has been made in their study. The microscope has been brought to bear on them, so that the germinal layers might be examined, and also the way in which the internal organs were developed. Mons. Barrois has done this, and the plan he adopted was to obtain quite fresh eggs and to stain them with bi-chromate of potash and osmic acid, so that very thin coloured sections might be obtained. Students had already observed the formative layer possessed by the granular character of the protoplasm. Barrois found there were germinal bands, or streaks pervading the length of the body. Behind these were discovered ten zonites, the first four of which had the earliest stages of appendages. Barrois worked well at his subject, and has given a good account of his researches, for which we refer to the "Journal Anatomique Phys.," Vol. xiv. (1878).

Have you ever noticed the charnel house of the spider? We have our crypts for the remains of the dead. They have their crypts for the dead they have slain. You will find them—say in your stable, coach-house or outbuildings, where the spiders' grounds have been very good. They are, as you would expect, a little below the web, and form a queer-looking, blackish mass of *débris*. The spiders eat what they want of their prey, and then let down by their thread, to the charnel house below, all they cannot or do not care to consume. It is the most heterogeneous mass imaginable,—you will, of course, find wings and empty cases of all sorts of flies—empis fly, house fly, and gnats,—also parts of bees and wasps, the parts of poduræ and moths, from the small ones to the larger ones, such as the tortoiseshell butterfly. Their slaughter-houses are high up, at the level of their feeding grounds, but whatever they cannot get through they send down below, so that their grounds may be always ready to capture fresh food. And have you ever noticed, not only the variety they take, but also how quickly they thrive upon, their food? A poor, hungry spider may be very thin now, but let him eat a really solid meal, and you will see very soon afterwards the effects of his gluttony. He will fatten enormously in a short time, and as it were, want the buttons of his waiscoat let out.

The water spider (*Argyroneta aquatica*) is a most interesting creature. When searching for fresh water shells, I used to find numbers of them in Bath, near Chester, but especially in Gloucester. They used to be captured in the Anacharis and other weeds, and, unless known to live in water, would not have been distinguishable from ordinary land spiders when out of water. But, having them in an aquarium, to see how they came to the top of the water, and when there went head downward for an instant, so that they might collect air, which was always done from the very opposite end of their body to the head, was a pretty sight, but more especially as, when charged with air, they descended in the

water. They seemed to be encased, as it were, in perfectly transparent quick-silver. Every hair, every limb, every fragment of the creature, was to be seen in the insect most splendidly. Then to see their mode of life was altogether to view how the Almighty has made everything perfect after its kind. To notice these things beguiles many an hour, and is rather seductive in making one neglect other work so as to meditate on what we call Nature. These water-spiders, for there are very few in Great Britain, form their nests and homes in water and are copiously supplied with hair which, when distended, beautifully retains the atmosphere they have imbibed, and which also they keep in their watery houses. Here we may introduce the subject of their nests. These nests are formed on aquatic plants below the upper surface of the water. They are used as nurseries for the young spiders after hatching, and for places in which the eggs are laid; also as the permanent home of the animal itself, as well as the feeding home to which all food is brought for consumption. The nest is strongly made of the material used for the web, and has been compared to a diving bell, the wide open part or mouth always being lowermost. It is into this part that the creature goes, and whilst inside it by day and night, he always lives head downwards. You will readily understand that the nest must be secure, and not a moveable air-containing ball. This is done by threads of the web being made which act like strings and cords of a tent. By one or more of these, the spider goes to get fresh air from the top of the water. But you will want to know how it is that when the web is made into the nest, and the nest approaches the requisite shape it is charged with atmosphere. The spider ascends to the surface, and just as he is ready to descend with a volume of atmosphere, he crosses his two hind legs at an acute angle, bounds off as quickly as possible to the nest, and has no sooner entered it than he discharges into it the volume just collected. Off he goes, again and again, until the full amount needed is obtained. Then his work is done, and he can stay there, catching his prey which gets entangled in the meshes of his web, or he can go to sleep perhaps for the whole of the very cold, wintry weather, and wake again by-and-bye.

I should greatly like to see a living trap-door spider just outside his nest, taking as it were a survey of his home and the country at large. It must be very interesting to see him. The lid of his house would be raised, and he would be ready at the slightest notice of alarm to jump inside, closing the door so tightly after him that it would scarcely be possible to detect the top of it at all, so exactly does it correspond with all the surroundings. A novice—if he did not notice the exact spot through close observation and keep his eye on it—would not possibly find it. The nest is formed by the spider of a sort of webbing which it spins and which is not unlike a wasp's nest, as to touch. If examined with the help of a microscope, the characters of a true web are found to consist of a flocculent, weblike matter. The lid of the nest, or rather the outside of it, is of a different texture from the other parts, and for this reason. The spider wants to be secure, and therefore, in making the nest while the exterior is still gummy, intermixes with the top of the lid a lot of the surrounding material, be it soil, moss, or whatever else are the component parts surrounding it. This is the cause why the nests, when once shut,

are so difficult to find again. The lid is most splendidly fitted to the trap, and shuts so closely that it is perfection. The best likeness to which I can compare it would be that of an orange. Cut into an orange, when on a plate, with a knife some little distance from the centre. Make a fair circle, leaving a little of the circle uncut, to act as a kind of lid. Raise this part bodily; it would easily be raised. Shut it again. The point of junction in the newly-cut orange would scarcely be discoverable. Not more so than would the lid of the trap of the trap-door spider. But how is it the lid opens and closes so easily? I believe it is that the joint—the hinge—is made of the web. The lining, the hinge, the lid are one material. This, so far, accounts for its elasticity, but does not give the reason why the lid opens and closes at the creature's will. Then there are spiders which make hanging nests, suspended say, from the branch of a tree. They are called pensile nests. Their only purpose seems to be the protection of their eggs, and young when very young. They are spindle-shaped and some four inches in length, nearly white in colour with a tint of yellow. You know in England we have many spiders which make nests that, instead of being fixed to a certain spot, are carried about by the parents for a time. No doubt the covering of the nests of both these and the pensile spiders is the same. Eggs are put into queer places. We find them in our sitting-rooms, cellars, and outhouses. They are to be discovered also in leaves matted together with the web so spun that it encases them.

There is a beautiful spider, called the Raft spider (*Dolomedes fimbriatus*), known in England. Mr. Blackwall, in his book on spiders, tells us it is in the fens of Cambridgeshire. It is one of the largest we have. It forms a raft on which to float about on the water. This raft consists of sticks, leaves, &c., which are woven together by the web which the animal forms. You may see the spider on his raft, if he does not see you, in which case he would instantly disappear under the water. He does not care where he floats about, because all places on the water are likely to find him food. If he sees a young gnat or fly he pounces upon it; and if he is in the least danger he descends into the water, not like the water spider with a globule of air, but down the stems of plants. Hence he lives not in an open pond, but in places where fens and marshes exist. He often goes for safety under his raft when surprised; he will run some distance away from his raft just as readily as he can run on land after food. He must be a most interesting creature from his amphibious habits.

Some of us may have heard of flying spiders. They are not British, but are so interesting in their movements that an explanation of the way in which they perform their flying motions will be interesting. The primary step for the spider to take is to get for himself some point of eminence, say the top of a post—a gate-post, for instance, from which he intends to ascend. He then assumes a position most unusual to witness, inasmuch as he raises his abdomen at right angles to his cephalo-thorax, an attitude just the same as though we were to lie down, nose downwards, on the ground, and point the soles of our feet to the heavens right above us, as an acrobat alone could do. Then from the spinnerets the web is ejected or ready for ejection—the face at the same time moving about until it meets the wind, in which attitude it remains. The next thing to be done is to lift

up the body, a feat easily accomplished by stretching all the legs to their greatest extent. This being done, the spider gives you the idea, as you look at him, that a heavy pressure from above is pushing him down nearer and nearer the level of the post. When he has reached a certain point, suddenly he detaches every one of his legs, and with a sudden bound he mounts upwards. Generally, though not always, he floats through the air, with his face looking upwards. As he passes on, his head is generally in front. The web seems to be let out by the resistance of the feet, and floats out in front of the animal. At the same time, another web is ejected from some of the spinnerets, thus giving the spider either of the two threads to travel on, or he may even make and select a third if he wishes. Then the creature unites its eight feet together by slender filaments, thus giving buoyancy and lightness to the balloon-like shape in which he finds himself. On with the wind he goes, and is carried hither and thither by the various currents. But how about his stopping? It would appear that, just as he can make his own balloon with which to start, so, by an act of his own will, he can stop going any farther than he likes. He simply gathers in the prominent web—say the first he made at all—he claws it in with his feet, and puts it in his mandibles, when he has made a white roll of it. Of course there may be other causes to check his progress. He may find the breeze gone; he may be knocked against a tree, or meet with some obstruction. At all events, he has succeeded in accomplishing a wonderful performance, one well calculated to find him a new home in which to start a new colony for his race. And whilst we look at the work of the flying spider, we may well see the handiwork of Him who created all the genera and species of spiders, to prove His consummate power, wisdom, and goodness, at least when men like to detect it.

Spiders, as we should naturally expect, are to be found as fossils. Mons. Brongniart discovered one in the tertiary marls of Aix-in-Provence, France. It is called *Atloides cresiformis*, and will be found in a magnificent drawing in "La Nature" of January 26th, 1878. *Protolycosa* also is a fossil form. Dr. Reemer gives the name as *Protolycosa anthracophila* to a fossil spider from the coal formation of Upper Silesia. The body is about an inch long. It is a very perfect specimen.

There is a creature which all of us who live in the country know—a creature with very long legs indeed, when compared with the size of its body. It is known as the Harvest-man spider, but there are many doubts as to whether it is a true spider or not. In any case, it cannot be a great remove from it. A few points of contrast may be named. The Harvest-man has a true tracheal system with spiracles, not so the spider, which has a fish-like series of membranous plates. The eyes of the Harvest-man are always four, a number which does not agree with those of the spider, which are six or eight, or occasionally two, but never four. Then again, the spider has two or more claws on the feet, not so the other creature, which has but one. A spider has a very slender waist, connecting the abdomen with the body. The Harvest-man has nothing of the kind.

How are spiders to be preserved for the cabinet? This is a thing much more easily done in warm climates than in our own country, except in the height

of summer, because it is not very easy to get the skins to be set and firm unless they are dried quickly. Of course with kitchen ranges, such as we have now, or a very warm corner near an open fire, if it be free from dust, or a bell glass of large capacity so as to scatter the moisture quickly, the setting may be done fairly well. However, let us suppose we have a good sized spider dead, and we want to keep him. We should have need of a finely pointed and light pair of scissors, curved or straight as the case may be, a blow-pipe and camel-hair brush, and forceps. Cut the under part of the spider along the abdomen nearly its whole length, so that the contents of the abdomen may be removed, which may be done by gentle and regular squeezing. This is to be done until you see from underneath the abdomen the beautiful colouring of the spider above, when by means of the forceps and camel hair brush you have removed all the internal matter, of course having used the blow-pipe to distend the animal. The great mistake people make in mounting consists in the fact that they cleanse the whole of the entrails, and even damage the skin, which is a delicate one, above them. For it should be remembered that all the colouring one sees in spiders is encased between two skins, and of course to damage either of these skins is to interfere with the pigments between them. Corrosive sublimate may well be used for the spiders kept in a cabinet, mixed with spirits of wine and camphor water. Thus far, we have only spoken of creatures for the cabinet, nor should we pass them by without saying that arrangements for the placing of their feet are desirable. They may be done similarly to the blocks or pads used by entomologists for butterflies and moths. In addition to the dry process for spiders, there is also what may be termed a wet one. This consists in a bountiful supply of wide mouthed bottles or test tubes, and, after setting the spider, which may take some ten days or a fortnight, immerse it permanently in the bottle which must, of course, be wide enough to take the whole creature. Suspended from the cork or stopper of the bottle, the creature may be kept in spirits of wine for examination.

Whilst these creatures are so voracious, it will be in keeping if we examine the digestive apparatus they have. Mons. Plateau gives us to understand that the dipneumonous spiders have such a small passage for the œsophagus and pharynx that capillary force makes their food enter the buccal intestine, it is then urged forward by the expansion of the suction organ, then forced forwards into the middle intestine by the contraction of this organ and cannot return. The food becomes mixed, as it passes along, with pharyngeal secretion. From a mechanical view, the cœca in the middle intestine are not vigorously active, but the reverse. The cœcal secretions, moreover, are not acid. In this respect, they are unlike the gastric juices of man and animals. The gland in the abdomen—which is generally yellow and slightly acid—has in it fine granules, fat globules, and epithelial cells, and is the principal agent in the digestion of the starchy, fatty, and albuminous matter. This agent is different from the pepsine of vertebrates, and when to it is applied a slight trace of hydrochloric acid it stops instead of increasing the action, whilst carbonate of soda has the contrary effect. This liquid quickly converts

starch into glucose. The spider has not a liver, although glycogen, which is present, would lead one to believe it had. There is no bile, as the re-agents to prove its presence are ineffectual. The middle intestine passes its contents forward, through the working of the very thin muscular covering of this part of the digestive tube, and the action of the muscles too. A thin covering then surrounds this matter through the epithelium of this intestine. Hence solid excrement is produced to be discharged by the creature.

As to capturing spiders. Beginners nearly always would use their fingers, in which case a great mistake would generally be made, because the fingers are rough, although ready, weapons of attack—moreover they are injurious to the creatures, because they are apt to damage the skin. Besides, some spiders sting sharply, and would just as soon, for self-preservation, sting one as not. It is possible that the minute forms of spiders would escape before appliances could be obtained to capture the creature, in which case the finger must be used. If this be so, moisten your finger with saliva quickly, just sufficiently to hold your prey until you can get out your spirit bottle, and, applying it to the spider, wash it into the bottle. One more remark about the use of the fingers. If you are capturing a spider with them, always capture by two legs, instead of one. The creature prefers losing a leg in the hope of saving his life, to being caught. With his two legs he is too safely secured, as a rule, to run away and leave them behind. As to places where they are to be found, they are almost everywhere. Bushes, trees, flowers, old buildings, palings, continually supply the searcher, but all spiders are not so readily to be had. You must search amongst cut grass, amongst water-weeds, rubbish in the way of sticks, amongst mosses, fungi, lichens, &c. Then when you see them, vigilance is absolutely necessary. Pill-boxes, too, of various sizes, a lid in one hand, the rest of the box in the other. A little ether or chloroform, if you want to stupify them, may be inserted between the cover and the box itself.

That spiders emit sounds there need be very little doubt. The fact seems well confirmed, although I am not aware that the way by which the noise is made has yet been discovered. We do know how the cricket uses his rasp, and by means of the drum beyond it creates its chirping; but the spiders' mode of uttering their noise, something like the tick of a watch, is not recorded, to my knowledge. Whilst the way is not known to me, the fact of its being made is not to be doubted. Sit in an ivy-covered arbour or bower in a summer or autumnal evening, and you will hear sounds of a queer kind; trace the source of them and you will find they come from the spider. Since writing the above, I find that Dahl has satisfied himself as to the presence of what are called auditory hairs, which not only can discern sounds, but detect also variations of atmospheric pressure. Besides this, an organ for smell is said to have been found on the maxillæ. Why these creatures should not possess these adjuncts to life it is hard to conceive. Great credit is due, undoubtedly, to those who study and work them out.

There are sea spiders, as well as land and water spiders. They are queer, weird-looking things. They seem to be all legs and no body. The main use of

the body seems at first sight to be simply that it must act as an attachment for the legs, and that they may grow out of it. Of course it serves other purposes as well. The process of digesting food goes on in it, but even all the digestion is not transacted there—it is asserted that some of the joints of the legs assist very much in the work—a most extraordinary thing for us to realise; nevertheless it is positively asserted that such is the case. These sea spiders vary very much in size. The greatest span in some of them is only the one-eighth of an inch, whereas others are as much as eight inches. They may be found on the mud when the tide is out, or crawling on the rocks. They live in all the different seas. Very few people seem to have observed them much. For one thing, there is no beauty about them—they are repulsive rather than otherwise. It was a source of much inquiry and patient investigation to find out their life history. The very earliest stage was a puzzle, as also how the eggs are produced. A little later on, though, in life, evidence has been furnished on which a conclusion has been drawn, and it is this—that they have been discovered in a baby state within some sea creatures, such as zoophytes; a most extraordinary thing that a crustacean should infest a zoophyte. Still, closer examination revealed the fact, step by step, that the young sea spider passed its early days under the skin of the other creature until it ate its way through the skin, so as to begin life as a free agent on its own account. I am not aware that it has ever really been found out how the spider first got into the zoophyte. Possibly the peculiar mode of feeding which the zoophyte has, may have been the means of drawing the eggs inside it, superadded to an instinct for specially getting them there known to the parent spider when laying them. If this be so, then we have a case very much resembling it, viz: that of the sheep fluke. The young state of the fluke is not passed in the sheep, but in one of our small freshwater shells (*Limnæus truncatulus*) found in ditches and moist places. It gets swallowed by sheep when grazing, and if it escapes being eaten and crushed to death, it attacks the liver of sheep with consequences such as their owners knew to their cost some years since.

Mr. Stavelly also refers to the instinct as to the approaching state of the weather, owned by the spider. He says, "A web, spun when windy or rainy weather is approaching, has its radiating or foundation threads much shorter than those of a web spun before fine or calm weather. The repairing of an injured web tells of the approach of fair weather, the spider being too provident to expend his silk to no purpose. It is also said that if the spider be seen working at alterations in the web between the hours of six and seven on a summer evening, the night will be clear and calm."

Spiders have been noticed for their love of music. Mr. Stavelly tells us how one of them was so tamed that it used to come for its food when a musical instrument was played for it to come. Pelisson, when confined in the Bastille, was the man who tamed the spider that did this. It was a source of great pleasure to him to do so, and must have made time pass all the easier to him. The same author quotes other passages in proof of spiders loving music. He tells of one that always made its appearance on the harmonium every evening when played by a musician who was regular as to time in his practices. They have

been noticed descending from ceilings during a concert and returning when the concert was over.

The pill-box process for catching spiders is good, but, like everything else, is not perfect nor of universal application. A bottle with some methylated spirit of wine is a useful thing. It is useful with a wide mouth, if you wish to put spiders you have captured into it. Or, if it has a narrow mouth, you can use it for stopping the runaway creatures wishing to escape you. You know that a camel hair brush, touched with the saliva at the point of one's tongue, will check an insect's course when it touches it. Spirit of wine is equally efficacious. A great deal depends upon the knowledge of the habits of special spiders to make one successful in their capture. Some drop down to the ground at once; others escape at any angle they can best make from their capture; others are in the middle, perhaps, of a box tree. Some, when alarmed, rush backwards into their hiding-place, and cannot be induced to return to their front entrance where they had been first seen. Others, again, must be taken by violently shaking the boughs of the trees in which they live—a cloth, or sheet, or something not of the same colour as themselves having been previously placed underneath. A butterfly net, such as is used by entomologists for moths, is of much service when you are working for those species which live only in grass. Shaken considerably in the grass, it takes within it many a surprised spider which cannot escape, if the collector is diligent in his work.

With regard to the classification of the spiders, Englishmen have not worked very much—not so much, indeed, as they have done in other matters—certainly not on account of the difficulty of the subject. The pioneer in their study was a Dr. Martin Lister, who, in the year 1678, published a work upon them called “*Tractus de Araneis.*” From his time until the Ray Society published Mr. Blackwall's *History of the Spiders of Great Britain and Ireland*, in 1861, nothing of importance was done except by our Continental neighbours. Good work, however, is being done now at home. There are many students amusing themselves with getting anecdotes about them, up to those who really study them as a branch of natural science. But about the classification of spiders. They really are more difficult to classify than most creatures. Spiders are not true insects, because the body has only two instead of three segments. Then again, they have no wings to help in their discrimination. There are no antennæ, so that insects, because they have these extra parts of their body, can much more easily be certified than spiders can. As far back as Aristotle, we have remarks made by him as to the different ways in which the webs were made. Indeed, the system in which spiders seized their prey was noted. Dr. Berthau, some few years ago, grouped the spiders into two sub-orders—*Tetrasticta* and *Tristicta*. Of the first of these he made a specific difference to consist in their stigmata or breathing apparatus. They had two pairs on the lower surface of the abdomen. In the other there is only one pair of stigmata. In the first the ovaries and testes were circular, the entrance to the seminal pouches was simple; in the other the ovaries and testes were in two branches, and there were two openings in the seminal pouches. These sub-orders are, of

course, sub-divided. This plan of Berthau is an attempt to solve the spider classification difficulty, but it has been severely criticised by Professor Thorold. The plan of arranging spiders according to the structure of their webs must be open to severe work and study before much progress could be made. Surely it is a difficult matter to detect a spider's web very often. I used to pass under a doorway many times before discovering that a web was in the corner of it, and yet there it was. That web supplied me with one of my best slides, and I injured it two or three times before getting just what I wanted. If this was so invisible to me at times when looking for it, how much more difficult would it be for those who did not know of its existence. It is often impossible to see a spider's web—you detect it by its crossing your path: and are sure of its presence by its being in your way. Professor Thorold makes a classification of spiders and divides them into sedentary and wandering. The sedentary are those which capture their food by means of snares, and do not move much from place to place for their prey; whereas the wandering are those which obtain their food from trees, water, or the ground. This may be a good system; it is certainly one of the very latest as to time, but it would be to a beginner, I should think, very difficult, from the fact that a young student could not possibly know, without much study, a sedentary from a wandering spider. Dahl classifies spiders according to the character and placing of the auditory hairs on the limbs of spiders. He divides them thus: 1. Tibia—with two series of auditory hairs; meta-tarsus with one hair, and tarsus without hairs. 2. Tarsus—without depression of these hairs, generally bearing hairs like the meta-tarsus and tibia. These are sub-divided according to the presence of one or two series of auditory hairs on the tarsus. For this summary I am indebted to the *Journal R.M.S.* for 1884. This classification is scarcely likely to find general acceptance. It is put in here to show what great difficulty there is in obtaining a satisfactory scheme to make spider study easy.

The plan which seems to me a good one, for arranging the genera and species of spiders, is that of our countryman Mr. Blackwall. He takes the eyes as the standard, and, although the eyes are said not to be always uniformly persistent in number, yet the plan seems a good one. All of them have eyes, and the eyes can readily be discovered by anyone looking for them. He makes his spiders to be classified under the two divisions—*Octonoculina*, or eight eyed, and *Senoculina*, or six eyed. General Hobson made a shield, by means of which he was able almost at a glance to tell to what genus a spider belonged. He found out the number of the eyes first; then, by means of a moveable index which contained the words Family, Genus, Abdomen, Breastplate, Cephalothorax, &c., he was able to refer the creature to the shield which contained the peculiarities of all the species. For ingenuity, this thing is not only a royal road to the study of spiders, but it shows an amount of skill rarely to be met with. In the circle most remote from the centre, he has drawn from Mr. Blackwall's spiders the peculiar positions of all the genera of our British spiders. There is only one more classification of spiders with which I am acquainted. It is based entirely upon the Vulva, and is not at all pleasing to think or hear about. Of one thing we may rest assured, that whilst spiders are differently classified by various writers, yet their

arrangement according to family is good and sensible. Look at a spider; what does he remind you of, when you take into consideration his mandibles as weapons of defence? Look at him, and think about scorpions, lobsters, and crabs. He is very nearly related to them. His position in the scale of animals is there. If you try to find a better place for him, you cannot. In your classical scheme, he is rightly put there.

Woolhope Naturalists' Field Club.

1889.

THE Annual Meeting of the Club was held at the Woolhope Club Room, Hereford, on Tuesday, April 9th: present—Rev. Prebendary Elliot (the President, in the chair), the Mayor (Mr. H. C. Beddoe), Revs. J. E. Grasett, E. J. Holloway, A. W. Horton, Augustin Ley, H. B. D. Marshall, Messrs. T. Cam, J. Carless, R. Clarke, James Davies, Gilbert Davies, T. Hutchinson, C. G. Martin, W. Pilley, O. Shellard, A. Watkins, Dr. Fitzsimons, H. C. Moore (Hon. Secretary), and James B. Pilley (Assistant Secretary). The financial statement for the year 1888 having been presented, it was resolved to proceed with the publication of the *Transactions* for the years 1883, 1884, and 1885. A letter from Mrs. Bull was read, enclosing a cheque for £10 towards the illustrations of this volume, and announcing the presentation by her to the Club of 300 photographs of the late Dr. Bull, which will form the frontispiece of the book. It was ordered that these very generous offers should be entered on the minutes. “The Flora of Herefordshire,” by the Rev. William H. Purchas and the Rev. Augustin Ley, recently published, was distributed to subscribing members. The following gentlemen were elected members of the Club:—Rev. A. H. Seacome and Mr. Guy Trafford; Mr. E. Cambridge Phillips, F.L.S., member of the International Permanent Ornithological Committee, was elected an honorary member; and five names were proposed for election at the next meeting. The following places and dates were fixed upon for the Field Meetings of the present year: Thursday, May 23rd, Titley and Presteign; Tuesday, June 18th, Ladies' Day, Newland, in the Forest of Dean; Friday, July 19th, Hay and the Golden Valley; Thursday, August 22nd, Malvern and East Herefordshire for Geology. The date for the Fungus Foray will be fixed hereafter, in order to suit the convenience of Dr. Fries, son of the late eminent mycologist, Elias Fries, who is expected from Sweden. It is expected that Ludlow and its neighbourhood will be selected for the Foray. In addition to books obtained by interchange with other kindred Naturalists' Societies, the Club has received during the past year the following valuable contributions:—A collection of Mosses, and a few Geological specimens from the executors of the late Rev. J. F. Crouch, of Pembridge; and the Herbarium of the County, arranged by the Rev. Augustin Ley. Mr. Thomas Blashill was appointed a delegate to the Conference of the Society of Antiquaries to be held on May 7th at Burlington House. Agreeably to a proposition received from the Rev. F. T. Havergal, D.D., a committee was constituted for supplying local information from Herefordshire to Mr. Arthur Hall, 13, Paternoster Row, for his Topographical Dictionary of British Prehistoric Antiquities. Mr. R. W. Banks, of Kington, Mr. Geo. H. Piper, Mr. James Davies (Secretary for Herefordshire of the Cambrian Archæological Society), and Mr. Thomas Blashill are members who have acquired much information on this subject, whilst many others can assist by their contributions.

RETIRING ADDRESS

[By the PRESIDENT, REV. PREBENDARY ELLIOT.]

GENTLEMEN, I shall best, I am sure, consult your feelings and my own, if, as, on this occasion of the expiry of my second year of office as your President, I offer you the customary address, I place in the forefront of my remarks a respectful and regretful mention of three eminent members of the Woolhope Club, who have been called away from us by death in the year that has elapsed since our last annual meeting here. I recall first the name of the Rev. Prebendary Crouch, the late Rector of Pembridge. Another and a very important link of the chain that binds us to the past has been broken by his death, for the record of Mr. Crouch's services to the Club extends back to the very earliest years of its existence. Three times, in the years 1855, 1859, and 1864, he filled the presidential chair. He was a man of very large and varied scientific attainment, the strong powers of whose highly-educated mind were stimulated by an ardent love of nature, and both in the field of botanical and of geological research he was distinguished. He was one of the now fast dwindling band who made the name of the Woolhope Club a name of power; and he leaves to it the grateful memory of his labours, and the encouragement of his example. Still more recently we have had to deplore the loss of Mr. Theophilus Lane. To the members of to-day a more perceptible blank has been caused by his removal than has perhaps been the case in the instance of Mr. Crouch, whose increasing age and physical inability to attend our meetings had rendered him for several years a less familiar figure amongst us. We cannot easily forget the valuable and important work which for the space of nine years, from 1878 until his retirement from ill-health in 1887, Mr. Lane so ungrudgingly performed as our secretary. A worthy successor in the former year to our much-esteemed and lamented friend, Mr. Thompson, it was with great regret that we had reluctantly to acquiesce in the resignation of his office which his failing health compelled two years ago. It was with every sentiment of gratitude that we then admitted him to our honorary membership. It is with sorrow we record the final severance of our connection now. Mr. George Cocking, too, of Ludlow, who died within the last few months, was a very old member of our society. He was elected in the year 1856, and I see in the list of 1873 that he is marked as having contributed papers to the *Transactions*, though I cannot find his name in Dr. Havergal's index. He was an accomplished geologist, and did much special work of an excellent kind in the interesting neighbourhood of the town where he lived. I recall the names of these departed worthies, gentlemen, in no mere spirit of platitude, or simply to evoke the evanescent tribute of a passing kindly remembrance, but in the serious conviction that if the Woolhope Club is to remain, as I sincerely trust it may, in the future what it has been in the past, it must be that we individually strive to emulate the loving devotion which, in their several

spheres of occupation, those who have preceded us displayed to its interests and to the purposes of its being. With several points before me to which I wish briefly to call your attention, I can do no more than advert in very few words to the series of Field Meetings which have been held during the past season. With the single exception of the Wormsley Meeting in August (when, however, it must needs be said an unusually heavy and persistently continuous downpour of rain was unequal to shake the fidelity or damp the courage of a large number of members who attended it), and possibly with the exception too of that held at Church Stretton in July, when the unfortunate concurrence of other engagements prevented so large a gathering as we are accustomed to upon the "Ladies' Day," we may claim, I think, for these a full measure of our ordinary success. The first meeting at Old Radnor, taken in connection with that at Church Stretton to which I have alluded, afforded a singularly favourable opportunity, upon the same axis of upheaval, for the study of those very early rocks, technically known as the "Archæan," whose obscure history is just now engaging so deeply the attention of the geologic world; while at the latter place we had the additional advantage of the *viva voce* exposition of the President of the Caradoc Field Club of the striking features of that locality, and of a paper read by him, in which Professor Lapworth had been kind enough to summarize the results of recent discoveries made by himself and Dr. Callaway among the rocks of the Cambrian series. These are of extreme interest. Among the papers which were read to us I would particularly notice one by Mr. Blashill, read at Kington, on "A Romance of Beetle Life;" one by the Rev. Thomas Powell, at Snodhill Castle, on the history of that somewhat secluded spot; one by Mr. Warde Fowler on "The Pied Flycatcher," and one by the Rev. M. Watkins on "The Migration of Birds," both read at Moorhampton; one too on the "Antiquities of Weobley," delivered partly at the Church of that place and partly during our halt at the fine old Tudor mansion of "The Ley," near to Weobley, by the Rev. Chancellor Phillott, and one given by Mr. Hutchinson at Brinsop Court. My personal thanks, as I am sure those of the Club at large, are due to the gentlemen who added in this way so much of interest to our excursions. Acting on the expressed wish of our mycological friends, who had found that locality in 1887 exceedingly suitable to the object of their quest, the Fungus Foray of last autumn took place in the Forest of Dean, head quarters being established at the Speech-house in the Forest. I can answer for myself, and I believe also for all those who met there, that the visit was a most enjoyable one; although, either from the peculiarity of the season or from the fact that we were there too early or too late, I hardly know which, the spoil of fungi gathered did not come up to the expectations that had been formed in quantity or in variety. There arise out of this short retrospect of our proceedings in the field one or two subjects on each of which I beg to say a word. The first is suggested by a representation which was made to us by Mr. J. W. Lloyd as to the ruthless way in which plants of the Royal fern (*Osmunda regalis*), were being taken from their favourite habitat at Rhos Goch, and hawked about the neighbourhood for sale. He suggested that by way of forestalling the speedy extirpation of the plant in

that vicinity a statement of the case should be made to the Hon. Major Hill, with a request to him to do what might lie in his power towards checking further depredation. It gave me much pleasure to accede to Mr. Lloyd's most well timed proposal, and the reply I received from Major Hill assured me of that gentleman's complete willingness to carry out our views. I have since been much gratified to learn that our action has been entirely successful, and that the beautiful fern is suffered to grow in peace and free from the devastating hand of the ignorant. Now it occurs to me to ask whether, seeing that in this particular instance the wise notice of a single member has resulted in such a signal benefit to the lovers of wild nature, a good deal more might not be done in this direction if members of the Club generally would exercise similar notice and a similar discretion. The destruction of wild birds, (almost, in the case of some species, to their extinction), is a matter which already has come much before the public eye. But I observe, what to me is almost equally lamentable, the rapidly increasing tendency within the few last years, and which is this year more marked than ever, of denuding our fields, and woods and hedgerows, of their wild flowers, primroses, daffodils, and so on, for the purpose of selling them in the larger towns, in many instances the plants themselves being uprooted. It seems hard to deny the town dweller the sight of what is so beautiful. But there is moderation in all things; and I cannot quite believe in all the waggon loads of spring flowers that now find their way from our country districts, even before they are thoroughly fullblown, being destined to cheer the dwellings of the poor, or those who most want the cheering of their brightness. I shall not be suspected of offering any opinion on the merits or demerits of a certain political league. But I own to wishing it had assumed some other title than that of "Primrose" when I see yards and yards of tall house fronts in large towns, covered with bushels upon bushels of the lovely little denizens of our rural lanes, for the trivial purpose of a one day's show. So out of place do they seem; and so pitiable to see them withering and dying almost as soon as they are set up. I do not know what might be done to stay the spoliation that I refer to, but something might be done I think; and if anything could, I think it should be done. For, I may be wrong but, it seems to me that such wholesale ravages, continued year by year, cannot fail to be harmful, or eventually destructive, to the plants. Owners of property might well be induced to do something to protect them. In this connection I would bring under your notice a Society called "The Selborne Society." Its title to the Naturalist's ear probably suggests its objects, namely, to "preserve birds of beautiful plumage" (this is especially directed against the senseless fashion of adorning ladies' hats and bonnets with their feathers) "rare and useful birds, plants, and pleasant places." The Society works under very influential patronage, both of ladies and gentlemen, and seems to me one that may well be made more widely known, and be more largely supported; while, as the lowest subscription is one shilling, though the more usual one is half-a-crown, to support it cannot be described as ruinous. In the paper which I have, though that is not of very recent date, the name of the secretary is given as G. A. Musgrave, Esq., 45, Holland Park, London, W.

I ventured in my last address from this chair to hint at some kind of

concerted action among members of the Club with a view of ascertaining facts as to the distribution of rainfall over our district. The idea does not seem to have commended itself to the Club, so far as I am informed, but in the paper read by Mr. Warde Fowler, a similar suggestion for such action was made, which may possibly be more practicable, endorsed as it was by what fell from Mr. Watkins subsequently in his paper on bird migration. As the study of ornithology and the observation of the avifauna of the district appear to be just now in some favour among us, I may, I hope, be allowed to give Mr. Fowler's suggestion in his own words, leaving it to members to act upon it as they shall see their opportunity. "And here I should like to make a remark in which I hope I shall not be anticipating anything that will be said by the next reader. I have often been struck by the comparative meagreness of our knowledge of the movements of birds in our own country. We know in a general way that certain birds move north and south at certain times of the year, and we know at what time they reach or pass our own particular haunts. But of the course they take in their journeys we know very little; yet we may be pretty sure, on the analogy of more distant migrations, that that course is regular, and, for the most part unvaried. Depend upon it there is much to be learnt of migration under our very eyes; and to this everyone can contribute something which a little organization might turn to good account. It is, in fact, organization which is the great thing needed to make county societies useful, so far as ornithology is concerned. Counties are purely artificial divisions, and the ornithology of a county has, as a rule, only the same kind of interest on a larger scale as the ornithology of a parish or a union. What county observers should aim at, if I may venture to say so, is some kind of organization which should include the observers of all such neighbouring counties as form in a greater or less degree a natural division of the island." I am indebted to Mr. Lloyd for suggesting to me another topic which I think it well to submit to you. This is, the practicability and the desirableness of making our Field Meetings more markedly occasions of instruction, for those who wish to be instructed, in any of the branches of natural science which come under review in the course of them. Mr. Lloyd's idea is that of one geological, one botanical, one entomological—or as the case might be—leader being marked out for each excursion, to whom members might attach themselves particularly according to the bent of their inclinations and tastes, and who should be prepared to point out what was most worth notice, give explanations, and answer questions, on the particular subject which he professed. Curiously enough, not long after Mr. Lloyd's conversation with me, I had the opportunity of seeing a correspondence which my friend Mr. La Touche had had with Sir Joseph Hooker on this very subject, and Sir Joseph's idea is precisely in the main that of Mr. Lloyd; or Mr. Lloyd's idea his. He (Sir J. Hooker) indeed seemed to me to have elaborated his scheme beyond what would be found workable, in the case at all events of ordinary field clubs. And, considering what the objects of a field club are from all points of view, I cannot but think that it is in the temptation to over-elaborate such a scheme, and to encompass it with too many rules and regulations, that danger would lie. But certainly the idea itself is well worth your consideration,

and is one which there should not be much difficulty in realising ; and certainly too it would be a very great advantage if we could pleasantly, and without pedantry, infuse a little more of the "scientific element" into our gatherings, and give opportunity to many, who would be very glad doubtless to acquire some little knowledge of the works of Nature if they could, to add to their knowledge and to develop their tastes.

I turn now to some details of what otherwise has distinguished the past year. And here I must congratulate you on the long looked for appearance of "The Flora of Herefordshire." So long ago as in the year 1861 I find it referred to in his retiring address by Mr. R. W. Banks, who expresses his hope that it may be published, in part at least, during the year then ensuing. And now, after a period of gestation extending, as I am told, over some thirty years, a work of real and undoubted importance has at length come to the birth under the Club's auspices. I am no botanist myself, but I am informed by those who are botanists, that the book fully merits the description I have given of it, and that it compares very favourably indeed with other books of a similar description published elsewhere. And for my own part, when I know it has had for years the patient labours of such men of science as the Rev. W. H. Purchas, and the Rev. Augustin Ley expended on its production, I am convinced that it must take its rank as a standard authority on the subject on which it treats. It will be no matter of surprise that the publication of such a volume, issued moreover at the price at which it is to members of the Club, should have proved a somewhat severe strain on the resources of the Club, hardly yet recovering themselves from the heavy subventions granted to the "Herefordshire Pomona," which latter had amounted in all to the sum of £440. I am glad, nevertheless, to be able to say that the financial arrangements which your Central Committee were enabled, with your sanction, to make with the publisher, have availed to reduce that strain to within tolerable limits. It became necessary, however, to delay for a short time the appearance of another volume of our *Transactions*, bringing down our record to the end of the year 1885, which otherwise was in a very forward state of preparation. The work of going to press with that volume will now be proceeded with at once. The Editorial Committee will be very grateful to any individual members of the Club who may be disposed to undertake the providing of one or more apiece of the plates by which the text of the *Transactions* will be illustrated. The cost of such plates is 25s. each. Several such are already promised by the kindness of members. Another matter of business claims a word from me. Prebendary Crouch bequeathed to the Club a collection of Mosses made by him during his life time, and one of Geological specimens, fossils, &c., of much value. Neither these, nor the Herbarium, presented some time ago by Mr. Ley, and at present lying hidden in one of the cupboards of this room, can be of the practical utility that they should be, for the very simple reason that we have no space, or other convenience, at our disposal in which to display them—

"Small is the worth
Of beauty from the light retired ;
Bid them come forth."

It is proposed to offer these collections to the Trustees of the Free Library and Museum, to be exhibited in the latter place, on the condition of their remaining the property of the Woolhope Club, and being marked as such in the cases provided for them. Towards the expense of such cases it is of course only reasonable that the Club should offer some substantial assistance. And at the same time I think we might ask the Trustees, and I feel sure that we should receive a favourable reply, if they would be good enough, in the arrangement of their books in this room, to set aside some few shelves distinctly for the reception of such volumes as belong to the Club, which otherwise, and under the existing state of things, may run some risk of being absorbed into the general property of the Free Library. I cannot quite leave this portion of my remarks without urging as strongly as I may upon the members of the Club the desirability of their using much effort, every one as it may come in his way, towards the improvement of the Museum and the increasing its value, by the enlargement of its contents. It is needless for me to say a word as to what interest such a Museum, well supported and carefully tended, is capable of supplying, or, indeed, as to how much of usefulness as an educational agency may be made to attach to it. And those of us who have had the opportunity of seeing how the Shrewsbury Museum has been developed under the management of Mr. W. Phillips, or what the Museum at Ludlow became under the fostering care of our fellow member, the late Mr. Cocking, and how it is maintained under the equally skilled attention of our friend Mr. Charles Fortey, can have little doubt of what a good thing we might make if we chose of that which we possess in Hereford. I sincerely hope members of the Club may be found who will direct their attention to this matter, and to the utilisation, for the purpose of rendering the Museum what it ought to be, a first-rate one of its kind, of the abundant resources which this county and neighbourhood can boast of, not only in the sphere of natural history, but particularly in that of Archæology, and of so-called pre-historic antiquities.

And now, gentlemen, that I have detained you at too great length with but meagre and cursory discoursing of many things, I have but one thing more to add. It is the renewed expression, as I vacate this chair, of my warm thanks for the signal honour you have done me in allowing me to occupy it for these two years. The recollection of that honour and of those years will, I do assure you, always remain most valuable to me, to be cherished with an unalloyed satisfaction, to be indulged in with the purest pleasure. I tender my thanks to every member of the Club with whom in that period I have come in contact, for the very great courtesy and kindness they have one and all extended to me during my temporary pre-eminence. I tender my thanks particularly to the officials of the Club, to the members of the Central Committee who have allowed me to work with them (I would hope to some useful purpose), and especially to the Secretary and Assistant Secretary for exertions which have made my own task an easy and a light one, and for the loyalty with which they have always been good enough to receive and act on any such suggestions as I have felt called upon from time to time to make to them. I cordially welcome my successor in the Presidency to a

tenure of office which I feel confident both his long connection with the Club and his love for, and acquaintance with, science, will combine to render distinguished for its usefulness. And I can but repeat for myself the assurance which I have previously given to you, that, as long as I may be permitted to reside among you, and so far as my services in any way, or for any branch of the Club's work, are thought worth your having, so long and so far I shall not only count it a duty but esteem it a privilege to put those services at your disposal.

Woolhope Naturalists' Field Club.

FIRST FIELD MEETING, MAY 23RD, 1889, EYWOOD,
KNILL, PRESTEIGN.

THE programme drawn out for the first Field Meeting this year, on Thursday, May 23rd, attracted a large attendance of members. The railway station at Titley Junction was the first *rendezvous*. The majority travelled by the Great Western Railway; they were joined at Titley Junction by a contingent who had arrived by the Midland Railway, from the Eardisley Junction, and a small party from Kington completed the roll, which on being mustered, was found to be composed as follows:—Mr. H. Southall, President; Dr. T. A. Chapman, Vice-president; The Mayor of Hereford, Mr. H. C. Beddoe; the Revs. J. O. Bevan, W. Bowell, J. Dunn, E. J. Holloway, A. W. Horton, A. G. Jones, W. H. Lambert, H. B. D. Marshall, F. S. Stooke Vaughan, and R. W. Warner; Sir Herbert Croft (Bart.), Dr. J. H. Wood, Messrs. J. A. Bradney, T. D. Burlton, J. Carless, Luther Davis, Charles Fortey, G. H. Hadfield, T. Hutchinson, J. Lambe, P. Levason, J. W. Lloyd, C. G. Martin, T. Meadows, T. C. Paris, W. Pilley, Mr. H. C. Moore, Hon. Secretary, and Mr. James B. Pilley, Assistant Secretary, and the following visitors—Rev. Thomas Westmoreland, Colonel E. Temple, Messrs. W. H. Cariss, J. Cockcroft, W. Davis, J. Hereford, P. Horton, G. P. Jenkins, — Lloyd, junior, A. Middleton, C. Phillimore, W. Sharland, and A. Temple.

The business of the day was transacted without delay upon the railway platform. Mr. W. H. Banks, Mr. W. P. J. Le Brocq, the Rev. T. Beville Paynter, Captain C. Dansey Oldham, and Dr. Alfred J. H. Crespi were elected members, and five names were proposed to be balloted for at the next meeting. Dr. T. A. Chapman was elected as corresponding member to the British Association for the advancement of Science; the Rev. J. O. Bevan was chosen as a delegate to their next meeting, on September 11th, at Newcastle-on-Tyne, and also as a representative of the Woolhope Club at the meeting of the International Geological Congress in Paris on August 18th.

From the western or Kington end of the platform at Titley junction, Offa's Dyke was seen, at a distance of about 200 yards, taking its usual northerly direction. In *Salop Antiq.* it is stated that "Offa's Dyke traverses a plain in its course from Lyonshall, and makes an angle without any apparent reason." The fact is that had the northerly direction been continued, its course would have been obstructed by various pools, of which the largest are Flinsham Pool, Titley Pool, and the pretty Garden Pool in the grounds of Eywood, and some smaller

pools, which may have formed eleven hundred years ago—the Dyke is supposed to have been constructed about A.D. 784*—a far more formidable swampy barrier than they do at the present time. Anyhow, it was necessary for the Dyke to deviate either to the right or left of these pools. The left, or western, side was selected, and the course was thence taken from Kennel Wood, in a direction almost due west for a distance of nearly two miles upon the top of Rushock Hill, then round the crest of Herrock Hill,† which it descends at its northern extremity, and from this point it resumes its northerly course, under Burva, and Evenjob Hills.‡

The approach to Eywood was made through the avenue of fine beeches and elms. The Adder's tongue (*Ophioglossum*) was found near Titley Pool, and the Brittle Bladder Fern (*Cryopteris fragilis*) was found on the boundary wall, near the Garden Pool. Conspicuous amongst the giant trees was a handsome *Sequoia gigantea*, or Wellingtonia, in the drive near Eywood. A halt was made at the Garden Pool, with the view of collecting the party together, in order to listen to a paper prepared by Mr. Lloyd; and whilst he was opening his folio of accompanying prints, some of the members were inspecting the "coracles,"—of which Ancient British Boats there were two on the bank of the Pool—whilst others were admiring the beauty of the surroundings; and Mr. Charles Fortey, searching for freshwater shells, found at once *Limnæa auricularia*, and *peregra*.

*Offa succeeded to the Kingdom of Mercia in A.D. 755. Mercia was formed into an independent state by Crida about A.D. 586, comprising in its full extent what are now the counties of Chester, Derby, Nottingham, and Lincoln (North Mercians), Leicester (Middle Angles), Rutland, Northampton, Huntingdon, Beds, Hertford, Bucks, Oxon, Gloucester, Warwick, Worcester, Hereford, Salop, and Stafford (South Mercians). The death of Offa took place at Offa-leia or Off-ley. Speed says 20th July, 794, Ingram's Saxon Chronicle A.D. 794, Chronica de Mailros A.D. 796, Matthew Westminster A.D. 797. (*Essay on The Life and Institutions of Offa, A.D. 755—794 by Rev. Henry Mackenzie, London, 1840.*)

†Herrock—"Hercope" of Domesday Book; probably from *hir*—long, and *cop*—a hill.

‡Evenjob, pronounced Enjob, probably from Evan's cop; so also Burlingjob, south of Old Radnor, pronounced Burchop, from Burchelin's cop.

The following notes were read by Mr. JAMES W. LLOYD:—

NOTES ON THE HARLEY FAMILY.

ON the 29th of June, 1882, the members of our Club visited Brampton Bryan Castle and Park, the principal residence of the Harley family in this county, with which they have been connected since the reign of Edward II., and on that occasion an interesting paper on "Brampton Bryan Castle, its sieges and Demolitions," was read by the Rev. J. D. La Touche, which will be found in the volume of our *Transactions* for 1882. It will not therefore be necessary for me to refer to the earlier history of the family or to the stirring scenes and times in which many of its members played a part. A family which has given to our country, besides its warriors, two bishops, several distinguished statesmen, liberal patrons of fine arts and founders of a library and collection of manuscripts which form one of the principal glories of our national collections in the British Museum, deserves at least a few words of notice on this occasion, when we visit for the first time—through the courtesy of the present noble occupant of Eywood—the beautiful grounds surrounding this mansion, built by the Hon. Edward Harley,—second son of Sir Edward Harley, to whom most of the touching letters written by his mother, Lady Brilliana, during the civil war, which were inspected by some of our members on our visit to Brampton Bryan in 1882, were written,—and brother of Robert, 1st Earl of Oxford. He held the important office of Auditor of the Imprest in the reign of Queen Anne, was Recorder of Leominster for 40 years, and represented that borough in Parliament for nearly 30 years. He died in London on the 30th August, 1735, and is buried in the churchyard of this parish of Titley, where a monument records his character and eminent virtues in terms no higher than they deserved.

INSCRIPTION ON THE TOMB OF THE HON. EDWARD HARLEY, TITLEY CHURCHYARD, HEREFORDSHIRE.

"Underneath this stone, by his own appointment, lie humbly interred the remains of the Hon. Edward Harley, Esq., of Eywood, in the county of Hereford, second son of Sir Edward Harley, Knight of the Bath, of Brampton Brian in the same county, and brother of the Right Honourable Robert Earl of Oxford. He married Sarah, third daughter of Thomas Foley, Esq., of Witley, in the county of Worcester, by whom he had three sons and one daughter. He was Recorder of Leominster for forty years, and represented that borough near thirty years in Parliament, in which his skill in the law, an unwearied application to business, and extensive knowledge of public affairs, joined with a calm and unprejudiced judgment, a steady and unbiassed adherence to the Constitution, and a disinterested zeal for the good of the country, made him justly esteemed one of the great supports and ornaments of it. In 1702, he was advanced by Queen Anne to be one of the auditors of the Imprests, which important place he

exercised to his death, with great care, integrity, and ability : and by his regulation of the National accounts, his service to the public remains after his death. Yet, assiduity in Civil employments neither lessened his attention to religion, nor interrupted his daily course of devotion. The discharge of his duty as a Christian was the source and centre of all his desires. His hospitality was great, his liberality greater, his charity private and without ostentation, nor ever made known but where it could not be concealed. He augmented several small livings in this county and in Monmouthshire ; he maintained several charity schools in both, and endowed one for ever at Brampton Brian, the place of his birth. From his known zeal to promote Christian knowledge, and particularly the instruction of youth, in the year 1725 he was chosen Chairman of the Trustees for the Charity Schools in London. The whole tenour of his life was strictly moral, without dissimulation, pride, or envy, his deportment affable and humble, his conversation cheerful and instructive. He was faithful and constant to his friends, charitable and forgiving to his enemies, just and beneficent to all, and the great example of piety and religion which shone through his life, and was most conspicuous on his death-bed, is the greatest consolation and blessing he has transmitted to his posterity. He was born on the 7th day of June, 1664, and died on the 20th April, 1735."

The Auditor, as well as his brother Robert, the first Earl of Oxford, incurred the animosity of their neighbour, the eccentric, and somewhat hot-headed, though "upright, courageous, and high principled" Earl of Conynsby, who in 1715 attended by 250 members of the House of Commons impeached the latter at the bar of the House of Lords of high treason, on which charge the Earl was committed to the Tower where he was confined for two years until his trial in 1717, when he was honourably acquitted by his fellow peers. Disappointed in his attempts to destroy the Earl, Lord Conynsby turned his enmity on the brother who had undauntedly stood forward in his defence in the Lower House, and caused a charge to be brought against him of having embezzled the funds of the State ; but like the more serious impeachment this charge also failed, the auditor, —through whose hands passed in one year thirty-six millions of public money—coming unscathed from the accusation, his accounts being correct within 3s. 4d. which had been mischarged through an error of a clerk. Robert, Earl of Oxford, the trusted and faithful Minister of Queen Anne, of whom Pope said—

" A Soul Supreme, in each hard instance tryd
Above all Pain, all Passion, and all Pride ;
The rage of Power, the blast of publick Breath,
The lust of Lucre, and the dread of Death,"

died 21st May, 1724, in his 64th year, and was succeeded by his only son, Edward, 2nd Earl, who married Lady Henrietta Cavendish Holles, only daughter of the Duke of Newcastle. Following in the steps of his noble father, who during his life made an extensive collection of manuscripts illustrating the history and antiquities of the country, the second Earl formed a library of the choicest and most magnificent works that had ever been collected in the kingdom, known as the Harleian Library. Both the Earl and his lady

were the most liberal patrons of literature and the fine arts, and it was to their support and encouragement that George Vertue, the great engraver, owed so much of his success. The portraits exhibited were all engraved by him, also the beautiful little souvenir of Lady Henrietta, recording the gift to her of a volume of historical interest by "her lord." Dying in 1741 without male issue, the second Earl, who was buried in Westminster Abbey, was succeeded by his cousin Edward, son of the Auditor, who had represented this county in Parliament from 1727, and was elected in 1745 by the Mayor and Corporation of Hereford High Steward of the City. His son Edward, fourth Earl, dying also without issue, was succeeded by his nephew Edward, son of John Harley, Bishop of Hereford, who again was followed by his son Alfred the last Earl, at whose death in 1853 the title became extinct, and the estates became the property of his eldest sister, the late Lady Langdale, widow of Lord Langdale, Master of the Rolls, who, outliving her only daughter, the Countess Teleki, a little more than two years, died in 1872, and was followed shortly afterwards by her successor, Lady Frances Harcourt, whose literary tastes were so well-known in this county. At the death of Lady Frances the estates were divided, the Brampton Bryan property falling to the present owner, Robert Dacre Harley, Esq., while Eywood is enjoyed by the direct descendant of the line of the Earls of Oxford and Mortimer, Edward Bacon, Esq., son of Lady Charlotte, second daughter of the fifth Earl, and sister of Lady Langdale. These hasty and incomplete notes on a family whose members have played an important part in the past history, not only of our county, but of the country, may well be closed by quoting the words of Byron in his dedication of *Childe Harold* to the last-mentioned Lady Charlotte Harley, when a girl of sixteen, whose parents the poet visited here and at their neighbouring residence of Kinsham Court. Byron addresses her as "Ianthé" in the following strain:—

"Not in those climes where I have late been straying,
 Though beauty there hath long been matchless deemed;
 Not in those visions, to the heart displaying
 Forms which it sighs but to have only dreamed,
 Hath ought like thee in truth or fancy seemed.
 Nor, having seen thee, shall I vainly seek
 To paint those charms which varied as they beamed.
 To such as see thee not my words were weak;
 To those who gaze on thee what language could they speak?"

"Ah! may'st thou ever be what now thou art,
 Nor unbesem the promise of thy spring;
 As fair in form, as warm, yet pure in heart,
 Love's image upon earth without his wing!"

* * * * *

"'Tis well for me
 My years already doubly number thine;
 My loveless eye, unmoved, may gaze on thee,
 And safely view thy ripening beauties shine:
 Happy, I ne'er shall see them in decline."

* * * * *

"My days once numbered, should this homage past
 Attract thy fairy fingers near the lyre
 Of him, who hail'd thee, loveliest as thou wast,
 Such is the most my memory may desire ;
 Though more than Hope can claim, could Friendship less require.'

Lady Bacon died in March, 1880, at the age of 79, and it may interest some of our members to see this portrait of "the Young Peri of the West," who thus inspired the poet to enshrine her memory in such beautiful lines.

These notes of this conspicuous family were rendered more interesting by the many prints of members of the family which Mr. Lloyd has been fortunate enough to have in his possession ; also "the volume of historical interest" presented to Lady Henrietta by "her lord." All these were handed round to the members during the reading of the notes.

The souvenir of Lady Henrietta Cavendish Holles, Countess of Oxford and Mortimer, is a copy of "Boscobel, or the compleat History of the Most Miraculous Preservation of King Charles II., after the Battle of Worcester, September the 3rd, 1651, published by Mrs. Anne Wyndham ; fourth edition, adorned with cuts : London ; printed for J. Wilford, at the Three Golden Flower-de-Luces, in Little Britain, MDCCXXV.," bearing the lady's autograph, beautifully written in old English hand, also the elegant book-plate engraved for Lady Oxford by George Vertue, described in the list of works by this artist in Walpole's *Anecdotes of Painters* as "a plate to put in Lady Oxford's books." The plate is inscribed :—"Henrietta Cavendish Holles, Oxford and Mortimer. Given me by (my Lord 1726)"—the last two words, with date, being inserted in MS.—and is thus described in "A Guide to the Study of Book Plates, by the Hon. J. Leicester Warren, M.A." who gives an engraving of it. "The charming book-plate of Henrietta Cavendish Holles, Countess of Oxford, is peculiarly valuable, as showing the precise point of transition between the Jacobean and the allegoric style ; and well illustrates, moreover, how easily the living allegoric figure sprang from the dead carved image of the Jacobean frame. The book-plate gives us, so to speak, an allegory within an allegory. There is the picture of Minerva as schoolmistress to a college of Amorini. Then there comes the frame. Two youthful heads which appear at its sides among the carvings are clearly wooden ornaments. But how about the Mercury and Archimedes at the top ? Are these carved upholsterers, or waifs and truants of Minerva's school within. Vertue spent a good deal of his time with Lord Oxford, in whom he found a congenial Mæcenas. The Peer used to take the engraver with him on tours about England to sketch the various objects of interest in their route. His patron's death in 1741 seems to have been a severe loss, in every sense, to George Vertue. The frontispiece to the Auction Book of the Harleian collection was also George Vertue's work. Design of the plate :—A library interior, with book-shelves to the ceiling ; in the centre an arched doorway, with Corinthian columns on each side, and the usual curtain and bell-rope draped above. Through the archway we are shown a charming vista of landscape outside. We see a straggling country-house in a park

or pasture, intersected by a river, crossed by a three-arched bridge. Over the pasture are dotted little spruce round-topped trees, like those in a child's toy box. The river winds from a line of distant hills. In the foreground stands Minerva, sandalled and helmeted, but unarmed, and with her skirts tucked up. She is superintending a school of six industrious cupids. The most prominent of these is painting in oils, with an easel before him and a palette on his thumb. To his progress the attention of the goddess is chiefly directed. Another cupid plays the harp, two more sit on the frame of the design weaving festoons, another, also on the frame near a celestial globe, is copying a satyr, playing on a flute under a tree, which picture cupid the sixth holds up for him. The whole design is set on a richly ornamented Jacobean frame, with the usual leafy curves and limbs, mingled with two youthful heads as lateral ornaments, and below palms and festoons, apparently of jewels. On the frame above are seated, right and left, two more cupids as supporters to a medallion bearing the Countess's monogram, above which is an urn, and below heavy bunches of fruit. The right cupid is masked in the flowing robes of a philosopher, one hand holds a plummet, the other an upright writing slab. The left cupid is attired as Mercury, with petasus and caduceus complete. The plate is 5½ in. by 3½ in. It is possible that the ex-libris represents an interior of the Brampton Library, and the view may be one in the Brampton Park. But Welbeck, which she possessed in her own right, seems to have been especially Lady Oxford's favourite place, so that the reference may be to Welbeck. Hither she retired after her lord's death, and in its galleries assembled the portraits of her ancestors to a prodigious number."

Thanks having been accorded to Mr. Lloyd, the Hon. Secretary, in the absence of Mr. E. H. Greenly, read the following

NOTES ON SOME OF THE RARER FLOWERS

To supplement a paper on the Botany of the neighbourhood, read by Mr. J.

H. DAVIES, on May 15th, 1873 (see *Transactions*, 1873, p. 67), by
Mr. E. H. GREENLY, Titley Court.

What plants would actually be found in flower must depend, of course, upon the season in which the district is visited. I shall merely try to give a list of some of those which may probably be met with by a party of botanists on or near the route of the day's proceedings, presuming, however, that some of them will be able to give a little more time to their search, and perhaps cover rather more ground than is usually possible at an ordinary Club Meeting. Arriving at Titley Station, Lyonshall Park, the large wood lying to the south-west of the station should first be visited, and on the way there, a few hundred yards up the line, may be noticed a large patch of the flowering willow (*Epilobium angustifolium*) which has increased its area at this station so much as to be quite a conspicuous object, when in flower, even from the window of a passing train. Passing into the Park, the boggy pools lying almost in the centre of the woods will be found rich in marsh plants, including the Marsh violet (*Viola palustris*) the small Marsh valerian (*Valeriana dioica*) the Buckbean (*Menyanthes trifoliata*) the Marsh Cinquefoil

(*Comarum palustre*), the tall Red Rattle (*Pedicularis palustris*), the Marsh Pennywort (*Hydrocotyle vulgaris*), and others. In shady spots the Herb Paris (*Paris quadrifolia*) grows sparingly, and in the wood, hedges, and along the line of the old tramroad towards Kington some of the rarer species of *Rubus*, e.g., *Leucostachys*, *macrophyllus*, *mucronatus*, *Kochleri*, *pyramidalis*, *sulcatus*, &c., are recorded in the Flora of Herefordshire as occurring in more or less abundance. Leaving the wood, and before crossing the river by the bridge below the station, the Danewort (*Sambucus Ebulus*) may be observed on a piece of waste ground on the right of the road, and in shaded spots on the river banks the alternate-leaved Golden Saxifrage and the Bitter Cress (*Cardamine amara*) have also been found. In and near the village of Titley we have the Frog orchis (*Habenaria viridis*) in a meadow adjoining Titley Court Park, the Skull cap (*Scutellaria galericulata*) in the Park itself; Snakeweed (*Polygonum bistorta*) in a meadow by the side of the Presteign-road, the large flowered Hemp nettle (*Galeopsis versicolor*) in a small copse adjoining the lane leading to the river, and the Sneezewort (*Achillea ptarmica*) Needle whin (*Genista anglica*), and Dyer's Greenweed (*Genista tinctoria*) in a rough pasture a little below. In the old walls surrounding Wapley Camp the Shepherd's Cress (*Teesdalia nudicaulis*) grows abundantly, and may probably also be found in similar situations in crossing the hill towards Knill. Returning towards Eywood, we may notice the Navelwort (*Cotyledon umbilicus*) in old walls by the roadside, and in the Garden Wood below the house the Bird's nest Orchis (*Neottia Nidus-avis*) has been found occasionally. In the lane leading up to the hill, the Hemlock (*Conium maculatum*) grows luxuriantly, and, in the open pastures above, the Musk Thistle (*Carduus nutans*) and trailing St. John's Wort (*Hypericum humifusum*.) After descending the hill to Knill village, and near the county boundary, the hairy Violet (*Viola hirta*) has been found in a small quarry near the roadside, and two species of Bellflower (*Campanula patula* and *C. trachelium*) are abundant in the hedges. Nash Scar, the steep hill on the left of the Presteign road, will repay a careful search, being rich in many of the limestone plants, two of which, the Buckthorn (*Rhamnus catharticus*) and the Bloody Cranesbill (*Geranium sanguineum*), are found, as far as I am aware, at no other station in this district. I must apologise for the incompleteness, as I had hoped to be able to compare notes with one or two members who are better acquainted with the flora of this neighbourhood than myself; but it may possibly be of some slight assistance in studying the botany of a district which appears hitherto to have been somewhat neglected, but which I think well merits a more careful investigation."

With reference to these notes, the Rev. A. Ley reported that the finding of *Teesdalia nudicaulis* on the fence of Wapley Hill gave a new and valuable station in this county for this plant. He would ask the botanical members to look out for *Draba muralis* which had been picked on Nash Scar, but whether in Radnorshire or Herefordshire was at present uncertain—the boundary line between the two counties is on the top of Nash Scar. He would also like further observation respecting *Myosotis sylvatica* which is known to grow on the Arrow for about one mile of its course, below Titley Junction. If it could be found growing also along

any of the smaller streams in the neighbourhood, the probabilities would be in favour of its being a native plant there. He had lately heard from Mr. Greenly that *Mœchia erecta* grew just at the top of the old road which crosses Knill Garraway for Knill, and so it might probably be found on the day's route; and *Ornithopus perpusillus* had been recently recorded by him from the Kington district.

The following are a few of the most rare plants which were found by the botanists when they compared notes on their return home. *Ophioglossum*, *Cystopteris fragilis*, *Botrychium lunaria*, *Polypodium dryopteris*, *Ceterach officinarum* growing native on the rocks at Nash Scar, *Comarum palustre*, *Menyanthes trifoliata* in flower, *Viola palustris* in flower, and on Nash Scar *Cynoglossum officinale* was abundant. The reed *Scirpus sylvaticus* was found by Dr. Wood, and *Luzula albida* or *nivca*, a grass foreign to this county, was gathered somewhere, most probably in the grounds of Silia.

The Entomologists reported *Clepsis rusticana*, a tortrix new to Herefordshire, on the wing, on the hillside above Knill, and *Argyresthia sorbicella* larvæ were mining the shoots of *Pyrus aucuparia* on Nash Scar; this is a *tinea* new to Herefordshire.

After leaving Eywood, the route to Knill Garraway* was taken on the eastern-side of Kennel-wood, and of the pools there, which are occasionally visited by the dabchick or little grebe, and on ascending the sheepwalk towards Scutchditch wood, the moonwort (*Botrychium lunaria*) was found; proceeding thence, parallel with the course of Offa's Dyke on the top of Rushock Hill opposite, Knill Garraway was reached, exposing a charming view of the most prominent hills of the adjacent counties, with Knill Church and Knill Court on the banks of Hindwell brook in the foreground.

At Knill, the "Chenille" of Domesday Book, the Rector and his family most kindly and hospitably received the party, and the Rector (Rev. G. H. Fielding) read the following notes on the Church:—

NOTES ON KNILL CHURCH.

[By the REV. G. H. FIELDING.]

The tower of this Church, situated in the narrowest part of the valley, midway between the old Castles of Stapleton and New Radnor, was probably originally a border tower, the Church itself being added afterwards. It has three bells with the following inscriptions:—1, Katherine de Knill, 1608—re-cast in 1884. 2, Soli Deo gloria, 1638. 3, Jesus be our speed, 1642. The stoup was supposed by Dr. Havergal to be only a pestle; but by Mr. Williams, by whom the Church was restored, it is thought to be a genuine holy water basin. It is of a kind found only in churches of the Marches, and there is one of similar form engraved in the *Archæologia Cambrensis*. The font is interesting with Norman work on it, if not pre-Norman. The Church was restored in 1873-4 by Mr. Williams, of Rhayader.

*Probably from garw, rough.

The porch is new; the nave and chancel re-built and re-seated with open seats, the flooring being laid down with Godwin's encaustic tiles. The only old window left is the north window in the chancel. Wailes of Newcastle supplied the painted glass for the chancel windows. At the restoration of the Church the base and shaft of the churchyard cross were found built into the east wall of the chancel, and the head was recovered by the Rev. H. T. Moggridge, who was then rector, from a cottage on the side of Herrock Hill. The dedication of the Church is to St. Michael and All Angels, and is shown in the small painted window in the tower—St. Michael slaying the dragon.

NOTES ON KNILL.

[By MR. F. TIDD PRATT.]

Few places possess simpler annals than this little border parish, the lordship of which has descended through the families of Knill and Walsham to its present owner, Sir John James Walsham, Bart., only son of Col. John Garbett (afterwards Walsham), whose mother was daughter and sole heir of John Walsham, of Knill, (See Baronetage). There can be no question that the earliest lords of Knill were the direct ancestors of Francis Knill, who entered his pedigree* at the Visitation of 1569, and was father of Barbara Knill, who married John Walsham, of Presteign, and conveyed to him the estates of the family and its representation; but the exact succession and names of these earliest lords of Knill cannot now be recovered. The most ancient deed in the possession of Sir John Walsham, belongs to the latter part of the reign of Edward I., at which date, Ralph, son of Sir John de Knyll, was lord of the manor.† Knill Court, enlarged about the year 1561, seems to have been then a substantial stone mansion, of five bays, with a superstructure of timber, wide gables, and barge boards of bold design. Nash considered the eastern and larger portion of the house to have been built temp. Edward II., and care has been taken in the recent restorations to preserve most of the old features. The Court stands in the midst of scenery of surpassing beauty.

The interior of Knill Court, with its many family portraits, was visited, by the kind permission of Lady Lewis. The following inscription, in mediæval type, appears on the arch over the front door:—"Joannes de Knill, miles, Gulielmi de Braosa Marchiæ Walensis custodis filius, ætate minor, idemque sub Ricardo

*The pedigree begins with John Knyll, father of William, whose son John left (by his wife, Margaret, d. of Sir John Lingen) a son and heir, Jenkyn Knyll, who, by Ann, d. of Sir Richard Devereux, had John Knill and others. John Knill (H.S. of Radnorshire, 1561, and M.P.) by his first wife, Margery, d. of Whittington of Pauntley, left at his death, in 1564, an only son, the above Francis, who m. Jane, d. of Hugh ap Lewis, of Harpton, and was father of John, o.s.p., Sibill, m. Jno. Price, and Barbara, wife of John Walsham, who eventually inherited, as heir general, the Knill estates.

†In Collin's Peerage it is asserted that James Sitsilt (anc. of the Marquises of Exeter and Salisbury) m. towards the end of the twelfth century, Isabel, d. of Sir John de Knyll; and besides the undated charter already mentioned, Sir J. Walsham has a marriage settlement made at Eyton, 1293, securing a dowry to Adam de Eyton, husband of Isolda, daughter of Amicia, widow of John de Knyll. The celebrated Cardinal Eyton was grandson of Isolda de Knyll. Arms of Knill:—Gules, a lion rampant, and semée of cross crosslets fitchée or—being the same (differenced only in colour) as those of the Baronial house of Braose.

Primo Angliæ rege crucizante crucizator, huiusce Domus fundator, primus exstitit A.D. 1187," and may be translated as follows:—John de Knill, soldier, son of William de Braose, Warder of the Marches of Wales, a minor in age, the same also a crusader under the crusading of Richard I., King of England, was the first founder of this house, A.D. 1187. This inscription has been cut in modern times in Bath Stone over a new doorway of the 15th Century style.

From the pretty village of Knill, the route to Presteign was taken by the high road. Time did not permit the ascent of Burva Hill, on the summit of which are the tracings of a large ancient camp. Some active botanists ascended Nash Scar, and were rewarded by the finds which have been previously recorded.

As regards the Geology of the Woolhope limestone of Nash Scar and of Corton quarries occurring in a subcrystalline and partially metamorphosed state, resting against highly fossiliferous Llandovery sandstone, there is nothing new to be added to what has already appeared in the *Transactions*, on page 11 of the address of the Rev. Thomas Lewis, on January 24th, 1854, on page 7 of the address of Mr. R. W. Banks, on February 7th, 1861, and to Mr. Curley's remarks on page 172 of *Transactions*, 1866. The same locality has been described also by the Rev. Wm. S. Symonds in *Records of the Rocks*, pages 139 and 160, and again in *Old Stones*, page 57, of edition 1880. A geological section through Nash Scar and another through Corton are delineated in Murchison's "Siluria." See Chapter vi

At Corton, "the King's Turning," leading to Broad Heath, where King Charles I. stayed a night on his way from Brecon to Ludlow in August, 1645, was pointed out, and some members embraced the opportunity of visiting The Rodd, an extremely picturesque brick building of date 1629, exhibiting some graceful oak carving above the porch and windows, and an elaborately carved mantel piece in the ancient dining-hall.

The following introduction to Presteign, extracted from Camden's "Britannia," is interesting, and will bear repetition. After writing of Radnor, he says—"Scarce three miles eastward from hence you see Prestaigne, in British Llan Andre, that is, St. Andrew's Church, which of a very little village within the memory of our grandfathers, is, by the means of Richard Martin, Bishop of St. David's, grown now to be so great a mercate Town and Faire withall, that at this day it dammereth and dimmeth the light in some sort of Radnor. From whence also scarce four miles off stands Knighton, a Town able to match with Prestaigne, called in British, as I have heard say Trebucle, instead of Trefyclandh, of a famous ditch lying under it which Offa, King of the Mercians, caused to be cast from Dee-mouth into Wy-mouth by this towne for the space of fourscore and ten miles, to separate the Britons from his Englishmen, whereupon in Britain it is called Claudh Offa, that is, Offa's ditch, concerning which John of Salisbury in his Polycration writeth thus:—'Harold ordained a law that what Welshmen soever should be found with a weapon on this side the limit which he had set them, that is to say, Offa's Dike, he should have his right hand cut off by the King's officers.'"

Again, Camden also writes : "Wy is not gone full three miles from hence,* but he intercepteth by the way the river Lug, who, running down a maine out of Radnor hils with a still course, passeth through the mids of this country from the North-West to the South-East. At the first entrance it seeith a farre off Brampton Brian Castle, which a famous family named hereof de Brampton, wherein the surname was usually Brian, held by continual succession unto the time of King Edward the First, but now by the female heiress it is gone to R. Harlie. Neere at hand it beholdeth Wigmore, in the English Saxon's tongue Winginga Mere, repaired in elder times by King Edward the Elder, afterward fortified by William, Earle of Hereford, with a castle."

But to return to Presteign. On entering the churchyard at its south side the base and two or three feet of shaft of the old cross are visible. In the church the nave has six bays on five octagonal plain columns, with the exception of one column at the western end on the north side which is circular. The chancel is large and wide, having a large and handsome monument on its northern wall, in memory of Evan Davies, of Llandewy Ystradenny, died 1672, and of —— Lewis, Canon Residentiary of Hereford, rector of this parish, died August 7th, 1684. Upon the western wall of the south aisle is a large piece of tapestry in a remarkably good state of preservation, both in substance and in colour, representing the Entry of Christ into Jerusalem. It is said to have originally formed an altar piece. It was presented by Richard Owen, of Brampton Parva, in the year 1737.

In the vestry is a massive flagon, plain, with an inscription denoting its presentation by Littleton Powell, Armiger, 1692.

There are a pair of patens, the gift of Thomas Owen de Brampton Parva, 1706. The Parish Registers record events embracing periods as follows—No. 1 embraces from 1561 to 1646 ; No 2 1646 to 1685 ; No. 3 commences 1685. Some events dealing with historical connections have been interpolated, but unfortunately not contemporaneously, as they bear the date 1793. Page 40 of the year 1670 is in the Latin language, and historical. From the numerous entries made in the years 1593, 1610, 1636, and 1637, it is manifest that Presteign was visited by some plague or epidemic which caused a great mortality.

The "Radnorshire Arms," Elizabethan, dated 1617, is a handsome building of that period. At the western end of the town is an eminence, the site of one of the ancient castles of the Marches. This ground was presented to the town by Edward, fifth Earl of Oxford, is called "The Warden," and is used as a pleasure ground or "Hyde Park." Opposite, upon another eminence, called "Silia," is a collection of plants and shrubs presenting a grand botanical garden, in which rare foreign plants occasionally meet the eye in juxtaposition with varieties of our beautiful cottage garden or even wild English plants. It is a little paradise, especially for birds. One would have to travel far to find any collection of Conifers which would bear comparison with those which are here so thickly—aye, too thickly—luxuriating upon "Silia." The proprietor, fully aware that the *flat* must go forth to thin out the trees, shrinks from pronouncing the decree which must sacrifice some rare and handsome specimens. He has been kind

*(Hereford.)

enough to furnish a list of some of the coniferæ, which is herewith subjoined:—

Araucaria imbricata, an avenue of these ascribed to be the finest collection in the West of England. Amongst them are several cone-bearing, (very rare). *Abies alba*, *Abies Albertina*, *Abies Canadensis*, *Abies Douglasii*, *Abies excelsa*, *Abies glauca*, *Abies inverte*, *Abies Menziesii*, *Abies nigra*, *Arbor vitæ*—various, *Cedrus Atlantica*, *Cedrus Deodara*, *Cedrus Libani*, *Cedrus robusta*, *Chamæcyparis variegata*, *Cryptomeria elegans*, *Cupressus Bentharii*, *Cupressus elegans*, *Cupressus Lambertiana*, *Cupressus macrocarpa*, *Cupressus sempervirens*, *Juniperus excelsa*, *Juniperus fragrans*, *Juniperus glauca*, *Libocedrus Chilensis*, *Picea amabilis*, *Picea firma*, *Picea grandis*, *Picea lasiocarpa*, *Picea magnifica*, *Picea nobilis*, *Picea Nordmanniana*, *Picea Pinsapo*, *Pinus Austriaca*, *Pinus Benthamiana*, *Pinus Cembra*, *Pinus excelsa*, *Pinus insignis*, *Pinus Laricio*, *Pinus Lambertiana*, *Pinus macrocarpa*, *Pinus ponderosa*, *Pinus Strobus*, *Sequoia sempervirens*, *Thuja gigantea*, *Thuja Lobbii*, *Thujopsis borealis*, *Thujopsis dolabrata*, *Wellingtonia gigantea*, various very fine specimens.

Besides these there are Holly trees and Ivies of great variety.

Mr. Charles Fortey in search of land and freshwater shells, found *Limnæa auricularia*, and *peregra* in the garden pool at Eywood, also *Planorbis carinatus* and *complanatus* in the pool at "Silia." The only collection of freshwater shells found in Herefordshire, of which we have received notice, is that in the Museum at Ludlow. Mr. Charles Fortey has furnished the following list:—*Paludina contecta*, *Paludina vivipara*, *Bythinia tentaculata*, *Succinea putris*, *Physa fontinalis*, *Limnæa auricularia*, *glabra*, *palustris*, *peregra*, *stagnalis*, *truncatula*, *Planorbis carinatus*, *corneus*, *complanatus*, *vortex*, *Anodonta anatina*, *Unio pictorum*, *tumidus*, *Dreissena polymorpha*, *Sphærium corneum*, and *rivicola*.

POSTSCRIPT.

Of British land and fresh-water shells we have in Hereford Museum a magnificent collection. Since the above was written we have been glad to hear that Mr. Charles A. Whatmore, a resident of Much Marcle, and a member of the Conchological Society of Great Britain and Ireland, has pursued this branch of study with much success in that parish; and still more pleased have we been by finding on page 77 of the April number of "Science Gossip" for this year (1892), a paper headed "Contributions towards a list of the Mollusca of Herefordshire" by Mr. A. E. Boycott, of the Grange, Hereford, in which the collector states that he has increased the county list to eighty-seven species.—[ED.]

PARISH REGISTERS OF PRESTEIGN.

[By Mr. JAMES W. LLOYD.]

THE Registers of this parish which were inspected by some of our members present many points of interest, few places possessing so complete a series and from so early a date. The keeping of registers of births, deaths, and marriages was established by Cromwell the minister of Henry the Eighth in 1538, but this was not carried out in country parishes until the early part of the reign of Elizabeth, and the existing registers of this parish commence in 1561, the third year after her accession.

Perhaps the most important historical fact to be gathered from the entries on these registers is—that at three different periods the town, which was then probably more populous than it is at the present day, was visited by the plague or pestilence, viz., in 1593, 1610, and 1636-7, and the extent of its ravages may be realized by the numerous entries recording the burials of its victims. In 1593 the disease broke out in May, the first recorded burial being on the 10th, followed by three others in that month. In June the letter “p” denoting cause of death is affixed to fourteen names, while in July out of a hundred and fifteen deaths a hundred and fourteen were thus distinguished. In August the deaths rose to a hundred and forty-nine—all but one due to pestilence. From this time the deaths decreased gradually until February, 1594, when two bear the ominous “p” for the last time. To enable a judgment to be formed of the severity of this visitation, it will only be necessary to state that the average number of burials per annum for the twenty-one preceding years was fifty, while in 1593 the total number was three hundred and eighty-three, of which three hundred and fifty-two were of the pestilence. In 1610 the total number of burials was a hundred and sixty-one, the deaths from plague not being distinguished, but in 1636-7 the fatal “p” again appears, showing a hundred and forty-six deaths from this cause in the former, and fifty-seven in the latter year. So severe was the distress caused by this visitation, no one daring to enter the town, country people carrying provisions, clothing, and other necessaries to a place near, still known as Market Lane, where they deposited them to be fetched by the afflicted townspeople, that the following precept and warrant, under the hands of Sir Robert Harley and John Vaughan, Esq., magistrates of the county of Hereford, was directed to the constables of the hundred of Wigmore for the relief of the place :—

“Forasmuch as the Lord hath visited the neighbourhood of the town of Presteigne, within the county of Radnor, with that grievous infection of the Plague; and now being certified from two of the Justices of the Peace of the same county, of the poverty of the inhabitants thereof, &c. These are therefore, by virtue of an Act of Parliament made on the first year of the reign of King James, of famous memory, for the charitable relief and the ordering of persons infected with the plague, to will and to require you to collect and gather weekly within the feudal rights and townships under-written, within your hundred, the

sums on them assessed; and the same to pay to John Price, of Combe, gent., at his dwelling-house there, every Friday weekly, and to begin the payment thereof upon Friday next ensuing the date hereof. And if any person or persons do refuse to pay such sum or sums of money, as shall on them be assessed, that then you certify to us, or some of our fellow Justices of the Peace of this county, that further order may be taken therein, either for distress for the same, or for the imprisonment of the bodies of the parties refusing according to the tenour of the said Act. Thereof fail you not the due performance, as you will answer the contrary at your perils. Dated at Pembridge, under our hands and seals, the Twentieth of September, 1636."

RO. HARLEY (L.S.)

JOHN VAUGHAN (L.S.)

Stapleton.....	2 6	Titley parish.....	5 0
Wiley	2 0	Mouldley Waples Stanton.....	5 0
Upper Kinsum	2 0	Leintwardine parish.....	5 0
Rod, Nash and Brampton.....	10 0	Brampton parish.....	2 7
Combe and Byton.....	9 0	Wigmere parish.....	2 7
Lower Kinsum	2 0	Leinthall parish.....	2 7
Knill and Barton.....	4 0	Aymstry parish.....	5 0
Litton and Cascob.....	8 0	Lingen parish.....	2 0

The following record in the Baptismal Register in the year 1672, introduces us to another matter in the history of this parish :—

"There was noe lawful minister settled in our parish, therefore I was constrained to send in those bad times for these gentlemen to Baptize my children, therefore I cause this to be registered, being May the 15th, 1672, as followeth :

"Nicholas, the son of Nicholas Tayler, Esq., was Baptized by Wm. Evanes, Doctor in Divinity, the first day of March, 1654. Charles, the sonne of Nicholas Tayler, Esq., was Baptized by Thomas Edwardes, Doctor in Divinity, the 17th day of November, 1657.

"Elizabeth, the daughter of Nicholas Tayler, Esq., was Baptized by Mr. Stephen Scandrett, the 20th day of December, 1658.

"John, the sonne of Nicholas Tayler, Esq., was Baptized by Consen Lewis, he was born the 20th of January, 1660.

"Thus Registered according to the Directions of Nicholas Tayler, Senior, Esq.

"Wit. PHIL. LEWIS,

"Rector of Presteign."

Appended to these entries is the following note by a later rector, William Whalley :—

"N.B.—In the time of Oliver Cromwell.

"N.B.—Nicholas Tayler, Esq., lived at the Lower Heath in the house now inhabited by Mr. Wm. Powell. When King Charles I. fled before Or. Cromwell, then in the neighbourhood of Hereford, he dined and slept at the Unicorn Inn in Leominster the first day, and the next two nights he slept at Mr. Nicholas Tayler's, of the Lower Heath, near Presteigne, from thence he rode over the Hills to Newtown, and so to Chester.

"W. W., 1793."

The information afforded in this entry by the rector is interesting and valuable, as no doubt showing the traditional belief of the district at that period as to the King's movements, which is to this day perpetuated by the fact that a bye road—leading from the present high road from Kington to Presteign—to the Heath is still called “the King's Turning.” Still it is difficult to reconcile the statement that the King spent two nights at the Lower Heath with the precise particulars of his Majesty's movements, as given in the *Iter Carolinum* by Sir Charles Slingsby, who was a daily attendant upon the King during his marches, retreats, and sufferings, from January 10th, 1641, till his death in 1648.

The diary mentions two occasions on which the King may have passed through or near to Presteign, but in neither case is his stay of two nights recorded, nor does it appear how such a stay could have been made unless the King's movements differed from those of his attendant, which is scarcely probable.

The following extracts from the *Iter* will best explain the difficulties to be overcome in reconciling the popular tradition with facts so clearly set forth:—

	Nights.	Miles.
His Majesty's March in July, 1645,		
Friday, the 25th, to <i>Ruppera</i> , Sir Phillip <i>Morgan's</i>	4	5
Tuesday, the 29th, to <i>Cardiffe</i> , Dinner, the Governor's at our own Charge	7	7
August, 1645.		
Tuesday, the 5th, to <i>Glancayah</i> , Mr. <i>Pritchard's</i> , Dinner, at <i>Brecknock</i> the Governor, Supper	1	29
Wednesday, the 6th, to <i>Gurnerit</i> , Sir Henry <i>Williams's</i> , Dinner, to <i>Old Radnor</i> , Supper, a Yeoman's house, the Court dispersed	1	18
Thursday, the 7th, to <i>Ludlow Castle</i> , no Dinner, Col. Wodehouse	1	14
This march ended at Oxford which was reached on the 28th.		
A Second List of his Majesty's marches from Oxford on		
Saturday the 30th of August, 1645.		
Saturday, the 30th, to <i>Morton in the Marsh</i> , <i>White Hart</i> ...	1	24
Sunday the last, no Dinner, Supper at <i>Worcester</i> , a Cruel Day	3	24
September, 1645.		
Wednesday, the 3rd, <i>Bramyard</i> , Mrs. <i>Baynham's</i>	1	10
Thursday, the 4th, to <i>Hereford</i> , Dinner, Bishop's Palace	1	10
Friday, the 5th, to <i>Lempster</i> , Dinner at the <i>Unicorn</i> , to <i>Wobley</i> , Supper, the <i>Unicorn</i>	1	14
Saturday, the 6th, to <i>Hereford</i> , Dinner, Bishop's Palace ...	1	7
Sunday, the 7th, to <i>Ragland Castle</i> , Supper, 17; Monday, the 8th, to <i>Abergain</i> , Dinner, <i>Ragland</i> , Supper, 14; Thursday, the 11th, to <i>Ragland</i> , supper; <i>Abergavenny</i> , Dinner, 14	7	15
Sunday, the 14th, to <i>Monmouth</i> , Dinner, the Governor's, to		

Nights. Miles.

<i>Hereford</i> , Supper, Monday, the 15th, we marched half way to <i>Bramyard</i> , but there was Leo in itinere, and so back to <i>Hereford</i> again	3	10
Wednesday, the 18th, the Rendesvous was at Athurstone, there dined, 10 miles, to <i>Hamlacy</i> , Supper, <i>Lord Scudamore's</i> ...	1	26
Thursday, the 18th, to a Rendesvous, five miles from <i>Hamlacy</i> , with intention for <i>Worcester</i> , <i>Poins</i> , and <i>Roscester</i> on the Passage, whereupon we marched towards <i>Hereford</i> , so to <i>Lcominster</i> , then to <i>Webley</i> , thence to <i>Prestine</i> , there halted at Mr. Andrew's; this March lasted from Six in the morning till midnight, &c.	1	28
Friday, the 19th, to <i>Newton</i> , Mr. <i>Price's</i> , a long March over Mountains	2	14

This no doubt was the visit to which the entry in Register refers, and shows the King rested *one* night at Presteign. Possibly, while his attendants halted at Mr. Andrew's, his Majesty may have found more comfortable and secluded lodgings at the Lower Heath, some mile and a half from the town, and may have remained there a second night, catching up his army before they reached the end of their long march over the mountains.

The following note by the same rector records a matter for which no doubt he had reason to feel grateful, and which clearly shows his loyal sympathies —

“The Rev. John Scull* was in the year 1611 presented to the Vicarage of Presteigne and to the Rectory in the year 1640. In the time of the Rump Parliament he was deprived of all the emoluments of his living and died in poverty in the year 1652. The income of this Rectory was, by a set of hypocritical parliamentary Rascals, under the influence of Oliver Cromwell, given to one Knoweles, an Anabaptist, and Lucas, a London Taylor, and enjoyed by them till the day that Oliver's Carcass was exhibited at Tyburn. By Mr. Scull's having, at a considerable expense, and by the friendly assistance of Lord Willowby, procured the grant of the Great Tythes from Charles the first. He became the greatest Friend to this Church that it has had since its foundation.”

WW. Rr.

The extracts above quoted were taken direct from the register some eight or nine years ago, but the writer has been indebted to a valuable paper read at the Kington Meeting of the Cambrian Archæological Society in 1863 by the late Dr. Davies, which will be found in “*Archæologia Cambrensis*” for 1864, and to Williams's “*History of Radnorshire*” for much useful information. Readers who feel interested in the subject are referred to those works for fuller details than can be given within the limits of this paper.

* The Rev. John Scull belonged to a family connected with the counties of Brecon and Hereford from a very early period, and he obtained the living at Presteign through the interest of Sir Gilbert Cornwall, Baron of Burford, who then lived at Stapleton Castle, in the county of Hereford, the ruins of which still remain within a mile of the town of Presteign.

Woolhope Naturalists' Field Club.

1889.

LADIES' DAY, JUNE 18TH, 1889.

TO-DAY the members and their friends, half a hundred in number, enjoyed one of the happiest days which the annals of the Woolhope Club have been able to place upon record. Accommodated with a special carriage to convey them to Newland, in the Forest of Dean, they owe thanks to the officials of the Great Western Railway for running a special return train, leaving Monmouth at 6.15 p.m., thus enabling those who came from the north, the east, and the west to return to Hereford in time for the evening trains in those directions.

Upon arrival at Ross, the first surprise to the party was the announcement that the President had some carriages in readiness to convey them to his hardy perennial garden. Although the time was limited, the seats were soon occupied, and a heureux quart d'heure was passed in the survey of this carefully tended, valuable, collection of rare plants, towards which each individual of the family appears to have contributed his and her share of attention and interest. Thirty-seven years' labour of love devoted to this flower garden has enabled Mr. Southall to collect within a small area such rarities as botanists would go far to see in their native habitats, the unpleasantness of sea voyage, and the toils of mountain travel notwithstanding. Here, however, plants appear to have been educated to acclimatise themselves to the situation, soil, and climate, for not only do they grow, but they thrive and multiply.

Arrived at The Graig, the members on entering the garden found themselves in an enclosure where their attention was attracted by plants from Alpine regions. To commence; upon a lower spur was growing a healthy specimen of the Edelweiss of the Alps, or the Lion's paw cudweed, *Gnaphalium leontopodium*; *Linaria alpina* and *pallida*, two dwarf Alpines allied to the snapdragon; *Linnæa borealis*, allied to the honeysuckle; several Alpine pinks, including *Dianthus alpinus*, *fragrans*, *sylvestris*, *arenarius*, and *Fischeri*; also the Cheddar pink, *Dianthus coesius*, and two rare British pinks, *Dianthus plumarius* and *deltoides*; finally various smaller rock plants of Alpine regions.

In striking contrast to these must be mentioned a truly gigantic variety of Cow parsnip or Hogweed appropriately named *Heracleum giganteum*, which grows majestic in the tropics. *Gentiana lutea*, another native of the Alps, whose roots have centuries ago acquired, and to this date have maintained, a well-deserved reputation for their tonic effects on the digestive organs, seemed to have donned its gaudy robes of yellow wheel-shaped flowers especially for this occasion, seeing that it has not hitherto, during its ten years of cultivation in this

spot, deigned to blossom. A fine plant of *Inula glandulosa*, with its large orange blossoms, was a striking object; among many others *Cistus* both white and crimson, *Buddlea globosa*, *Campanulas* in various forms of colour, including *muralis*, *rhomboidea*, *garganica*. Of *Tropæolum* many species in gaudy efflorescence, but most conspicuously *podophyllum*, with its golden clusters of drooping flowers. *Heuchera sanguinea*, with a panicle of bright crimson flowers. *Delphiniums*, *Iris*es, *Helianthemums*, *Potentillas*, and *Anemones* in considerable variety; *Linum tauricum*, the yellow flax, forming an agreeable contrast with the deep blue of the *Linum provinciale*. The spectator, dazzled and mystified by the embarrassing display of colouring, instinctively seeks the relief of change; it is at hand under the gratifying shade of a natural bower, having penetrated which he finds himself suddenly introduced into a cool recess carpeted with every shade of verdure which can be afforded by ferns indigenous and exotic, luxuriating in close interlacing and pleasing variety, instructive to the student, and rejoicing the heart of the Nature printer. More charms attend him as he emerges from this retreat! his sense of hearing is shortly attracted by the refreshing sound of rippling waters, here seen flowing through clefts in the miniature rock scenery irrigating endless species of sedums, saxifrages, and other diminutive rock plants. Acquiring force as it gurgles down the ravines, hiding again and lost to view awhile, the stream finally loses itself in the pool below, gaudy with water-loving plants, most conspicuous amongst which is the Ladies' slipper, *Cypripedium spectabile*. Amongst orchids must be mentioned an *Orchis foliosa* with grand spikes of bloom, a *Cypripedium Calceolus* just beyond its prime, and strangely close together the Butterfly orchis and the Frog orchis. How comes this extraordinary admixture of plants from various climes here acclimatised? The different plants are suited, so far as is possible, to their various proclivities, and are allowed to grow in the natural way without interference other than preventing their overgrowing their neighbours. During the month of May more than 200 species came into bloom, and from June 1st to June 24th about 160 more flowered—this computation is made from the diary which is daily kept notifying the date of first flowering of any plant.

The horn, punctual to the minute, now sounded the assembly; therefore this ornamental oasis of pleasant memory had to be left, not, however, before the kind and cordial hospitality of the hostess and family of the President had been extended to an invitation to re-visit the scene in the evening.

Monmouth (May Hill) was reached punctually, and here again the same good fortune awaited the party. Dr. Willis met, and took charge of it; his long extended acquaintance with the town and the fact of his having held the highest office in its Corporation gave him the "Open Sesame" to all its official or other important buildings. For their description see the excellent *Waugh's Guide to Monmouth*, but commend us to the guide who will lay aside his professional, official, and domestic duties to sympathize with naturalists and archæologists in their progress. Not only was the programme carried out in its entirety, but more was seen and heard than could have been expected, for Nelson's arbour in the garden of the Capital and Counties' Bank had not even been mentioned, nor the

reputation of the Monmouth Grammar School for producing not only a Senior Wrangler, but one also who had guided so many others to the envied position of Wrangler, nor had the party been informed that such a remarkable festooning of foliage in plaster had ever been executed as was found by them on the ceiling of the first floor of the Castle House built for one of the Duchesses of Beaufort, now occupied by the Monmouth Volunteer Engineers. More might have been seen of the interesting Castle adjoining, but for the circumstance that in 1655 its demolition was rendered more complete by the use of its materials in the building of the Castle House. Neither was the kind reception, the drawing-room entertainment by Mrs. Willis, the spread of viands and refreshments upon her cool lawn, any portion of the authorised programme; yet the opportunity was seized of making them all a portion of the day's accomplished work, the usages of the Weolhope Club and of the Blue Ribbon Army notwithstanding. It is not our province to write a history of Monmouth, especially when one object alone in the town, namely the ancient Gate Tower, has had so many chapters to itself; long may its masonry remain *in situ*! Long be it preserved from removal like Temple Bar! But one work must be recorded which will deserve a place of honour when the next edition of *Waugh's Guide to Monmouth* comes to be printed, viz., the Jubilee Hall, an excellent model of what such a building ought to be, for the suggestion of which we believe Monmouth owes as much to Dr. Willis, whilst Mayor during the Jubilee year, as it does to the family of Rolls for its execution.

Before leaving Monmouth the business of the Club was transacted. It consisted of proposing the name of Mr. Cecil Butler, of Dulas Court, to be balloted for at the next meeting, and of electing the following members:—Rev. H. Brierley, Messrs. W. J. Curtiss, William Sharland, and H. J. Southall.

A list of the company present was now taken:—Mr. H. Southall, F.R. Met. Soc., President; Sir Herbert Croft, Bart., Revs. R. H. Cobbold, J. E. Grasett, E. J. Holloway, A. G. Jones, A. C. Lee, R. Remington, W. R. Shepherd, H. W. Tweed, Messrs. S. W. E. Gilliat, R. Clarke, T. Hutchinson, C. G. Martin, J. Riley, A. Watkins, H. C. Moore, Honorary Secretary, and James B. Pillely, Assistant Secretary; and the following visitors:—Miss Armitage, Miss Nora Armitage, Miss Baylis, Mrs. Clarke, Mrs. Cobbold, Miss Gould, Miss Grasett, Miss Holloway, Miss M. Holloway, Mrs. Hutchinson, Miss F. Jones, Mrs. Jacob, Mrs. H. C. Moore, Mrs. W. Pillely, Mrs. Pocock, Miss M. C. Remington, Mrs. A. Watkins, Colonel E. Temple, Dr. Cockcroft, Messrs. W. C. Blake, H. M. F. Croft, — Holloway, W. Jacob, and H. J. Southall.

Mr. Moore obtained the sanction of the Club to send copies of their *Transactions* and to submit their name for registration to the Council of the Society of Antiquaries, with the view of being recognised hereafter as one of the "Societies in Union."

The following Ornithological record was given by Mr. Thomas Hutchinson:

"A specimen of the Hobby Hawk was shot by a farmer in the parish of Kimbolton, and three eggs taken from its nest. The eggs are now in the collection of my sister at Kimbolton Vicarage, but unfortunately the bird was hung up as a scare-crow and the skin was spoilt before she heard of the bird being shot."

The visitors left Monmouth with pleasing memories of their kind reception at the hands of Dr. and Mrs. Willis.

From Monmouth (Troy) the line passes through pretty river and woodland scenery, with occasional peeps of valleys in its gradual ascent towards Newland. At Newland Mrs. Wm. Bagnall Oakley met the party, and carriages from the Speech House were in readiness to convey the members to the next object of interest—the Great Oak Tree, growing in a field the property of Mr. Charles T. Palmer, of Newland House, visible at a distance of two or three hundred yards on the right hand side of the road leading to the church; visible also as a veritable monster from the railway carriages on the right hand immediately after leaving Newland station, at a distance of about a quarter of a mile.

A short walk brought the members to this field, where a path, mown through the tall grass, led to the patriarch which, unfolding “the history of many a winter’s storm,” remains the solitary survivor of the fittest in the original Forest of Dean.

Upon arrival at the tree, a tape was passed round it. Fair measurements gave 45 feet 6 inches at the base, and 43 feet 6 inches at a height of 5 feet from the ground, being (at this height) more than five feet in excess of the noble oak at Cowthorpe, near Wetherby, in Yorkshire, which measures 38 feet 4½ inches at 5 feet from the ground. The Cowthorpe Oak, from measurements taken by Dr. Bainbridge, has a circumference of 78 feet at its roots; the trunk immediately commences to taper, having at 3 feet from the ground a girth of 48 feet, whereas the trunk of the Newland Oak tree represents a massive cylinder of almost the same dimensions, say an average girth of 43 feet for a height of ten to twelve feet. A drawing of the Cowthorpe Oak tree, from the pencil of Dr. Bainbridge, exhibited, in a drawing in his sketch-book, the glories of this magnificent tree with its stupendous overspreading boughs. Some estimate of what it was in its prime may be formed by the knowledge that, in the year 1718, a large bough was rent off which weighed five tons and 110 pounds. The tree is now hollow, with an inside diameter of 17 feet. The Newland Oak tree presents externally a solid trunk, but on climbing the pollard, it was reported to have a cavity filled with dead leaves. Vestiges remain of the bases of its former powerful limbs, with which time and tempests have played such havoc, but none of the existing limbs called for special remark, or specially invited measurement, in fact its canopy or area of overspreading is deficient. The Newland Oak tree is of the variety *Quercus pedunculata*; it is said to be mentioned in Domesday, but upon whose authority cannot be ascertained; it may safely be said that it is not mentioned in Domesday. It may perhaps be considered as old as the Cowthorpe Oak, but in absence of data, a calculation cannot be made with anything like accuracy. Experts have estimated the Cowthorpe Oak to be 1660 years old; we should like to know whether this calculation was based upon the number of concentric rings in the bough which fell in the year 1718. As regards the age of the Newland Oak we will not venture to say more than that we believe it to have outspanned the twelve hundred years allotted in the following quaint lines, thus versified by Miss Jane Williams :

“Three hundred years the oak expends in growth,
 Three hundred years in majesty stands forth,
 Three hundred years declines and wastes away,
 Then dies, and takes three hundred to decay.”

Iolo: MS.

Another oak tree mentioned in Strutt's *Sylva Britannica* is the Salcey Forest Oak in Northamptonshire, an utter ruin, gapped through and through, but still said to measure 46 feet 10 inches at three feet from the ground.

Before leaving the subject of comparison of the two greatest oaks in the kingdom, it is worthy of remark that the bough of the oak tree in the lawn of Oak House, Newland, which fell from the overweight of snow, exhibits, at its junction with the trunk, the enormous diameter of thirty-four inches, or nine feet in circumference.

Dendrologists have some difficulties to contend with in the discrepancies of measurements given by different observers. Here are a few instances:—The girth of the Cowthorpe Oak at its base is given in Hunter's notes to Evelyn's "*Sylva*" (1776) as seventy-eight feet, and the same dimensions are given by Strutt in 1822; whilst a writer in "*Notes and Queries*" made it fifty feet in 1857, and Mr. W. Brailsford writing in 1884 made it fifty-three feet. The measurements at three feet from the ground differ similarly. Measurements even taken by the same person vary—for instance, our Honorary Secretary, Mr. Moore, measuring the Newland Oak tree on September 15, 1887—(see *ante* page 176)—in company with Dr. T. A. Chapman, an equally accurate observer, made its girth at five feet from the ground 41 feet 10 inches; and to-day, June 18, 1889, Mr. Moore, under the observations of the goodly company here assembled, reports the measurement 43 feet 6 inches at the same height. Much as the surveyor may endeavour to avoid excrescences and to give a truthful measurement, he rarely succeeds in getting his first calculation corroborated to the nicety he desires.

Here is another flagrant instance of discrepancy in measurements. A correspondent (Mr. Southwell) in the *Standard* gives the girth of the Winfarthing Oak as forty feet, but unfortunately omits to state at what height! In Ablett's book the circumference is given as seventy feet in 1820—see "*The Growth of Trees*," *Standard*, October, 10th, 1889.

The following notes were contributed by Mr. F. BAINBRIDGE on

“THE COWTHORPE OAK.”

Presumably the original name, Colthorpe, was derived from Col—a hill. This village on a hill is in the West Riding of Yorkshire, near Ribston Hall (the seat of the Dent family), whence was produced the esteemed apple, the Ribston Pippin. For a representation of the last remnant of the original Ribston Pippin tree in its honoured age, see the text accompanying Plate XXV. of "*The Herefordshire Pomona*."

The oak tree for which the village of Cowthorpe is celebrated is acknowledged to be the oldest in Britain, and is certainly a splendid specimen of its genus. The

associations with which the tree is environed are common to the rest of the ancient trees of which this country affords several notable instances, being those which antiquity imparts, but this particular tree, from its huge dimensions and great age, has higher claims to our attention than any of which I have read. It is not only a remnant of the forests of Ancient Britain, but a monarch among the kings of trees. Not only has it outlived its contemporaries, but it has outgrown them, and in it we see not only the oldest oak in England, but possibly the oldest living organism. For upwards of 1,000 years it has kept alive the vital spark, it has partaken of the plant pabulum in the soil through the same roots, and has returned the sap to the roots through the same vessels. There, alone, this giant stands on the pleasant grass-grown plateau dotted with flowers and herbs, the wonder of many visitors, who appear as pigmies in contrast with its vast bulk. Five times has York Minster—man's work—fallen in half the period! Annually has it put forth its buds, its leaves, its flowers, and the bonny squirrel has dined upon its fruit, and despite all that storm and tempest and wanton hands have done to its main lateral branches, which once reached 100 yards from its trunk, and covered half an acre of ground, it still is not what Shakespeare terms—

“An oak without one green leaf,”

but is, at this season, crowned with a coronet of verdant foliage.

Tradition speaks of it as having been in a state of decay for several generations. The intermixture of foliage amongst the dead branches shows how sternly the giant struggles for life, and how reluctantly it surrenders to conquering time. “Compared with this,” says Dr. Hunter in his *Evelyn's Sylva*, “all other trees are children of the forest.” It is said that a coach might be driven through the holes of the celebrated oaks of Winfield Chase in Cumberland, and that of Welbeck in Nottinghamshire, as described and pictured in the recent number of the *Graphic* of June 8th, 1889: but supposing the trunk of the Cowthorpe Oak to be hollowed for the purpose, two coaches might pass through it. The leading branch fell during a storm A.D. 1718, and weighed with accuracy 5 tons 110 lbs.

Under the shadow of the Druidical worship-inspiring Newland Oak, Mr. Moore, in the absence of its author, read the following few notes.

THE LEAFING OF THE OAK AND THE ASH.

[By Dr. T. A. CHAPMAN.]

If the Oak is in leaf before the Ash,
 'Twill be dry, and warm, and good wheat to thrash;
 If the Ash is in leaf before the Oak,
 'Twill be cold, and of rain too great a soak;
 If the Oak and the Ash open their leaves together,
 Expect a summer of changeable weather.

If the Oak is out before the Ash,
 'Twill be a summer of wet and splash;
 But if the Ash is before the Oak,
 'Twill be a summer of fire and smoke.

There are several versions of this piece of weather-lore, an old Kentish one being "Oak, smoke ; Ash, quash," and according to a version given in *Notes and Queries* (1st series, v. 71) :—

If the Oak's before the Ash,
Then you'll only get a splash ;
If the Ash precedes the Oak,
Then you may expect a soak.

The Folk-lore of Plants, Thistleton Dyer, p. 117.

Two versions of these rhymes are to be met with, whose prophecies are diametrically opposed, it is enough for me at present to take them as a proof that common observation asserts that the leafing of these two trees varies in different seasons, sometimes one and sometimes the other acquiring its foliage in spring earlier than its fellow.

This year it has been a matter of frequent remark that the oak is notably in advance of the ash.

I have very little to say except to record this circumstance, and to inquire what is known about the matter.

I may first give a few dates which are very approximate for two reasons, firstly, that it is difficult to say precisely what advance in growth may be decided to be "in leaf ;" and secondly, trees of the same species may differ from each other by a week or more in their forwardness.

About the 6th of May, when an oak leaf about an inch long could be readily found, the season for oaks was about 18 days behind an ordinary season. So rapid has been the progress since that date, that at present, May 23rd, trees that submit to forcing are at about a stage normal to the season.

On May 17th oaks were generally well in leaf ; that is there were shoots of several inches long and leaves fairly developed. At this date many ash trees showed nothing like a leaf, and the most forward were only at about the stage reached by oaks on May 6th, and even yesterday, May 22nd, I saw an ash tree with buds only just breaking, whilst most oak trees now have full sized leaves.

But there is another circumstance that is very curious, though few, I think, have noticed it, and that is that when ash and oak have been cropped in hedges, the reverse state of matters holds. Well developed ash leaves could be found in hedges on April 29th, and on May 5th all such specimens were fairly in leaf. Yet on May 17th many oaks clipped in hedges had buds swelled to an inch or two in length, yet without anything like a leaf.

I think these dates are well to be noted ; the only comment I would make on them would be in the form of a few questions.

Firstly, and most radically, does the ash ever leaf before the oak ? The ash always blossoms a week or two, more often four or five weeks, before it breaks into leaf. For the last few years the ash has blossomed very freely, and many trees thereby put on a clothed, not exactly leafy, appearance, very early. This year the ash has hardly bloomed at all, and the first movement seen has been the bursting of the leaf bud. My inquiry is, therefore, whether the supposed variation in the date relative to the oak, at which the ash bursts into leaf, is not in reality merely a variation in the amount of blossom it bears.

The hedge plants behave this year in a way to suggest that the ash may, under certain circumstances, leaf first. My next query would be why this remarkable difference between trees and plants cropped to bush size and protected in hedges? If it is the warmth afforded by the protection of the hedge that forces on the ash, why does it not force on the oak?

I have noticed that many oaks leaf first at the top, whilst ash trees are apt to be latest there, and ash suckers leaf earlier than trees.

If the relative dates of leafing are reversed in the two trees in different seasons, we can only suppose that one tree breaks into leaf after a long-continued moderate temperature, but is not rapidly affected by a higher temperature, whilst the other does not move at the temperature suitable to the former, but advances rapidly at a slightly higher temperature. Should this be so, which is the tree that moves at the lower temperature? Has anything accurate been recorded on the subject?

April 20th.—Ash in flower.

April 29th.—Ash in leaf in hedges (not hedgerow trees, but ashes cropped with the hedge).

May 6th.—Oak leaves may be found on trees.

May 6th.—Ash buds (on trees) barely swelling.

May 17th.—Oaks well in leaf.

May 17th.—Most ash trees quite bare; shoots perhaps two inches long.

May 17th.—Oaks in hedges leafless, though buds well grown.

May 22nd.—Oaks in hedges still to be found without decided leaves; and

May 22nd.—Ash trees without leaves.

The President, Mr. H. Southall, said he had received two answers to inquiries he had made respecting this subject. Mr. Gulson, a very good observer, in writing to the *Coventry Herald*, June 7th, says:—"The newspapers contain the usual observations that the oak is in leaf before the ash, and predict the wet or dry season which they suppose is to follow. As I have never observed any season in which the oak was not in leaf before the ash, I am unable to say what force there is in such predictions."

Now follows a letter from Mr. Westley Richards, dated June 7th, 1889:—

"Dear Sir,—Mr. Symons informs me that you have been keeping records about the oak and the ash. This year, in my county (Rutland) the oak was decidedly out much before the ash, and we had 5·75 inches of rain, and it is one of the best grass years I ever remember. This does not agree with the proverb I enclose:—

When buds the oak before the ash,
You'll only have a summer splash.

I do not remember to have had 5·75 of rain in May before.

Yours faithfully,

WESTLEY RICHARDS."

From a newspaper cutting of a letter, signed John Thomson, Tweedside, June 2nd, 1889:—

Oak and ash. The rhyme varies in words, but its meaning is always the same, thus—

When buds the oak before the ash,
You'll only have a summer splash;
When buds the ash before the oak,
You'll surely have a summer soak.

That is, oak and soak rhyme together, and ash and splash.—G. A. H.

The appearance of the ash in this part of the borders must be very different from that which it presents in North Radnorshire as described by Mr. G. A. Haig. Here it is almost impossible to state with rigorous exactness whether the oak or the ash has priority this season. A great many trees of both species as yet show scarcely any signs of energetic vitality, while an equal number are well advanced in frondescence, oaks and ashes vying with each other. On the borders the rhyme runs

The ash before the oak,
Choke, choke, choke;
The oak before the ash,
Splash, splash, splash.

Considerable weight attaches to arboreal and other signs in this part of the country, and had the ash been so advanced as it is in North Radnorshire, instead of a wet summer, as anticipated by Mr. Haig, a very dry season would have been confidently looked for.

The President then made a few remarks on the peculiarity of the present season,—saying that the three spring months of March, April, and May, of 1889, were wetter than any corresponding period since observations were first taken in this county in 1818,—the amount being as under:—

				Total inches.		Rainy days.
March	...	...	...	3·28	...	18
April	..	...	...	5·64	...	22
May	...	...	...	3·81	...	18
				—		—
				12·73		58

or more than double the average fall, the fall in April being three times the usual quantity. Another striking fact had been the absence of frost. Since March 26th there had been no frost at Ross at 4ft. from the ground. During May, the lowest temperature in the screen was 42·4, on May 1st and 2nd; this appears to be unparalleled, and perhaps explains the unusual prevalence of insect life which, in some places, has been so destructive.

POSTSCRIPT.

Whilst this volume is in the press, 1892, the following observations taken from a letter by one John Arkle, of Lancaster, published in the *Naturalists' Gazette* for July, 1891, page 53, are thought worthy of a place here:—

THE OAK AND THE ASH.

“For many years past I have paid no little attention to the leafing of the oak and ash and other trees. In 1880, owing to some remarks upon the above subject in a local paper, which were quite contrary to my observations, I then determined to note down in a systematic manner the first appearance of the leaf, and this I have continued to do down to the present year. The results thus obtained, covering a period of ten years, prove that the opinion I then held was well founded. The oak always shows the leaf before the ash. I have never known the ash leaf first. In 1881 the oak showed leaf six days before the ash; in 1882 five days; 1883 eight days; 1884 four days; 1885 eight days; 1886 five days; 1887 eight days; 1888 three days; 1889 ten days; 1890 eleven days, and this year over a fortnight has elapsed between the two trees leafing. In looking over my records, which contain a good deal of other information on the state of the weather, &c., I cannot come to any other conclusion than that expressed above, that the oak always leafs first, and that the weather is not foretold by either the ash, oak, or any other tree, but that they one and all—the ash especially—are very considerably retarded by cold frosty weather in the spring.”

Our own observations—too limited we must confess—corroborate in every respect those of Dr. T. A. Chapman. No decision upon this point can be of any value unless it is based upon observations protracted through several years. A correspondence upon this subject extended through several successive numbers of *The Field*, commencing in the number for June 14th, 1890. We agree with Rusticus that

The ash being out before the oak
Is nothing better than a joke.

Having sifted the chaff, we extract the following letter as the most conclusive:—It is signed Fletcher Moss (the Old Parsonage, Didsbury), and is to be found on page 982 of *The Field*, for June 28th, 1890, “As regards the respective times of the oak and the ash coming into leaf, I heard a disputation on the subject thirty years ago. It was then maintained by the closest observers that the oak was always the first, and they had never seen it otherwise. Since that I have taken notice every year, and have proved them to be correct. Trees in special situations may be exceptions. For instance, an ash on a warm southern slope may be earlier than an oak on a cold bleak place, and individual trees of the same sort, though standing together, will often vary; but on the whole, in this part of the country (say Cheshire) the oak is always the first, and there has been no exception for thirty years, and for a much longer period, according to the witness of reliable observers now living.”

The Editor of *The Field* informs us that it requires a higher temperature to bring the ash into leaf than it does to bring the oak. It is therefore a question of temperature, and consequently of situation, or of sheltered or exposed positions. The proper period for peeling oak bark is between the bursting of the buds and the full-leaf, after which the foresters say that “the bark will not go.”

In the year 1890 the peeling of oak bark was nearly finished before the ash in the same woods had burst its buds, being an interval of fully three weeks in favour of the oak tree.

After the papers had been read and discussed, the party resumed their seats in the carriages for their next destination, viz., St. Briavel's. Passing through Newland village, a handsome specimen of the *Quercus suber*, or cork tree, was espied from the carriage seats, growing in the gardens of Oak House, and, on the lawn of the same house, the oak tree which had lost the huge limb which succumbed under an overweight of snow, measuring thirty-four inches in diameter at its base, as previously mentioned (page 340).

The road to St. Briavel's passes through a country somewhat undulating, and occasionally over portions of the old Roman roads, about 9 feet in width, conspicuous by their boundary kerbstones, with which our members have become tolerably familiar, having on many occasions previously observed traces of these roads in various localities in Dean Forest. The tall shaft of the cross in Clearwell village, resting on a square base, 14th century, somewhat resembling in character the White Friars' Cross at Hereford, was passed on the left hand. During the dusty drive it was remarkable that more than one lady's hair had turned grey in three-quarters of an hour, whilst our Assistant Secretary who brought up the rear, looking as if just turned out of a flour mill, presented the most ludicrous contrast in comparison with the rusty coloured miner just emerged "raddled all over" with the red ochre which abounds in a few localities in the subterranean iron mines, indicating the existence of the variety of iron ore called hæmatite.

The carriages having eventually arrived at St. Briavel's took up position in the road opposite the entrance to the Church on the right, and the Castle on the left. The Vicar, the Rev. Wm. Taprell Allen, had deposited some notes with the veteran sexton, which were of assistance to the visitors, from which the following extracts are given:—The Church, dedicated to St. Mary the Virgin, is a cruciform building, consisting of nave, north and south aisles, north and south transepts, and a tower built in 1831 on the south side. The tithes were originally granted by Wm. Fitz Osbern to his Abbey of Lire in Normandy, which he founded A.D. 1046. The Church was built A.D. 1089, temp William Rufus; enlarged in 1164 by the addition of choir, transepts, and chancel; and re-consecrated in 1165. The Abbot of Lire and his house made over the patronage to the Dean and Chapter of Hereford about 1219. Robert, Abbot of Lire, Canon Residentiary of Hereford Cathedral, died August, 1272. It is suggested, or rather it is asked, is the coffin slab with a triple cross in the south transept in any way connected with him? It appears to be of the 14th, or late 13th, century work. The female head in freestone, covered with a wimple, however, is a later insertion. The slab is ornamented with carvings of oak and laurel leaves, and has on it a triple cross, the mark of a high ecclesiastic. The 13th century canopied tomb, restored, is probably an *Easter* tomb. The present north arcade of the nave was probably built in the 13th century. It has four lofty pointed arches resting on

octagonal pillars, with moulded caps; these arches are of a later date than that between the aisle and the north transept, which leads to the conclusion that the present north arcade took the place of an earlier Norman one. The staircase leading to the rood loft is in the south aisle and of Early English work. The north transept was once used as a chantry to the Virgin Mary. The small excellently-proportioned pointed arches leading from the transepts into the aisles are well worthy of notice. The string-course is continued over them as a label, terminating in a fanciful representation of a serpent's head. When the present chancel was built in 1861 an Early English piscina was removed to the chancel and converted into a credence table. The remains of effigies now on the chancel floor are those of William Warren, a large landowner, and of Mariana Catchmay, his wife; erected about 1573. The lower portion of the font is modern, the upper, Norman, with a frill moulding round the base of the bowl.

The old east window had Early English interlacing tracery; there are Early Decorated windows of the 13th century in the transepts; there were an Early English eastern window and piscina in the north transept; and a fine Perpendicular window of five lights, probably of 15th century, at the west end of the nave. The clerestory windows in nave were re-opened by the alterations. The four Early arches forming the crux originally carried a central tower. This was taken down from the intersections in 1831, and the present tower built on the south side. The Church was restored and the chancel was rebuilt in 1861—the old west window was taken out in 1861. Extensive repairs and improvements took place again in 1880 to 1881, and subsequent years. The crown of the tower was re-built and improved in 1881. Of the peal of eight bells, six were re-cast in 1764, and two given in 1831. The rude stone coffin in the churchyard near the vestry door, was taken out of the nave in 1881. At the present time there is in the bar-parlour of a local inn a 12th century coffin lid, with an incised cross, which has been used as a breast-stone in the chimney. On page 92 of Bishop Swinfield's Household Roll, a note says: "The Church of St. Briavel's and others witnessed sanguinary outrages in the Episcopate of Swinfield; fugitives who sought refuge being not always safe." In truth, St. Briavel's was a lawless place, and it is feared that many old coffin slabs were carried away ruthlessly from the Church and used in building.

Some members ascended the tower, and reported favourably of the view obtained therefrom. On the west and north-west are the Trelleck Beacon, the Sugar Loaf and Scyrrid near Abergavenny, the hills on the boundaries of Herefordshire, such as Garway and Saddlebow, &c. On the north are the Kymin, Buckstone, Staunton, Berry Hill, Ruardean, the Plump Hill, and the more distant May Hill in Gloucestershire. The Forest of Dean is in the foreground, to the north-east, and the elevations in the neighbourhood of Dursley, beyond the Severn are seen a little south of east. The tower itself is on an elevation of 800 feet above the valley of the Wye. On the south the ground rises, and the view is more limited.

No wonder that such a site should have been selected for military defence. St. Briavel's Castle was apparently one of those forming an outer line of defence

to the important castle of Chepstow (see Ormerod's *Venta Silurum*, page 11.)* The neighbouring castle of St. Briavel's was built about 1131 by Milo of Gloucester, who espoused the cause of the Empress Maud, and was by her created Earl of Hereford, of which dignity he was deprived by Stephen, the honour being restored by Henry II. to Milo's eldest son Roger. A Norman keep, square in plan, originally stood on the southern side. This fell in 1752, and was completely destroyed in 1774. The outer enclosure represented an irregular seven-sided figure, with walls about 30 feet high, surrounded by an embankment, beyond which is the moat, which about thirty years ago was drained, leaving the castle pool at the north-west. The earliest mention of St. Briavel's in the public records occurs in the Pipe Roll of 31st Henry I. St. Briavel's was the special head of Dean Forest, the Constable of the Castle was Warden of the Forest, and here were held the miners' courts. St. Briavel's formed the connecting link between Gloucester and such of the Monmouthshire and Herefordshire castles as were in the hands of the Crown in the southern or western March of later years. It was not only noted as a fortress, but also as a resort for the pleasures of the chase. King Henry II. was in the Forest of Dean in 1158, since he granted a charter to Richard de Luci, which he tested at Newnham (Itin. of Henry II, p. 38). He probably visited St. Briavel's also in 1164 (Rot. Pip. 11th, Henry II.) King John also visited the castle on five different occasions, viz. A.D. 1200, Nov. 12; 1207, Nov. 15, 16, 17; 1209, Dec. 4; 1212, Nov. 10, 11, 12; 1213, Nov. 28, 29, 30.

On February 24, 1205, King John ordered two tuns of wine to be sent to St. Briavel's; and on November 13, 1207, the constable of Bristol was ordered to purchase five dolias of wine, of which two were to be sent to St. Briavel's. In earlier years, William the Conqueror was hunting in the Forest of Dean when he heard of the descent of the Danes on the eastern coast in 1069 (Ordericus Vitalis, Vol. ii., p. 25). After the conquest of Wales, St. Briavel's was no longer valuable as a fortress on the Welsh Marches; hence its buildings fell into decay. There are records of repairs having been executed in 54th Henry III., and in 49th Edward III. Camden says that in his time more than half the castle was demolished.

Additions to the building, upon the north side only, were made in 1275 or 1276 in ashlar work of red sandstone. They consisted of two entrance towers, on octagonal bases, with semicircular superstructure, and buttresses, triangular in shape, carried up from the angles of the bases. The gateway between the entrance towers has a crenelated curtain above. The portcullis had no lateral grooves; this construction is unusual and rare, although the same is seen on the opposite side of the river in Chepstow Castle; boiling water, molten lead, and missiles might be poured down the cavity from above upon any invaders of the entrance; or the portcullis by its own weight might secure itself upon its spiked extremities, and

*The final ruin of Caerwent seems to have followed the Norman Conquest, and its traffic and military consequence to have been transferred to Chepstow, which agrees with Leland's opinion (*Itinerary*, Vol. v., p. 6). The Saxon name "Chepstow" indeed points to earlier traffic there; but it was in the time of the Conqueror that the existence of the Castle of Striguil adjacent to the town superseded the military importance of Caerwent. Subsequently the feudal tenants of the Lord Marcher of Striguil erected their dependent fortalices on the Welsh side of his domain, and Newport, Caerleon, Usk, and St. Briavel's formed an outer line of defence. The fortalices were Pencoed, Penhow or St. Maur, Dinham, Crikke, Matherne (afterwards Moynes Court), and Hodetun now Itton.

would prove a formidable weapon of defence in case of a struggle at the gate itself. A second and a third gateway, each provided with a portcullis continued the defences. In the second court on the right hand a fireplace, in a lofty room used as a kitchen, has upon it the initials E. R., indicating the period of Queen Elizabeth. Here there is a turnspit's wheel *in situ*.

On the floor above is a prison—and amongst other rudely carved writings upon the walls, the following has been deciphered :—“William Bound was taken 1677 July 11.” This prison was visited by the great philanthropist John Howard on January 31, 1781, as mentioned in his work on the “Lazarettes of Europe.” Of the more internal buildings, the state apartment, 40 feet by 20 feet, has the remains of an Early English pointed window of two lights and a large transomed window of Perpendicular date on the west side, overlooking the Monmouthshire hills on the opposite side of the river Wye. This state apartment communicated through an ante-chamber with the chapel. In after years the chapel and ante-chamber were converted into a court room, and a room on the south became the jury room. These alterations were most probably made in the reign of Elizabeth, since formerly there was a text of Scripture and the date MDLXVII., on a beam over the judge's seat. Access to a large cellar was obtained through a pointed archway at the south-east angle, and under the jury room and chapel is a large stable having a narrow-pointed doorway leading to the moat. The jury room, 24 feet by 23 feet, with an open roof ceiled between the rafters, has a 15th century four-light window in the south wall, and a lofty transomed window in the west, on which side is an Early English fire place, resting on capitals of different design, supported on shafts apparently inserted during the execution of repairs at a later period, and there are also carved brackets, probably for lamps. This fire place is surmounted by an elegant Early English chimney which has on its apex a horn, the symbol of jurisdiction of the warden of the Forest, the erection of which is assigned by tradition to Henry de Bohun. This chimney was removed from its original site on the eastern side between 1783 and 1824. A somewhat similar chimney, even more elegant in design, is still to be seen at Grosmont Castle in Monmouthshire. These elegant designs of architecture are all represented in the paper “on St. Briavel's Castle,” which was read by the Rev. Wm. Taprell Allen, vicar of St. Briavel's, at Gloucester on 5th February, 1879, and printed in the *Transactions* of the Bristol and Gloucestershire Archæological Society, Vol. iii.

As a matter of course there are to be found the usual underground store-rooms which were so necessary for retaining provisions and ammunition in case of siege, and which are at the present day so frequently and wrongly assumed to have been dungeons for prisoners.

Thanks were accorded to the present residents of the Castle, members of the family of Mr. W. H. Hinton, who, in his unavoidable absence, so kindly conducted the members over the buildings of this ancient fortress. Thanks were especially due to the Vicar for a loan of his valuable before-mentioned paper on the Castle, and also of his “Notes on the parish, the Church, and the ancient religious foundations of Ledeneia Parva, or St. Briavel's” printed in the *Transactions* of the Bristol and Gloucestershire Archæological Society, Vol. ix., part 1,

from which the members gathered all the interesting information respecting both the Church and the Castle, which has been here so condensed.

Having viewed the Church and the Castle, the party resumed their seats for the return journey, diverging slightly to the right or eastward of Clearwell village, by Sling's Pit, in order to visit one of the many so-called "Scowles," or "workings of the old men," as the Foresters term them, being really the traces the Romans have left behind them in the Forest of Dean of their excavations in following the course of the veins of the iron ore. "Scowles" is said to be derived from a British word signifying a hollow—where excavations in search of the ore have caused a subsidence of the overlying surface, this condition is termed by the Foresters as "scowled in." These vestiges now present a series of labyrinthine caverns, having their Cyclopean walls overgrown with ferns, creepers, brushwood and even forest trees with grotesque gnarled roots in character with other weird surroundings, and their floors at this period were carpeted with tempting-looking white flowers, *Allium ursinum* or Ramsons, exhaling, almost to an oppressive degree, after being trampled upon, the odour of wild garlic.

Mr. W. H. Fryer, a mining engineer of considerable experience, says that the iron ore occurs in a bed of crystalline Limestone on the upper portion of the Mountain Limestone. The bed varies from 10 to 20 yards thick and is locally called the "crease" or vein. It is found in irregular veins locally called "churns," which sometimes widen out into caverns, or narrow into very small strings or "leads," containing ore varying from 15 to 60 per cent. of metallic iron in the form of a hydrated peroxide. From the "churns," fissures, usually called "back joints" frequently run back into the underlying Limestone. Mr. Fryer considers that the iron ore was deposited by infiltration from above, the excavation of the channel and the deposition of ore going on concurrently.

As regards the Coal mines in the Forest of Dean, the chief seams worked are the Parkend, Churchway, Yorkley, Whittington, and Coleford high delf seams. It is reported (upon some authority which we have failed to make a note of) that the best pit for visitors to descend is the Trafalgar Colliery on the Serridge or watershed near the Drybrook Road Station on the Severn and Wye Railway. The electric light is employed in this Colliery. In the other coal mines candles are used in the place of the Regulation Safety Lamp. The very remarkable immunity from Fire-damp in the mines of the Forest of Dean is thus explained in a note to a paper read on July 6th, 1888, by Mr. Wintour F. Gwinnell, F.R. Met. S., F.A.S., published on page 528 of the "Proceedings of the Geological Association," Vol. x, No. 9, November, 1888. "Thick porous sandstones overlies most of the coal seams, through which the carburetted-hydrogen escapes, instead of accumulating under pressure, as it does where impervious shales form the great mass of the partings as they do in many other coal fields."

NEWLAND CHURCH.

[By the Rev. WILLIAM BAGNALL-OAKELEY, M.A., Lecturer of Jones's Almshouses, Newland.]

UPON their return to Newland, the Rev. William Bagnall-Oakeley received the members upon alighting from their carriages, and from the steps at the base of the Cross in the churchyard, read to the assembled party the following paper on "Newland Church":—

Newland Church differs in one respect from the generality of the old Churches of Gloucestershire, for while most of them bear traces of their Norman origin, and were gradually added to in different styles as years rolled on, this church appears to have been built as we now see it, with a few trifling additions. It is evident, however, that it took many years to complete, as the base and windows of the tower are of a Decorated period, while the battlements are Early Perpendicular.

The absence of earlier work is easily accounted for by the fact, that, while the great Norman Church-building movement was in progress, Newland was still a dense forest; and it was not until the reign of Edward I. that the parish was formed out of all the assarts, which had been made, or that should hereafter be made in the Forest, and that had not already been united to any existing parish. It is the mother Church of Coleford, Bream, and Clearwell. These parishes originally formed part of Newland, and were only provided with Chapels for their religious services. There is no mention of Newland in Domesday. King Edward I. gave the advowson of the Church (*ecclesiam de novâ terrâ*—Church of Newland) to the Bishop of Llandaff, and on the 9th February, 1304-5, he granted him licence to appropriate it to himself and to his successors for ever. The tithes of the assarted lands were given to the Church in 1336, and the great tithes remained in the see of Llandaff until recent date. The Bishop of Gloucester now has the patronage of the living.

The Church of Newland is dedicated to All Saints, but whether this was the old dedication is uncertain.

This noble Church consists of nave, chancel, two nave aisles, two chancel aisles or chantry chapels, a chantry chapel in the south aisle, porch, and grand tower. The nave is 57ft. 9in. long, by 29ft. 8in. wide, the aisles are each 26ft. wide, and the chancel 43ft. long. The styles of architecture are Decorated and Perpendicular. The pillars of the arcades, five in each aisle, are octagonal. There is a very fine example of a Decorated window of four lights in the west end of the tower, in which remains of some of the old glass may be seen. Another window of about the same period stands in the east end of the Clearwell Chapel. These windows give the date of the building, which was about the end of the 14th century. A Perpendicular window of rather uncommon example is in the east end of the Gage Chapel, which, until the restoration in 1862, was hidden by a modern vestry; most of the other windows have been renewed, or are modern.

The north wall of the Church has been re-built, and two buttresses at the same time were added ; portions also of the south aisle, Clearwell Chapel, and the eastern walls of the chancel underwent the same process, as also the south pier of the chancel arch, and three of the arches in the south arcade, and two in the north. There is a noticeable difference in the two sides of the arch of the chancel, which was the same before the late re-construction. The east window of the chancel is entirely new ; the old one was a fine specimen of Perpendicular, but somewhat decayed. The original clerestory windows were small. The walls of the nave have been raised, and the present high clerestory windows were inserted at the restoration in 1862. The pulpit was made out of some of the oak from the old roof. The painted glass of the new east window was given by Mrs. Palmer, of Newland House. The subject is the Resurrection and Ascension of our Blessed Lord. The windows in the south aisle were given by the Brickdale family ; that in the west end represents the four Evangelists with their emblems. The window in the west end of the north aisle was placed in memory of the late vicar, the Rev. G. Ridout ; and represents the Good Shepherd attending to the sheep and lambs of His flock.

The porch is large, and appears to have had a parvise, or priest's chamber over it ; it has a second doorway on the east side. The slab over the present church door has in late times been inserted when the window opening was filled up. The end of the north aisle shows that an alteration has taken place, and Mr. White, the architect of the restoration of the Church, says that the Gage Chapel was added in 1446, when also the rood staircase appears to have been built. There is an entrance doorway into the north aisle, as also a private entrance to the Clearwell Chapel, and a priest's doorway into the chancel on the south side. At the east end of the south side there is a chantry chapel, built by one of the early owners of the estate of Clowerwall, now Clearwell.

Between the Clearwell Chapel and the porch is the Probyn Chapel, containing memorials of many members of that family. This was called in some old documents King Edward's Chapel. The last incumbent of this chantry was Edward Fryer.

There is a piscina in the Clearwell, as also in the Probyn Chapels, showing the site of the ancient altars ; there now exists no trace of a piscina in the chancel, but there is an aumbry in the south wall.

The tower is a very grand one, and contains a peal of six fine-toned bells ; the weight of the tenor is 19 cwt. Memorial slabs of the Early Decorated period have been used as sills in some of these windows. It is remarkable to find them so soon transferred from their original purpose to such a position. The turrets are very beautiful, and the cluster on the south-east, which contains the staircase turret, is well worthy of notice. The tower is 85ft. high, and the walls at the base are over six feet in thickness. The font is a good specimen of a very unusual date, 1661, on which account it is of great interest ; it formerly stood near the tower. When the Bristol and Gloucestershire Association visited this Church in 1881, Mr. Middleton drew their attention to an aumbry existing at the west end of the north aisle, which probably showed the original position of the font. The

use of this aumbry was to hold the salt and oil used at baptism. There are in the floor of this Church five altar slabs; one under the present altar, measuring 9ft. 4in. by 2ft. 5in., was anciently the high altar slab. The others are placed in different parts of the flooring of the Church, and were no doubt the altar slabs of the various chantry chapels; three of these altar slabs have been used since their desecration as memorial stones. The monuments of this Church are worthy of notice. Among them are two effigies of priests in eucharistic vestments, the one on the south side is beautifully executed, and dates about the beginning of the 14th century; the other is nearly a century later, with a chasuble and alb of a different type.

In the south aisle is the monument of Sir John Joce, of Clearwell, and his wife; it is of the time of Edward III. This monument was sadly damaged by being scraped during the restoration of the Church. Margaret, daughter and heir of this John Joce, or Joyce, married a certain Greyndour, who by that marriage acquired the Clearwell estate. A descendant, Robert Greyndour, married Johanna, daughter and heir of Thomas Rugg, or Rigge, of Charlecombe, county Somerset. He died in 1443, and his widow founded a perpetual chantry in the Church of Newland at the altar of St. John Baptist, and St. Nicholas, and obtained royal licence to endow it with £12 per annum.

John Clifford was the first chaplain.

The Clearwell estate descended to the Baynhams, and afterwards to the Throckmortons.

There is a good brass in this chapel to some members of the Baynham family. The date of the armour, and the lady's dress, show it to be about 1443; nearly contemporary with this brass, though probably later, is a brass plate, inlaid above the heads of the two figures, with which however it has no connection. It is a curious representation of an iron, or coal, miner, equipped for work, with cap, pick, candle, and hod on his back. No doubt the owner of this crest was a free-miner of the Forest of Dean. In the floor of this chapel are some remains of interesting tiles, which were removed from different parts of the Church at the restoration. One has the arms of Edward the Confessor, and another of Beauchamp, &c.

Similar tiles occur at St. Mary's Church, Monmouth, and Malvern Abbey.

In the churchyard, on the north-east of the Church, lies the effigy of Jenkin Wyrall, a Forester-of-fee of the 15th century, which is probably the only effigy in hunting costume in the kingdom.* He wears a peculiar loose cap, folded in plaits, and tied together towards the top. A small portion of an inner garment appears under a loose frock, or jupon with full sleeves, and a short skirt, which was put on over the head, as there is no opening down the breast; it is slit at the sides. He has trunk hose, fitting closely to the legs, and low boots, which are here open at the ankles on the outside—they are not open on the inside. The horn is of the usual shape, but small, and the hanger or hunting sword, which is slung by a double strap, has what appears to be a small scabbard for a knife, attached to the

*Excepting the one in Pershore Abbey.

larger. Jenkin's feet rest on a brache, or hunting dog. The inscription on his tomb is as follows:—

“HERE LYTHE JUNK (IN) WYRALL, FORSTER OF FEE,
YE WHICH DYSESED ON THE VIII. DAY OF SYNT LAUROC,
THE YERE OF OUR LORDE MCCCCLVII., ON HIS SOULE
• GOD HAVE MERCY—AMEN.”

It is remarkable that the inscription should be in English at this date.

On the south-west of the churchyard cross stands a monument of a bowman; the figure is nearly life-sized, incised on a slab in a dress of Jacobean type. As bowbearer it was his duty to attend his Majesty with a bow and arrow, and six men clothed in green, whenever his Majesty should be pleased to hunt within the forest. It is interesting to note that at the present time the body-guard of her Majesty in Scotland consists of archers of the guard.

The shaft of the Churchyard cross is modern, but the old base is close by it, and has a niche in it, which was probably used as a reliquary, or as a receptacle for the pix, when Offices were said in the Churchyard.

Newland is fortunate in having two sets of almshouses. The one on the south side of the Church was founded in 1615 by William Jones, a Hamburgh merchant, for 16 old men and women, with a lectureship attached to the charity. The same person founded the Monmouth Grammar School and almshouses.

The other almshouses lie on the north side of the Church, and were founded in 1632 by Bell, who received some of the chantry lands. He also founded a Grammar School, which is now removed to Coleford. The original school buildings stand on the west of the Churchyard, and were sold to pay for the erection of the new ones at Coleford.

The sepulchral monuments in the Churchyard and the Church itself were now inspected. After the lucid explanation just given by the Rev. Bagnall-Oakeley, they were the more readily understood, and perhaps nothing worthy of observation escaped notice. Perhaps the most interesting in the Church itself was the 15th century brass representing the free-miner in his working costume, with cap and pick, bearing his hod upon his back, and carrying his candlestick in his mouth.

The members next were summoned by Mrs. Bagnall-Oakeley to a hospitable entertainment where coffee, tea, and refreshments, including produce from her own fruit garden, were served upon her beautiful lawn, amidst charming surroundings of natural beauty.

Mrs. Bagnall-Oakeley's fine collection of Roman coins was exhibited, and other valuable and interesting curiosities in her studio, including some valuable lace work which elicited much admiration from the ladies of the party, and an enamelled pix of the 12th century.

So much was to be done, and so much had to be seen in a limited time, that a paper promised by Mrs. Bagnall-Oakeley had to be taken as read, but happily we are now enabled to produce *in extenso* the following

NOTES ON THE NEIGHBOURHOOD OF NEWLAND,

[By Mrs. WM. BAGNALL-OAKELEY.]

IN the immediate neighbourhood of Newland there is little which can be claimed as the work of the ancient races who inhabited our Forest before the arrival of the Romans. The great camp at Symond's Yat, with its five banks of earth defending the peninsula, is a work of great strength and of very early date. On the road between Staunton and Coleford is a large *Menhir*, known by the name of the Long Stone; this stands exactly due east of the Buckstone with which it may have had some connection, as these monoliths are often found so placed with regard to rude stone monuments, for though the Buckstone is due to natural causes, yet its extraordinary appearance probably made it a subject of superstitious reverence in early ages. (A few years ago another large monolith existed near St. Briavel's, but it has been destroyed by the vandalism of the farmer on whose land it stood). So far as I know these are the only relics of the ancient Forest people, though some of the old lanes are probably their ancient trackways, and the iron-workings may have supplied them with iron. We have ample proof that when the Romans had gained possession of the country which lay between the Severn and the Wye, they were fully alive to its value, and traces of their occupations are to be found all over the district. Although no great stronghold of that people is to be found here, there are small camps at Stowe and Lydney, and a fine villa exists at the latter place which discoveries prove to have been the residence of someone of superior rank. No great military road ran through our forest, but John Bellows tells us that nearly every carriage road in it bears traces of its Roman origin. The old Roman iron workings called *Scowles* abound here. (This name of *Scowles* has caused considerable discussion. I am not aware that any satisfactory explanation has been given). These iron workings are narrow tortuous passages where the miners have followed the vein of iron ore, and left the limestone rock standing on each side, often within a few feet of a similar working. In and near these *scowles* large quantities of Roman coins have from time to time been found, and they are mostly 3rd brass, or the small money which would be required for the pay of the miners. Only one "find" of silver coins has been made, and that was in a "working" between Bream and Lydney. One thing is remarkable about these hoards; although between three and four thousand have been described, there are no coins of the reign of the Emperor Dioclesian, very few of the usurpers Carausius and Allectus, and not any of the succeeding emperors (we must except the villa at Lydney, where coins of all the emperors are found), which looks as though the Romans ceased to work these iron mines after the close of the third century.

Of Saxon times we have but a confused history of invasions and feuds, and the only work which remains to us of that period is "Offa's Dyke." This great territorial barrier which King Offa in A.D. 779 placed between his people and the Welsh, runs within a mile of Newland, and between it and the Wye. At this place it skirts an ancient camp called Highbury, but whether the camp is of the

same age, or a relic of an older time, I must leave to those better acquainted with such matters to determine. It is to be noticed that no names of Welsh origin occur on this side of the Dyke, though where it and the river are not in close proximity Welsh names occur between the river and the Dyke.

Of the work of Norman and subsequent periods we have good example in the Castle of St. Briavel's, though the great Norman keep fell some years ago. The Church which stands near to it has also much of its Norman character remaining, and at Staunton there is a Church of the same period. In both these Churches the old fons remain. The one at Staunton was formerly considered to be a Roman altar, made into a Christian font, but good authorities consider it is an ill designed and clumsily executed example of a not very early Norman font. At Clearwell there is a good specimen of the base of a 14th century village cross, and two others of a similar kind remain in the neighbourhood, at Lydney and Aylburton. I do not refer to our fine parish Church, or the grand old oak, as both these have been described by abler hands than mine.

Mrs. Bagnall-Oakeley next presented her paper upon

ROMAN COINS FOUND IN THE FOREST OF DEAN,

which had been reprinted from the "Numismatic Chronicle, Vol. II., Third Series," pages 52—56, 1882, from which the following extracts are made:—

Nearly the whole of the coins discovered have been found either in the ancient iron workings themselves, or closely adjacent to them. Near Lydney, where are the remains of a temple and a Roman villa, previously referred to, large quantities of gold, silver, and brass coins have been found of all the Emperors, from Augustus to Arcadius. In an ancient iron mine near the town was discovered the only hoard of silver denarii which has been recorded in the neighbourhood; they were contained in an earthen jar, and were mostly in a fine state of preservation. The coins are as follows:—

HOARD OF SILVER COINS FOUND NEAR LYDNEY IN 1854.						
					Coins.	Types.
1.—	Marc Antony	...	...	...	1	1
2.—	Nero	...	...	...	1	1 plated
3.—	Galba	...	...	...	1	1
4.—	Vitellius	...	...	...	1	1
5.—	Vespasianus	...	...	...	20	20
6.—	Titus	...	...	...	2	2
7.—	Domitianus	...	...	...	5	5
8.—	Nerva	...	...	...	6	6
9.—	Trajanus	...	...	...	28	20
10.—	Hadrianus	...	...	...	23	20
11.—	Sabina	...	...	...	3	2
12.—	Antoninus Pius	...	...	...	20	19
13.—	Faustina, sen.	...	...	...	16	16

			Coins.		Types.
14.—M. Aurelius	...	...	17	...	17
15.—Faustina, jun.	...	...	5	...	5
16.—Lucius Verus	...	...	5	...	5
17.—Commodus	...	..	1	..	1
			<hr/>		<hr/>
			155	...	142

The only "find" which was described before it was dispersed was one which was discovered in 1852 near the Parkend Ironworks, on the Coleford-road (for full description see *Journal Brit. Arch. Association*, 1867, p. 393; and 1869, page 158). It was composed of small brass and billon, with the exception of one silver denarius of Julia Domna. The following is a summary of the coins:—

			Coins.		Types.
1.—Julia Domna	...	...	1	...	1 silver
2.—Gordianus III.	...	..	1	...	1 Æ 3
3.—Philippus	...	..	9	...	9
4.—Trajan Decius	...	...	2	...	2
5.—Valerianus	...	...	2	...	2
6.—Gallienus	...	...	102	...	52
7.—Salonina	...	...	21	...	11
8.—Saloninus	...	...	18	...	6
9.—Postumus	...	...	175	...	29
10.—Victorinus	..	...	71	...	18
11.—Marius	...	...	2	...	1
12.—Tetricus, sen.	...	...	33	...	14
13.—Tetricus, jun.	...	...	11	...	6
14.—Claudius II.	...	...	126	...	36
15.—Quintillus	...	...	18	...	9
16.—Probus	...	...	10	...	2
17.—Carinus	..	..	1	...	1
18.—Carausius	...	..	1	...	1
19.—Allectus	...	...	1	...	1
Illegible	...	...	500	...	0
			<hr/>		<hr/>
			1105	...	202

The coins of Carausius and Allectus were bought about the same time, but there is reason to doubt whether they really formed part of this find.

In 1849 a hoard of more than three thousand coins, all small brass, billon, and plated denarii, was found at Perrygrove, near Coleford. They fortunately fell into the hands of a local antiquary, Mr. Fryer, who has left a descriptive catalogue of the most interesting, but has, unfortunately, omitted to state how many coins there were belonging to each Emperor. The numbers after the coins below are only those now remaining undispersed in the collection of his son:—

	Coins.	Types.
1.—Valerianus	6	6
2.—Mariniana	2	2
3.—Gallienus	33	24
4.—Salonina	7	7
5.—Saloninus	1	1
6.—Postumus	24	18
7.—Victorinus	31	15
8.—Laelianus	1	1
9.—Marius	2	2
10.—Tetricus, sen.	25	8
11.—Tetricus, jun.	12	4
12.—Claudius II.	25	15
13.—Quintillus	13	13
14.—Severina	2	2
15.—Probus	1	1
16.—Tacitus	1	1
	186	120

Very near the spot where the last hoard was found another discovery was made a year or two afterwards at a place called Tufthorn; several thousands of small brass coins were found in an earthen jar, but of these no record was made at the time, and those now remaining are only the refuse left by collectors who had picked them over.

FOUND AT TUFTHORN ABOUT 1852.

1.—Gallienus	22
2.—Postumus	1
3.—Victorinus	73
4.—Tetricus, sen.	51
5.—Tetricus, jun.	28
6.—Claudius II.	25
7.—Quintillus	1
Illegible	50
	251

There was a hoard of many thousands of small brass coins found at Lyd-brook in 1848, but all that is known about them is comprised in a short notice in *Brit. Arch. Journal*, 1848.

The situation in which all these coins were found leads to the belief that they were intended for the payment of miners' wages, deposited for temporary safety in some sheltered hole or corner, and covered up by some fall of earth, such as often occurs in these workings at the present time. From the isolated position of this district, cut off from the western limit of *Britannia Prima* by the dangerous and difficult navigation of the river Severn, it must have been a district of more value as a mercantile than as a military position; and as no Roman coin has been found here later than the one of *Allectus* (with the exception of those at the *Lydney Villa*) it would appear doubtful if the Romans worked the iron mines of the *Forest of Dean* later than the close of the third century.

Woolhope Naturalists' Field Club.

JULY 19TH, 1889.

THE third Field Meeting was held on Friday, July 19th. The members advanced upon Clifford Castle in two detachments: those who travelled to Hay proceeded thence by the Golden Valley Railway, whilst those members who lived in the western part of the county reached Clifford by the same railway from its other terminus at Pontrilas.

An excellent paper on "Clifford Castle" was read by the Rev. T. W. Walwyn Trumper, and the character of its military defences was pointed out in detail. The Cliffords appear in *The Battle Abbey Roll*, originally under the name of Pounce, De Pons, or Pains, before they became castellans of Clifford Castle. They were of a race ever engaged in "fighting in France," or "quelling the Scotch," a family whose boast it was that "of half a score of successive barons only one had been unhappy enough to die in his bed."

Mr. Walwyn Trumper afterwards conducted the visitors to his vicarage. Here was seen, preserved underneath a glass case, and in a charred condition, a fragment of the oak stake upon which John Hooper, the Protestant Bishop of Gloucester, was burned to death on February 9th, 1555, on a spot just outside the Cathedral precincts, formerly known as "St. Mary's Knapp." Three centuries after that date during some alterations at that mound, amidst a quantity of wood ashes, a charred stake of oak, over 20 inches long, and 9 inches in diameter, was discovered two feet below the surface, tightly rammed down with stones. After passing through several hands, this stake was presented to the County Museum at Gloucester. The identification of the site of this discovery with the place selected for Hooper's burning in accordance with Queen Mary Tudor's order as the nearest possible to the scene of his former preaching, i.e., the Cathedral, has been lucidly confirmed in a learned paper by John Bellows, of Gloucester, read by him at the Annual Meeting of the Cotteswold Club at Gloucester, 1878, and recorded in the *Proceedings* of the Cotteswold Naturalists' Field Club for 1877-1878.

From the vicarage the members went to the Church, concerning which a few notes were read by the Vicar. On the sundial in the Churchyard is an inscription stating that it is erected above the grave of John and Mary Stallard:—

Learn from the shadow of the dial
How quick our hours onward move:
Be mindful in this state of trial
Every moment to improve.

*Nascimur; atq: statim cippo stat nomen inane,
Gnomonis ut vite præterit umbra cito.*

From Clifford Church the route was taken past the Clifford Priory Oak tree on the roadside by the Priory Farm, whose dimensions are given on page 310 of *Transactions*, 1870, as being 25 feet 4 inches at 5 feet from the ground. The girth of the tree is now decidedly larger, but comparisons are valueless, because the increase of girth is mainly due to the wider separation of the parts of the hollow trunk, split down to the ground on the north side and otherwise ruthlessly treated by vandal hands.

From the Priory Oak the direction was taken across country and the park, in front of the residence called "The Moor," into the turnpike road, thence along a lane towards Cusop Church, leaving Llydyadyway to the left; the botanists, however, ascended Cusop Hill, leaving Llydyadyway on their right hand. Some even explored Mouse Castle Wood, but did not succeed in finding even the traces of the ancient encampment on its summit, which undoubtedly exist there and are represented in the six-inch Ordnance Map.

The fine yew trees in Cusop Churchyard have often been referred to. Upon this occasion they were again measured and they gave the following dimensions:—The largest, at the south-east corner of the Church, had increased from 21 feet 2 inches at 3 feet from the ground to 22 feet 3 inches, and the tree at the south-west corner had a girth of 23½ feet at 5 feet from the ground, and 23 feet at 3 feet from the ground in comparison with 20 feet 8 inches at a height of 3 feet, as recorded in *Transactions*, page 246, of 1866.

In the Churchyard is an inscription on a flat stone, called the "Martyr's tomb."—"Here lyeth the body of William Seward, of Badesey, in the county of Worcester, gent., who departed ys life Oct. ye 22nd, 1742, aged 38. To me to live is Christ, and to die is gain. Phillipians, Chap. ye 1st, ver 21.

If earth be all,	}	1797.
Why ore and ore a beaten path		
You walk and draw up nothing new,		
Not so our Martyr's seraph did		
When from the verge of Wales he fled.		

Mr. Seward was an itinerant preacher who was so violently wounded by stones, whilst preaching on Black Lion Green at Hay, as to have died in consequence.

The site of Cusop Castle, on a knoll contiguous to the Churchyard and upon its western side, was inspected. Mr. Lilwall, of Llydyadyway, contributed the information that, upon conducting some excavations here some years ago, he found extensive remains of building stones, and also in the field on the eastern or opposite side of the adjoining lane; he also added that Duncumb says "Cusop had a 'Peel' tower," that is to say it was a stronghold of which the tower is the only considerable work, and which stands within a walled base court or barnkin of moderate area; the tower itself being the fortress, the residence of the family, &c., &c., not only during a siege but at all times; a tower rather than a castle. The finest specimen now extant of the Peel Tower, so celebrated upon the Scotch border is that of Borthwick in Midlothian, built about the middle of the 15th century, temp. James II., (Clarke's *Mediæval Military Architecture*, p. 247).

In the valley below flows the Dulas brook, which here forms the boundary between Herefordshire and Breconshire. The botanists were engaged in exploring Cusop Hill, and although the time was limited some very good botanical work was done, as is shown in the accompanying report. The remainder of the party went onwards up the valley until they crossed the brook which brought them to the Artillery camping ground in Breconshire.

A mule mountain battery was here encamped, and the process of dismounting a gun from its carriage, unscrewing it into its two component parts, detaching the wheels from the gun-carriage, and the method of placing them upon the saddles, was exhibited by Capt. Irving, R.A. This whole process of saddling the mules with all the component parts of a battery has been executed in the remarkably short period of forty seconds. A battery consists of 6 guns; about 126 or 130 mules constitute its full establishment. The transport of one gun with its carriage and sixteen rounds of ammunition is distributed over 5 mules, the average weight transported by each mule being 200 lbs. A mule with this burden is capable of ascending and descending a slope of 45°; and will descend this declivity with greater ease and comfort than he will perform the ascent. The gun has a calibre or diameter of 2½ inches, and carries a cylindro-conical projectile of 7 lbs weight. In the old Indian Battery the gun was formerly of one piece weighing 200 lbs; in the present day the gun weighs 400 lbs, and is a screw-gun composed of two pieces screwed together each piece weighing 200 lbs.

Carriages met the party punctually and conveyed them along the devious and narrow lanes, a distance of three miles, to the Crown Hotel at Hay, where dinner awaited them. This seemed a fitting opportunity of taking a list of those who attended the meeting, which is now given.

Mr. H. Southall, F.R. Met. Soc., President; Rev. Wm. Elliot, Rev. A. Ley and Dr. T. A. Chapman, Vice-Presidents; Major H. Wilson, President of the Malvern Club; Rev. Canon W. L. Bevan, of Hay Castle; Sir Herbert Croft, Bart.; Revs. T. M. Beavan, J. O. Bevan, J. E. Grasett, H. B. D. Marshall, T. P. Powell, Wm. H. Purchas, D. Price, R. Remington, M. G. Watkins, and H. T. Williamson; Captain de Winton, Dr. J. H. Wood, Messrs. H. C. Beddoe, J. Carless, R. Clarke, George Cresswell, James Davies, S. Gilliat, W. H. Harrison, W. P. J. Le Brocq, C. J. Lilwall, J. W. Lloyd, B. St. John Attwood-Mathews, T. C. Paris, A. Purchas, John Riley, Guy Trafford, James B. Pilley, Assistant Secretary, and H. C. Moore, Honorary Secretary; and the following visitors:—Rev. Walwyn Trumper, Rev. H. North, Colonel E. Temple; Messrs. J. Cockcroft, — Dillow, E. Holcombe, Wm. Marriott, Secretary of the Royal Meteorological Society, and Herbert Riley.

Mr. Cecil Butler was elected a member, and the two following were proposed to be balloted for at the next meeting:—Rev. H. North, and Rev. W. H. Webster.

The Honorary Secretary notified that the Woolhope Naturalists' Field Club had been registered as one of the "Societies in Union" with the Society of Antiquaries, London.

After dinner the members adjourned, by invitation of the Rev. Canon

Bevan, to tea and coffee upon the lawn at his residence—Hay Castle, where during the remainder of the time, until the departure of the train for Hereford, the attention of members was being successively carried from one interesting subject to another.

Mr. Geo. T. Clark in *Mediaeval Military Architecture*, p. 110, says:—
 “Hay Castle was built by Sir Philip Walwyn, destroyed by Henry III. in 1231, and probably rebuilt soon afterwards. The town was walled and had three gates.”

Most conspicuous were observed the ruined, ivy-mantled walls, which reminded how

Time	
Has moulder'd into beauty many a tower,	
Which, when it frown'd with all its battlements,	<i>Mason.</i>
Was only terrible.	

Here were traces of Norman work, a gateway arch of Early English character, with a grooved Portcullis, closed by a very ancient and massive wooden gate studded with iron nails clamped. The modern portion of the Castle is Elizabethan, supported at one extremity by a wall of the more ancient building. Interiorly there remains an Elizabethan or Jacobean oak staircase. The Elizabethan approach to the Castle from the town, by flights of stone steps, having the columns of the walls at the landings surmounted with balls, is still extant, but the approach is direct, and not the zigzag approach as represented in the view on page 187 of “*The progress of the Duke of Beaufort through Wales in 1684, by Dineley*,” recently published from his MSS.

Whilst some members were examining miniatures in painting of ladies of the period 1757, an excellent miniature pencil drawing of date 1640, and a gold trinket with whistle and charms given to Anne Boleyn by King Henry VIII, and by her presented to an ancestor of Canon Bevan's family, in grateful acknowledgment of kindness during her imprisonment in the Tower, others were engaged in endeavouring to follow the tracings of a pedigree through Fitz-Hamon, (one of the Conqueror's Knights), and Ham to Noah. An illuminated pedigree also attracted not a little attention.

The Pedigree commencing with Noah was drawn up in the beginning of last century for the Gwynnes of Swansea, represented by the Rev. Canon Bevan through his grandmother. It follows apparently the usual course of such documents by selecting Ham amongst the sons of Noah so as to include the heroes of Troy, one of whom, “Brutus, ye son of Silvius after a long and weary journey with his Trojans, arrived at Totnes, in Devonshire, reigned Kinge, &c., and built Troynewydd, now called London.” The pedigree includes a large number of celebrities such as King Lear, Ludh, or Lud, Hewell Dda, and Tewder Mawr, and terminates with “Richard Gwynn, of Swanzey,” who lived in the reign of Charles II.

The illuminated pedigree refers, so Canon Bevan imagines, to the Morgans of Machen. It starts from the date of the Norman Conquest and in its present condition terminates in the 17th century. It is, however, in an imperfect state.

All these and much more were exhibited and explained by the Vicar, who also demonstrated how the Parish Church of St. Mary, of Hay, was endowed with tithes at the time of consecration in the time of Henry I., as recorded in a charter of Bernard, the consecrating Bishop, the preservation of which is due to the connection of the parish with the religious house of the Priory of St. John of Brecon. Bernard was the first Norman Bishop in Wales, circa A.D. 1115--1135 when Henry I. died. The endowment was given by William Revel, a vassal of Bernard "de Novo Mercato" (Newmarch), the Norman conqueror of this and other parts of South Wales; Newmarch himself assenting to it, and being present at the consecration. Bishop Bernard's charter is printed in appendix 3 to Bishop Kennett's "Case of Impropriations" (published A.D. 1704), and also in Carte's MSS. in the Bodleian Library at Oxford. The translation into English was read by Canon Bevan; it is too long to reproduce here, more than the following portion. "Also, he gave to the said Church all the tithe of all his land in Hay, in all things, and of all his tenants of the fee of Hay; and to prevent question as to what was so defined, he gave and granted the tithes, to wit, of corn and hay, of colts and calves, of lambs and pigs, of wool and cheese, of flax and coppice wood, and of Welsh revenue, and of passage, and pleas;" thus vesting the sole title in the incumbent of the benefice, which was so called, because the incumbent was beneficially entitled to the whole profits of the emolument. (See appendix 1 to "A defence of the Church of England by the Earl of Selborne," 4th edition).

BOTANY.

The following plants were noticed at the meeting:—

On the railway ballast quantities of *Linaria minor* (Lesser Toad Flax) were, as usual, growing; and at the Hay, in the same position, several rare introduced plants were picked, viz., two species of *Bromus* (Brome Grass), probably *tectorum* and *patulus*, with *Lepidium ruderale*, with a cruciferous plant which remained un-named by any of the botanists present. *Linum usitatissimum* (the Flax of commerce) was flowering on the railway at Clifford Castle.

In the "Leech Pool" the *Carex stricta* was observed, but was not obtained owing to the water being too high; the handsome *Ranunculus Lingua* (Greater Spearwort), was noticed here by Mr. Le Brocq, with *Menyanthes trifoliata* (Buckbean), and the rare grass, *Alopecurus fulvus*.

On the wooded slopes of Mouse Castle and the adjoining Cornstone quarries, *Rosa micrantha* (the wild Sweet-briar) was found in large quantity, with several forms of *Rosa tomentosa* (the wax-scented Rose); and nearer Cusop Hill the lane hedges were bright with a very handsome variety of *Rosa arvensis* (Field Rose). A rare bramble, ascribed by authorities to *Rubus montanus* was also seen here, with another species local in Herefordshire, *R. umbrosus*.

On Cusop Hill several interesting plants were picked. Dr. Wood obtained *Helioscadium inundatum*, an inconspicuous but rare Umbellifer; and Mr. Le Brocq was fortunate enough to get *Veronica humifusa*, a mountain variety of the Thyme-leaved Speedwell, with *Peplis portula* (Water Purslane). Here, also,

Eriophorum angustifolium (Cotton-grass) was gathered, and several Sedges, amongst which was the rare *Carex sterilis*. Here, too, both the Wild Thymes, *Thymus chamædris* and *serpyllum*, were detected by the Rev. William H. Purchas, who pointed out the sweet scent by which the former could be recognised, as contrasted with the sharper and more acrid perfume of the latter. *Equisetum sylvaticum*, in a strange position for the Wood Horsetail, was plentiful on one part of the heath.

Among other noteworthy plants observed during the day may be mentioned *Papaver dubium* (the long-headed Poppy) a novelty for both districts 13 and 14, on the railway banks at Clifford Station; *Brassica Briggsii* (the annual field Turnip) in corn crops; *Sinapis alba* (the white Mustard) by the river bank at Hay, a new record for the district; *Coronopus didyma* (Swines' Cress) a rare little weed well known to frequent the streets and roadsides in and around Hay; *Epilobium roseum* (the rose-leaved Willow-herb), in several spots; *Pectasites vulgaris* (Butterbur) in a large and handsome form, probably unrecorded for the county; the beautiful Bell-flower (*Campanula patula*) on hedge-banks near Clifford Priory; a Mint, probably *Mentha pubescens*, new to the county at Eardisley; the common Calamint (*Calamintha menthifolia*) gathered by Dr. Wood; the Hybrid Wound-Wort (*Stachys ambigua*) plentiful near Clifford Castle; and here also the curious Hound's Tongue (*Cynoglossum officinale*) with its disagreeable mice-like odour. *Polygonum amphibium*, the Water Persicaria, was abundant in the Leech Pool, both its forms in full abundant flower.

In conclusion, a few absentees must be mentioned, which were looked for, but were not seen (so far as we know) during the day. No *Clematis vitalba* (Travellers' joy) was seen, this plant being far more rare here than in South Herefordshire, and unrecorded for district 13. No *Thalictrum flavum* (Meadow Rue) was seen on the river; no *Aquilegia vulgaris* (Columbine), nor *Melampyrum pratense* (Cow-wheat) in the woods; no *Euphrasia officinalis* (Eyebright) on the hill; whilst no time was allowed for visiting the localities of the rare plants *Littorella*, (Shore-weed), *Trollius* (Globe-flower) or *Salix repens* (Creeping Willow) known to grow at one habitat or other within the district in which the excursion took place.

CLIFFORD.

[By the Rev. T. W. WALWYN TRUMPER, M.A.]

THERE is such a thing as robbing a story or history of its reality, by making it so true, so inartistically accurate, as to leave nothing to the imagination.

This charge, however, can hardly be laid against the antiquary and historian, who are generally inclined to err on the other side, and are in danger of giving to the world delightful fiction in the form of fact.

It is not an easy task to get particulars with regard to Clifford Castle (Clivus Fortis), but it is to be hoped, if there be but little to be said which can be vouched for, still that the spot, which in olden days was probably the birthplace and early home of one of the most beautiful women the world has ever seen, may be of sufficient interest to draw our thoughts to the time, when the old ruin before us was a noble building, full of busy people, and occupied by men of renown.

Clifford has fall'n—howe'er sublime,
 Mere fragments wrestle still with time ;
 Yet, as they perish, sure and slow,
 And rolling dash the stream below ;
 They raise tradition's glowing scene—
 The clue of silk, the wrathful queen,
 And link in mem'ry's firmest bond
 The love-lorn tale of Rosamond.

We may picture King Henry II. coming to Clifford Town to hunt, and no doubt the Lord of the Castle found him magnificent sport, to say nothing of the society of his bewitching daughter.

His Majesty evidently possessed the secret of ingratiating himself with women. He was strong in wind and limb, "A mane usque ad vesperem stat in pedes," and, although selfish and of an ungovernable temper, he had a charm of manner and address at once gentlemanlike and pleasing. Added to this he had the character for being "Parthis mendacior," doubtless both scientific and social. And why, pray, should not the cultured and fascinating liar have been as irresistible in the 12th as in the 19th century?

The Queen's disagreeable and mischief-making temperament was not likely to improve such a disposition as her husband's, and may account for his indiscriminate love-making and fickleness.

How could such a man help being enamoured of the beautiful "Rosa Mundi," nature's lovely child, simple and unaffected ; what a contrast she must have offered to the grand artificial ladies of the Court, who of course wore high shoes, dyed their hair, tight-laced, and painted their faces, like the silly fashionable women of our own or any other age.

And can we blame the fair Joan for liking the boisterous stranger, with his athletic form and handsome face ? And besides he was a King.

The knightly Baskerville was, as the poor, always with her, and perhaps too fond and assiduous in his attentions, possibly he bored her, and, womanlike, she

craved for novelty, and longed to step out into the gay world, which seemed to promise her so much, and gave her so little.

Let us draw a curtain over the dishonourable courtship, the ill-treatment of the old lover, and the desertion of the peaceful home by the River Wye.

Flow on, fair stream,
And murmur with thy waters,
For Rosamund has gone.

* * * * *

THE CASTLE.

Clifford Castle stands upon a bold eminence commanding the Wye, and in a position which must from the earliest times have been found most suitable for a fortress, protected as it was, on one side by the river, and on the other by a ravine communicating with it.

It does not seem improbable that the Romans may have had a road from Clyro Hill *viâ* Clifford to Abergavenny (Gobannium) which would be shorter than going through Hay and less difficult, and the ford, being an important one, must clearly have been well defended.

As early as the middle of the 9th century, the Saxons penetrating as far as the Isle of Anglesey, compelled the Welsh to acknowledge their superiority, and it is but natural that they should make, rebuild, and strengthen fortresses on the Welsh border, such as Cardiff, Caerleon, Builth, Clifford, &c., in order to keep the Welshmen in check.

At any rate it is pretty certain that in the reign of the "Confessor" several Norman families settled in England, and amongst them Richard Fitz-Scrob, who had lands in the North of Herefordshire, and gave this name to Richard's Castle, which it is supposed was built of stone after the Norman fashion, and was of great use during the invasion of Prince Griffith.

About this time a law was passed condemning every Welshman found in arms on the east of Offa's Dyke, to lose his right hand; and the natives of the mountains, taught by fatal experience, seemed to grow more respectful of their neighbours' territory.

Herefordshire was at this period, as afterwards, one of the most valuable and dangerously situated of all the English acquisitions on the Welsh border, and that the building and repairing of fortified places was much encouraged in this part of the country, is certified by the fact that, of the small number of castles recorded in "Domesday," no less than ten are named as standing in the Marches of Monmouth and Hereford, amongst them Clifford.

The Castle is reported to have been built, but most likely repaired, by William FitzOsborne, Earl of Hereford, a kinsman of William the Conqueror.

William FitzOsborne was slain in Flanders in 1070, and was succeeded by his son Roger, surnamed de Breteuil, who, having conspired against his King, was deprived of his estates.

It was to this man that Lanfranc wrote concerning the repairing of castles,

&c., as ordered by William the Conqueror, "et mandat ut quantum possumus curam habeamus castellis suis, ne, quod Deus avertat, inimicis suis tradantur."

At the time of the Domesday Survey, Ralf de Totenie, said to have married one of Roger's daughters, was in possession of the Castle. Then it went with Margaret, Ralf's daughter, to Richard Fitz-Pontz in marriage.

Simon Fitz-Walter, son of Richard Fitz-Pontz, founded the Priory of Cluniac Monks at Clifford, and he and his brother Richard are said by Dugdale to have adopted the surname of Clifford.

It is related that "In the reign of Henry II. Sir Ralph Baskerville, of Aberedw, married a daughter of Lord Clifford, of Clifford Castle. A violent quarrel respecting some property arose between the father and the son-in-law, of which the former rudely and unjustly dispossessed the latter.

"A challenge ensued, and they fought at a place near Hereford, where afterwards a white cross was erected, which stood in Queen Elizabeth's time, and then was pulled down by one Gernons. The event of this battle was fatal to Lord Clifford, and Sir Ralf purchased from the Pope a pardon for killing his father-in-law."

Walter de Clifford, ancestor of the noble house of Clifford, son of Richard, a powerful Marcher* Baron, was, as far as can be made out, the father of Fair Rosamund. Walter, his son, was a man of still more power and influence; he married Margaret, daughter of Llewelyn, Prince of Wales, and was father of another Walter, who died in 1263, closing the male line.

Maud, his heiress, married first her cousin, William de Longue-épée or Longue-épeé (Longsword) great-grandson of Fair Rosamund, who was killed in a tournament at Blythe; secondly, John Giffard, of Brimsfield, who forcibly carried her off, and obtained the King's permission to marry her.

Giffard was a man of considerable parts. His possessions were large, he being at his death, 27th Edward I., seized of Brunles Castle, the Manor of Glasbury, and the Manor and Castle of Clifford. He opposed Simon de Montfort, and assisted Prince Edward to escape from Hereford. He also, with the help of Edmund Mortimer and Sir Ely Walwyn, defeated and killed Llewelyn, Prince of Wales, near Builth.

Maud's daughter Margery (by Longuepée) married the Earl of Lincoln, Henry de Lacy, and in the inquisition held upon de Lacy and his wife, 4th Edward II., the Manor and Castle of Clifford are included.

Afterwards, the Castle was granted by the Crown to the Mortimers, and gave shelter to Richard II. and his uncle, John of Gaunt. From this time it

*The Norman Knights who settled on the Welsh border acquired the name "Lords Marchers." "Marchiones Walliæ"—the title Marquis was not introduced till Richard II. These Lords Marchers, of whom were the Cliffords and other families in Hereford, had each a law for his own Barony, and themselves determined all suits between their tenants. In case of a tenant dying intestate his goods and chattels went to his Lord. This despotic power prompted the "Marchers" to resist the English laws and customs, and their territory was the constant scene of anarchy and confusion; so much so, that a Court of Judicature was instituted for their district alone. This Court continued until the first William and Mary, when it was dissolved by Act of Parliament, as being grievous to the subject. In the time of Henry VIII. the "Marches" were united to England, and Clifford and other places, formerly a debatable land of bloodshed and lawlessness, were joined to Herefordshire.

seems to have ceased to be a place of importance, and most likely was of little use, as, since the death of Llewelyn, the Welsh gradually became peaceful.

Henry Stafford, Duke of Buckingham, was constable of the Castle in Edward IV's reign, and Edward Croft in the reign of Henry VII., but for what length of time it was inhabited it is impossible to say.

The Manor of Clifford and its Castle were granted to Lord Clinton in 1547, for his services against the Scots, but remained in his family a very short time. They now are attached to the Whitney Estate, but at what date and for what reason they were joined to it, does not appear.

At the present time there is but little of the ruin of the Castle remaining, and it requires a professional and experienced eye to be able to make out what the original plan of the building and the site really was like. There is a description of Clifford Castle in Clark's "Mediæval Military Architecture," which goes considerably into detail, and to which those interested in the matter would do well to refer.

Roughly, the site of the Castle may be divided into three parts. The inner ward, the outwork, and the outer ward. The inner ward is about 100ft. square, and here alone are there any walls standing, originally no doubt there were several towers, but only one is now to be seen. There are two or three garderobes still plainly visible.

At the north front are two circular depressions marking the situation of the towers of the Gatehouse, and between these is the entrance. This entrance leads from the outer ward, and is raised upon a causeway of earth, so crossing the ditch, which divided the outer from the inner ward, and which ran from the ravine on the east to the river, where a curtain protected it. The curtain now in sight is about 6ft. or 7ft. high, but of course was originally much higher.

The outwork lies south of the inner ward or central position, and separated from it by a deep ditch. It is of a triangular form some 30 yards on a side; it shows no trace of masonry whatever, and was most likely a timber structure. Clark says it is a very curious work.

The outer ward is situated to the north of the inner ward, and is of rather large extent. It was defended on the west by the river bank, and perhaps a low curtain; on the south by the ditch, across which passed the causeway to the inner ward; and on the east and north partly by a scarp and partly by a curtain; also to a certain extent by the ravine.

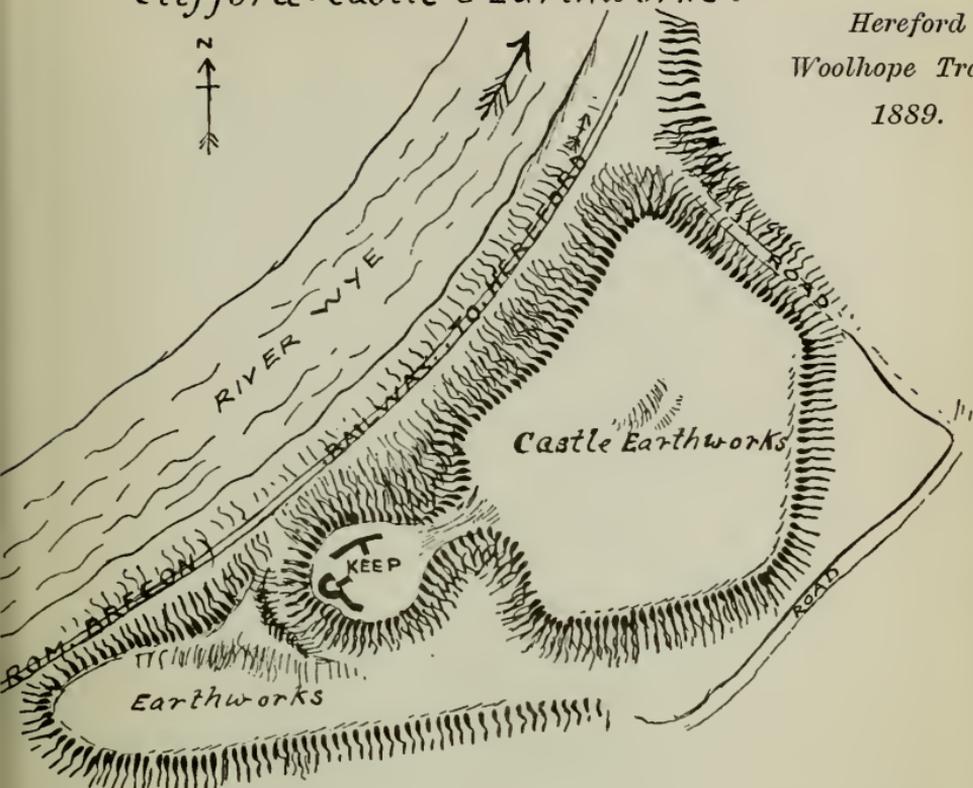
In the centre is a mound of earth full of stones, surrounded by a clump of trees, indicating possibly the position of a tower or enclosure of masonry. This outer ward was intended as a place of shelter and refuge for the villagers and cattle during the attacks of the Welshmen.

The outer ward was approached, as far as can be judged, from the north, and on either side, at some little distance from the gate, there seem to have been two towers, one at the river and the other at the ravine corner, guarding the entrance.

The earthworks of the Castle are probably very old, but the masonry of the present ruin is not supposed to be of earlier date than the time of Henry the 2nd or 3rd.

Clifford. Castle & Earthworks.

Hereford
Woolhope Trans.,
1889.

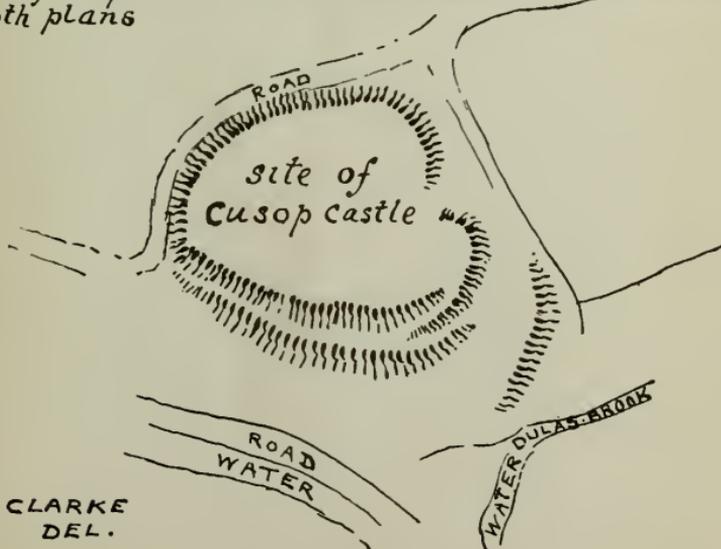


ordnance survey 100 yds

200

300

scale of 100 yds
for both plans



R. CLARKE
DEL.



The Castle Chapel, the chancel of which was standing in 1657, was situated on the east side of the outer ward, not far from the spot now occupied by a cottage which shows signs of having been built of materials obtained from the old ruin.

There is a tradition that the old Castle Mill stood upon the island, which can easily be seen in the river, looking upwards towards the Hay. Just below the island is the ford, which is very shallow, except at high water. There is another ford, but deeper, at the bottom of the common, some little distance down the stream, which would be the direct way to Cabalva, a village on the opposite side of the river. *Cabalva means a "ferry." The steep bank on which the Castle is placed is now much steeper than in old days, having been cut away to make room for the "line" to pass between the castle and the river.

The Castle Park or hunting ground included, doubtless, the tract of land now called "The Parks," and extended down the bank of the Wye (which then ran with a much straighter course), towards Merbach Hill, as far as Castleton Nab, or Nap; this spot is marked by some oak trees curiously grouped together, and here formerly there must have been some building or small fortified enclosure. A little further down, at Lower Castleton, is the site of either an old castle or fortress, which when erected must have been close to the stream, and protected by it on the north side.

There is no reason to imagine why this place might not have been attached to Clifford Castle, especially as it was either adjoining to, or perhaps in, its park.

In later years Castleton belonged to the Duppa family, but there is no reliable history relating to it.

Whilst this Volume is in the press, (September, 1892), the following translation of a Patent Roll of date A.D. 1404 has come into the possession of the writer of the above paper.

TRANSLATION OF PATENT ROLL, 5TH HENRY IV., 1ST PART, NO. 372,
MEMBRANE 2.

"The King to all to whom, &c., greeting. Know ye that since the father of Robert Whiteney, esquire, and his uncle and a great part of his relatives have been killed in our service at the capture of Edmund Mortemer, and his property has been burned and destroyed by our rebels of Wales, so that the said Robert has not any castle or fortress where he can tarry to resist and punish our aforesaid rebels, as we accept—(accipimus). We, of our special grace, have granted to the said Robert the Castle of Clifford and the lordships of Clifford and Glasbury together with all the lands, tenements, rents, services, fees, advowsons, royalties, liberties, franchises, jurisdictions, escheats, fines, redemptions, and other commodities whatsoever to the said Castle and lordships in any manner belonging, and also full punishment and execution of all rebels who are or shall be of or in the above said lordships, with all forfeitures and escheats of such rebels, which Castle and lordships before that they were burned, devastated and destroyed by

*According to Professor J. Rhys, in Welsh, Cenbalfa from Cenbal, "a boat," and ma "a place." The English word "coble," or "cobble," "a small boat" is similar.

our aforesaid rebels stood of the value of one hundred marks per annum as is said. To leave to the said Robert the Castle and lordships aforesaid with all the above said profits, commodities, and appurtenances, from the fifteenth day of October last past until the full age of Edmund son and heir of the Earl of March last deceased, and so from heir to heir until any one of the heirs aforesaid may arrive at his full age, without rendering anything therefore to us or to our heirs at our exchequer during the minority of the heirs aforesaid. So always that the said Robert has repaired the aforesaid Castle and tarries in the same in the defence and keeping safe of the Castle and lordships aforesaid. And in case that the Castle and lordships aforesaid exceed the value of the aforesaid hundred marks per annum the said Robert shall answer to us yearly at our exchequer of the surplusage of them as is just. In testimony whereof, &c., Witness the King at Westminster the fourteenth day of February.—By the King himself.”

FAIR ROSAMOND.

To write a paper on Clifford Castle and not to give some account of its heroine would indeed be a grave omission.

Joan de Clifford (sometimes called Ann),

Jane Clifford was her name, as books aver,
Fair Rosamond was but her nom de guerre.

was youngest daughter of Walter de Clifford, and had a sister Lucia, married first to Hugh de Say, of Richard's Castle, and afterwards to one of the Mortimer family. Rosamond (see biography of Fair Rosamond, by John Hutchinson) "Rosa mundi," was a term of endearment given to Joan on account of her exceeding beauty, and signifies "Rose of the world;" it is otherwise interpreted as "Rosa munda," the "Fair Rose;" also as "Rosa mund," "Rose hand," mund meaning hand (A.S.), this latter evidently having reference to the beauty of her hands. She is said to have been fair, with blue eyes and golden hair, and of a complexion only to be found among the English women. The following lines convey an idea of her good looks:—

Her crispèd locks like threads of gold,
Appeared to each man's sight;
Her sparkling eyes, like orient pearls,
Did cast a heavenly light.
The blood within her crystal cheekes
Did such a colour drive,
As though the lillye and the rose
For mastership did strive.

It is recorded* that "King Henry II. being enamoured upon Rosamond Clifford, a damoselle so faire, so comely, so well favoured without comparison, that her beauty did put all other women out of the Prince's minde, in so much as now she was termed "Rosa mundi," that is "Rose of the world," and for to hide

*I have to thank Mr. G. H. Piper, Ledbury, for the extracts, which follow.

her out of the sight of his jealous Juno the Queene, he built a labyrinth in his house (Woodstock) with many inexplicable windings backward and forward ; which, notwithstanding, is no where to be seen at this day."

It is also recorded of King Henry II. :—

"Concubines he had many, but two more famous than the rest ; and one of them more famous than the other, and this was Rosamond, daughter of Walter Lord Clifford, whom he kept at Woodstock in lodgings so cunningly contrived, that no stranger could find the way in ; yet Queen Eleanor did, being guided by a threed. So much is the eye of jealousie quicker in finding out, than the eye of care is in hiding. What the Queen did to Rosamond when she came to her is uncertain ; but this is certain, that Rosamund lived but a short time after, and lies buried in the nunnery of Godstow, near to Oxford."

Upon the tomb were inscribed these verses :—

Hic jacet in tombâ Rosa mundi, non Rosa munda :
Non redolet, sed olet, quæ redolere solet.

Henry II. had two sons by Rosamond Clifford—1st, William "Longue-épée" (Longsword), who married the daughter and heiress of the Earl of Salisbury, and succeeded to the title and estates of that powerful nobleman ; 2nd Geoffrey, who was consecrated Bishop of Lincoln. When Prelate elect (he was appointed when very young) he dispersed the northern insurgents, and greatly assisted his father the King, who, on meetiog him after the rebellion, expressed his gratitude in very emphatic language. After five years' banishment in his brother King John's time, he died in the year 1213.

There are several portraits of Fair Rosamond, but they can hardly be considered genuine. One represents her as charmingly fair, with a beautiful colour upon her cheeks, and holding a cup in her hand upon which she is gazing intently. This may account for the supposed legend of the poison.

It is said, and mostly believed, that Rosamond retired before her death to the convent of Godstow, where she endeavoured by a religious discipline to atone for her former misdoings.

Henry, we are told, "for her sake, bestowed many presents upon the nuns, who, through gratefulness to her memory, buried her in their choir, hung a pall of silk over the tomb, and surrounded it with lamps and tapers."

Hugh, Bishop of Lincoln, disapproved of their conduct, and remarking that there was no difference between the mistress of a King or of any other man, ordered the body to be removed, but the nuns replaced it as soon as the Bishop had taken his departure. Whatever may have been the end of Fair Rosamond, whether she was poisoned, whether she died a premature death, worried by Queen Eleanor, or whether she passed away, as some writers aver, in a good old age, it is certain that her faults have been forgotten, but that her memory is still fresh.

With no better words can we take our leave of her than the following :—

Qui meat huc oret, signumque salntis adoret ;
Utque sibi veniam detur, Rosamunda precetur.

Let him who travels past this spot,
Plead, and adore the cross alway,
And, that his sins may be forgot,
For Fair Rosamond must he pray.

CLIFFORD CHURCH.

[By the Rev. T. W. WALWYN TRUMPER.]

There is not very much to be said about the Church. It is dedicated to St. Mary the Virgin, and probably was built about the 14th century. The oak roofs are handsome, substantial, and in good repair. There is a curious old window on the south side of the nave which has been a puzzle to more than one architect.

The tower is very strongly built, and is of good proportions, the mortar has become as hard as the stone, and they cling together in one impenetrable mass.

The most interesting feature in the Church is the figure of a monk, described by Silas Taylor as follows:—

“In ye Church is ye tombe onely of a fryor, cutt exquisitely in wood, under an arch of ye north side, and nothing else as I could meet with; viewed May 20, 1657.” And he goes on to say

“Chapples of ease are many, as one by ye Castle of Clifford, the steeple and chancel yet remaining; then ye Church of ye priory wherein was the burial of ye Cliffords but all destroyed; then those in Middlewood; and not farre thence St. Oswald’s Chapple, besides the parish Church.”

The parish Church has now been entirely restored.

The living of Clifford belonged to the Walwyn family, who seem to have been connected with the neighbourhood from a very early period; it now is, and has been for some 150 years in the possession of the Trumper family, who obtained it through kinship with the Walwyns.

Appended is an old pedigree which has been copied at the request of the Hon. Sec., Mr. H. C. Moore.

PART OF PEDIGREE

that was taken out of a worm-eaten shedule (*sic.*) which hanged up in Major Walwyn’s parlour of Huntington.

The righteous shall be had in everlasting remembrance.

The Paternal Pedigree of Margaret (late wife to Samuel Baynham), from Sir Ely Walwyn, who died Anno quinto Edwardi primi, and was byried at the Hay.

1.

Sir Ely Walwyn Knight. William Walwyn married

2.

Margaret, daughter to Sir

Thomas Walwyn, Esq., married Bryan Harley.
the daughter and heiress of Sir John Walwyn, Esq.,
John Hellins, Knight, her married.

mother daughter and heiress Thos. Walwyn married
of Jno. Hackket of Marcle. Ellenore, daughter and

Sir Richard Walwyn, Knight, married the daughter to John Lacon of Willey, Esq.	3. Thos. Walwyn, Esq., of Hellins and Marcle.	heiress to John Vaughan, Kinton, her mother heir- ess to Grynways.
Richd. Walwyn, Esq., married Catherine, daughter to James Darry, of Poston, Esq.	4. Richd. Walwyn, Esq., married Catherine, daughter to Ralph Bromedge.	Nicholas Walwyn. Thos. Walwyn, Esq., married Elenore, daugh- ter to Sir John Price.
Ely Walwyn, Esq.	5. Thos. Walwyn, Esq., married Agnes, the daughter and heiress of Simon Milborne.	Nicholas Walwyn, Esq., of Longworth, married Margaret, daughter to Francis Braco, of Ross- odge.
Foulk Walwyn, Esq., married the daughter to Sir Walter Pye.	6. Foulk Walwyn, Esq.	Robt. Walwyn, of Brock- bury and Newland, Esq., married Elizabeth, daugh- ter to Herbert Westfaling,
	7. Thomas Walwyn, Esq.	Lord Bishop of Hereford.
	8. Alexander Walwyn, Esq., married Ursula, daughter to Sir John Scudamore, of Hom- lacy.	Humphrey Walwyn, Esq., brother to the said Robt., founded Colwall College in Herefordshire, but died without issue.
Happy is the man that hath his quiver full of them.		Memorandum that Robt. Walwyn, of Brockbury and Newland, Esq., men- tioned above was great- grandfather to John Walwyn, Rector of Snod- land, in Kent.
Et genus et pro avos tua non fecimus ipsi. Vix ea nostra voco . . . Ovid.		
Transcribed anno, 1679.		

The ancient Walwyn was a nephew of King Arthur, and several exploits and valiant deeds are recorded of him in Geoffrey of Monmouth's British History.

William of Malmesbury relates that, in the reign of William the Conqueror, in a province of Wales called Ros was found, on the sea coast, fourteen feet long, the sepulchre of Walwyn, the noble nephew of King Arthur; he reigned, a most renowned Knight, in that part of Britain which is still named Walwerth.

Some say he was wounded by his enemies and suffered shipwreck, others that he was killed by his subjects at a public entertainment, Geoffrey of Monmouth records that he fell fighting against his brother Modred who had become a traitor to King Arthur.

CLIFFORD PRIORY.

[By the Rev. T. W. WALWYN TRUMPER.]

As stated above, Clifford Priory was founded by Simon Fitz Walter who adopted the surname of Clifford. According to Dugdale the living of Dorstone was under the jurisdiction of the Priors of Clifford.

The monks were of the Clunia order, the Priory must have been of considerable importance. It is built in a position of great beauty by side of a brook, which no doubt yielded a plentiful supply of fish, indeed at the present time, if properly cared for and looked after, it would afford excellent sport to the angler.

There are too, traces of fish-ponds, so that we may infer, that with good land round them and abundant produce from their farm—fat mutton, beef and poultry—the Clifford monks “lived well.”

Silas Taylor says, that when he wrote, the Priory was in the possession of the Traceys, which seems questionable, as about that time the Wellington family was living at, and probably owned the Priory.

In recent years the Priory farm belonged to people of the name of Woodhouse, and some twenty-five years ago it was purchased by its present owner, Mr. B. Haigh Allen, who has built a large house (called the Priory) overlooking the old site, and commanding an extensive and picturesque panorama.

Where stood the grand old Priory with its gray walls and cruceiform Church, now stands a farm-house with its modern slate roof and general ugliness: nothing to interest the student of antiquarian remains (excepting the patriarchal oak tree), but everything is changed, and all relics of the past have been ruthlessly swept from the face of the earth.

“Tempora mutantur, nos et mutamur in illis.”

Woolhope Naturalists' Field Club.

4TH FIELD MEETING, AUGUST 22ND, 1889.

A VISIT TO LEDBURY AND THE MALVERN HILLS.

ON Thursday (August 22nd) the members of this Club paid a visit to Ledbury and the Malvern Hills. They first travelled to Ledbury for the study of the geology of the Passage Beds there. They were met at the Ledbury railway station by the members of the Malvern Field Club. The explanation of these Passage Beds was given by Mr. G. H. Piper, who exhibited fine models of the rare fossils *Auchcnaspis* and *Cephalaspis*, including a bony-plated body of *Auchcnaspis Egertonii*, believed to be unique. Here Mr. Piper pointed out, *in situ*, the Lower Beds of the Old Red Sandstone formation, and the topmost shales of the Silurian deposits, together with the whole of the Passage Beds, lying sectioned in unbroken sequence between these two great geological systems; it is believed there is no other place presenting the same advantages of the present opportunity, as weathering and vegetable growth are fast obliterating the lines of demarcation between the various beds.

Commencing his measurements from the cutting into some good building stone of the Old Red Sandstone, which is observed on the north side and just opposite the goods shed of the Ledbury Railway Station, Mr. Piper pointed out the various thicknesses of the different strata, of which he determined so many as 29 in number, extending for a length of 395 feet, and terminating in the Aymestry limestone, more than 200 feet thick, containing the Pentamerus bed dwarfed down to the diminutive thickness of a few inches. Mr. Piper described the character and thickness of each stratum successively, and when he came to No. 7, the blue, muddy, soft, frangible stone of the Lower Ludlow character, gave the information that about 100 tons of this stone, which originally was mud, and which in the course of two years would, upon exposure, be re-converted into mud, had been used as ballast in the formation of the Ledbury and Gloucester Railway, before he had detected it and indicated to the proper authorities its unsuitability for that purpose. For a more detailed description of these beds, the reader should refer to *Transactions*, 1884, page 138, where the thickness of the separate beds is given in the extracts from Mr. Piper's address.

When Mr. Piper had concluded, the Rev. J. D. La Touche said the same succession of beds, but upon a smaller scale, could be seen in Shropshire, at Ludlow, and also at Onibury, where they had a thickness of 100 feet; and he hoped to have an opportunity of exhibiting them to the Woolhope Club upon some early future occasion. Mr. Garnett Botfield had found them 50 feet thick also at Bishop's Castle, thinning out westwardly.

The members spent the limited time at their disposal in exploring the strata in the easterly direction, beyond the bridge leading into Frith Wood, and in the Aymestry limestone a *Pentamerus Knightii* was immediately found, and other fossils in the 25 feet of fossil-yielding portion out of the total length of 395 feet.

Carriages conveyed the members from Ledbury Railway Station to the British Camp Inn, distant about five miles, whence the ascent was made of the Herefordshire Beacon, whilst the carriages returned down the Ridgeway to the Holly Bush Pass. From the Herefordshire Beacon British Camp the members proceeded along the ridge of the hill, in a southerly direction, passing by Clutter's Cave (the locality of the Sacrificial Stone on the Herefordshire slope below the Cave having been pointed out), across the Silurian Pass, over Swinyard Hill, through the Gullet Pass, up the eastern slope of Midsummer Hill, until they arrived at the hollow between it and Holly Bush Hill, where Mr. Piper read a paper illustrated by diagrams, indicating the site of the ancient British town, the hut hollows on Midsummer Hill, and the means of storing water by a series of embankments. See a paper on this same subject by Mr. F. G. Hilton Price termed "Camps on the Malvern Hills," on page 217 of *Transactions*, of May 20th, 1880. See the diagram opposite. As soon as Mr. Piper's paper had been concluded, it then being about half-past three, rain began to descend. This was unfortunate, because the members were obliged to spend the next hour in seeking shelter, instead of listening to a field address upon the geology of the district from Mr. Piper, accompanied with diagrams, specially prepared for the occasion.*

On the journey home from Holly Bush Pass to Ledbury the carriages halted at an exposure of greenstone on the road side on the left hand, where Mr. Piper directed the attention of the members to the boulders, formed by igneous action, existing abundantly in this eruptive rock.

On arrival at Ledbury dinner was partaken of at the Royal Oak Inn. There was a large attendance of members and visitors, including the following:—

Woolhope Club: Members—The President (Mr. H. Southall, F.R. Met. Soc.), Vice-presidents, Dr. T. A. Chapman, and Rev. C. Burrough; the Rev. J. D. La Touche, President of the Caradoc Club; Rev. J. Dunn, Rev. Preb. Elliot, Rev. H. B. D. Marshall, Rev. D. Price, Rev. Stooke-Vaughan, Rev. H. W. Tweed, Messrs. Cecil Butler, E. Ballard, Joseph Carless, junr., R. Clarke, Luther Davis, George Hadfield, T. Hutchinson, Guy Trafford, T. C. Paris, G. H. Piper, W. Sharland, A. Watkins, H. C. Moore, Honorary Secretary, and J. B. Pilley, Assistant Secretary. Visitors—Rev. H. North, Rev. S. H. Farwell Roe, Colonel Hopton, Colonel E. Temple, Captain Elliot, Dr. Malcolm Poignand, Messrs. Burrough, Wm. Davies, W. R. Diamond, Frank James, — Dunn, — Hadfield, jun., and R. Hooker. Malvern Field Club—The President, Canon Gregory Smith, and friend; Mr. and Miss Fitton, Miss Whiting, Mr. G. H. and Mrs. Williamson, Mr. and Mrs. Hayes, Mr. Sheppard, Mr. McCarthy, Mr. Bates, Mr. R. P. Hill, Mr. Hopkins, Mr. Snell, Mr. and Miss Baylis, Mr. Poulton, Mr. J. S. and Mrs. Burrough, and Major Wilson, Hon. Sec.

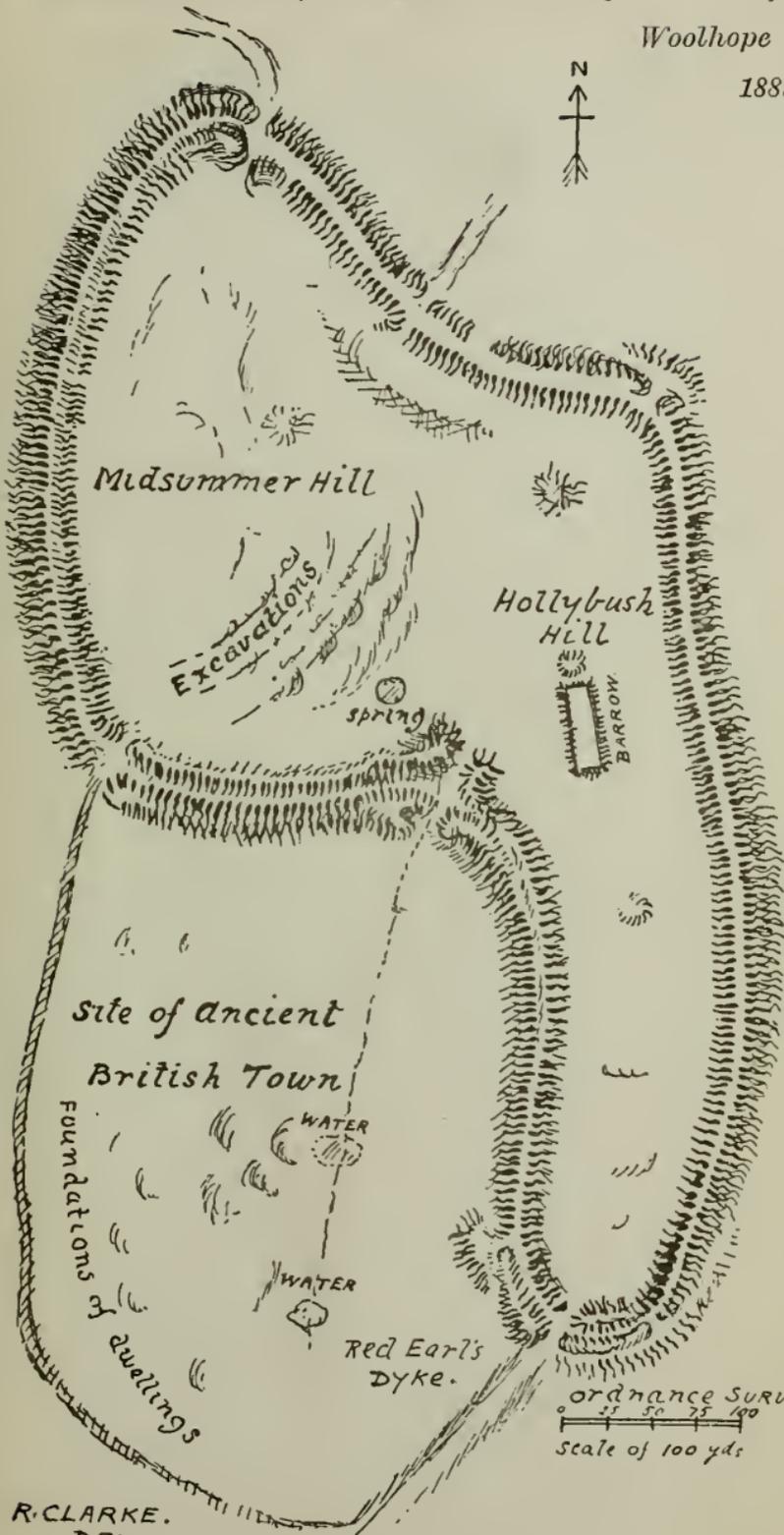
*As this manuscript has not come to hand it has been resolved to reserve the diagrams, geologically coloured, of succession of Palæozoic strata, dipping westward from the Malvern Hills, until some future visit of our Club to this locality.—Ed.

Midsummer & HOLLYBUSH HILLS

Hereford

Woolhope Trans.,

1889.



R. CLARKE.
DEL.



The Rev. H. North and the Rev. W. H. Webster were elected members, and Dr. Malcolm Poignand was proposed to be balloted for at the next meeting.

The Honorary Secretary has received from the Society of Antiquaries, London, the following resolutions agreed to on the occasion of the Conference of Archæological Societies, held on July 17th last, the Woolhope Club being one of the "Societies in Union."

I.—That each local society be requested to take into consideration the desirability of placing on record, on the 6-inch scale maps of the county with which they are concerned, all the local names of fields, and all relics of antiquity for which a locality can be fixed. That such maps should be kept in duplicate, so that eventually a copy may be deposited with the Society of Antiquaries.

II.—That all local societies be requested to be on the watch against any wilful or injudicious destruction of ancient monuments or buildings, so as at once to bring local public opinion to bear against the destroyers; and that in cases of what appear to be national importance, the aid of the Society of Antiquaries or the Inspector of Ancient Monuments be invoked.

III.—That a committee (consisting of the Rev. Canon Benham, F.S.A., Messrs. R. S. Faber, Edwin Freshfield, LL.D., V.P.S.A., W. J. Hardy, F.S.A., and Ralph Nevill, F.S.A., with power to add to their number) be appointed to draw up a scheme for the uniform transcription of Parish Registers and Records, showing the best form of arrangement, &c., and in the case of their being printed, the best form of size, type, &c. That the report of such scheme should give as much information as possible in regard to printing and publishing, and such other information as may be likely to be useful to inexperienced people, who may be willing to undertake the work of transcribing.

IV.—That in the case of extracts from Parish Registers and Records being printed in Parish Magazines, the Incumbents be requested to communicate copies to the Local Societies and to the Society of Antiquaries.

V.—That the attention of the Local Societies be called to the proposed Bill, entitled An Act for the Preservation of Public and Private Records, which it appears may provide for a long recognised want.

With reference to these subjects, it is admitted that the Club has much work in prospect. Mr. Thomas Blashill, the representative in London, purposes shortly to lay before the members certain propositions, whereby he hopes to enable them the more easily to carry out the execution of the above resolutions.

Woolhope Naturalists' Field Club.

THE FUNGUS FORAY, 1889.

THE Annual Fungus Foray commenced by the meeting of mycologists at Ludlow, on Monday, September 30th. On Tuesday, October 1st, the Foray was made over the grounds of Mr. A. R. Boughton Knight, of Downton Castle.

The party explored over the south bank of the River Teme so far as Hay Mill, and returned by the north bank. Some few geologists extended their rambles beyond the Bow Bridge in search of an out-crop of the bone-bed underneath the Downton Sandstone. Dr. Cooke kept a record of the species of fungi observed during the day, and later in the day reported that 86 species had been met with, including three or four specimens of *Strobilomyces strobilaceus*.

A few botanical plants were observed upon the north bank of the river Teme, which are here given because they are not recorded from this locality in "The Flora of Herefordshire":—*Serratula tinctoria* (common sawwort), *Origanum vulgare* (common marjoram), and *Solidago Virgaurea* (common golden-rod). *Euonymus europaeus* (spindle tree) was also noticed, but "The Flora of Herefordshire" states that this is common, and distributed through the county, it being recorded from every district except Kington (11).

On the outward journey a halt was made at Bromfield, distant three miles from Ludlow, to inspect the Church which was undergoing extensive restoration. The square tower at the north-western end of the Church appeared to date from the early part of the thirteenth century. A plain bold Norman arch, with remarkably small plinth and capitals, does service in the northern wall of the chancel. The plastered roof of the ceiling of the chancel has some exquisite fresco colouring, of date 1658. Some handsome shafts of Norman architecture had just been discovered under the plastering, in the east wall of the chancel, and were partly exposed; they shewed that the original arch had a span of twenty feet. One stone in the north shaft was recognised as formed from the Upper New Red Sandstone of Grinshill Hill, north of Shrewsbury, twenty-five miles distant from this locality. On the east there is a pretty approach to the Churchyard through an avenue of about thirty Cypress trees on each side.

The handsome oaken rafters and tie beams over the nave with the names of their makers, and the date 1577 inscribed, are in an excellent condition of preservation. Attached to the southern wall of the Church is a lofty dwelling house, now ruinous, with Tudor doorways and windows. The history of this building and its connections with the adjacent Priory may, upon some future occasion, form a subject of further investigation by the archæological members of the Club.

On Wednesday, October 2nd, the grounds of Sir Charles Rouse Boughton, at Downton Hall, were visited, and the search for funguses was conducted in the plantations on each side of the drive, for a distance of one mile and a half, with the result of sixty-eight species being met with. This ground is situated wholly in Shropshire.

The Museum at Ludlow was visited. The excellent arrangement of the geological specimens in their proper sequence; the classification of the British birds, and the natural way in which they have been set up; the cabinet for the Herbarium of the county; and the method of exhibiting the various objects of natural history, of local and of general interest, reflect great credit on the Committee of the Institution, which is fortunate in having secured upon its staff the services of one of the members of the Woolhope Club, Mr. Charles Forthey, to whose fostering care we feel assured the citizens of Ludlow are much indebted.

The mycologists returned to Hereford on Wednesday night, and resumed their foray on Thursday, October 3rd, the Club Day, over Dinmore Hill. Dr. Cooke continued his daily record of species found, which to-day amounted to sixty. Of edible funguses a solitary specimen of *Cantharellus cibarius*, and a dish of *Hydnum repandum*, the vegetable oyster, were found, which latter, excellently cooked in a stew with white sauce, was served at the dinner which took place, as usual, at the Green Dragon.

The Annual Meeting took place in the Woolhope Club Room soon after the return of the mycologists from Dinmore. The following members attended:—Mr. H. Southall (President), Rev. Preb. Elliot, Rev. A. Ley, Dr. T. A. Chapman, Dr. O. Lane, Dr. J. H. Wood, Dr. A. J. H. Crespi, Messrs. T. Cam, James Davies, Luther Davis, W. P. J. Le Brocq, E. Cambridge Phillips, Walter Pilley, Burton Watkins, James B. Pilley (Assistant Secretary), and H. C. Moore (Honorary Secretary). Sir Herbert Croft, Bart., was elected President for the following year, and the name of Mr. James Davies was added to the Central Committee.

After dinner Dr. Cooke, in an address, reminded the members that the subject of mycology was first taken up by the Woolhope Club twenty-two years ago, in the year 1867, by a paper on the probable identity of *Agaricus Georgii* (known as the "Horse-mushroom") and the common edible mushroom (*Agaricus campestris*) by Mrs. Cooper Key, published on page 75 of the *Woolhope Transactions*, 1867. This was followed by excellent coloured illustrations of the following three edible funguses in the same volume; namely, *Agaricus prococcus* (the parasol agaric), *Lactarius deliciosus* (the orange milk agaric), and *Marasmius oreades* (the fairy-ring champignon). A great stimulus was given to the subject in the following year, 1868, by the first prize being awarded to the Woolhope Club by the Royal Horticultural Society, South Kensington, for the finest collection of funguses, classified as 1st, confessedly edible; 2nd, edible but not usually eaten; 3rd, not edible from a variety of causes; 4th, poisonous; the report of which by Dr. Bull is given on page 193 of the *Woolhope Transactions*, 1868. The first expedition termed "a Foray amongst the Funguses" was organised in 1868, when

the services of Mr. Edwin Lees, Vice-President of the Worcester and Malvern Field Clubs, and of Mr. Worthington G. Smith, F.L.S., of London, were enlisted for naming the various funguses found. The "Clavis Agaricorum" by Mr. Worthington G. Smith, was published in the *Woolhope Transactions* for 1869, and since that period the Forays have been conducted annually. Paying a tribute to the memory of the late Mr. Broome, and of the lately deceased Rev. J. M. Berkeley, the Father of British Mycology, Dr. Cooke considered "The Introduction to Cryptogamic botany," published by Mr. Berkeley in 1857, a perfect encyclopædia for those times. His "Outlines of British Fungology," 1860, was a good book, notwithstanding the very unfavourable circumstances under which it was written, seeing that the author was limited and cramped in every direction, being obliged to confine so much material into a limited number of pages; in fact the book was "written to order." Cooke's "Handbook of British Fungi" appeared in 1871. A passing reference was made to numerous other works, with a modest omission of several from his own pen, notably "A plain and easy account of British Fungi," 2nd edition, 1871, Hardwicke. "Fungi, their nature, influence, and uses," International Scientific series, 2nd edition, 1875. "Rust, smut, mildew, and mould," 4th edition, 1878, Hardwicke. That useful book, dedicated to Dr. Bull and the officers and members of the Woolhope Club, "The diseases of field and garden crops," by Worthington G. Smith, was published in 1884. An especially favourable mention was made of the recent addition of "A manual of the British Discomycetes," by William Phillips, published in the International Scientific Series, and still more recently a book which was much wanted, "The Uredineæ and Ustilagineæ," by Charles B. Plowright. Of the "Illustrations of British Fungi," from his own pen he reported that the 72nd part was now complete, forming seven volumes containing twelve hundred drawings; and to bring the literature of a kindred branch of botany up to the present date there should be mentioned the "Fresh Water Algæ," which would be issued in the International Scientific Series, at the beginning of 1890, another of his own books. Dr. Cooke congratulated the Woolhope Club upon the taste, arrangement, type, and composition of the publication "The Flora of Herefordshire." As regards the 483 species of the larger Agarics in Order 1, as therein recorded, he called the attention of members to the fact that, since 1,334 British species had been already described, there yet remained 851 for them to discover; and they must look to their laurels, for the Essex Field Club had already recorded 410. Drawing a comparison, he had to report that the Woolhope Club on Tuesday had found 86 species at Downton Castle; on Wednesday 68 at Downton Hall, in Shropshire; and to-day, at Dinmore Hill, 60 species; whereas in Epping Forest, a few days ago, 108 species had been found in one day, and on the following day 29 more, or a total of 137 species.

In the evening the members met, by invitation, at the house of Mr. Cam, where some papers were read.

On Friday, October 4th, the grounds of Lady Emily Foley were visited. Notwithstanding the general scarcity of funguses, it was satisfactory, on summing up the results of this year's foray, to report that altogether seventeen additions were

to be made to the list in "The Flora of Herefordshire." They are as follows :—

Corticium epiphyllum, <i>P.</i>	Downton.	Ag. (<i>Panæolus</i>) <i>retirugis</i> , <i>Fr.</i> ,	Dinmore.
Diaperthe inquilina, <i>Fr.</i>	do.	Ag. (<i>Pholicta</i>) <i>præcox</i> , <i>Fr.</i> ,	Stoke Edith.
Russula lutea, <i>Fr.</i>	do.	Ag. (<i>Galera</i>) <i>mniophilus</i> , <i>Fr.</i>	do.
Puccinia scorodoniæ, <i>Link.</i>	do.	Ag. (<i>Psathyrella</i>) <i>trepidus</i> , <i>Fr.</i>	do.
Puccinia glechomatis, <i>D.C.</i>	do.	Ag. (<i>Hypholoma</i>) <i>casus</i> , <i>Fr.</i>	do.
Ag. (<i>Mycena</i>) <i>acicula</i> , <i>Fr.</i>	do.	Ag. (<i>Naucoria</i>) <i>sobrius</i> , <i>Fr.</i>	do.
Grandinia ocellata, <i>Fr.</i>	do.	<i>Empusa muscæ</i> , <i>Cohn.</i>	do.
Ag. (<i>Hebeloma</i>) <i>nauseosus</i> , <i>C.</i> ,	Dinmore.	<i>Phyllachora angelicæ</i> , <i>Fr.</i>	do.

and to this list must be added a *Morchella Smithiana* found at Dadnor, near Ross, by Miss Armitage, this being the first time this Morel has been recorded from this county.

A magnificent elm tree, growing south of the mansion of Stoke Edith in the deer park, was observed, which, upon measurement of its trunk, was found to have a girth of 19 feet 8 inches at the height of five feet from the ground.

The following papers were read and discussed during this week :—"Some remarks on the Puccinia attacking Galium," by the Rev. J. E. Vize, F.R.M.S., &c. "The Breathing system of Flowering Plants and their Allies," by the Rev. J. E. Vize, F.R.M.S., &c. "Observations on Popularizing the Knowledge of Edible and Poisonous Fungi," by William Phillips, F.L.S. "On the occurrence of the Great Black Woodpecker, *Picus martius*, in Great Britain," by E. Cambridge Phillips, F.L.S., M.B.O.U., M.P.I.O.C., &c.

The two latter papers produced some discussion. As regards the instruction of the public in the knowledge of discriminating the edible varieties, and overcoming their general antipathies, it was admitted that the experiment attended with the most favourable results was the appeal to the sense of taste. A dish of funguses, well cooked, known to have been carefully overlooked by an experienced hand, once tasted, never failed to produce many a convert to the belief in its suitability to the palate, and to its innocuous qualities.

Mr. E. Cambridge Phillips is not inclined to doubt the observations of some few who have borne testimony to the accidental appearance, as a visitor, of the Great Black Woodpecker in Great Britain, especially when amongst them is numbered a man of such well-known accuracy and judgment as the Rev. Clement Ley, familiar with the cry of the bird in its native country, and familiar from his earliest childhood with the haunts, habits, migrations, notes, mysterious instincts of birds, and beauties of bird life.

The following mycological visitors attended the forays :—Dr. M. C. Cooke, Rev. Canon Du Port, Rev. J. E. Vize, Mr. T. B. Acton, Mr. C. Bucknall, Mr. Wm. Phillips, Mr. C. B. Plowright. Mr. Wm. Beacall, of Sunfield, Shrewsbury, accompanied the party on Tuesday, and the following members joined in one or other of the excursions :—The President (Mr. H. Southall), Rev. E. J. Holloway, Rev. Augustin Ley, Rev. M. G. Watkins, Dr. T. A. Chapman, Dr. J. H. Wood, Dr. A. J. H. Crespi, Messrs. R. Clarke, Luther Davis, Charles Fortey, Walter Pilley, James B. Pilley (Assistant Secretary), and H. C. Moore (Honorary Secretary).

WOOLHOPE FUNGUS FORAY.

Twenty-one years ago the Woolhope Club organized its first "Foray amongst the Funguses," as it was called, the primary object being to collect specimens of edible fungi for cooking and serving at the annual dinner. Subsequently and speedily the scope of the forays was widened, so as to include all the larger fungi, especially the Hymenomycetes, and has been continued with more or less success down to the present day. The total number of the species of British Agaricini may be taken as 1334, and of these 483 have been collected in Herefordshire and recorded in the new *Herefordshire Flora*. This is, as yet, the largest number recorded for any British county, that of Essex having reached only 410. The Woolhope excursions for this year commenced on October 1st, and the place of assembly was Ludlow, in Shropshire, with the weather favourable, but the ground and the woods on this side of the kingdom were too dry to give any promise of success. The party was a smaller one than usual, scarcely exceeding ten on any of the days, whilst the lack of "game" represented also a lack of enthusiasm. Amongst those who took part in the explorations of the week were the Rev. Canon Du Port, Rev. J. E. Vize, and Messrs. Bucknall, Phillips, Plowright, and M. C. Cooke. Tuesday's excursion was made in the woods of Downton Castle, over ground which had not been visited by the Club for many years; but it soon became painfully manifest that the old success was not to be realized, and after patient and diligent search for about four hours, only about eighty species could be enumerated, and of these only one or two individuals had been seen. Two old and dry specimens of *Strobilomyces* only were found, and this has generally been a species of certain occurrence somewhere during the Woolhope week. *Marasmius Hudsoni* was rather plentiful on Holly leaves, but scarcely anything else of interest. The Wednesday's excursion was made in the woods of Downton Hall, now for the first time visited by the Club. The excursion was in itself a pleasant one, but as barren of results as the previous day had been, only sixty-eight species being determined, of which the most interesting was *Agaricus (Inocybe) haemactus*, a species first found at Credenhill several years ago, and now seen again for the second time. Although the total number of species found was below that of the Tuesday, there was a larger number of interesting species, such as *Agaricus plicanthinus*, *calamistratus*, *acerosus*, *Fricisii*, *Marasmius erythropus*, and *Russula Linnæi*. The Club day, Thursday, was occupied by a morning excursion to Dinmore, where about sixty species were determined between 10 a.m. and 2 p.m.; but this number had to be made up by recourse to microscopical species. The annual dinner afterwards, at the Green Dragon Hotel, was characterized by no especial feature, and *Hydnum repandum* was the fungus dish cooked "from the Club recipes," and served round to the assembled guests. In the evening, at a conversazione held at the house of T. Cam, Esq., one of the past presidents of the Club, a very large party of ladies and gentlemen were assembled, and papers read by E. C. Phillips, F.L.S., "On the Occurrence of the Great Black Woodpecker in Great Britain;" by Rev. J. E. Vize, on "The Breathing System of Flowering Plants and their Allies;" and by W. Phillips, F.L.S., "On Popularizing the Knowledge of Edible

and Poisonous Fungi," which latter was followed by a lively and interesting discussion, mainly on the proposal to recognize a few definite popular names for common edible fungi, and to disseminate information concerning them as widely as possible, especially amongst rural populations. The last day "of this eventful history" was devoted to Stoke Edith Park, and as park lands are perhaps the driest and most unproductive of any this year, it will not be surprising to learn that the record scarcely exceeded fifty, although more than half of these were pastoral species, which had not been met with on previous days.

Reports have reached us of a plentiful harvest of fungi in Devonshire, and of a profusion in the North, but our own experiences in Essex, Shropshire, Herefordshire, Surrey, etc., during the past two or three weeks have satisfied us that, as a general rule, the present autumn has been unusually barren of fungi, no better, if not worse, than last year.—M. C. COOKE.

THE BREATHING SYSTEM OF FLOWERING PLANTS AND THEIR ALLIES.

[By the REV. J. E. VIZE, M.A., F.R.M.S.]

IN a Club like ours, we take it for granted that the fact of vegetables having the power to breathe is well known. They could not exist for long if it were not so, through want of fresh air passing into them. Trees, shrubs, plants, do breathe. Perfectly true it is that there is not one uniform stereotyped system in which this is done, and that there are modifications in the breathing is certain. Most plants breathe on the upper surface and the under surface of the leaf, but not necessarily all of them. Take the Water Ranunculus, for instance. The upper portion of the leaf only has these breathing organs. Why so? Because the lower portion touches the water and does not need them. This plan holds good with many of the aquatic species.

But for the benefit of those who have not studied these things, and perhaps have not known of their existence, let me explain how the work of breathing is done. There is in nearly all the surfaces of leaves a cavity, and from within and without air is conveyed through the leaf, and therefore through the whole tree. The proper term for these cavities is *stomata*. Let us, however, take the simpler word, breathing-tube, and use it instead of the classical word. They are queerly shaped things, scattered very much on the leaves, the stems, the stalks, and even the bulbs of flowering plants. Grasses have them abundantly. They are easily detected under the microscope. Possibly some may wish to know how they are to be obtained as permanent objects of examination. My plan has been simple enough, and I daresay, may be generally adopted. I, of course, choose my specimen, say, a tulip. Gather your tulip leaf, do not operate upon it at once, but leave it until it becomes somewhat limp, say an hour or two after having been gathered. Then with a very sharply-pointed knife cut through the outer skin of the tulip just enough to cut through the skin, but not to cut far into the cells of the leaf. Then with the back of your knife raise this skin very tenderly. Take hold of it with your nail or a broad pair of forceps, or something which will give you a firm hold on the cuticle. Pull gently, and you will get, if successful, which is especially likely to be the case when manipulated under water, a beautifully thin skin. Upon this skin are the mouths of the plant. Lay it carefully on a slip of glass and examine under the microscope,—you will then see these apertures for the breathing arrangement. These mouths are *very* interesting. No uniformity of arrangement exists such as equidistance. No two touch each other. Yet they are connected together, sometimes by two vein-like grooves, sometimes by three or four grooves. Moreover, these veins are endless as to variety. They may be tolerably regular or very irregular; tolerably straight, as in the grasses, or anything but straight.

These veins, it seems to me, correspond somewhat with the shape of the leaf.

In a very straight leaf you will not find the veins separating widely apart; just as in a poplar leaf you would not get them straight.

Then, notice their number in the square inch. These calculations are not my own, nor do I know whence they were obtained. They are, however, as follows:—

	Upper Surface.	Lower Surface.
Mesembryanthemum	30,000	40,000
Yucca	40,000	40,000
Iris	12,000	12,000
Vine	13,000	13,000
Hydrangea and Lilac		160,000
The stem of the Cereus has } Ditto Stapelia }	15,000	

These numbers are very astonishing, and profoundly so when we reflect upon the myriads there are in an entire tree or shrub. Still, there they are. Each has its appointed mission in life. Each is useful for breathing. Moreover, they work systematically, as is necessary from the very nature of the thing. Is the weather very hot, these apertures close. They must not have too much moisture extracted from them, or they would be exhausted. Moisture is essential to their vitality.

Observe now, the organ of breathing. There are two lips as shown clearly enough in the diagrams I show you. These lips vary very much in shape as you will see. Nor are they always simple. The horse-tail family (*Equisetum*) supply compound forms; not merely are there the ordinary two lips, but there are also bars within them at right angles to them.

There are some wonderful modifications in these breathing organs. Some of them are delicate and need protection. They obtain it by means of beautifully organised hairs which are to be found on certain plants. Whether the hair of the common stinging nettle is used for this purpose or not I am not sure, but when the leaves have hairs stellate in shape, these hairs have the power of elevation or depression, according to the amount of moisture in the atmosphere, and consequently are graduated in height so as to adapt the admission of moisture.

In all these minute things then, we see design, wisdom, and excellence. There is a rich field for investigation and study in every branch of science. The more such fields are searched, the more they show how nothing could have come of itself.

I have only noticed the breathing organs as viewed from above. Sections of leaves cut at right angles to the leaves, as generally seen by us, are most interesting, and I have not touched upon them to-night. They furnish varieties quite as numerous as those we have examined. Strange, too, it is, that whilst phanerogams supply simple forms, they must yield the palm of honour as to complicated beauty to the cryptogams. The lowly liver-wort will be found with organisms far higher in the scale than any flowering plant owns. Thus again and again do we detect the works of God in their glory.

I have finished my paper, and have made it not very long, knowing that others were to be read. I prefer to listen to them rather than hear myself.

SOME REMARKS ON THE PUCCINIA ATTACKING GALIUM.

[By the Rev. J. E. VIZE, M.A., F.R.M.S.]

THE occurrence of a plant when for many years one has been searching for it gives joy to the discoverer. In the month of July in this year I was fortunate enough to find an *Æcidium* growing on *Galium aparine* (Kze), and before putting it under the press for the purpose of drying, I noticed on the lower part of the stems of the *Galium*, some intensely black bullate swollen patches which were unhesitatingly *Puccinia*. They might fairly be taken to be the teleutospore of the *Æcidium*. At once I took it to be *Puccinia difformis*, a fungus which is very unusual in England—at least, as far as my searchings have gone; so also in those of Dr. Cooke, because I well remember at the Woolhope Foray last year, at the Forest of Dean, when *Puccinia acuminata* was found on *Galium saxatile*, he asked if I had ever met with *P. difformis*. My answer was, No. He had only found it once, I believe, the locality being Shere, in Surrey.

Thus far we have noticed two *Puccinias* growing on *Galium*, *P. difformis* on *Galium aparine*, and *P. acuminata* on *Galium saxatile*. But there are two other *Puccinias* also growing on *Galium* according to the Handbook, namely, *P. Valantiæ* (Pers) on *Galium cruciatum* and *Puccinia Galiorum* (Lk) on various species of *Galium*.

On referring to Prof. Saccardo's Sylloge, vol. vii., p. 600, he gives no less than 13 species of *Galium*, two of *Asperula*, and one of *Rubia* as the host plants of *P. Galii* (Pers). As a synonym he gives *Puccinia difformis* (Kunze), about which we shall say a little presently. Let me merely say with regard to *P. Galiorum* that this plant has its four forms of spores on the same plant in orthodox succession, and they are easily traced from the œcidial stage to the teleutospore.

At page 685, Prof. Saccardo gives *Puccinia Valantiæ* (Pers) as growing on five species of *Galium*, and two of *Mollugo*; four of the *Galium* having been the habitats of the previously recorded *P. Galii*, against which there may be, and probably are, no objections to be laid. Both the two species of Saccardo, as inserted in his work, are according to my frequent additions of knowledge occurring continually, one preceded by a *Puccinia*, the other never.

We have now Cooke's Microscopic Fungi, last edition, giving four *Puccinias* on *Galium*; Saccardo's Sylloge gives only two.

We now come to the latest date to see what further records may be found. About *P. Galiorum* (Lk) everything is most satisfactory, so [it is about *Puccinia Valantiæ* (Pers.) which cannot be mistaken for the other plant, inasmuch as it has large bullate patches of sori, as contrasted with the sori of *P. Galiorum*, which are sparse and small. Even an ordinary observer would scarcely fail to detect the difference.

With regard to *Puccinia acuminata* (Fckl) said to grow on *Galium saxatile*, Prof. Saccardo gives it as a synonym of *P. Valantiæ* (Pers.). I have very critically examined my specimens gathered at the Forest of Dean, Welshpool, and Barmouth, and confess that every example of *G. saxatile* seems to correspond with *P. Valantiæ*, not only in the external aspect of the fungus, but also in the spore. The spores of my specimens are without coloured peduncles, and only a few are acuminate. I hoped to have gained assistance from the only plant of *G. saxatile* of foreign growth. But on looking over it there is not an atom of any fungus on it. Baron Thumen supplied it, and his earlier work never was too accurate. So far, therefore, as my experience goes, our Italian friend is right. I am open, however, to conviction when an opportunity occurs of seeing *P. acuminata* (Fckl). May the chance be soon.

Let us now consider the so-called *Puccinia difformis* (Fckl). Is it a distinct species or is it not? My own theory is clearly that it is distinct, and not as Prof. Saccardo gives it, namely, a synonym of *P. Galiorum*. No one looking at *P. Galiorum*, say on *Galium cruciatum*, and looking at *P. difformis* would take them to be the same. The one is a brownish lump of sori. The other is like pitch or tar. On referring to the Handbook, I see the remark made about it, which says it is "Very distinct from either *Puccinia Galiorum* or *P. Valantiæ*, the sori are firm and compact, like little spots of pitch." Exactly so. Let us look now to Mr. Plowright's "British Uredineæ and Ustilagineæ," a book which is a credit to its author, and especially so because he is a true Woolhopean. At page 144, speaking of the Biologies of *P. Galii*, which includes *Puc. difformis* as a synonym, it says "The presence of the mycelium in the stems, especially in *G. aparine* causes swellings and distortions." Yes indeed they are considerable. If we examine them they are very considerable. They are black, and split up the cuticle into fragments. Unless there be further proof of the identity of *P. difformis* with *P. Galii*, such as the positive growth of the latter from the spores of the former, I cannot think they are the same plant. Besides, not only is the external aspect of the two so very dissimilar, but the shape of the spores, especially at the summit, is not alike. I fancy a little more critical examination of these two species will cause each to have its own name, and therefore that the one is not a synonym of the other.

SOME OBSERVATIONS ON POPULARIZING THE
KNOWLEDGE OF EDIBLE AND POISONOUS
FUNGI.

[By WILLIAM PHILLIPS, F.L.S.]

It is now nearly 20 years since I first joined the Woolhope Club in a Fungus Foray, and I very well remember that one of the prominent ideas held by the early promoters of these gatherings was that a vast quantity of wholesome food lay at the doors of cottagers, and even of well-to-do people, which through ignorance was entirely neglected and left to rot in the place where it grew ; and that one of the great missions of this Club was to dispel the ignorance existing in peoples' minds as to the edible value of a vast quantity of the so-called frogstools. I also remember that to give practical proof that properly selected species, when correctly cooked and served up, were not only harmless, but wholesome and nutritious, the cook at the Green Dragon was served with the right sort, which were prepared, and partaken of at the annual dinner, without any serious results following. I do not remember that our ranks were thinned by a single fatality. Howbeit some sceptics stood by and looked when we should have swollen, or fallen down dead suddenly ; but after they had looked a great while, they changed their minds. Recipes were published in the Transactions of the Club to guide the experimenters in arriving at the most toothsome form in which to prepare them at home, and many returned the following year to tell of their success.

Now, after these 20 years, I wish to ask the question, what progress has been made in popularising a knowledge of the edible and poisonous species amongst those who have not had the advantage of attending the Herefordshire Forays ?

The answer is, much in every way. When Fungus Forays were first established there were hardly a hundred men in the kingdom who, if they had been taken into the woods, could have correctly named a hundred species. This was especially true of those whose profession it is to teach Botany, men occupying chairs in the Universities. The 900 Hymenomycetes forming our Flora were to a large extent a blank to them, and were regarded as too low in the vegetable scale to be worthy of attention. This condition of things made it difficult for the organisers of the Forays to make a start. Our valued and lamented friend, whose recent loss we all deplore, the late Rev. Joseph Miles Berkeley, was the great referee to whom doubtful species were submitted. He, with a promptness and kindness never to be forgotten, gave his valuable assistance to all who sought it, and there are few amongst living mycologists who have not profited more or less by his great knowledge. Mr. Worthington G. Smith, and Dr. Cooke assisted in the same work. By the aid of these gentlemen, and others known to you all, the members of the Woolhope Club became acquainted with the commoner and rarer types of the genera and sub-genera of the Hymenomycetes. The first result was

that many lovers of nature from outside sought permission to join in those delightful rambles, and carried away the knowledge they gained, becoming in their turn centres of information and instruction in their own neighbourhoods.

Thus arose the practice amongst many of the Field Clubs of the country of devoting their latest Field Meetings to collecting and studying these plants; and at the present time there are hundreds of diligent students hard at work from one end of the country to another.

Another outcome of this awakened interest is the publication of a work which surpasses all others that have appeared in this, or any other, country, containing drawings of nearly every British species, executed with excellent skill, and scientific accuracy—I mean Dr. Cooke's great work, "Illustrations of British Fungi." But for the popularization of the subject such an enterprise would have been a complete failure, and would have involved the rash projector in financial loss. It is a work that no University, or public school, library can afford to be without, and which no working mycologist can dispense with. I earnestly hope the author may be rewarded by a large sale.

Simultaneously with this awakened interest in the large fleshy fungi, there has been a similar movement among professional botanists in regard to the great groups of microscopic fungi; the pathological effects of which are of such vast importance in animal and vegetable life. In sanitation, in agriculture, and in horticulture these minute organisms have asserted their claim to attention in a manner that cannot be ignored; they have touched the health and the pocket of the community so severely that how to combat their ravages has become both a vital and economic question of great importance. Although this subject is a digression from the one before us, I cannot help reminding you of the labours and the writings of such men as Mr. W. G. Smith, Mr. Charles B. Plowright, and Mr. Marshall Ward, whose contributions to this branch of mycological literature stand in the highest rank. To return to our subject: Can anything be done to clear the way of obstacles that tend to retard the multitude from gaining a knowledge of edible species, and thus open the door to a storehouse of wholesome food from which they are at present debarred by ignorance? It must be confessed that no royal rule has, up to now, been propounded, by which the poisonous can be distinguished from the edible. Charlatanism has stepped in and pronounced its rules in all the confidence of ignorance. If a silver spoon turns black when inserted in the stewing mass of fungi it has been said there is no danger, but this rule has never been endorsed by any good authority. A few years ago a learned judge laid down certain rules, the particulars of which I cannot remember, but I know that his utterances called forth very just and severe criticisms at the time from those who had given most attention to the subject. Much risk to human life is caused by such unwise general rules. The real facts of the case are well put by the joint authors of "Fungi; their Nature and Influences," which is worth quoting in this connexion. "The inquiry is constantly being made," say the authors of this work, "as to what plain rules can be given for distinguishing poisonous from edible fungi, and we can answer only that there are none other than those which apply to flowering plants. How can *aconite*, *henbane*, *cenanthe*,

stramonium, and such like plants, be distinguished from parsley, sorrel, water-cress, or spinach? Manifestly not by any general characters, but by specific differences. And so it is with fungi. We must learn to discriminate *Agaricus muscarius* from *Agaricus rubescens* in the same manner as we would discriminate parsley from *Aethusa cynapium*."

Nothing need be added to this; and the more widely it is made known and recognised the better. Ordinary mushroom gatherers know but two species. *A. campestris*, and *A. arvensis*, and they know them so well that no accident occurs. They must be taught to know *A. rubescens*, from *A. pantherinus*; *Lactarius deliciosus* from *L. torminosus*; *Cantharella cibarius* from *C. aurantiacus*; as certainly as they know an apple from a potato.

But who are to teach them? I consider that our endowed elementary schools are the proper channels through which this knowledge should be conveyed. It is of much more importance and practical utility in after life for children to be taught the difference between a poisonous and an edible fungus than the exact population of the British empire or the distance of the moon from the earth. Two conditions are necessary for carrying this out—the first is teaching the teachers, and the second is making it a subject of the annual examination, in connection with other elementary subjects of natural history, which are at present lamentably neglected. The knowledge of some dozen species is all that requires to be taught, so that no fear need be excited that a serious additional burden will be added to the already heavy one on the shoulders of teacher or scholar. Children are naturally fond of natural history, and the subject would be regarded by them as a pastime rather than a labour.

Another great help in popularizing this study is the adopting, and giving fixity to, English names of species, which should embody some prominent characters by which the species can be known. When an intelligent and observant boy runs up to you with a beautiful or curious fungus he has just found, and asks, "What is its name?" how blank and bewildered he looks if you tell him it is the rare *Strobilomyces Strobilaceus*; or if his little sister produces from her basket one that she has found on the stump of an old tree and you tell her it is the rare *Polyporus Schweinitzii*, what wonder if she should drop her basket in dismay. If they survive these shocks they must be marvellous children indeed! For scientific purposes Latin names, even though barbarous, as they often are, must be regarded as essential, but if English birds, quadrupeds, fish, and flowers have English names, why not fungi? Some few years ago I published a list of the Hymenomycetes of Shropshire, in which I gave the English names as well as the Latin, but was severely called to task in a botanical periodical of high standing for so doing. This wiseacre had his say, and I had my own way. Surely "giant puff-ball" is as good a designation for popular use as *Lycoperdon giganteum*, and "parasol mushroom" as good as *Agaricus procerus*. Many of the attempts to give English names to fungi have been unfortunate, and some even ridiculous. A book appeared a few years back called a "Text-book of British Fungi," in which the author indulged his fruitful fancy in coining new names, which caused much merriment at the time. Amongst them were the Wrinkletwig, the Jelly-sprout,

the Thimble-finger, the Rootingshank, the Couch, the Guilty-sprout, and the Striped Stump flap! One can hardly believe the author to have been in earnest when inventing such mountebank names. If some three or four gentlemen whom I have in my mind would draw up a list of English names of species, to be submitted for consideration, and afterwards to be published under the authority of the Woolhope Club, more would be accomplished to popularize the knowledge of British Fungi than anything hitherto achieved.

THE GREAT BLACK WOODPECKER IN ENGLAND.

[By E. CAMBRIDGE PHILLIPS, F.L.S., M.P.I.O.C., M.B.O.U., &c.*]

THE disinclination on the part of Professor Newton and Messrs. Seebohm and Saunders to give *Picus martius* a place in the List of British Birds is now well known to ornithologists, and doubtless their decision was arrived at after a careful and painstaking enquiry. It is not with the slightest intention of setting my humble opinion against theirs that I offer these few remarks. The publication in the "Birds of Herefordshire," of a distinct statement of the occurrences of *Picus martius* in that county has re-opened the question, and as the statement has called forth many letters on the subject, it has seemed to me worth while to notice the reported occurrences of this bird in this paper, alluding principally to those mentioned in the "Birds of Herefordshire," in the hope that its omission from the List of British Birds may be reconsidered.

First, I must mention Mr. Harting's list in his well-known and useful "Handbook of British Birds." There he enumerates thirty-three instances of its reported appearance, out of which eight are considered to be doubtful. Professor Newton, however, who seems to have taken great pains in the matter, states, in the 4th edition of Yarrell's Birds, that Mr. J. H. Gurney has critically revised this list, and has completely disposed of the claims set up in *nearly* every instance. I may, however, point out that the two shot at Nottingham, and referred to by Macgillivray, whose name carries considerable weight, seem to have been certified by the person who procured them.

I next come to those instances recorded in the "Birds of Herefordshire," and which have attracted far greater attention than anything else in the book, as evidenced by the controversy which has arisen on the subject. The statements of the Rev. Clement Ley are undoubtedly of the greatest value, because he has heard the cry of the bird when on the Continent, and even an adverse critic says that his statements are deserving of the greatest consideration. The Rev. Clement Ley states with great distinctness that he saw *Picus martius* in Ruckhall Woods, Eaton Bishop, about the year 1874, in company with Mr. Edward W. du Buisson, that he and his daughter also saw it and heard it at Mount Edgecombe in Devonshire in 1876, and that he heard its cry twice unmistakably in Pengetbley Gorse, Ross, once unmistakably in the parish of Fownhope (certainly a most likely place), and once dubiously, distant, and uncertain, in the parish of Little Doward; and what is of the utmost value in cases like this, he adds, he possessed the faculty, and still retains it, of never forgetting the note of any bird which he has once heard, and he points out that without the knowledge of this note (and I quite agree with him) he would have been unable to recognise the bird. He graphically adds:—"Can any sane man have mistaken *Picus martius* flying at less than twenty yards distance towards the north-east of the observer, the sun being in the

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west, for any other bird?" That is a question which appears to me to require a great deal of answering. Unfortunately the state of Mr. Ley's health is, I regret to learn, very feeble, or a paper from him instead of myself would have been very highly appreciated.

Mr. D. R. Chapman, another member of the same Naturalists' Club, and an observer of considerable experience, states that he saw a Black Woodpecker at Belmont, about a mile from where Mr. Ley saw it, in the spring of 1879. To make sure he crawled along the meadow for some sixty or seventy yards, and was rewarded by a clear view of the bird.

Captain Mayne Reid also states that in 1880 he saw two specimens in the woods near Frogmore, Ross, and has noted the occurrence in "The Naturalist in Siluria" (p. 46). As he has given great attention to Natural History, his statement is deserving of consideration. See "The Zoologist" for May last (p. 46).

Lastly, I come to the bird seen by myself and one of my sons as it was flying from an oak at Dinas, near Brecon, on Whit Monday, 1885, and reported by me in "The Zoologist" (1885, p. 305). I certainly should not have noticed it but for its cry, which was most startling, loud, and resonant, and quite unlike anything I ever heard before or since, although I have been a field naturalist for thirty-five years. This cry was very like the cry of the Curlew when unexpectedly disturbed (omitting the "*Courlee*"), but was louder and more weird-like, and I think I may add, almost human in its shrillness. I admit that this cry is most difficult to describe, and, although the Rev. Clement Ley says that it would not have occurred to him to compare it to the startled cry of the Curlew, still he agrees with me in the main. That it was a Woodpecker, and a Black one, I have no doubt. And if it was not *Picus martius*, what bird was it? I omitted to state that it flew with a bold sweeping flight, and with its tail slightly forked. I heard its cry twice afterwards, but saw it no more.

It must not be forgotten that the Bird at Ruckhall Wood was seen in the month of June, that in Devonshire in the month of April, that at Belmont in the spring, that by myself in Dinas, Brecon, on the 25th of May, whilst no date is assigned to Capt. Mayne Reid's specimens; and, although the Rev. Clement Ley says that the evidence against the supposition that *Picus Martius* is migratory seems to him overwhelming, yet the circumstances of the above occurring in the spring and early summer are certainly worth noting. Probably it is more silent in winter, but possibly it may be a stray summer visitant. I think, moreover, that it is almost impossible that the observers in the cases I have quoted could have been mistaken in every instance. It may be remarked with a great deal of truth that most of this has been said, and better said, before. I admit that there are links of evidence yet wanting, and probably most people will agree that the production of a freshly-killed British specimen in the flesh will alone settle this much-disputed question.

Trace!
12 OCT. 92

