WNFC Field Meeting 14 May 2022 Geology of North Malvern with Moira Jenkins

With Moira Jenkins as leader for the day, twelve Club members met at Tank Quarry, North Malvern. The trip started by examining the rock displays close to the parking area (Fig. 1). Before moving on, the group admired the far-reaching views across the East Malvern Fault with the Lickey Hills in the background (Fig.2).

Figure 1. A clear example of a granite sill in rocks near the parking area at Tank Quarry. (Photo. Stephen Harker)

Figure 2. The view across the East Malvern Fault with the Lickey Hills in the background. (Photo Stephen Harker)

Moira led the group past the clock tower to the North Quarry carpark and into the wooded area cloeby. At the back of this is a fine exposure of a fault line which branches off the main East Malvern Fault. Movement took place during the Triassic and there is a fault breccia against the surface of the Precambrian Malverns Complex rocks. The breccia contains angular fragments of the Malverns Complex. This surface is now covered in moss (Fig.3) On part of the surface slickensiding can be seen with the grooves on the rock showing the direction of movement on the fault (Fig.4).

From here the group walked on up the track to reach Ivy Scar rocks where the curved rock surfaces are believed to show the lines of flow of the magma as this microdiorite was intruded (Fig. 5).

Figure 3. The breccia contains angular fragments of the Malverns Complex. This surface is now covered in moss (Photo) Stephen Harker

Figure 4. Grooves on the slickensiding show the direction of movement of the fault, (Photo, Stephen Harker)

Figure 5. Ivy Scar rocks. The curved surfaces indicate the lines of flow of the magma as this microdiorite was intruded. (Photo by Stephen Harker)

The group walked on to visit Dingle Quarry which has many interesting types of igneous rocks intruded at different episodes (Figs 6 and 7). The quarry overlooks Green Valley where the granite is decomposing – a process called kaolinization. The deep steep sided valley is eroded along a fault line perpendicular to the line of the hills. It is terminated by a north-south trending fault which runs between North Hill and Table Hill and then down Dingle Valley. We went on up and over the crest of the hills and descended Dingle Valley. Dingle Quarry has many interesting types of igneous rock intruded in different episodes (Fig. 6). Fig. 7 shows the top of a dolerite sill with granite above. There is a chilled margin of the dolerite showing that it was intruded against cold rock. Calcite crystals have formed along the junction.

Figure 6. Dingle Quarry: There are granite dykes intruded into dioritic rocks. (Photo Stephen Harker)

Figure 7. A Woolhope Club member examines the calcite crystals which formed along the junction of the dolerite sill and granite (Photo Stephen Harker)

After a brief lunch stop, the party continued along a path on the west side of the hills (Figs 8-9). Moira pointed out an unconformity between the Silurian and Precambrian rocks. She explained that there was a sea shore here about 440 million years ago when beach deposits were laid down against the Precambrian rocks. Since that time, at the end of the Carboniferous, the Malvern Hills were pushed upwards and the originally horizontal rock layers have been tilted steeply to the west.

Figure. 8. The view to the north west shows ridges of Much Wenlock and Aymestry Limestone.

Figure 9. The party with End Hill in the background.

The group walked on up and over the top of the hills to descend the Rocky Valley. This valley is floored by periglacial scree formed by frost shattering in the Ice Age (Fig 10). The final stop was made at Waterworks Quarry where there is a fault gouge in the back face (Fig. 11).

From there the party walked back to Tank Quarry for refreshments and the journey home.

Figure 10. The group in Rocky Valley.

Figure 11. The party examining the fault gouge in the back face of the Waterworks Quarry.

Moira Jenkins