indicates that the rocks crystallized some time between 3×10^9 and 4×10^9 years ago. Allowing for uncertainties in the determination, the report says, this means that some of the rocks may be older than the oldest rocks found on the Earth. Going by the presence of cosmic ray nuclides, the rocks have been no more than a metre beneath the surface for the past $20-160 \times 10^6$ years.

The rocks can be classified into two categories: the fine and medium grained igneous rocks which were once probably lava flows and which have been broken up by impact, and what are called breccias which have a more complex history. The volcanic rocks contain typical gas cavities and recognizable minerals. One specimen is described as 53 per cent clinopyroxene, 27 per cent plagioclase, 18 per cent opaque material chiefly ilmenite, 2 per cent of other translucent material, and some olivine. The figures take no account of the 15 per cent of the sample which is made up of vesicles between 1 and 3 millimetres across. Grains of olivine can be as long as 0·5 mm, but in general the grain size is between 0·05 and 0·2 mm and the report says that in many ways the rock is like some terrestrial olivine-bearing basalts. Other volcanic rocks in the sample are less fine grained, with grain sizes going up to 3 mm. Typical composition for these medium grained rocks is 46 per cent clinopyroxene, 31 per cent plagioclase, 11 per cent opaque material (again chiefly ilmenite), 5 per cent crystobalite, and 7 per cent of other material including an unidentified yellow mineral and a colourless phase of high refractive index. These rocks do not contain olivine. The breccias are described as mixtures of different rock types with most fragments smaller than 0·5 cm, and a large number of fragments show microfractures and vitrification. They seem to be consistent with impact ejecta.

All the rock samples are characterized by small surface pits lined with glass, areas of splattered glass and whitish markings which are small areas of microfracturing. Each of these three factors points to erosion by the impact of small particles. What is more, many of the rocks have a rounded, eroded upper surface, but are flat or angular on the protected under side.

Roughly half the returned material is classified as fine material—the lunar soil—consisting of glasses, plagioclase, clinopyroxene, ilmenite and olivine together with occasional spheres of nickel–iron. The glasses make up about half the fine material, and are divided into three types: (1) botryoidal, vesicular and globular dark grey fragments, (2) angular fragments with refractive indices of about 1·5, which are pale, colourless, or occasionally brown, yellow or orange, (3) spheroidal, ellipsoidal, dumb-bell, and teardrop shaped fragments which can be red, brown, green or yellow and with refractive indices from 1·6 to 1·8.

The fine material contained two core samples, one of 10 cm and the other of 13·5 cm. There was no obvious change of particle size with depth in either case, but one of the cores showed a 2 to 5 mm layer of lighter colour 6 cm from the surface. The upper boundary of the layer is sharp but the lower is less well defined.

A rare-gas analysis of the soil indicates that they contain inert gases which probably come from the solar wind. Samples from within the breccias also contain the same gases and this indicates that the breccias must have been formed out of surface material.

Unfortunately for followers of Gilvarry, there are no secondary hydrated minerals in the material, and the report says this rules out the presence of surface water at the landing site since the rocks were exposed. And the authors of the report say they are being generous when they place an upper limit of one part per million on the amount of organic matter present.

There is every reason to believe that the surface at Tranquillity Base is as reasonable a sample of the Moon as one can get from a single landing. Although there are faint rays in the area from the craters Theophilus, Alfraganus and possibly Tycho, none of them crosses the landing site. Many of the fragments may have come from small craters in the neighbourhood —there was a 180 metre diameter crater 400 metres east of the landing site and the whole area was pockmarked with craters from centimetres to tens of metres across. Craters less than 1 metre deep have floors of fine grained material, but a 4 metre deep crater which Armstrong visited had larger rocks on the floor and the suggestion is that the floor must have been close to the underlying bedrock.

Apollo Down to Earth

The Moon has finally come to Britain. Dr S. O. Agrell of the University of Cambridge and Dr P. E. Clegg of Queen Mary College, London, arrived at London Airport early on September 19 carrying the initial 105 g of dust in something like a shopping bag, variously reported to have been bought the day before for thirty shillings, and later that morning the white plastic containers holding the samples were formally unveiled at a press conference at the Science Research Council. After the festivities, conducted by Professor Sir Brian Flowers (chairman of the SRC) and Professor V. C. Wynne-Edwards (chairman of the Natural Environment Research Council) and watched over by two shirt-sleeved policemen, the samples were rushed away to the fourteen groups concerned for work to begin.

During the succeeding weekend, the Museum and Institute of Geological Sciences in London exhibited Dr S. H. U. Bowie's allocation of lunar material, drawing what were apparently unprecedented numbers of visitors. Another display, at Queen Mary College, may have attracted less publicity but provided a videotape show explaining what the college was going to do with its dust as well as showing the substance itself.

There is more to come yet from Apollo 11—the first batch, entirely dust, made up about a third of the total that is due to be sent to Britain, and the larger fragments, which include polished sections and chips of rock, will follow when they are ready. As for Apollo 12, Dr K. C. Dunham of the Institute of Geological Sciences said at the press conference that the list of proposals for the present samples were all the good ones that came to mind, but Professor S. Tolansky of the Royal Holloway College, London, has hopes of finding diamonds if the next visit brings back rocks from the edge of a crater. Should these turn up, they would help in clarifying the question of whether the craters are of meteoritic origin.