XV. *The Mineral Albertite, Strathpeffer, Ross-shire.*

By W. Morrison, M.A., &c.

(Communicated by the Rev. W. W. Peyton.)

[Read June 24th, 1884.]

Chemical Composition.—This body is a hydrocarbon which has been classed under the Asphalt group; but, unlike Asphalt, it does not melt at 100° C., nor is it at all soluble to the extent Asphalt is in such solvents as ether, oil of turpentine, benzol or carbon disulphide. When heated in a closed tube it shows incipient melting after intumescing, but, at the same time, it decomposes into its constituent gases. This chemical change takes place at 300° C. In the above solvents about 5 per cent. of bitumen is obtained. Carbon disulphide softens the mass throughout to a pasty consistence.

In 100 parts of Albertite there are of—

Volatile matter	62·00
Fixed Carbon	37·00
Water	·60
Ash, Sulphur	A trace.

Detailed analysis by Prof. Penny, C=79·75, H=8·12, N=1·63, O=10·30, Ash= ·20.

The chemical composition given by Boussingault for the black insoluble residue of Asphalt is C=75·5, H=9·9, O=14·8—giving the formula $C^7 H^{11} O$, and answers so far to the foregoing analysis by Penny, which I obtained from Sir James Mackenzie, Bart., of Findon, for whom the analysis was made. Albertite does not, however, behave like Asphaltene when treated with oil of turpentine. It does not easily dissolve, like Asphaltene, in oil of turpentine, or in naphtha, nor does it easily melt without decomposition at 300° C.

Physical Properties.—It becomes negatively electric by friction like amber and jet. It differs from jet by its superior lustre and conchoidal fracture. This lustre it loses after some use. It has been made into ornaments like jet, but its lack-lustre and brittleness are defects. It is much more porous than jet. Under the microscope it shows fine lamination on edge. The streak is black, not blackish-brown as in Asphalt.

The specific gravity of Albertite is 1·089, that of Asphalt is from 1·00 to 1·60. Altogether on chemical and physical grounds it must be ranked as a distinct genus of the hydrocarbon or mineral resins, intermediate between the coals and the asphalts. I consider it to be an oxidation product of petroleum.

Geological Position.—In the Strathpeffer district, Albertite is found in veins, of thicknesses varying from the thinness of writing paper to two and three inches thick. The veins in all cases are vertical or nearly so, and run horizontally east and west—strange to say in one invariable direction, no matter what the geological formation may be in which they are found, whether that be gneiss, micaceous sandstone, or conglomerate.

Attention, it seems, was directed to the existence of this mineral in 1825, by Witham (who visited Strathpeffer the previous year), in a paper read before the Wernerian Society of Edinburgh. According to Jameson's description of Asphalt, Witham classed Albertite as Asphalt, and specifically termed the Strathpeffer variety a "slaggy mineral pitch." Witham expressed astonishment at finding such a mineral in "primitive rock." The same mineral, according to Dawson (known as "Albertite" since his description of the variety found in Albert County, New Brunswick), is found at the base of the Carboniferous formation.

Between the gneiss, or metamorphosed Silurian of Murchison and Geikie, in which this mineral is found at the head of Strathpeffer Valley, and the compact micaceous and calcareous sandstone, in which it again appears farther down the valley, is that deposit of the bituminous shales which supply the famed Spa Wells of Strathpeffer with their characteristic constituents of sulphuretted hydrogen, and salts of magnesia, lime, &c. These shales are strongly impregnated with bituminous matter in the neighbourhood of the Albertite veins, and are thus suggestive of having a common origin with the mineral in question. Whether the bituminoid matter be the source of the mineral, or both are from a common origin, the fact of the presence of the mineral in the gneiss underlying these shales leaves open to question.

No Albertite veins are seen in the shales proper, and, where found, no bituminoid matter saturates the rock in which these veins are seen. The cracks in the Conglomerate of the Old Red, which in this district overlies the micaceous sandstone and the shales, and not underlying these, as commonly believed—are cut as clean, and sheer down through the mixed mass as if made by some gigantic knife. Those cracks only which run east and west contain the Albertite, quite as pure and as compact as in the

underlying sandstone. In cracks running in other directions no Albertite is found.

I am disposed to think that the shales interjacent between the underlying gneiss and the overlying sandstone and still higher conglomerate received their bituminoid matter from the same hypogene source, whatever that may have been. Doubtless superheated steam and air played a principal part in the process. The hydrogen, nitrogen, and oxygen of the substance are easily accounted for by this hypothesis, but whence the carbon?