glass, with numerous closed, often elongated, vesicles, and with a few individualised mineralogical elements. This variety is rich in silica, and hence is referred to the lithological types of liparite or trachyte. The minerals which are embedded in the vitreous mass, or project from the weathered surfaces, are sanidine, plagioclases, black mica, augite, and magnetite, and with the microscope many microliths belonging to the same species can be observed. Quartz is very rare; sometimes rhombic pyroxene is present.

A second variety, but less abundant than the liparitic variety, is that known as *andesitic pumice*. In external characters andesitic pumice stones nearly approach the liparitic ones, and might at first sight be confounded with them; they have the same grey colour, are sometimes fibrous, and decompose in the same way. They are especially distinguished by the minerals which they contain, the most important being augite, plagioclases, and magnetite, while microliths of augite and hornblende are sometimes seen in the transparent base. Olivine is absent, and the silica in this andesitic pumice is estimated at 60 per cent. A specimen of this variety, from 2300 fathoms in the North Pacific, was analysed, with the following results:—

Station.	Depth in Fathoms.	No.	Loss on Ignition.	SiO_2	Al_2O_3	Fe_2O_3	MnO_2	CaO	MgO	K_2O	Na_2O	Total.
241	2300	80	4·95	60·95	15·97	9·08	g.tr.	2·92	1·40	1·61	2·34	99·22

The surface of the fragment analysed was extremely friable—almost earthy. Beneath this decomposed layer the centre was still formed of a whitish mass, having the appearance of a fresh rock, but, as shown by the analysis, especially by the percentage of water, which rises to nearly 5, this central portion had also undergone a profound alteration.

A third variety of pumice met with in deposits is *basaltic* or *basic pumice*. In a large measure we owe our knowledge of the nature of this variety of pumice to the investigations of Cohen[1] on the lavas of the Hawaian Islands and of Niafou in the Friendly Islands, as well as on some floating pumice collected between New Britain and New Ireland. He has pointed out that volcanic products from several areas of the Pacific far removed from each other have a true basic character, and belong to the basaltic glasses. The pumice stones collected from numerous stations in the Pacific during the voyage of the Challenger have exactly the same characters as those described by Cohen. These are vitreous vesicular rocks of a rather deep colour, yellowish or approaching to bottle-green. The pores affect in general a more rounded or spherical form than those of the preceding varieties of pumice. The vitreous partitions between the vesicles are not very thick, and when the specimens are but little altered they show

[1] E. Cohen, "Ueber Laven von Hawaii und einigen anderen Inseln des grossen Ocean, etc.," *Neues Jahrbuch für Mineralogie, etc.*, Jahrg. 1888, Bd. ii. p. 23.