few vesicles to the bulk of the rock, and the scoriaceous varieties contain many, so many as to make the rock light. Pressure of much overlying lava prevents vesiculation, and this takes place, therefore, near the surface; but it is not ascertained what amount of pressure so limits it.

241.

Vesicles in basalt at Kiama. D. '49.

Ordinary vesicles are usually oblong, rather than spherical, unless the size is quite small; no distinction between those made in volcanoes by different kinds of vapors has been observed. But in some streams of igneous origin (as in the trap of the Connecticut Valley) they sometimes have the form of slender cylinders, 2 or 3 inches long; and such elongated forms imply great expansive action at the moment of vaporization, and therefore point to the vaporization of liquid carbonic acid as the cause.

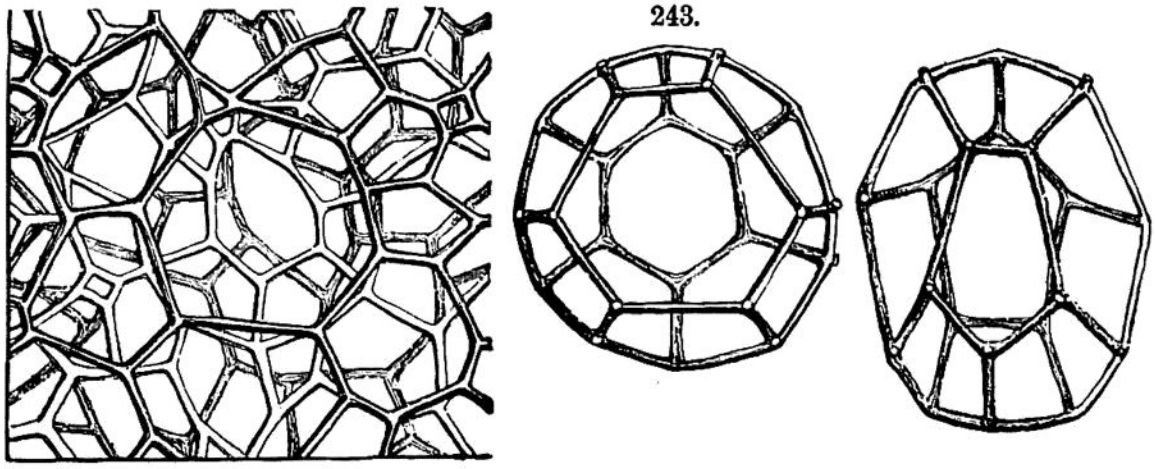
Oblong vesicles sometimes are pointed at one end, and thus show the direction of movement — that of the blunt end; an example from Kiama, New South Wales, is here represented.

The lightest of all kinds of scoria, called "thread-lace scoria," has the thin walls reduced to mere threads, as in the annexed figures of a specimen obtained at Kilauea. Fig. 242 represents a portion of the scoria, magnified 30 times. Figs. 243 and 244 show two forms presented by the more regular of the cells. The form of Fig. 243, which has 12 sides besides the two bases, is the most common. The natural size of the cells is $\frac{1}{30}$ to $\frac{1}{40}$ inch, though

242.

243.

244.



Thread-lace scoria, from Kilauea. ×30. D. '88.

some are much larger. This scoria contains only 1·7 per cent of its bulk in rock-material, and hence a layer of glass one inch thick would make a layer 60 inches thick of the scoria; and 1·2 per cent of moisture in the glass by weight would suffice to produce it.

The light glassy scum of the lava of the Kilauea lava-lakes (like the scum on fermenting molasses) flows off as the top of each outflowing stream, and cools as a separable