fibers, as if on crystallizing in these dendritic forms the latter mineral had drawn the feldspar into parallel position with it." Fig. 253 represents the facts well, as the feldspar crystals are larger than usual. Fig. 252 shows one large ordinary crystal of pyroxene below the tuft. Figs. 254–256 represent some of the microlites in the basalt-glass of the region. (E. S. D., 1888.)

In the consolidation of igneous rocks a more decided concretionary structure sometimes results. This is especially true of glassy or semi-glassy kinds, which often contain *spherulites*, having more or less distinctly a radiately fibrous structure. Spherulites appear to differ little from the radiate concretionary forms common in manufactured glass which has been artificially devitrified. (Rutley, 1890.) Some spherulites are in part separated peripherally from the inclosing glass, as if formed within "lithophyses" or vesicles. (Iddings, 1888.) See page 337, beyond, under Metamorphism. A concretionary form in dioryte is represented on page 97.

(*b*) *Volcanic bombs.* — Volcanic bombs are roundish or ovoid masses of lava, concentric in structure. They sometimes have a center of chrysolite, or of the more scoriaceous lava. They occur on Hawaii in connection with the *aa*, and are of various sizes, from one inch to ten feet or more in diameter. They are produced on Hawaii by the rolling movement of the front of the stream due to friction at bottom. It is possible that the same kind of movement in the ordinary lava-stream may produce them; but on Hawaii they are found only in *aa* lava-fields; one is shown in Fig. 249 at *a*. Johnston-Lavis gives essentially the same general explanation of the origin of some bombs observed by him about Vesuvius. The bombs of the Eifel region, in many of which chrysolite makes the center, have been supposed to be projected bombs; but in view of the above facts this may be questioned. Projected blocks of ordinary lava are not bombs, but merely projected blocks.

(*c*) *The opening of subordinate or lateral volcanic cones.* — Cones of eruption often form over fissures during the progress of an eruption from the fissure. Each such cone, when it is in progress, has its own lava-conduit, as a branch from the general lava-conduit of the mountain. But it is relatively small, and its liquid lavas consequently may soon become chilled by the cold rocks about it; and hence such lateral or subordinate volcanoes have usually a brief existence. They, however, often work hard during their short life, and even in two or three weeks may make a cone many hundred feet in height.

Such cones occur about the sources of great eruptions; but they are most common near the seashore, where subterranean fresh waters most abound for the supply of moisture, and where the sea is at hand as another source. They may be either cinder-cones or tufa-cones, but are most likely to be the latter if near the seashore. The volcanic origin of such cones can be proved by the *pericentric* arrangement of the materials constituting them. The sea, with its broad waves and the aiding winds, can make heaps or ridges out of the sands existing or produced on its borders, but it cannot arrange the layers of sand or earth pericentrically into a