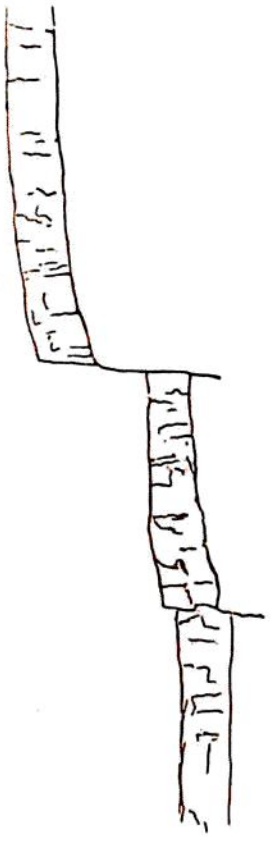
The principal kinds of ore deposits that have no relation to veins are as follows: —

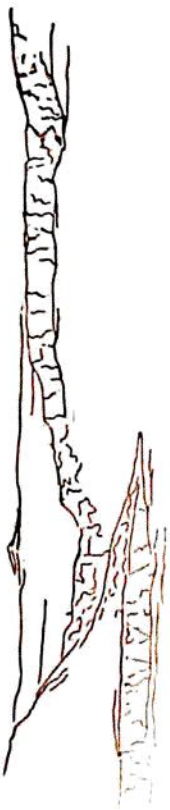
(1) Beds of iron ore called limonite, including marsh-made ores (page 128), sometimes containing also manganese oxide, cobalt oxide, and some black copper oxide; (2) beds consisting of concretionary masses of clay iron-stone, the ore either hematite, limonite, or siderite, — common in coal regions; (3) beds of hematite and magnetite in metamorphic and other rocks, which often stand vertical and look like veins, whence they are sometimes so called; (4) auriferous gravel deposits along valleys, made by the degradation of schists that are intersected by veins of auriferous quartz.

4. *Sediment-filled fissures.* — Fissures have sometimes become filled with sand or gravel from the adjoining beds. Near Astoria, Oregon, occur several large sandstone veins of this kind. One of them, half a mile above that place (Fig. 318), is five feet wide, and extends the whole height of the bluff; it has two transverse faults, the upper one eight feet. The filling is granitic sandstone, like that of the inclosing rock. Another, 18 inches wide, is shown in Fig. 319; it is in the same rock two and one half miles above

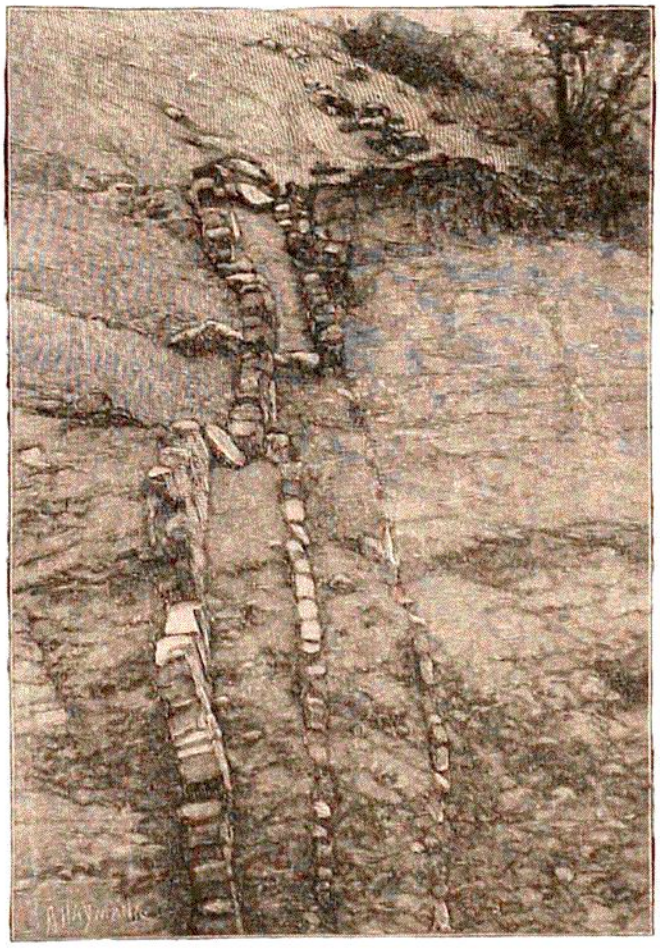
318.



319.



320.



Figs. 318, 319, sandstone veins, near Astoria, Oregon. D., 1849. Fig. 320, sandstone veins, south of Shasta Peak. Diller, 1890.

Astoria. Fig. 320 represents similar sandstone veins from the coast region in California, south of Mount Shasta, described by J. S. Diller (1890). Diller infers, from his observation, that the fissures were filled from below by upthrust force during the progress of an earthquake.