

mian conglomerates which lie at the base of the Ural Mountains, although large quantities of iron and copper detritus are mixed with the pebbles of those Permian strata. Hence it seems that the Uralian quartz veins, containing gold and platinum, were not formed or certainly not exposed to aqueous denudation during the Permian era.

In the auriferous alluvium of Russia, California, and Australia, the bones of extinct land-quadrupeds, have been met with, those of the mammoth being common in the gravel at the foot of the Ural Mountains, while in Australia they consist of huge marsupials, some of them of the size of the rhinoceros and allied to the living wombat. They belong to the genera *Diprotodon* and *Nototherium* of Professor Owen. The gold of Northern Chili is associated in the mines of Los Hornos with copper pyrites, in veins traversing the cretaceous-oolitic formations, so called because its fossils have the character partly of the cretaceous and partly of the oolitic fauna of Europe.* The gold found in the United States, in the mountainous parts of Virginia, North and South Carolina, and Georgia, occurs in metamorphic Silurian strata, as well as in auriferous gravel derived from the same.

Gold has now been detected in almost every kind of rock, in slate, quartzite, sandstone, limestone, granite, and serpentine, both in veins and in the rocks themselves at short distances from the veins. In Australia it has been worked successfully not only in alluvium, but in veinstones in the native rock, generally consisting of Silurian shales and slates. It has been traced on that continent, over more than nine degrees of latitude (between the parallels of the 30° and 39° S.), and over twelve of longitude, and yields already an annual supply equal, if not superior, to that of California; nor is there any apparent prospect of this supply diminishing, still less of the exhaustion of the gold fields. It seems reasonable, therefore, to share the anticipations of M. Delesse that the time will come, and cannot be very remote, when a marked depreciation will be experienced in the value of this metal.†

It has been remarked by M. de Beaumont, that lead and some other metals are found in dikes of basalt and greenstone, as well as in mineral veins connected with trap rocks, whereas tin is met with in granite and in veins associated with the granitic series. If this rule hold true generally, the geological position of tin in localities accessible to the miners, will belong, for the most part, to rocks older than those bearing lead. The tin veins will be of higher relative antiquity for the same reason that the "underlying" igneous formations or granites which are visible to man are older, on the whole, than the overlying or trap-pean formations.

If different sets of fissures, originating simultaneously at different levels in the earth's crust, and communicating, some of them, with volcanic, others with heated plutonic masses, be filled with different

* Darwin's *S. America*, p. 209, &c.

† *Annales des Mines*, 1853, tom. iii. p. 186.