

bonates. These are found in metamorphic rocks, in the Trias and the Tertiary. Immense quantities of native copper are mixed in the Lower Silurian and Huronian rocks about Lakes Superior and Huron.

The only ore of lead, of much importance, is the sulphuret. This is found in the Laurentian series, in both the stratified and unstratified rocks: in the Hudson River group, especially in the Western States; but it exists also in the Mesozoic system.

The deutoxide of tin is the principal ore of that metal. This is most commonly found in the oldest formations of gneiss, granite, and porphyry; also in the porphyries connected with red sandstone. It is found likewise in quantity sufficient to be wrought in Drift.

Of zinc the most abundant ore is the sulphuret, which is commonly associated with the sulphuret of lead, or galena. Other valuable ores are the carbonate, silicate, and the oxide, which occur in Mesozoic rocks.

The most common ore of antimony, the sulphuret, has hitherto been found chiefly in granite, gneiss, and mica schist.

The principal ore of mercury, the sulphuret, occurs chiefly in New Red sandstone: sometimes in a sort of mica schist.

Silver in its three forms of a sulphuret, a sulphuret of silver and antimony, and a chloride, has been found mostly in Hypozoic and Palæozoic slates; *sometimes in a member of the New Red Sandstone series, and in one instance in Tertiary strata.*

Cobalt, bismuth, arsenic, etc., are usually found associated with silver, or copper; and of course occur in the older rocks. The other metals, which, on account of their small economical value and minute quantity, it is unnecessary to particularize, are also found in the older strata; frequently only disseminated, or in small insulated masses.

*Theory of the origin and distribution of Gold.*—Gold in its original situation occurs mostly in veins of quartz that traverse the older Palæozoic slates and schists, frequently near their junction with eruptive rocks. Sometimes also it is found in the latter. Talcose schist is the most usual gold-bearing rock; the rocks containing it are metamorphic members of the Silurian, Devonian, and Carboniferous series—especially the first. In European Russia, for example, the Palæozoic rocks, scarcely even yet solidified, contain no auriferous bands; but by following the same strata into the Ural Mountains, where they have been lifted up, and metamorphosed in conjunction with the intrusion of porphyry, greenstone, syenite, and granite, gold is seen to abound.

But at what period was the gold introduced? In the Mesozoic and Tertiary strata none, or scarcely none, is found, and yet those rocks were derived from the more ancient Palæozoic members. Moreover, the loose deposits of gravel and sand, derived in part from the same Palæozoic strata, are the chief repository of gold. Hence the conclusion is irresistible, that the older schists were not impregnated with gold, while the Mesozoic and Tertiary strata