

CONCERNING TELLURIDES.

From the Mining Journal, Railway and Commercial Gazette.]

The announcement that telluride ores have lately been discovered in depth in some of the West Australian mines has attracted a considerable amount of public attention, and whilst this fact, for such it appears to be, has been made use of for the purpose of, as far as possible, "booming" the properties upon which the finds have been made, the public have not as yet shown any symptoms of desperate eagerness to rush in and buy up the shares of these vaunted telluride properties. Possibly the public have come to the conclusion that what they want is gold, that a goldfield which at the end of ten years' hard work only produces 281,000 oz. can hardly make up any deficiencies with tellurium. We remember not more than a dozen or so years ago that the chairman of a gold-mining company gravely informed his shareholders that unfortunately the assay-value in gold of the ore had been very much lower than was anticipated; but, on the other hand, analysis showed their ores to contain a considerable percentage of aluminium, the presence of which would doubtlessly recoup them for the low yield of gold. The investing and even the speculating public is getting wiser nowadays, and we look upon the general desire to know what tellurides are as a hopeful sign. It is the best thing possible when shareholders in mines begin to take a real interest in the more technical portions of their subject. We hold this view so strongly that we propose to explain to-day what tellurides are, how they are worked, and where they occur, for the benefit of our unscientific and non-technical readers, and we shall ask our mining friends to excuse this statement of facts familiar to them, though, after all, they are not compelled to read this particular column, unless they perchance wish to refresh their memories.

Tellurides, then, or telluride ore, is the general term applied by miners to a series of minerals into the composition of which the rare element tellurium enters in considerable proportion. Tellurium itself presents many analogies to sulphur, and forms with many of the metals compounds known as tellurides, strictly analogous to the sulphides. There is, however, this curious fact about tellurium: that it is the only known mineraliser of gold—that is to say, that native compounds of gold and tellurium exist although gold is not found in nature combined with any other element. We are quite aware that certain authorities consider that gold occurs in combination with sulphur, but the evidence in favour of the existence of such a compound is far from clear, and upon the whole it seems more probable that there is not a native sulphide of gold than that there is. In the matter of the telluride there is, however, no doubt possible. We have, for instance, the mineral sylvanite, also known as graphic or graphic tellurium, a tin-white to steel-grey brittle mineral, consisting of gold and tellurium only in its purest form, though it contains at times small or large quantities of silver and lead. The other important telluride minerals are: Calaverite, a yellowish-grey brittle telluride of gold; nagyagite, a soft blackish-grey mineral, consisting chiefly of tellurium, lead, and gold, and some sulphur; hessite, a telluride of silver, with some gold; petzite, a telluride of silver, with much gold; there are besides other tellurides, such as altaite, a telluride of lead; tetradymite, joseite, and wehrlite, tellurides of bismuth; and a few other minerals of less importance, such as melonite and krennerite. Whatever their composition, all this list of tellurium minerals is especially characterized by its persistent occurrence in connection with gold, and in gold-bearing veins. Not only do a large number of the above tellurides contain gold as an essential constituent, but nearly or quite all of them at times contain gold as an accidental constituent, so that any of them on assay would show more or less of the precious metal; but, besides this, they are almost invariably accompanied by free gold. In veins containing tellurides those portions that show the largest amount of these minerals are almost invariably the richest in free gold, and specimens are known of such minerals as altaite, themselves almost free from combined gold, showing well-marked plates of native gold that have been deposited between the cleavage planes of the tellurium mineral. The intimate association between tellurium and gold is too marked and obvious to be overlooked, though it would be very difficult to assign its precise genetic meaning to this phenomenon, although no one doubts that it has a very important significance if we could only interpret it aright.

As far as we know, tellurides never occur in any quantity except in this intimate connection with gold; but it by no means follows that gold always occurs in association with tellurides, certain important gold-producing districts being quite free from these minerals. In Europe tellurides are chiefly known in the very important gold-mining districts of Transylvania, at Offenbanya, and Nagyag in Siebenbürgen, Schemnitz in Hungary, &c., in various localities in the Altai, and in small quantities at the Bremnæs Mine in Norway. As far as we know, tellurides do not occur in the Mysore goldfields, and their only known Asiatic occurrence so far is in the Choukpazat Gold-mines in Upper Burmah. We have no record of the occurrence of tellurides in Africa; they have not, we believe, been identified even in small quantity in the Witwatersrand conglomerates, in spite of the large number of minerals that have now been determined in these beds. In America tellurides are widely disseminated; they occur in numerous localities along the great Mother lode of California, especially on the Stanislaus and in Calaveras County; they have been found in numerous localities along the eastern gold belt, notably in Virginia and North Carolina; also, but more rarely, in Montana; and quite recently in the now well-known Cripple Creek district of Colorado. In South America tellurides are known in Brazil. We believe that tellurides have not hitherto been found in Australasia, the recent discoveries in Western Australia being the first, and serving still more to sharply differentiate the gold occurrences of Western Australia from those of the rest of that continent. It will thus be seen that the occurrence of tellurides in gold-mines is decidedly capricious; it occurs in some very rich districts and in some decidedly poor ones, whilst some of the most productive gold regions have never produced any tellurides at all. Upon the whole, it seems as though tellurium, whilst distinctly characteristic of gold districts, is apt to be found associated with low-grade rather than with high-grade ores. This is certainly the case