

This sort of ore-filling is comparable in some degree with ore-deposits in soluble rocks when the filling has passed from the space of discission proper into the rock, after room has been made for it in the latter by dissolution. In the cases before us such room was made by the partial washing away of the (probably clayey) cement of the breccias and conglomerates.

*Verespatak.*—The gold-district of Verespatak is situated at the north end of the second eruptive range. The two porphyry masses of Kirnik and Boi form a centre, around which sandstone and porphyry-tufa lie almost horizontally, and in part unconformably, upon folded Cretaceous sandstones below. The whole district is surrounded by a zone of trachytes, andesites, and their lavas, which once (as may be inferred from the fragments remaining on the porphyry and tufa) overspread the entire district, and have been removed by erosion, laying bare the two older eruptive masses of the porphyry.

A funnel-shaped depression seems to have been formed in the folded Cretaceous strata, from the middle of which ascended the porphyry-outflows, furnishing also the material for the porphyry-tufa which fills this funnel-shaped basin.

The principal gold-bearing rock is the porphyry, yet the tufas and the Cretaceous rocks near the porphyry-outflow carry gold, whereas no gold or ore of any kind occurs in the trachytic and andesitic lavas which once covered the region.

*Vulkoj.*—At Vulkoj, however, at the southern end of the second eruptive range, almost the opposite is the case. Here the older and deeper quartzose rock carries little ore, while gold abounds in the overlying andesites. Several mines of the Dacian gold district have encountered in depth the stratified rocks through which the eruptives came, and the result has generally been disastrous to the miner, the ore-veins having either ceased entirely or become pinched to barren fissures. In the first case it would appear that the vein-fissures had been formed by the contraction of the eruptive material. But, in general, it should be said that these phenomena are by no means clearly and reliably reported. The prejudices of the miners play too large a part in their reports. This much is certain, that any fissure, in passing from one rock to another, is likely to exhibit a certain irregularity in both direction and filling, and that a change of this kind should not be allowed to discourage at once all further exploration.

In some cases there has been found, below an eruptive rock containing ore-veins, a decomposed breccia of the same, which was quite barren. The great porphyry mass of Kirnik, at Verespatak, has been pierced through and through with ancient and modern workings like the pores in a sponge. In recent years deep adits have been driven into it to reach fresh ground, but with unsatisfactory results. A short time ago the deepest of these adits encountered in the nucleus of the Kirnik mass not the ore-bearing porphyry but decomposed clastic rock and porphyry-breccia, which may be supposed to be the filling of the crater-opening. The Vulkoj mass, which has been almost cut into two halves by very ancient open-workings along its crest, contained a series of N. to S. veins, the richest of which (the Jeruga) was cut in depth by adits from both sides. On the south side appears a slaty Cretaceous rock, underlying the porphyry, and extending (see Fig. 43) upon the Jeruga plane, with two offsets, to the deepest adit on the north side, where it strikes the decomposed breccias, in which the very rich ores mined above can no longer be found to continue.

As to the continuation of the veins in the slaty rock, the following facts are pertinent. West of the Vulkoj mass, in the sandstones and slates, there is another goldfield, that of Botesiu, the veins of which are analogous, both in strike and in ore-filling, to those of Vulkoj. Botesiu shows no eruptive rocks; nevertheless, a study of the whole region shows that the formation of its vein-fissures must have been connected with them, and it is even not impossible that they may once have extended as far as this, and may have been removed by subsequent erosion. It follows that we must assume the Vulkoj veins to extend below the andesite into the slate, though this has been doubted by some. Fig. 44 shows the situation in an E. to W. section.

In the region of Boitza the eruptive zone (predominantly of quartzose dacites or porphyries) crosses an exposure of Mesozoic limestones and melaphyrs, and the veins pass directly from the porphyry into the underlying melaphyr.

At Nagyag, Magura, and Füzesd, in following the gold-veins in depth, masses of Tertiary sandstones and conglomerates are formed, broken through and enveloped by the eruptive rocks.

At four places in the Dacian gold district—namely, Offenbánya, Faczebaja, Fericiel, and Nagyag—telluric ores occur. In the neighbourhood of Zalatna there is cinnabar, and at several points near Körösbánya there are copper-ores carrying a little gold. Gold is, however, mainly connected, as has been observed, with the four ranges of Tertiary eruptives, and appears chiefly in these rocks, though also in the stratified rocks which they traverse.

The occurrence of gold in this case is thus somehow related to the eruptions; but as it has not been found as a primitive or idigenous constituent of these rocks, it is not to be supposed that it was derived originally from them. There is, therefore, nothing left but to consider the eruptions as the agents of a communication with the deep region, from which at these points the mineral springs ascended. The Dacian gold district will furnish, upon further explorations, important contributions to the inquiry into the original source of the gold. For instance, if the auriferous character of the veins of Vulkoj should be found to continue in the shaly sandstones underlying the andesite, my view would be confirmed.

*The Comstock Lode.*—The most thoroughly studied American vein-phenomena bearing on this question are doubtless those of the Comstock Lode. It is not necessary to enter here upon a detailed description. As already observed, the general geological conditions of the Comstock Lode show a strong analogy to those of the Schemnitz district. Only occasional bodies of sedimentary rocks are found, while the principal mass of the whole elevated region consists of a great variety of eruptive rocks, principally of the more recent periods. The altitudes of the more important points above sea-level are about as follows:—