So far as the sources of the eruptive rocks can be inferred, they were all (except that of the diorite) on the hanging-wall side of the vein, as were also the mineral springs which subsequently decomposed these rocks. But the ascending thermal waters encountered in these mines were within the vein itself; whence it may be concluded that the ore-bearing solutions came by that road from the deep region, and not, according to the lateral-secretion theory, from the side. In other words, the Comstock ores were not washed from those rocks which have been mined between 7,941ft. and 2,986ft. above sea-level, but from material lying much deeper.

The investigations of G. F. Becker were made at a time when importance was still attached to Sandberger's theory, and the correctness of his method of inquiry was assumed. The matter takes a different aspect when we (quite justifiably) doubt whether the minute metallic admixtures detected by wet or dry analysis were originally in the rock, and acknowledge that they may possibly have entered it afterwards. This is evidently the case with the precious metals in the pyrite of the ore-bearing rock. That this pyrite is a secondary impregnation can be proved with the microscope, and is admitted by Becker also. In my opinion, any eruptive rock may give rise by metamorphosis to the type which we call in Hungary greenstone, greenstone-trachyte, &c., and which F. von Richthofen named propylite, because of its frequent occurrence as the country-rock of ore-deposits. Whether the precious metals can be detected in this rock depends wholly upon its impregnation, or that of one of its constituent minerals, with pyrite. But it does not follow that this was the primitive condition. From this standpoint are to be regarded the metallic values reported by Becker, and here reduced, for the sake of better understanding, from cents per ton to grammes per 1,000 kilogrammes. A pyrite washed from decomposed diabase, near the face of the north branch of the Sutro Tunnel, contained 3 cents silver and 8 cents gold—*i.e.*, 0·72 grammes silver and 0·12 grammes gold—per metric ton. The pyrites from the slates in the Belcher Mine carried even 4·32 grammes silver and 0·30 grammes gold. Fresh diabase is said to have contained 0·6 to 0·7 grammes of gold; the diorite of Bullion Ravine, only a trace; while the andesite yielded about as much as the diabase. Augite separated by Thoulet's method from the diabase was found to be eight times as rich as a corresponding quantity of the feldspar.

Comparative investigations are reported to have shown that the decomposed diabase contains only half as much silver as the fresh—a circumstance which was interpreted in favour of the lateral-secretion theory, on the assumption that the decomposed diabase had given up half its silver to the vein-filling.

Since the diorite in the upper portion of Bullion Ravine shows only traces of silver, but at the mouth of the ravine, near the vein, contains a considerable amount, Becker considers this indicative rather of an impregnation of the rock proceeding from the vein.

Moreover, the andesites and quartz porphyries also contain small amounts of silver; whilst the strongly calcareous metamorphic diorite carries 1·92 grammes per ton, which might be connected with the vein-filling in the Justice Mine. Finally, the basalt contains nearly as much silver as the older diabase; but the basalt cannot be cited as a source, because it comprises the freshest rock in the district, and shows no trace of decomposition in its olivine. These facts would be favourable to the notion of lateral secretion, if only it could be proved at the same time that the metalliferous character was primitive. But our knowledge does not go so far as that; and the Comstock, like the deep mines of Przibram, ceases, therefore, to be a proof of the lateral-secretion theory.

The Comstock differs in many respects from typical ore-veins. It is properly a quartz vein in which, at various points, important ore-concentrations have been formed, not showing (except in the Justice Mine) any clear crustification, though this may have been present at some time, and may have been obliterated by metamorphosis of the vein-mass—*e.g.*, through the replacement of calcite by quartz. It is also, in the main, a contact-vein, between a diorite foot- and a diabase hanging-wall, with steep spurs running upward into the diabase and traversing also still more recent eruptives. Some of these peculiarities are represented in other districts.

2. Ore-deposits in Soluble Rocks.

In this group we shall find two genetic types represented—the fillings of spaces of dissolution, and the metasomatic deposits, the origin of which will be particularly considered, together with some related metamorphic deposits in soluble rocks which have not yet been sufficiently studied to be classed apart.

The expression "soluble rock" is to be understood in its ordinary sense of solubility in the waters commonly represented on the earth's surface. Acid and caustic waters will attack, more or less, nearly all rocks, though not so as to dissolve them completely, as we see limestone dissolved. We include especially among the soluble rocks, rock-salt, gypsum, limestone, and dolomite.

Rodna.—The ore-deposit of Rodna, in N.E. Transylvania, is interesting to me (apart from analogies which it offers with Leadville, Colorado) as the first to which my study of the origin of an ore-deposit by replacement was directed.

It is situated on the line of two andesite ranges, having a common strike—the Hungarian Vihorlat Gutine, stretching N.W., and the Transylvanian Hargitta Range, running S.E.—and at the point where this line cuts through the mass of the Rodna Alps. The predominant rock is mica-slate, with numerous intercalations of limestone, and is traversed by many dykes and masses of andesite. Ore-deposits have been found at many points in the district. The most important, situated in the Benyes Mountain, was carefully studied by me in 1862, after the ore-bodies in the mine had been worked out. J. Grimm had examined the mine in 1834, and had considered the deposits to be primitive beds at the contact between limestone and mica-slate, and to have occupied that position before the andesite eruption, by which they had been much shattered.

The ores (pyrites, black zinc-blende, and argentiferous galena, slightly auriferous, with quartz and calcite) often occurred, it is true, on the gently-dipping contact-planes; but in certain E. and W. lines they stood steeply, much like veins. In these places the flat deposit, and with it the