approximately parallel with the mountain axis, and filled with a clayey or fragmentary material full of striations and slickensides, and generally of dark colour.

*Andreasberg.*—Roughly parallel with these *ruscheln* run the silver-ore veins of Andreasberg, which carry the ore only on one side of the *ruscheln*, and lose their ore when they approach the latter. It was formerly imagined that the two main *ruscheln* enclosed a lenticular mass of the country, to which the silver-ores were confined; and H. Credner still expresses this view. But Kayser observes that the mines have disclosed a convergence of the *ruscheln* to the west only, and that a similar convergence to the east has been purely assumed from analogy, whereas the surface indications are rather those of a wider separation in that direction. (See Fig. 38.)

We have here a case in which the ores occupy, not, as in Clausthal, a previously-prepared zone of dislocation, but a network of veins. H. Credner has pointed out that the mineral solutions were unable to penetrate the walls of the dislocation-zones, and conceived in this connection that these walls enclosed a lenticular body of rock. But the main question concerns the origin of the more recent network of fissures. We must assume that, when the dislocation-zones were formed, the mineral solutions had no opportunity to enter them, because (as was the case in many great faults—*e.g.*, those of Przibram) no spaces of discission were formed. Afterwards, however, a second system of fissures originated, adjusting itself to the conditions created by the first, and producing rock-fragments, the relatively slight movement of which did not fill the interstitial spaces with the detritus of friction.

But, outside of the angle between the *ruscheln*, there are also veins which, considering their direction, may be continuations of the silver-veins inside, although, being differently filled, they are not so regarded.

It was formerly attempted to connect two eruptive rocks with the formation of these ore-veins: the granite which appears to the north, beyond the fault-fissures, and the diabase which touches them at many points to the south. The latter, however, is now considered to be a stratified layer in the series of the country. Both rocks have been passive in the formation and the filling of the fissures, and we must look again to the deep region as the source of the ores.

*(b.) Ore-veins in the Neighbourhood of Eruptive Masses.*

*The Erzgebirge.*—It would be impossible here to pass in review the innumerable veins of the *Erzgebirge*, in Saxony and Bohemia. Such a review will soon be furnished by the publication of a work on this subject by the eminent Saxon mining geologist, H. Müller (who has received the honorary title of "Gangmüller," to distinguish him from the many other Müllers of Germany). In this region veins in the greatest variety occur in gneiss, with here and there an eruptive dyke; but the latter can scarcely be considered as more than indications of a former communication with the barysphere.

Besides different porphyries and diorites, there is an occasional dyke of basalt. At Joachimsthal, in Bohemia, we can recognise Pre- and Post-Basaltic ore-deposition. We find here, as in many other districts, two vein-systems at right-angles; one striking N. to S., and accompanied with porphyry dykes; the other striking E. to W., and accompanied with dykes of basalt and (according to recent views) phonolite. The E. to W. fissures are occupied partly by basaltic dykes, partly by ore-veins which were deposited some before and some after the basalt, a satisfactory proof that the fissures were formed at the period of basaltic eruption. How far the basalt took part in the ore-deposition, however, has not yet been shown.

In the basaltic and "basalt-wacke" dykes of this district, at the considerable depth of some 984ft. below the surface, petrified tree-trunks were found, a fact which furnishes an analogy to the reported discoveries in the Bassick Mine, in Colorado.

*Przibram.*—An entirely different picture is presented by Przibram, in Central Bohemia, where we encounter not only a great structural fault, but also eruptive dykes, which are followed by most of the ore-veins.

In central Bohemia the general strike is N.E. to S.W. for all rocks except the diorite dykes, which strike N. to S., thus varying 45° from the prevailing direction. Above the granite lies, first, a formation of Pre-Cambrian slates; upon this follows unconformably the Cambrian system, consisting below of conglomerates and sandstones, and above of fossiliferous slates. Sections across the strike show repetitions of the Pre-Cambrian and Cambrian strata due to great faults, which likewise strike N.E. to S.W. (Fig. 40).

The one main fault, which has been exposed by mining to the depth of 3,600ft., is properly a so-called *wechsel*, by which the older stratum (in the hanging-wall of the fault) has been slid over the later stratum (in the foot-wall). Several other faults, similar in character, though not explored on an equal scale, occur in the district; and it may be imagined that, before this shoving together of the Palæozoic strata of central Bohemia, they must have occupied a much larger area than at present.

This main fault, called the "*lettenkluft*," is constituted by a zone of clay and crushed rock, from 6·5ft. to 33ft. wide. At Przibram itself the sandstones which contain the ore are succeeded in the hanging-wall side by Pre-Cambrian slates. A little further south-west, at Bohutin, granite appears on the hanging-wall of the *lettenkluft*—evidently, as the cross-section indicates, the granite foundation, here outcropping a second time, of the whole Palæozoic series.

Numerous N. to S. dykes occur, and in the ore-bearing zone they are so close together that some cross-sections show them to constitute almost one-third of the total rock-mass. The ore-veins are mostly in these diorite dykes. Only occasionally do they enter the stratified rocks, returning soon to the dykes they have left, or to others of the group. In dip also they mainly follow the dykes, so that we may here assert with confidence that the already-existing dykes determined the formation of the ore-bearing vein-fissures.

As already narrated in Part I., this district was made a test of Sandberger's lateral-secretion theory. Careful and repeated analysis showed the presence of metals in the rocks, but could not