

In enquiring next as to what geological formation in Europe most closely resembles the Upper Copper-bearing series of Lake Superior, the opinion expressed by Delesse ought not to be lost sight of, viz., that the constituent minerals have the same meaning and importance for eruptive rocks which organic remains have for those of sedimentary origin. Therefore, where the palæontological evidence does not entirely contradict it, that derived from lithological resemblance ought to be allowed its full weight. The melaphyres of the upper rocks being interbedded with conglomerates and sandstones, the age of the latter may be ascertained approximatively by enquiring under what circumstances and during what period the melaphyres of Europe were developed. Upon this point Naumann thus expresses himself: "With regard to the eruption-epochs of the melaphyres, there appears, indeed, to have been many of them, but the most occur in the period of the Rothliegende, or in the first half of the Permian formation, and all are probably more recent than the Carboniferous system. This applies at least to the melaphyres on the south side of the Hunsrück, to those of the Thuringian Forest, of the neighbourhood of the Hartz, of Lower Silesia, Bohemia, and Saxony. Many of these melaphyres were deposited soon after the commencement, others towards the end, of the Rothliegende period, and generally the latter, in many countries, shews a decided coincidence, both as regards time and space, with the formation of the melaphyres." Zirkel, in his recent work on "Petrographie," gives a description of the melaphyre deposits of Germany, of which the following is a translation: "In districts which are older than the Carboniferous formation melaphyre rocks are but seldom found. The melaphyres of the southern Hunsrück and of the Pfalz, whose stratigraphical relations are better known than their mineralogical composition, appear in the Carboniferous system or the lower Rothliegende. This melaphyre region extends from Düppenweiler to Kreuznach, a distance of twelve miles, with a breadth between St. Wendel, Birkenfeld, Kirn, and Grumbach of several miles. Very few irregular masses are known, but, on the other hand, numerous veins have been observed with thicknesses varying from four to sixty feet. They possess mostly a vertical dip, cut sharply the Carboniferous strata, and often extend on their strike considerable distances. The mass of the vein frequently encloses fragments of the side rock, slate-

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