

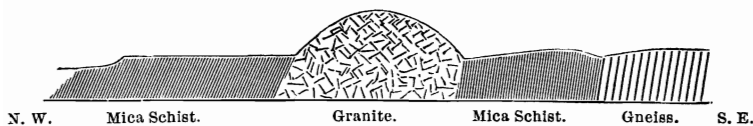
ART. XXIII.—*Note on a Fossil Coal Plant found at the Graphite deposit in Mica schist, at Worcester, Mass.; by JOSEPH H. PERRY.*

IN the eastern part of Worcester, there is a granite knoll rising about three hundred feet above the surrounding country, and surrounded on all sides by the formation referred to by Professor Edward Hitchcock as mica slate or mica schist. In this mica schist is contained the coal deposit of Worcester as to whose age there has been much doubt. Professor E. Hitchcock believed it to be much earlier than the coal formation at Mansfield and Wrentham; and Professor C. H. Hitchcock assigns the mica schist to the Huronian.

I have recently found at the coal mine two specimens of a fossil coal plant of the genus *Lepidodendron*, the largest about eighteen inches long and six wide. The whole of one surface of the specimen and the larger part of the other are covered with the narrow rhombic scars, which were most distinct are about an inch long. The specimen has been examined by Professor J. D. Dana, by whom photographs were sent to Professor Lesquereux. The latter referred the fossil to the very rare species "*Lepidodendron* (*Sagenaria*) *acuminatum* of Goeppert (Foss. Fl. d. Uebergangsgebirge, 1852, p. 185, pl. xxxiii), partly, especially fig. 4, which however does not give so good a representation of the plant as the figure in Heer's *Culm Fl.*, p. 291, plate xxii, fig. 4;" and he adds: "the specimen (photograph) is the first I have seen from America; the specimens from which Goeppert made the species were from the Carboniferous limestone of Silesia." He also says: "It is very much like a variety of the old and most common *Lepidodendron Veltheimianum* Sternb.; but it shows a marked difference in the disposition of the scars (cicatrices) to be arranged in a verti-

arms, long and slender, somewhat thorny. Mouth-papillæ unequal, mostly slender, spiniform, crowded outwardly, about 6 to 9 on each side of a jaw. Mouth-shields 4-lobed, the inner end angulated. Tentacle-scale large, flat; inner ones obtuse, others lanceolate. Diameter of disk 14^{mm}.

cal direction, forming ribs like those of *Sigillaria*." These ribs are really long spiral, and Lesquereux, although he has observed the same in another species, queries whether they are normal or not. The Carboniferous limestone of Silesia corresponds (as I am informed by Professor Dana) to the American Subcarboniferous.



The section represented in the accompanying figure has in the center the granite knoll, and extends to the northwest only far enough to show the mica schist resting against the granite. To the southeast the section cuts through the mica schist into the gneiss which lies to the east and southeast toward Mansfield and Wrentham. The gneiss and mica schist are conformable, having a general strike northeast and southwest, and where the section was made a dip of 75° to 85° to the northwest inclined away from the granite.

The outcrop of the coal-bearing strata of the mica schist is about half a mile northeast from the top of the granite knoll. Here the strike is northwest by southeast at about right angles to the strike of the mica schist outcropping not more than an eighth of a mile distant to the east. The dip is about 50° to the northeast, the strata leaning toward the granite. The fact that the same rock, identified by peculiar markings as well as by constitution, varies so greatly in dip and strike within so short a distance, indicates an additional disturbance to that which tilted the whole mica schist and gneiss to their present position and transformed them to their present condition. This additional disturbance was the forcing up from beneath of the granite knoll, breaking or bending the strata to the northeast and north, away from that to the east. This thorough working over of the rocks containing the carboniferous deposit has transformed this deposit for the most part into graphite; and in the specimen, mentioned above, the carbon is in the form of graphite though the scars of the plant are distinctly preserved.

It is my purpose to follow the rocks to the southeast and then to the west during the next season. So far as I have gone, I find my results agreeing quite closely with those of Professor E. Hitchcock.

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