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(For the MICROSCOPICAL BULLETIN)

AN OUTCROP OF FOSSIL DIATOMS NEAR SHILOH, N. J.

CORRESPONDENCE WITH THE NOTTINGHAM, MD.,
OUTCROP AND THE ATLANTIC CITY
WELL STRATA.

BY LEWIS WOOLMAN.

In the BULLETIN for December, 1888, appeared a notice of the discovery of a fossil marine diatomaceous deposit underlying Southern New Jersey as revealed by the borings from an artesian well at Atlantic City. Remarkable as were the statements then made, subsequent investigation shows that they fell short of the actual facts. It is proposed in this article to concisely review these in the light of subsequent research, and also to notice the discovery, about half way between Bridgeton and Salem, N. J., of an outcrop of the basal portion of the deposit.

The sinking of another well at Atlantic City has enabled a very careful study, foot by foot, to be made, and it can now be certainly stated that the deposit has a vertical extent of about 300 feet, occupying the interval between 382 and 677 feet. It is practically one enormous clay bed, interstratified with a few sand seams, none of which are over one to ten feet in thickness; the clays themselves being sometimes quite pure and at others very sandy, but all considerably diatomaceous excepting the lower 20 feet which are only sparingly so. The strata at 406-466-510 to 535—and 625 to 632 feet are especially rich.

The material from 466 feet is noticeable for the

great variety of small and novel forms, that from 510 to 535 feet for many varieties of *Rhaphoneis*, and that from 625 to 632 feet for a profusion of the beautiful many-rayed iridescent discs of *Actinocyclus Ehrenbergii*. From a small lump (from the probable depth of 500 feet) were obtained two varieties of *Coccinodiscus excavatus*—this form has not been found along the Atlantic slope except here and in artesian wells at Cambridge on the eastern shore of Maryland and at Fortress Monroe, Va.; in the former at a depth of 275 feet, and in the latter at 558 feet.

Until quite recently the writer believed the occurrence of diatoms ceased at 658 feet, but a more careful examination of a black clay at 677 feet has revealed a few forms associated with numerous foraminifera, the latter in such good state of preservation as to answer for transparent mounts.

Among the diatoms is the five-rayed *Aulacodiscus Molleri*. The bed at this depth rests upon a stratum of Miocene shells, the equivalent of the shell and marl outcrops near Shiloh and Jericho, N. J., about eight miles northwest of Bridgeton. From these facts the writer inferred that diatoms should be found in the top layer of the marl pits in the latter region, and being led thereby to visit the locality was gratified to find in the yellow and black clay marls overlaying the Perna shell beds, these minute micro-botanic structures; in association, however, with many salt-water sponge-spicules. Here occurs the five-rayed *Aulacodiscus margaritaceus*, but larger than the other form of this genus just noticed in the well. There are also several varieties of the beautiful star-centered *Heliopelta Ehrenbergii*. This species has not been obtained from the well borings, though special search has been made for it; and in this country it has heretofore been found only at Nottingham, Md., and immediate vicinity. It may be reasonably inferred that the outcrops at Nottingham, Md., and at Shiloh, N. J., and the 677 feet stratum in Atlantic City well, are one and the same bed; and as the stratum at Shiloh and at 677 feet depth in the well are undoubtedly at the base of the diatomaceous clays (since both rest upon the same shell horizon); the prediction in a former article in the BULLETIN of similar position for the Nottingham deposit may therefore be regarded as verified.