tion of the ores. There were not sufficient excavations made to determine the character of the ore as it exists unaltered underground. On its line of outcrop, embracing many miles on each side of both ridges, it existed in great abundance, and possessed the characters of hematite It deserves a thorough investigation.

There are some indications of iron ores in Sideling Hill and Town Creek, west of Hancock, but they have not been sufficiently investigated to determine their industrial value.

i. *Iron Ores of Alleghany County.*

There are good appearances for iron ore on a spur of Polish Mountain, near the Potomac. At one point near the mouth of Town Creek an opening was made, under my direction, which disclosed a bed of ore about 18 inches thick.

It was opened far enough into the hillside to prove it to be a *regular* stratum, lying between strata of brown shale, (No. 16 of the table.) The ore, as far as penetrated, is a compact argillaceous oxide of iron, but has evidently been changed by atmospheric agency. Deeper excavations will probably prove it to be a carbonate of iron.

The abundance of large pieces strewed over the surface in that region indicates the existence of other strata in this region.

I believe there are no iron ores of value between Polish Mountain and Cumberland. On either flank of Will's Mountain we have outcrops of important strata of iron in the formation numbered 14a in the table. It is called the *Clinton Group* in the New York reports, and *Surgent Shales* in Pennsylvania.

There are several strata of ore, some of which are too thin to be profitably mined. The lower strata called hard ore contain much sand, and vary in composition considerably, but usually contain less iron than those higher in the series, called *fossil* ores, because of the numerous impression of fossil shells they contain. There is an outcrop of hard ore, five feet thick, a mile and a half above Cumberland, (on the Baltimore and Ohio Railroad,) containing twenty-four and three-quarters per cent. of metal. The fossil ore varies in the proportion of iron from thirty-five to fifty per cent., and has been extensively used in the furnaces at Mount Savage and Lonaconing. Much of the fossil ore contains sufficient phosphoric acid to affect injuriously the quality of the metal.

j. *Carbonate of Iron of the Coal Fields.*

There are several varieties of these in our coal fields, differing in appearance as well in their proportion of iron. They exist either in flattened nodules, called balls by the miners, or in stratified masses called bands. The balls vary in weight from two or three