"The exact thickness of the formation is in doubt and there are no places within the region here described where the exposures are sufficiently continuous to yield dependable measurements. Along Delaware River, Sanders estimated the entire Martinsburg to be 5240 feet thick, but says that this is more likely an understatement than an exaggeration." This is the maximum thickness mentioned in any of the reports of the Second Geological Survey of Pennsylvania. Stose regards the thickness as about 3,000 feet. Three sections have been measured in great detail by the writer,—one each along the Delaware and Lehigh rivers and one between the two streams—and the arithmetical average of these measurements is 11,534 feet, though on account of possible repetition through folding, this is probably too high, rather than too low a figure. It is impossible to obtain accurate measurements, yet it would seem that approximations should not be discounted in favor of mere guesses. In general, the thickness in this region may therefore well be taken as about 11,000 feet.

"The thickness of the lowest member of the Martinsburg formation in Lehigh and Northampton counties is about 5000 feet. No sections have been measured farther west, but from the width of outcrop it is assumed that this figure also holds for eastern Berks County.

"The thickness of the middle member in the area here discussed is about 4,200 feet, this being the average of two measurements—one along Little Bushkill Creek and the other along Lehigh River.

"Along the Little Bushkill, in Northampton County, where a poorly exposed section was measured by the writer, the thickness of this member appears to be 4,415 feet, but the exposures here are discontinuous and the measurement may well be vitiated by repetition.

"On the basis of these observations the thickness of the upper Martinsburg in eastern Lehigh and in Northampton counties may be about 2,600 feet."

Paleontologic characteristics.—Fossils are rare in the Martinsburg of Northampton County and where found are almost invariably in a poor state of preservation. In the detailed investigations now in progress in Lehigh and Berks counties and which will be extended into Northampton County, more fossils have been found and it is believed that careful search will yield further results in this region.

"The larger part of the fossils are from coarse, impure sandstone occurring near the top of the middle member. The list, identified by Dr. E. O. Ulrich, includes:

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