of pyrite, garnet, magnetite and hematite are noted in many specimens. No one of these minerals was found to be diagnostic of any particular formation, so that correlations were based on their relative abundance. In addition, Dr. Hills found some microscopic foraminifera as had B. Frank Buie previously while engaged in the study of insoluble residues of the Allentown formation.

**Hardyston Formation**

**By Benjamin L. Miller and Philip B. Myers**

**Distribution.**—With the exception of a small area exposed on the south side of Camel's Hump, the outcrops of the Hardyston formation in Northampton County as shown on the accompanying map are confined to that portion lying south of the Lehigh River and included within Lower Saucon and Williams Townships.

Prime\(^7\) gives another locality at the extreme west end of the outcrop of the gneiss of Chestnut Hill where

Potsdam (Hardyston) sandstone was seen ... south of the blacksmith's shop at S. Seips, east of the road leading to Easton ... In the spot colored yellow (on Prime's map accompanying his report) a shaft had been sunk in 1875, in damourite slate, and a little brown hematite iron ore found, but not enough to justify further search. Below the damourite slate Potsdam sandstone was found nearby in place, but much fractured, and below this the gneissic rock.

The writers have failed to find any surface evidence of this occurrence.

Rogers\(^1\) reports the same formation outcropping on both sides of Chestnut Hill and gives the following description:

Both on the south and north sides of the axis (of the hill) the Primal (Potsdam) sandstone is very well exposed. On the south side it seems to constitute a separate low arch. It is here largely displayed on the river side, and is very vitreous, much fused and generally of a reddish hue; but a white sandstone of the more normal character is associated with this. Just at the north end of the gap there is a considerable mass of Primal (Potsdam) white sandstone, forming a stonewall or talus. In the northwest flank of the ridge, the sandstone may be seen in place dipping vertically.

It would seem from this definite description that the Hardyston must be present in the localities mentioned but Prime\(^2\) states that he and his workers failed to find any trace of the formation there and the recent investigators have likewise failed.

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\(^7\) The senior author began his study of the Hardyston formation in 1907 and has continued it ever since. Recognizing that a further investigation was desirable, Philip B. Myers, while holding a Research Fellowship in the Department of Geology of Lehigh University from 1922 to 1924, was assigned this problem. He has remapped the outcrops of the formation throughout Northampton County and with slight modifications the lines of this formation appearing on the accompanying map represent his conclusions. The following descriptions are in large measure abstracted from his unpublished dissertation, especially that portion entitled Local Details, but modified sufficiently to conform to the treatment of discussion of other formations. Mention should be made of the assistance rendered by Dr. D. M. Fraser in the microscopic investigation.
