Lithologic characteristics.—The Hardyston in Northampton County presents more varied lithologic features than any of the other sedimentary formations. This variability occurs not only in the vertical range of the beds but also along the strike and in very short distances. In many cases certain of these characteristics are peculiar to only one or a few local outcrops.

From an early date, when the formation was designated as the Potsdam, to the present, it has been more or less customary to speak of the whole formation as Hardyston (Potsdam) quartzite. Such a designation is distinctly inaccurate since we have learned that true quartzite constitutes only a minor part of the formation. Instead, it contains conglomerates, sandstones, quartzites, jasper, chert, shales and locally a micaceous material that has been called pinite.

Conglomerates.—At or near the base of the Hardyston formation there is often a coarse conglomerate. It is composed of well-rounded quartz pebbles, often lightly stained to a wine-red color. These pebbles are cemented in a dark quartzose matrix. This matrix contains some epidote, chlorite and detrital heavy minerals. The size of the quartz pebbles ranges from one-quarter inch to four inches in diameter, even the largest being well rounded. The color of the matrix varies somewhat, but usually it is dark. At no exposure in Northampton County does the thickness of this member exceed eight to ten feet.

Although the conglomerate occurs often as float, there are only a few places in the counties where good exposures occur. At the east end of Morgan Hill, south of Easton, a good outcrop shows the relation of the conglomerate to the underlying gneiss. A few inches of mashed gneissic material intervenes between the gneiss and the conglomerate, which is itself only a foot or two thick. The conglomerate is overlain by a gray pyritic schistose bed. The latter has acted as an incompetent member, and it shows fine fracture cleavage. The occurrence of the conglomerate is irregular here, even within a few feet. For this reason, and because the schistose material above the conglomerate shows that there has been movement, it appears that a bedding plane fault within the Hardyston has displaced some of the conglomerate, leaving only a few inches of it on the gneiss.

Quartzite and sandstone.—The sandstones and quartzites are not discussed separately as they grade into each other so thoroughly that no sharp distinction can be made. Following the custom previously mentioned, here all are called “quartzite.” There are two common varieties,—the arkosic and the non-arkosic.

The non-arkosic is less abundant. In a hand specimen it is commonly bluish gray, gray or white whereas the arkosic varieties are