In some of the pits the decomposition of the gneiss is very irregular, and certain parts of the pits must be abandoned on account of the large amount of waste rock. In one place the gneiss may be thoroughly decomposed to a depth of fifty feet, and close-by hard fresh rock may come within a few feet of the surface. A few pits contain dikes of basic rock, which must be discarded. In a pit in Bethlehem two dikes of such rock carrying much biotite caused considerable inconvenience, as the material resulting from their decomposition was worthless and had to be separated from the other sand.

The gneiss sand is used for a variety of purposes. It is well adapted for a molding or core sand on account of the kaolin, which acts as a binder, and large quantities have been used by the furnaces, foundries, and pipe mills of the region. For plaster and mortar, it is less desirable, as the presence of the kaolin is detrimental, but this is partly counterbalanced by the sharp angularity of the grains of quartz, which increases the strength of the plaster or mortar. The decomposed gneiss has been used widely as a building and brick sand throughout the region. The coarse material has been used extensively in concrete work and to a less extent for road metal.

The prices of the sand depend upon both the quality and competition. The waste material used for road work sells for a very low price. The industry is almost entirely local, although some sand has been shipped to foundries and furnaces outside the county. The production, which varies greatly from year to year, has been small recently.

Glacial sand and gravel.—Although an ice sheet covered almost all of Northampton County, workable deposits of glacial sands and gravels are comparatively few except in the vicinity of the Delaware River where they occur as terrace and kame deposits. Most of the glacial deposits of the region consist of clay and boulders.

The most extensive sand and gravel deposits of the county are the kame deposits along Jacoby Creek west and north of Mt. Bethel. Thick, poorly stratified and sorted deposits of sand, gravel, cobbles and boulders occur there. The maximum thickness is not known but a face eighty feet high was worked at one point. The materials occur in lenses and layers of varying thickness and areal extent. In every working the character of the face changes as work progresses. At one time sand may predominate, and a short time later the coarser material may be more abundant.

The pebbles and larger stones are mostly hard siliceous sandstone and conglomerate, yet mixed with them are shale, slate and limestone. Impure limestones of the Onondaga, with the characteristic flint nodules and bands, are conspicuous, and material from almost every