Decomposed gneiss.—The most unusual sand of Lehigh County is that obtained where the lighter-colored quartz-feldspar gneisses have decomposed into a mixture of angular particles of quartz and impure kaolin. Technically, decomposed gneiss should not be called sand, but in this section, where such material is used as a substitute for the ordinary kinds of sand, the commercial usage seems to be justified. The alteration of the feldspar to kaolin and the oxidation and removal in solution of the hornblende and pyroxene causes the rock to disintegrate. As water carrying oxygen in solution is the most active factor in this change, the decomposition starts along the joint planes of the gneiss and gradually extends into the blocks bounded by these fissures. Near the surface the alteration is more complete, and the rock is soft enough to crumble into sand when disturbed. At greater depths many masses of partly altered rock are still so hard that they must be discarded when the material is quarried for sand. In some of these quarries these resistant blocks are passed through a rock crusher and screened, the finest portions being used for sand and the remainder for concrete work or road metal.

The gneiss sand pits, as shown on the map, lie along the slopes of the gneiss hills, especially near Farmington. Besides those shown on the map there are other openings where at times a few wagonloads of sand have been dug.

The pits that are opened along the sides of the mountains increase in depth as the work progresses, and in some of them a 60-foot face is obtained. In some places the rock is decayed sufficiently to furnish sand at depths of 100 feet or even more.

In most of the pits less than four feet of overburden must be removed. It is loamy clay and fresh gneiss boulders derived from the outcrops of gneiss higher up the mountain. The quarrying is done with pick and shovel, and the loose material is thrown against a sloping screen, the mesh of which differs according to the kind of sand desired. The particles that fail to pass through, roll to the bottom of the screen. By pounding these coarser fragments with the back of the shovel many of them can be disintegrated sufficiently to pass through the screen when they are again thrown against it. The tough pieces are thrown aside as waste or put through a stone crusher.

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.

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.