lime produced in other sections, more care was taken in its manufacture, both in the selection of the stone and in the burning.

The early product naturally was of variable quality. The farmer burned whatever stone he had on his property. Some of the Toms-town limestones are high in silica and alumina and almost all others are highly magnesian.

Lime is not produced commercially at present in Lehigh County. However, from time to time some old kiln is restored and a small quantity of stone burned for local use. Formerly there were many fairly large lime plants in the east, south, and southwest parts of Allentown, at Limeport, and in the vicinity of Catasauqua. Most of the quarries furnishing the stone are now idle or are being worked for crushed stone.

There are few places in the county where the highest grade of lime could be produced. In general the silica content is high and the magnesium carbonate is too high for high-calcium lime and too low for high-magnesium lime. Large, well-equipped plants in other parts of the State supply the local demand.

**Limestones for flux.**—When the local iron ores were being mined and smelted in the furnaces scattered along the Lehigh River, in the Saucon Valley and elsewhere, many limestone quarries were operated in regions nearby to supply the necessary fluxing stone. Some of these were worked for fifty years or more and are of large size. Practically all the stone used was highly magnesian. The silica and alumina also were high in some quarries. The proximity of the quarries to the furnaces and the consequent low transportation costs generally made the use of rather poor stone profitable.

Nearly all the quarries from which stone was obtained for flux were along the railroads, and spurs were built into the quarries. In many places better material might have been obtained elsewhere, but the cost of hauling the stone to the railroads was prohibitive.

Although the limestones have been used extensively for flux, some objectionable features have inconvenienced the operators, the worst of which is the presence of layers high in silica. Most of the furnace operators prefer limestones that contain strata with less than 4 percent silica, and where shaly or sandy strata are interbedded with the limestones it is necessary to separate these beds as waste rock. The presence of solution cavities filled with clay, which are common in regions where the rocks have been deformed or shattered by earth movements, is equally objectionable. Clay fills deep solution pockets in the surface in places, and the removal of this overburden greatly increases the cost of quarrying.

Rock of quite different composition was obtained from a single quarry, so that it is difficult to select a typical analysis. The following analyses of stone actually used by local furnaces represent the best grades that could be obtained. These are copied from the analysis book of the Thomas Iron Co. and are furnished by Dr. B. F. Fackenthal, Jr. Many other analyses of similar character are available.