In the washing process several modifications of the common log washer were used. In its simplest form this device is merely a log or shaft to which are attached, in a spiral arrangement, iron plates that project a few inches. This log, which can be rotated, is set at an angle and surrounded by a trough, into which the mixture of ore and clay is dumped. Above the trough runs a water pipe or small trough with numerous perforations through which the water passes to mix with the clay and ore. The ore and the associated clay are dumped into the lower part of the trough, and the log is rotated to carry the large particles upward to the end of the trough, where they fall on a platform, while the water carries the clay in suspension to the lower part, where it flows into wooden troughs, usually supported by trestles, that convey it to a settling pond.

If the clay adheres very firmly to the ore it may become necessary to reverse some of the teeth or plates in the log in order to retard the passage of the ore and give them more opportunity to loosen the clay.

In the washing process pieces of chert or other rocks remain with the ore and must be picked out by hand, and many small fragments of ore are washed away by the water.

Most of the mines yielded enough water for washing the ore, but at times some of them had to obtain additional water from wells or near-by streams. In some places the comparatively clear water from the settling ponds was drawn off into another basin and again pumped to the washers.

The daily average of ore handled by a single washer was never large but ranged from 15 to 35 tons.

**Economic Considerations**

If a region where iron mining was once one of the principal industries gradually undergoes a change by which all the mines are closed and yet the iron-manufacturing industry still continues, the natural conclusion would be that the iron ore deposits had been exhausted. In Lehigh County, however, where 261 limonite mines are known to have been worked and at present none are in operation, other causes have contributed to the existing situation. Many of the mines were worked out or abandoned because the ore was too lean, but many of them were closed for other reasons, and it is not improbable that as much ore still remains in the ground as has ever been mined. Many of the mines when closed had as much ore in sight as at any preceding period, and undoubtedly there are numerous deposits that were never worked. When the fields are freshly plowed many promising places for prospecting can be distinguished by the brown color of the soil and the fragments of float ore, which favor the conclusion that some ore deposits have never been developed.

In the early days many of the iron companies that operated furnaces acquired ore properties which they either worked or leased under the arrangement that all the ore would be sold to the furnaces at current prices. The royalties paid ranged from twenty to fifty cents a ton. In addition, independent companies acquired ore properties and engaged in iron mining and always found a ready market for their ores. In recent years, however, a great change in the iron industry