work by running short tunnels into the banks above the water level. One of the mud-dams was on the south side of Sanoen Creek. Later some of the material was dug from it for paint and still later it was worked extensively for the manufacture of brick.

MINES IN THE HARDYSTON FORMATION

38. In the southwest corner of Camels Hump a small amount of iron ore was once mined. This locality later proved to be more valuable forumber and is more fully described on a later page under "mineral pigments."

39. One mile southwest of Seidersville a few pits have been dug in search of iron ore but evidently only a small amount was obtained. The dense vari-colored jasperoid rock thrown out in the diggings indicates a somewhat unusual phase of the Hardyston quartzite.

40. Bachman mine.—The Bachman mine was opened in 1887 and worked for about five years. About 15,000 tons of good ore were taken out. The ore became lean, and the mine was abandoned. The great masses of yellow chert in the east part of the pit show conclusively that the ore was formed by replacement of Cambrian quartzite. Some of the ore contains considerable wavellite and cacoxenite, but so far as known no objection was ever raised on account of the phosphorus in the ore.

41. Kauffman mine.—The Kauffman mine was similar to the Bachman mine. It was worked by the Crane Iron Co.

42. Blank mine.—The Blank mine was operated intermittently for about five years and was closed in 1888. The ore was of good quality and was high in manganese. The vein was fairly thick, but the mine failed to pay because of poor equipment.

44. Wharton mine.—The Wharton mine, located about two miles east of Heltiertown, was first opened by George Wharton in 1852, who worked it as an open pit for several years. The mine was abandoned and no work done until 1872, when it passed into the possession of the Sanoen Iron Co. It was then reopened and worked for about twelve years and then again abandoned, as it could no longer be worked profitably by the open-cut method. In 1884 the Thomas Iron Co. purchased the property and at once began to sink a shaft. It was worked more or less continually until 1910, when it was finally abandoned, because the old shaft had been forced out of plumb by the pressure of the clay that slipped down the slope and it was not thought advisable to bear the expense of a new shaft.

The ore was in yellow, white, and red clays segregated in veinlike bodies five to ten feet wide, which in general headed eastward, parallel to the direction of the valley. At the 150-foot level one of these