

The effect of the time-temperature relations should be studied closely for every clay, since only when reliable information concerning this subject is at hand is it possible to exercise complete control of the burning. The importance of such results applied in factory practice cannot be emphasized too much.

The use of pyrometers in plant operation is to be urged most strongly, as they afford the only means of controlling the rate of firing. For the establishment of the end point of the burned pyrometric cones, shrinkage and porosity determinations are of value.

In the use of cones the time factor should be taken into account.

Wood, Paper, and Steel Pulleys. H. A. WOODWORTH. (*Power*, xxxvi, 848.)—Woodworth and E. D. Biggs made tests at Purdue University to determine the breaking strength of pulleys of different materials with the object of ascertaining their principal points of weakness. Mechanical engineers will find these very interesting. Some of the conclusions arrived at are: (1) Rim joints midway between arms are serious defects and materially reduce the bursting speed. (2) The solid-web-and-rim paper flywheel will safely withstand a peripheral speed of 106 feet per second. (3) Wood flywheels with solid rims have an ample factor of safety at a peripheral speed of 90 feet per second, if the wood is of good quality. (4) Steel wheels of the split-rim type are unsafe at speeds above 80 feet per second.

Special Rails for Heavy Curves and Grades of the Lehigh Valley Railroad. ANON. (*Eng. News*, lxxviii, 779.)—The use of specially heavy rails on sharp curves and steep grades, where conditions of rail wear are severe, is being successfully introduced by the Lehigh Valley Railroad. The rail is a 110-pound section of the same height and base width as the 100-pound standard, but with a heavier web, $1\frac{9}{32}$ inch instead of $\frac{9}{16}$ inch; and a larger and much deeper head, $1\frac{7}{8}$ inches deep instead of $1\frac{9}{16}$ inches. A six-bolt joint is used, but the outside splice bar is of special design, extending along the side of the rail head to secure additional depth and rigidity. A section of the 110-pound rail and its splice joint, with the head of the 100-pound rail shown in dotted lines, is given. There are at present about 77 miles of track laid with the 110-pound rail, and additional rails in process of laying will bring the total to about 100 miles. A compromise joint is used to connect rails of the two forms of section, the tops being stepped to fit the different heights of web and head.