

principles. This paper is intended to form the foundation of the theoretical part of a series of researches on the strength of materials.

•Sir D. Brewster begged to suggest to Mr. Rankine that by an examination of the action of transparent solids on polarized light, the correctness of these theoretic views might be tested or corrected: and so accurate and simple was this method found to be of testing the nature of the constraint under which the several elements of a strained body were, that models of pieces of carpentry were now actually constructed in glass, subjected to the kind of strain to which their representatives would be exposed; and the kind and degree at each part rigorously ascertained by polarized light.—*Ibid.*

*On a New and Ready Process for the Quantitative Determination of Iron.*

By DR. F. PENNY.\*

The author recommends the employment of the chromate and bichromate of potash for the estimation of iron in the common ores of the metal, and especially for the analysis of the clay-band and black-band ironstone of this country. He was led to the application of these salts in the course of some recent investigations on the materials and products of the manufacture of alum from "alum-shale," in which he was much retarded by the want of a ready method for estimating the oxides of iron. The chromates of potash give very exact results, and possess the great advantage that a much larger quantity of material may be operated on than can be conveniently treated by the usual methods. For practical purposes, he says, the bichromate is to be preferred. The process requires no other apparatus than that commonly used for centigrade testing, which is familiar to all persons engaged in chemical pursuits. It may be easily and rapidly executed, occupying only a fraction of the time required for the process of estimating iron by precipitation as the sesquioxide; and it is not interfered with by the presence of alum and phosphates which usually exist in the ore. The method is based on the well known reciprocal action of chromic acid and protoxide of iron, whereby a transference of oxygen takes place, the protoxide of iron becoming converted into sesquioxide, and the chromic acid into sesquioxide of chromium.—*Ibid.*

*On the Self-Imposed Taxation of the Working Classes of the United Kingdom.* By MR. G. R. PORTER.†

The object of the author is to exhibit the amount expended on three articles of luxury, the use of which he presumes might advantageously be dispensed with, viz. spirits, beer, and tobacco; the respective values of which are £24,091,458; £25,383,165; and £7,588,607, making a total of £57,063,230.

\* From the London Athenæum August 10, 1850.

† From the London Artizan, October 1, 1850.