

them in their true relations. The dissected highland of fig. 116, with the broad cone of detritus forming the only habitable region at its foot, will remind the traveller of the valley of the Inn or of the Drau. The volcanic relics in fig. 132 explain Gergovia and Mont Dore. The eighth chapter, on "Der aride Zyklus," appeals strongly to pioneers on the edges of our colonised lands, and would have edified the Roman senate, when it republished the Carthaginian text-books and faced the problems of the desert and the steppes. On pp. 375-6 the evidence for a recent uplift of central and southern Africa is well stated. A characteristic discussion on the methods of presenting geographical problems finds its way somehow into this chapter. British geologists will turn with interest to the chapters on glacial conditions and marine erosion. The explanation of the features of the coast of south Devon on p. 502, which seems at first somewhat complex, is fully justified when we realise that the "soft rocks" postulated really exist in the form of Cretaceous and perhaps Eocene limestones beneath the English Channel.

The disguise of Prof. Davis as a Prussian is a thin one. Who does not recognise him in the brilliant description of the Roman area on pp. 393-4, which is to occupy four minutes of oral instruction; or in the terrifying discovery on p. 398 that every land-form can be treated geographically in four-and-fifty different ways?

GRENVILLE A. J. COLE.

OUR BOOKSHELF.

The Manufacture of Iron and Steel: a Handbook for Engineering Students, Merchants, and Users of Iron and Steel. By H. R. Hearson. Pp. xi+103. (London: E. and F. N. Spon, Ltd., 1912.) Price 4s. 6d. net.

THIS small volume is obviously primarily intended to give engineering students an outline of the manufacturing operations of iron and steel, and also an idea of the chemical characteristics and the mechanical properties of the finished products. The author has undoubtedly, to a great extent, produced a lucid and useful little text-book.

After a preliminary chapter on elements, the blast furnace is considered, being followed by a short chapter on wrought iron. Steel is next dealt with, including the Bessemer, Crucible, and Siemens methods. The book has so much valuable and accurate information that it may be of very great use to elementary students of iron and steel metallurgy, but several remarkable errors should be revised in any future edition. For instance, on page 37, steel containing 0.3 per cent. of carbon is classified as medium instead of mild, and steel containing 0.7 per cent. of carbon is designated hard instead of medium. In describ-

ing the manufacture of "blister steel" by cementation, the author states, "None of the bars is carburised right through to the centre, so the centre still remains as iron." This is true of, say, No. 2 bars, but high-number bars are always "steel through." Some of the paragraphs on crucible steel also need serious revision; for instance, the curious assertion that if kept too long in the furnace the steel will become brittle by taking up too much silicon from the crucible. Mr. Hearson also revives the obsolete dictum that mild steel is crystalline and wrought iron fibrous. On page 77 the somewhat astounding information is given that the top of an ingot may be prevented from rapidly solidifying by covering the top with sand. The chapter on the mechanical testing of steel is excellent, but in the brief final chapter dealing with the heat treatment of steel many metallurgists will be surprised to learn that steel containing 0.25 per cent. of carbon becomes "hard" on quenching, and the paragraphs on hardening are out of date. If carefully revised, however, the book will become of distinct value. J. O. A.

Photochemische Versuchstechnik. By Dr. Johannes Plotnikow. Pp. xv+371. (Leipzig: Akademische Verlagsgesellschaft m.b.H., 1912.) Price 11 marks.

THIS book forms the complement of a previous volume by Dr. Plotnikow on the theory of photochemistry ("Photochemie," W. Knapp in Halle a.S., 1910). In the present work he describes at length the apparatus and the experimental methods used in photochemical research. Part i. contains a useful summary of the characteristics of the various sources of light that may be employed. The mercury arc lamp, in which a steady electric current is passed through the vapour of mercury in a highly exhausted tube of Uviol glass or of fused quartz, is recommended as providing a constant and trustworthy source. Other sources discussed are the arc and spark between metal terminals, the carbon arc, the Nernst lamp, and the Röntgen ray tube. In part ii. Dr. Plotnikow describes the construction of the special forms of thermostat which he has devised for photochemical experiments, and enumerates a number of solutions that may be employed as light filters with the mercury vapour lamp in order to give approximately monochromatic light.

Part iii. contains an account of the instruments used in optical measurements, including photometers, spectrophotometers, spectrometers, refractometers, and polarimeters.

In part iv. the author describes a number of interesting lecture experiments for illustrating the fundamental laws of photochemical reactions, the various phenomena of luminescence, and the principal facts of photoelectricity. It is satisfactory to find attention directed to the subject last named, since the separation of negative electrons under the influence of light probably forms the clue to the understanding of the mechanism of all photochemical processes.

Part v. contains a collection of tables likely