ten tenth-metres. The region of spectrum studied extends from about λ 2500 to λ 7000.

In the production of the arc spectrum, rods of the metal were used as poles whenever possible, though in many cases carbon electrodes were employed, and scraps of metal or salts of the metal volatilised on them. The selection of carbon as electrodes seems to us a very unfortunate one, as it is next to impossible to disentangle the real spectrum of a substance from the structure of the carbon bands. Surely a better method would be to use poles of some inexpensive metal the spectrum of which is a fairly simple and characteristic one, such as zinc, aluminium, or silver.

Among the spectra represented in the charts are several, such as boron, arsenic, the rare earths, the platinum group, phosphorus, selenium, which are reproduced here for the first time. The previously existing records relating to some of these were very meagre, and those now published will be distinctly useful. For some of the gaseous elements vacuum-tube spectra have been obtained.

The authors have not given—and it seems unnecessary to do so—complete lists of wave-lengths, but have confined themselves to a selection of the most characteristic lines for each element. The wave-lengths of these are given only to the nearest Ångström unit or tenth-metre, which is scarcely of sufficient precision for modern spectroscopic research. A chapter of notes is given at the end of the text, touching on such points as varying numbers of lines, kinds of spectra, character of lines, division into pairs, triplets, and series, lines specially prominent in any particular light source, &c.

Notable amongst the few elements not investigated by these observers is scandium. This is unique among the rarer metals in the prominence of its lines in various celestial spectra—notably the chromosphere and stellar types of intermediate temperature—and a reproduction of its complete spectrum would therefore have been of interest.

The reproductions are generally excellent; exception must be taken, however, to that of the solar spectrum, which, apparently included as a reference spectrum, is practically useless. Upon the whole, the production of the atlas is very creditable to the authors, and without being in some ways of so elaborate a nature as Crew's or the recently published atlas of Eder and Valenta, it will, through its uniform treatment of all the elements investigated, be useful, as the authors surmise, to the physicist, chemist, and astronomer. F. E. B.

OUR BOOK SHELF.

Précis d'Hydraulique—La Houille Blanche. By Raymond Busquet. Pp. viii+375. (Paris: J. B. Baillière et Fils, 1905.) Price 5 francs.

THIS book forms one of a series of little volumes which are being issued under the title of "Encyclopédie Industrielle, and treats of the principles of hydraulics and their applications, which possess an enhanced importance in view of the recent great extension of the employment of water-power for industrial purposes, resulting from the discovery that it can be economically transmitted to a distance when converted into an electric current. Thus, by the development of electrical transmission, it is now practicable to use waterfalls and water stored up in reservoirs, in remote mountain valleys, as sources of power for towns, of which the Falls of Niagara, supplying electrical energy to Buffalo, furnish so notable an instance; and the author has given the name of "La Houille Blanche," or white coal, to this source of power.

The subject is discussed in five chapters, dealing successively with fundamental laws, flow of liquids in pipes, flow of liquids in open channels, hydraulic motors, and creation of a fall of water; and the text is illustrated by forty-nine diagrams and drawings. The hydraulic problems relating to the utilisation of water-power are solved by aid of arithmetic and simple geometry; and the author's aim has been, by making the book neither purely descriptive nor wholly didactic, to render it serviceable to a large number of persons. In the chapter on motors, the different forms of waterwheels and the various types of turbines are described; and, finally, the principle of the hydraulic ram is explained, as being distinct from motors, and yet transforming the fall of water into useful work by raising some of the water to a considerable height. Though reservoirs have been, and are being, formed by constructing high masonry dams across narrow gorges in the valleys of mountain streams, with the object of furnishing water-power, the final chapter of this book relates exclusively to the erection of a masonry weir across rivers, with the necessary sluiceway, closed by wooden panels, for the discharge of floods, by which the ordinary water-level of the river is raised so as to enable water to be drawn off into a branch canal for supplying water-power; and it deals mainly with the requisite calculations of the flow of the river, the discharge through the sluices, the pressure on the panels, the fall available, and the section of the branch canal and of its side retaining walls. The author entertains great expectations as to the future of water-power, and considers that, whereas last century was the century of steam, the twentieth century will be called the age of water-power, or white coal.

Catalogus Mammalium, tam viventium quam fossilium. By E. L. Trouessart. Suppl. part iv., Cetacea to Monotremata. (Berlin: Friedländer and Son, 1905.) Price 8*s*.

WE have much pleasure in congratulating the author on the completion of the first quinquennial supplement, whereby an absolutely invaluable work is brought well up to date, or, rather, as nearly up to date as is possible in undertakings of this nature. We notice that in the part before us references are given in the case of well-known species to passages in which they have been recently mentioned—a plan which cannot fail to be of the greatest assistance to students.

In accordance with the recent changes in nomenclature, the titles adopted for several genera differ from those employed in the original issue, as, for instance, Orcinus in place of Orca, on account of the preoccupation of the latter term. In the case of the Edentata, the list of names proposed by Dr. Ameghino for South American Tertiary forms looms very large, and, we fear, occupies much more space than it is really entitled to claim. In this connection it may be noted that the author follows Dr. Wortman in classing the North American Eocene ganodonts as ancestral types of the true edentates, Prof. W. D. Scott's recent opposition to this view probably not having been published in time to receive