

this subject, the author has wisely limited his account to the more important facts. It is somewhat unfortunate that Hopkins's method for the estimation of uric acid has been omitted, since it is much simpler than that of Salkowski and Ludwig, which has been selected by the author. A considerable amount of space is devoted to the subject of the toxicity of the urine under normal and pathological conditions. A comprehensive account is next given of the various theories dealing with the secretion of the urine. The description of the functions of the urinary system concludes with a very full and lucid review of the functions of the bladder.

The physiology of the skin and its glands forms the subject of the next chapter. The final pages of the section are devoted to a very thorough and interesting description of the histological and chemical changes involved in the secretion of milk.

Part vii. deals first with the general physiology of muscle. An exceptionally complete account is given of the methods employed in studying muscular work. The mechanics of the special organs of motion are also discussed in greater detail than is usual in text-books of physiology. A description of the mechanism of voice production forms a natural conclusion to this chapter.

The following chapter gives a clear and detailed account of the general physiology of the nervous system, and includes several hitherto unpublished figures from Golgi. An excellent critical review of the neurone theory of the constitution of the nervous system forms a prominent feature of this section. The recent work of Verworn and his pupils on the hitherto somewhat obscure subject of the metabolism of the nerve centres is fully described. The recent interesting experiments of Baglioni and Winterstein on the isolated cord of the frog are also included in this chapter. The physiology of the spinal cord and its nerves forms the subject of the next chapter. A noteworthy feature is the very lucid and thorough description of the segmental distribution of the spinal nerves. Baglioni and Winterstein—the translators of the work—have added a very useful summary of the physiology of the sympathetic nervous system.

The physiology of the bulb and associated cranial nerves is next described in detail. In the following chapter, a very valuable and critical account is given of the physiology of the cerebellum, largely based upon the author's own work.

The two final chapters deal with the physiology of the mid-brain, basal ganglia, and cerebrum. They embrace a very comprehensive survey of the historical development of our knowledge up to the most recent date. A masterly description is given of the localisation of the sensori-motor, sensory, and association centres in the cerebral cortex of man and the higher mammals.

It would be difficult to speak too highly of the value of this text-book. Its preparation must have entailed an almost incalculable amount of labour, combining as it does that wealth of detail usually only found in text-books written by numerous contributors with the uniformity of treatment resulting from the fact that it

is essentially the work of one author. The account of the nervous system especially reveals an exact and intimate knowledge of the literature. The work of English physiologists in this field receives fuller treatment than in most foreign text-books.

The translators of the work—Baglioni and Winterstein—have made many valuable additions with the object of bringing the book fully up to date. The book is remarkably free from typographical errors. The following errata, however, should be noted:—on p. 370 of vol. ii. "phenol" is used instead of "indol," and on p. 600 of vol. iii., in the description of Flechsig's scheme of the projection and association centres, "parietal" is used instead of "frontal." In one instance also the word "verleiten" is used instead of "verleihen."

J. A. MILROY.

TECHNICAL CHEMISTRY.

Leather Industries Laboratory Book of Analytical and Experimental Methods. By Prof. H. R. Procter. Second edition, revised and enlarged. Pp. xx+460. (London: E. and F. N. Spon, Ltd.; New York: Spon and Chamberlain, 1908.) Price 18s. net.

AS the first edition of this work has been out of print and unobtainable for more than two years, the appearance of a second and revised edition is extremely welcome to those who are in any way connected with the leather and allied trades.

The second edition of this work is similar in style and external appearance to the first edition, but has been considerably enlarged and in parts completely re-written. Prof. Procter has added new methods of analysis for the control of the tan-yard, in some cases as supplementary to the old, but in others has substituted the newer methods as being more accurate; and as the author states in the preface that "they have been carefully tested in my own laboratory," the dictum of such an authority will suffice to satisfy all chemists working in this branch. The work is not meant to teach either chemical theory or the principles of leather manufacture, but contains in handy form practically all the various common analytical methods likely to be required either by the chemist in the tannery or by those doing work in connection with the chemistry of the leather and allied trades. It is not intended to take the place of ordinary chemical text-books, but to supplement them; and throughout the volume the fullest references are given to original papers and methods.

The work deals in various chapters with general methods of analysis, technical water analysis, depilants, the estimation of ammonia and hide substance, the analysis of materials used in puering, bating, liming, &c. Chapter viii., dealing with the chemistry of the tannins and their derivatives, has been considerably enlarged and brought up to date. In this the author has summarised all the work which has been done on this subject up to the present time, and gives copious references. The chapters dealing with the analysis of tanning materials and the official methods of tannin estimation have been completely re-written, and full details of the new international

method of tanning analysis are given. The subsequent chapters deal with the estimation of colour in tanning materials, the analysis of used tan-yard liquors, the analysis of alum and chrome. In connection with this last-named subject the author gives some valuable practical information on the making up of chrome liquors in the testing of liquors in use. This branch of leather manufacture has progressed by enormous strides during the past ten years.

The next chapters deal with the estimation of adulterants in leather, the analysis of soaps, oils and fats, and a table of important constants for oils and fats used in the leather trade is given, and the effect of various fats on leather explained. The analysis of leather, dyes and dye-stuffs follows. The last three chapters are devoted to the use of the microscope, the structure of the skin, and bacteriology. These have been largely re-written, and the author has added some fine photomicrographs of adulterants in tanning materials, and indicates the value of the use of the microscope in competent hands. The bacteriology and mycology of tanning is gone into thoroughly, and our somewhat scanty information on this subject brought up to date, the rapid growth of our knowledge of this most important branch being made evident.

The work is illustrated and printed on good paper, and is written in Prof. Procter's well-known clear style.

At the end of the book some blank leaves are bound in, so that pending the arrival of the third edition those using this book may add notes, and so keep the volume up to date. With such a volume as this before us one is almost tempted to say that after all science has secured a firm foothold in one of the most conservative trades existent.

J. GORDON PARKER.

OUR BOOK SHELF.

Geology and Mineral Resources of the Western Coal-field. By J. E. Carne. Pp. xii+264; with 37 plates and portfolio of maps and sections. (Sydney: Geological Survey of New South Wales, 1908.) Price 15s.

IN New South Wales the existence of beds of coal was known in very early days, and was the reason for the name of the colony. It is calculated that New South Wales has yielded altogether 138½ million tons of coal, the output last year alone having exceeded 8½ million tons. In addition to coal, the kerosene shale deposits are of considerable importance, and are at present attracting attention owing to the introduction of British capital for their development. Mr. Carne's elaborate monograph, which reflects great credit upon himself and upon the Geological Survey, is consequently a work of the utmost importance to the mining industry, as well as a valuable addition to scientific literature. With the accompanying portfolio of coloured geological maps and sections, it forms the first instalment of a systematic geological survey of the productive Permian-Carboniferous Coal-measures of New South Wales. The total area mapped and described in this memoir amounts to 2877 square miles, of which 2261 square miles may be regarded as productive. The country described embraces the principal parts of Cook and

Hunter counties, and a large portion of Roxburgh and Phillip counties, the greater part of the Blue Mountains being included. From an economic point of view, coal and kerosene-shale are the chief assets of the country mapped. Limestone, firebrick, pottery clays, building stones, and iron ore follow in order. The smelting of local iron ore has been successfully begun at Lithgow; and if the iron-smelting venture and the extensive development of the kerosene-shale export and retorting industry continue to progress, the district will soon become a great centre of industrial activity. The picturesque character of the country is well shown in the numerous admirable illustrations accompanying the memoir. Massive Triassic sandstone, imparting boldness to the scenery, is sculptured by denudation into rugged walls and isolated masses. Irregularities of the plateau are not less varied. Huge domed laccoliths, conical volcanic peaks, and flat coulees remnants are everywhere prominent. A glance at the illustrations impresses one with the magnitude of the task of geologically surveying these mountains, which in 1788 effectually barred Governor Phillip's progress into the interior from the settlement on the shores of Port Jackson. The persistence of the explorer of the present day in forcing his way along jungle-fringed and boulder-strewn streams flowing through deep cañons and almost impassable ravines is hardly less astonishing than that of the first surveyors, who, far from an accessible base of supplies, traversed this unknown and inhospitable region.

Science and Empiricism. By H. C. Daniel. Pp. 29. (London: Scientific Press, Ltd., 1908.) Price 1s. 6d. net.

THIS booklet contains a strange medley of fact and fiction, though apparently written with a good motive, for in his preface the author acknowledges the "splendid efforts of our scientists and medical professors," and deplors "the neglect of hospitals and laboratories." In section i. the author discourses on biology and Weismannism; in section ii. on pathology, with special reference to cancer and its cure, in which we are exhorted "in the place of fiction to substitute truth. Instead of holding to the absurd principle that the red corpuscles are the bearers of oxygen, let us in the future build upon the more scientific principle that oxygen is the bearer of the red corpuscles." Cancer is easily explained. "Superficial cancer is a disease of the blood tissues and is only dangerous in so far as it affects the tissues or envelope of life. Plasmic cancer, however, is a disease of the oxygen or vital ground, that is to say, of the white corpuscles or physical unity of life, and as such it goes deeper than the tissues." The seven last pages are devoted to sections on theology, education, and government, but what they are all about we really are not quite sure!

R. T. H.

Vegetationsbilder. Edited by G. Karsten and H. Schenck. Sixth Series. Part i., Samoa. By Karl Reehinger. Part ii., New Guinea Archipelago. By Karl Reehinger. Part iii., North-Eastern Brazil. By E. Ule. Part iv., The Algerian Sahara. By H. Brockmann Jerosch and A. Heim. Parts v. and vi., Alpine Vegetation. By H. Schenck. (Jena: Gustav Fischer, 1908.)

THE sixth series of the "Vegetationsbilder" fully maintains the reputation of the preceding volumes. The pictures of Samoan vegetation furnish an indication of the humidity of the climate where ferns supply 25 per cent. of the higher plants. Illustrations are provided of *Polypodium sabauriculatum*, an epiphyte in the rain forest, *Angiopteris evecta*, growing by the streams, and *Todea Fraseri*, an