

REVIEWS OF BOOKS.

The Nature of Enzyme Action. By W. M. BAYLISS, D. Sc., F.R.S.,
Assistant Professor of Physiology, University College. (London, 1908 :
Longmans, Green & Co., 39, Paternoster Row, E.C. Pp. x + 90. Price
3s. net.)

This book, the first of a series of "Monographs on Biochemistry," deals in a lucid and interesting manner with the properties of the important group of substances which are known as "enzymes" or "unorganised ferments." Although very little is known of the actual nature of these substances, their behaviour is very similar to that of the simpler compounds which are often employed as "accelerators" or "catalysts" in order to promote chemical changes. The author lays stress on the view that catalysts in general and enzymes in particular do not initiate, but only accelerate, change, so that hydrogen and oxygen must be supposed to combine together very slowly at ordinary temperatures, although the combination only becomes appreciable in presence of spongy platinum or some similar accelerator. In support of this view he quotes the fact that the velocity of combination falls in the ratio 600 to 1 when the temperature is lowered from 700° to 500° and would become inappreciable on cooling to 0°, but he omits to add that even at 1,000° no change takes place if the gases are dry, and that therefore, after all, a catalyst (water) must be present to bring about the change, not only at 0°, but also at 500°, 700°, or 1,000° !

In spite of the general similarity between the properties of enzymes and those of inorganic catalysts there are many important points of contrast, of which the simplest are perhaps those arising from the instability of the enzyme even at ordinary temperatures (which causes a steady diminution in the amount of accelerator and of the degree of acceleration) and its complete destruction when heated to 60–100° C. The author also discusses the abnormal behaviour of enzymes when used as synthetic agents. Usually a catalyst is equally effective in promoting the direct and the inverse change, so that it influences the speed with which equilibrium is attained but does not disturb the final balance : in the case of enzymes this is not strictly true, apparently because the enzyme combines with the materials on which it acts and displaces the equilibrium. One case is also quoted in which the reverse action differs *qualitatively* from the direct action : maltose is hydrolysed by maltase to glucose, but the main product of its action on glucose is not maltose but an "isomaltose" : this result is attributed to the presence of a second enzyme in the extracts used. Finally it is noted that the law of mass action does not apply when enzymes are used as catalysts even when acid catalysts give perfectly regular results : this also can be explained by the formation of compounds between the enzyme and the materials on which it acts, the speed of the action increasing during the action if the enzyme combines with the original material, but decreasing if it combines with the products.

Those who are familiar with modern physico-chemical methods will find in this volume an interesting series of problems which have been solved by assuming the fundamental validity of the well-known laws and then studying the many deviations that are observed in actual practice. As a result of this method of work the study of enzymes has advanced to a remarkable degree, and if the purpose of the series of monographs were to interest chemists and physicists as well as physiologists, no more suitable introduction could have been chosen.

Jahrbuch der Elektrochemie. Edited by DR. DANNEEL. Vol. XII. (Pp. xiii. + 1049. Halle a. S., 1909 : Wilhelm Knapp. Price 30 marks.)

At last the twelfth volume of the *Jahrbuch* containing the report of the progress in physical and electrochemistry during the year 1905 has made its appearance *in toto*. Part of the volume appeared two years ago, but the issue of the complete volume has been delayed owing to the fact that one of the collaborators of the technical section was prevented by pressure of other work from handing in his manuscript sooner, a state of affairs much to be deplored. The present volume contains over 100 pages more than its predecessor, and in consequence the price has been increased by two marks. We also notice a change in the list of collaborators. The sections formerly in the hands of Dr. Mugdan are now in the hands of Dr. Roloff. The section on Contact Chemistry has been written by Dr. Berl, and that on Thermochemistry by the Editor, whereas in the previous volume they were compiled by Dr. Sackur and Dr. Meyer respectively. Otherwise there has been no change. The Editor himself is responsible for more than half of the volume, and the general arrangement is the same as before. Pp. 3-655 are devoted to the scientific side, pp. 659-959 to the technical side, pp. 960-968 to a list of books which have appeared during the year under review, pp. 969-1,005 to the index of authors, and pp. 1,006-1,049 to the subject index. We have again noticed several misprints, mostly in the spelling of the authors' names; the more important of these we will point out as we go along.

Part I., General Group, Constants of Nature. The experiments on p. 17 attributed to William Ramsay are really due to O. Hahn. The name Jaquerod is uniformly (pp. 19-21, 174, and index) wrongly spelt Jacquerod; p. 19, l. 3 from bottom, Andrien should be Adrien and p. 20, l. 12 from bottom, C. Scheuer should be O. Scheuer. In the first equation on p. 22 the factor should be $(1-b)$ instead of $(1+b)$, and on p. 23 $\log. \beta$ should be 3.50825 instead of 3.50825. The molecule of Argon should be A instead of A_2 (p. 23, over last table). The section Reviews of Books (pp. 25-62) follows, and is very good. On p. 58 we are referred to a later chapter for details of Skrabal's paper, but on looking this up we find nothing but the title. The next sections, on Apparatus and the Periodic Law, do not call for any special comment. In the section Valency 17 pages are devoted to Werner's interesting book, *Neuere Anschauungen auf dem Gebiet der anorganischen Chemie*. Then follow the sections on the Phase Rule, Reaction Velocities and the Law of Mass Action, Catalysis, Thermochemistry, Ionic Theory, Electronic Theory and Osmotic Pressure. Of special interest to the members of the Faraday Society is the excellent account given of Lowry's Paper on the Hydrate Theory and the discussion thereon, read before the Society in 1905 (pp. 211-217). A special section on Colloids of 53 pages is introduced for the first time, and contains, besides the abstracts of papers

which appeared in 1905, a summary of the more important previous work. This section from the Editor's pen is extremely interesting and valuable, and is followed by that on the Application of Physical Chemistry to Medicine and Physiology (pp. 282-305), which concludes the general part.

The next large section (pp. 305-384)—Conductivity and State in Solutions—divided into several sub-sections, is specially remarkable for the large amount of numerical data given. On p. 349, l. 21, Δ_0 should probably be Δ_∞ , and the heading to the first table on this page is unintelligible. On p. 352, last paragraph, we are told that a Paper by Jones and Bassett will be discussed further on, but we have not been able to find out where. The index gives no clue. On p. 370, l. 3, J. Auerbach should be F. Auerbach. The table of dielectric constants of organic compounds on p. 384 is very useful.

We now come to the section on Chemical and Electrical Energy (pp. 384-470), where, on p. 458, l. 1, Brisley should be Brislee. The section contains a mass of interesting information, one of the most interesting parts being that dealing with the theory of the alkaline accumulator (pp. 467-469), as expounded by Förster. This section is followed by that on Polarisation and Electrolysis (pp. 470-619). On pp. 524, 608, and 616 Molwo should be Mollwo; on p. 558, l. 20, Niccelisalze should be Nickelisalze. A good account is given of Sand's Faraday Society Paper on Electrode Potentials; and Carveth and Mott's Paper on Electrolytic Chromium, read before the American Electrochemical Society, is reported at length (9 pages). On p. 560, l. 1, Wyddham should be Wyndham. The scientific part is brought to a close with the chapter on Electric Phenomena in Gases and Radio-activity. On p. 642, l. 8 from bottom, H. Makower should be W. Makower, and on p. 645, l. 4 from bottom, Slates should be Slater. Taken as a whole, this first part of the *Fahrbuch* must be described as very satisfactory. The abstracts are in most cases of sufficient length and contain sufficient detail to enable one to get a fair idea of what the originals really contain.

Part II., Applied Electrochemistry, is divided into Current Production (pp. 659-675), Inorganic Processes and Products (pp. 675-852), Organic Products (pp. 853-889), Electrolysis of Alkaline Chlorides and Bleaching Products (pp. 889-915), Technical Electrochemical Apparatus (pp. 915-938), Galvanotechnics and Allied Branches (pp. 938-959). On p. 677, l. 5 from bottom, bat should be hat; on p. 681, ll. 6 and 21 from bottom, Guilford should be Guildford; on p. 712, l. 20, Youlesche should be Joulesche; p. 743, l. 21, Mauchot should be Manchot (the initial to this name in the index should be W instead of V); p. 756, line 24, liln should be kiln. The summary of patents at the end of each section in the part devoted to inorganic products is very useful. The section on Organic Products shows that workers in this field are very active, but whether all the work done is of any practical use must remain an open question. The section on the Electric Separation of Ores will be of special interest to the metallurgist.

The amount of work necessary to compile such a comprehensive volume as the *Fahrbuch der Elektrochemie* is enormous and cannot be efficiently undertaken by one or two men. Several collaborators are essential, but it is to be sincerely hoped that Dr. Danneel's collaborators will not leave him in the lurch again, and that subsequent volumes will appear at less than three years' interval. Otherwise, this almost indispensable *Fahrbuch* will become so hopelessly behind-hand as to be little more than useless. Another point we would like to mention, in view of the committee which was appointed at the last International Congress of Applied Chemistry to collect numerical physico-chemical data, is that all such data which the *Fahrbuch* contains—and they are exceedingly numerous and widely distributed—

should be collected together in tabular form at the end. Such a tabular summary would be extremely useful and would save a lot of hunting about in the index, which, although very extensive, cannot be sufficiently detailed to give everything. A little more care in the proof-reading is also to be desired. Apart from this, we have nothing but unstinted praise for the way in which Dr. Danneel and his helpers have done their work. May the volumes for 1906-8 soon make their appearance !

Les Découvertes modernes en Physique. By O. MANVILLE. Second Edition. (Paris, 1909: A. Hermann et Fils. Pp. 463. Price 8 francs.)

This bulky-looking volume of 463 pages should never have appeared in its present state. The success of a book of this nature depends a great deal on the general impression one gets on casually looking through it ; and this, in the case before us, cannot be said to be very favourable. Apart from the general get-up, which leaves much to be desired, there are so many misprints that one begins to doubt how many of the equations and how much of the *Zahlenmaterial* one can accept at all. The author himself gives a list of well over 100 errata to correct, which alone is about the work of two hours, and we could add a further list, almost as long, of misprints which have escaped the author's vigilance. Proper names are in a great many cases wrongly spelt, as, *e.g.*, on p. 101, M. Clelland for McClelland ; on p. 129, Wolf for Wölfl and Markwald for Marckwald ; on p. 130, Exer for Exner ; on p. 12, Ackrayd for Ackroyd ; p. 214, Wetham for Whetham ; p. 284, Spottisvoode for Spottiswoode ; p. 444, Olivier Lodge for Oliver Lodge, and so on. Then there is a great lack of uniformity in the abbreviations of journal titles in the references ; *e.g.*, we find all possible combinations of Phil., Philo., Philos., with Mag., Magz., and Magaz. Sometimes even half the title of the journal is translated into French—*e.g.*, on p. 286, *C. R. de la Deutsche Physikal. Gesellschaft* (the last being wrongly spelt and wrongly divided) ; and all through the work we find evidence that the author's knowledge of foreign languages is not profound, words being spelt with a capital letter instead of a small one, and *vice versa*. Further, the supply of dots seems to have occasionally run out, so that the i's, instead of being dotted, have an apostrophe over them ; and the same remark applies to the Greek letters, for which, in a great many cases, a wrong fount has been used, making some of the formulæ and equations look absurd. We should also like to protest against the use of the apostrophe in place of the "dash," *e.g.*, N' for N', which occurs all too frequently ; and also the superfluous politeness, in a scientific work, of prefixing authors' names with M. Occasionally, however, authors have not risen to this dignity, while on p. 287 J. J. Thomson has been blessed with two M's. There is no index of authors' names and no subject index. So much, then, for general impressions. Although this is a second edition, the author expressly states that it is practically a new work, and we trust that, should a third edition be necessary, the author will bear the above remarks in mind and get some friend acquainted with English and German to assist in the proof-reading. There is distinctly room for a book on recent researches in physics, but unless it is reliable it is worse than useless. The book is divided into three parts: I., Electricity and Matter ; II., Ions and Electrons in the Theory of Physical Phenomena ; and III., Matter and Ether ; and the field covered is a wide one. At the same time, we have noticed that a great deal of modern work on some of the subjects treated by the author has not been mentioned at all.

Traité complet d'analyse chimique appliquée aux essais industriels. Par J. POST et B. NEUMANN. Translated by L. GAUTIER. Second French Edition. Vol. I. Part III. Pp. 561-863. (Paris, 1909: A. Hermann et Fils, 6, Rue de la Sorbonne. Price 8'50 francs.)

This book is a part of the translation by Dr. Gautier of the third edition of the well-known German *Chemisch-technische Analyse* of Post, as edited by Neumann. But it is more than a mere translation, as the translator has in every case carefully revised each section and brought it up to date. The part before us deals with the analysis of commercial metals and their alloys. About one-third of the work (119 of the 302 pages) is devoted to iron and steel analysis, and the remainder to copper, silver, gold, zinc, cadmium, nickel and cobalt, tin, bismuth, antimony, arsenic, mercury, aluminium, platinum, chromium, tungsten, uranium, vanadium, and molybdenum. We find that not only gravimetric and volumetric methods, but also colorimetric and electro-chemical methods of analysis have all been taken fully into account. Full directions are always given for carrying out an analysis, and the book should be of great service to the metallurgist, especially as its moderate price places it within easy reach. The book emanates from the same publishing house as that reviewed above, but in contradistinction to that, it is exceedingly well and carefully printed, and the get-up leaves little to be desired. We can thoroughly recommend this book to all metallurgists to whom the reading of French presents less difficulty than the deciphering of German. We might perhaps add that the German edition appeared in 1907.

Exercises in Physical Chemistry. By W. A. ROTH. Translated by A. T. CAMERON. (London, 1909: Constable & Co., Orange Street, W.C. Pp. xii + 196. Price 6s.)

As stated in the author's preface, this book is based on the very excellent physical-chemical "Praktikum," which students in Nernst's Laboratory have to attend before commencing research work. An English translation should therefore be very welcome to teachers and to students in this country, who wish to gain a working knowledge of the methods by which physical chemistry has gained its present impregnable position. It is, however, essentially a *practical* book, and consequently it is adapted more especially to such students as are able to work through the exercises experimentally in a properly equipped physical-chemical laboratory. For the purpose in view the exercises have been well chosen, although some of them would, according to British practice, belong rather to the course on general physics. Of special value is the weight which is throughout laid on method, and on the student working out for himself in each case the effect of errors of observation on the final result.

As regards the English translation, the reviewer must disclaim the credit which a passage in the translator's preface might seem to imply, he having read the book carefully for the first time—with the exception of a few pages—in connection with this review. He may, therefore, perhaps be allowed to point out a few faults, which should be corrected in a future edition. For the most part Mr. Cameron has succeeded in reproducing the sense of the original, but there are a few exceptions—*e.g.*, in determining the heat of evaporation (p. 62) the escaping vapour can hardly have a "*higher* temperature than the bath." "Temperature velocity" (p. 63) is not a happy rendering of "Gang." On p. 76 "atoms of the same valency" should

be "multivalent atoms." The description of Ruhstrat's sliding resistance on p. 118 does not convey a clear idea of this simple apparatus. The resistances in a resistance-box (p. 119) are not "inserted in a circuit" by pushing in a "conical brass key" (? plug): quite the contrary. To increase the damping of a galvanometer (p. 123) a resistance is put in *shunt*, not "series." Also, it is surely too sweeping to say that the third equation on p. 2 "is applicable to all calculations." On the other hand, in a few places the German has been too closely followed. For instance, on p. 112 a "volt-ampere" and a "watt per second" are referred to as quantities of energy, the correct terms being "volt-coulomb" and "joule" respectively. The recommendation on p. 120, to remove soldering fluid from electrical connections, should be replaced by an emphatic direction to use rosin as a flux. The phrase, "a feeble, as shrill as possible, tone" (p. 122), is not English. On p. 124 *et seq.* "side circuit" is used for "shunt" and "ampèremeter" for "ammeter," and on p. 155 "element of work" for "working cell," or simply "battery." On p. 156 *et seq.* "compensation apparatus" should be changed into "potentiometer." In correcting for the vapour pressure of the water in the eudiometer of the Victor Meyer apparatus (not Viktor) (p. 24), only half this vapour pressure should be subtracted from the barometer reading, seeing that the air in the apparatus was about half saturated to begin with (*cf.* p. 20, note). In the capillary electrometer (p. 125) the surface tension of the mercury is *increased*, not "diminished," by negative polarisation. The formula at the top of p. 160 is true only when the anion and cation have the same valency. The equations on p. 168 do not balance, and the statement below "In all these cases" (*viz.*, cells) "the production of an anion is associated with the disappearance of a cation," should be corrected by reading "equivalent to" for "associated with." In addition, there are a few fairly obvious misprints. In spite of the above criticisms, however, the book can be warmly recommended, and the additions made to it during translation are a distinct improvement.

N. T. M. WILSMORE.

Outlines of Physical Chemistry (Methuen's Text-Books of Science).

By GEORGE SENTER, Ph.D., B.Sc. (London, 1909: Methuen & Co., 36, Essex Street, W.C. Pp. 369. Price 3s. 6d.)

It is of the utmost importance that the publication of elementary text-books treating on a branch of science that is growing with the rapidity shown by physical chemistry should proceed at such a rate that the use in the schools of the current text-book should create the most favourable conditions possible for the further vigorous development of the science in question. This country, to say the least, has not in recent years been in the front rank as far as progress in physical chemistry is concerned, and Dr. Senter's very successful attempt to provide the necessary grounding required at the present moment is deserving of most cordial welcome, all the more so since no elementary text-book of the kind has appeared, we believe, since the publication of Dr. Lehfeldt's little book some ten years ago, when the science had hardly outgrown its infancy.

As is usual in books of this kind, only the most elementary mathematics is employed. This is no doubt inevitable, but unfortunately it prevents the author from proving the truth of many of the relationships and formulæ which illustrate his text. Many teachers will disagree with Dr. Senter when he says that the really important thing is not that the student should be able to prove

the formula, but that he should thoroughly understand its meaning and applications. It may be argued with much force that the former is one of the necessary conditions of the latter. The physical side of the subject becomes a mere matter of arithmetic, if the student is not able to deduce the special laws of physical chemistry from the fundamental laws of energy.

Assuming a general knowledge of physics and chemistry, the book opens with an introductory chapter on Atomic Theory, thence passing to the Laws of Gases and the Properties of Liquids. There naturally follow the chapters on Solutions and Dilute Solutions, the latter chiefly devoted to the Van't Hoff theory and its consequences. We wish the author had strengthened his treatment of this subject on the physical side by dwelling at greater length on the mechanism of osmotic pressure; the short section on p. 98 may whet the student's desire for knowledge, it certainly will not satisfy it. Dr. Senter is so strong on the thermodynamic side that perhaps he under-estimates the ordinary person's craving for concrete realisations of physical conceptions. On the other hand, we certainly think that in the section on molecular weight of dissolved substances (p. 101) the author should have at least indicated how the relationships of osmotic pressure and lowering of vapour pressure, elevation of boiling-point, and lowering of freezing-point may be deduced from the laws of thermodynamics. The mere statement of these relationships without either mathematical proof or physical picture will satisfy no class of student. The author does not at this point follow the usual text-book procedure and deal with Electrolytic Conduction, but he passes on in the first instance—on the whole, we think wisely—to treat of the Laws of Thermochemistry and of Equilibrium in Homogeneous and Heterogeneous Systems. These sections are written on the well-known lines, and they are simply and clearly expressed, although more attention might perhaps, in view of their practical applications, have been paid to the properties of solid solutions. The short chapter on Theories of Solution, which ends, as was to be expected, on a healthy note of uncertainty, is rather curiously placed in between the chapters on Equilibrium in Electrolytes and Electromotive Force, the former following that on Electrical Conductivity. The general treatment of the electrochemical portion of the book follows more or less the usual lines.

The book generally is written with clearness and with a knowledge of what students require, and those who, with the proper grounding, are approaching the subject for the first time, will find it a comparatively easy matter to grasp with understanding the principal conceptions and results of modern physical chemistry.

Some Electro-Chemical Centres. (University of Manchester Publications, Vol. XLI.) By J. N. PRING, M.Sc. (Manchester, 1908: The University Press, 34, Cross Street. Pp. 136.)

This interesting and useful volume forms No. 7 of the Gartside Reports on Industry and Commerce which are made by the holders of the Gartside Scholarships at the University of Manchester. It is intended that each of these scholars shall select some industry for examination, and investigate this comparatively in the United Kingdom and abroad. Mr. J. N. Pring's Report is a concise survey of the present position of the electrochemical and electro-metallurgical industries, and is based on information acquired by the author personally on the Continent and in America during the years 1907 and 1908. Among the centres visited and described are Niagara Falls, the copper refineries in New Jersey, the water powers—the potential electrochemical

centres—and the actual electrochemical centres in Canada, the various electric iron and steel smelting furnaces working, the ozonising plants on the Continent, the electrolytic bullion refineries in the United States, the hydro-electric installations and possible installations in the Alps and Pyrenees, the Norwegian nitrate plants, and finally, the power centres and electrochemical works in Great Britain.

The Journal of the Institute of Metals. Edited by G. SHAW SCOTT, M.Sc., Secretary. (London, 1909 : Published by The Institute of Metals, Caxton House, Westminster, S.W. Pp. 319.)

This first issue of Transactions of the new Institute of Metals forms a very attractive and interesting volume. The Papers it contains are those read at Birmingham last November, with the adjourned discussions which in some cases were afterwards held in London. Besides Sir William White's Presidential Address, the following are the Papers which are published here : "Some Points of Interest concerning Copper and Copper Alloys," by J. T. Milton ; "The Mechanism of Annealing in the case of certain Copper Alloys," by G. D. Bengough and O. F. Hudson ; "Aluminium and some of its Uses," by J. T. W. Echevarri ; "Notes on Phosphor-Bronze," by Arnold Philip ; "Metallographic Investigations of Alloys," by W. Rosenhain ; "Inter-Metallic Compounds," by C. H. Desch ; "Plant used in the Manufacture of Tubes," by W. H. A. Robertson ; "The Relation between Science and Practice," by Sir Gerard Muntz, who is to be the next President of the Institute.

The very full discussions on these Papers are printed *in extenso*, and many of them are of great value. It is noteworthy that the Institute numbered some five hundred members in July last.

An Introduction to the Science of Radio-Activity. By CHARLES W. RAFFETY. (London, 1909 : Longmans, Green & Co., 39, Paternoster Row, E.C. Pp. 208. Price 4s. 6d. net.)

This little volume purports to contain a concise and popular account of the properties of the radio-active elements and of the new conceptions which the study of these has engendered. The author first describes the properties of the radio-active elements, and of the rays which they emit and the products they yield ; he then proceeds to discuss the theories of atomic structure which have been put forward to explain the facts described. Finally, he adds a short "practical" section which will enable any one to study for himself the principal radio-active phenomena with the simplest possible means. Suffice it to say that the book admirably fulfils its purpose. Any one who has a good general idea of physics and chemistry will find it gives him a very simple and readable account of the principles of radio-activity.

The National Physical Laboratory. Report for the year 1908.

The Report again contains a great deal which will be of interest to the members of the Faraday Society. In the Electrical Department the work on the Weston cadmium standard cell has been continued, and in order to study further the reproductibility and constancy of these cells interesting comparisons have been made with cells set up in foreign laboratories, particularly at the Washington Bureau of Standards.

In the Thermometry Section the new electric furnace room has been completed and partly equipped with the furnaces and other appliances which it is

to contain. These include a horizontal carbon spiral tube furnace, which has been designed by Mr. W. Price and Dr. J. A. Harker in order to obviate the difficulties associated with the ordinary type of tube furnace. In the new form, the carbon tube is retained as a lining only, heat being supplied by current in a graphite spiral, surrounded but insulated from the central tube. The furnace is being made in three sizes, and is extremely economical for its size, a temperature of $2,000^{\circ}\text{C}$. being maintained in a space near the centre of the furnace measuring 8 in. long by 3 in. diameter, with a current of 105 amperes at 40 volts. An account of this furnace and the experiments made with it is promised. For the verification of radiation pyrometers there are being installed three large furnaces, including a platinum-foil wound tube furnace for use up to $1,400^{\circ}\text{C}$., and a vertical graphite spiral furnace similar to the horizontal one referred to above. The lagging in all these furnaces appears to have been brought to a high state of perfection, seeing what high temperatures are attained with a very small consumption of energy.

A motor alternator has been installed in this department for the working of the Kjellin induction furnace presented some time ago. The equipment of the department is particularly adapted for the study of the purity and properties of the metals used in high temperatures in electric furnace work and nowhere in the world is more important work in this direction being carried out. In the Metallurgical department the work of the Alloys Committee on the alloys of copper and aluminium with manganese, nickel, and zinc has been, and is being, continued. An account of the method of experiments adopted in this department will be found in the Paper which Mr. Rosenhain read at the first meeting of the Institute of Metals.

Laboratoriumsbücher für die Chemische und verwandte Industrien, Band VII. Laboratoriumsbuch für die Industrie der verflüssigten und komprimierten Gase. By Dr. KARL URBAN. (Halle a. S., 1909: Wilhelm Knapp. Pp. 40. Price 1.80 marks.)

In technical chemistry during the last few years the use of compressed gas has become greater and greater until the manufacture of the gases and the compression into steel cylinders has assumed large dimensions. The question of the purity and consequent analysis of these gases is therefore a matter of great importance. The difficulty generally is to know what methods are the most satisfactory for specific gases, and one may waste a considerable amount of time in finding this out. The little book before us meets the wants of the technical chemist in this matter, and consequently we have very much pleasure in drawing attention to its appearance and recommending it to those interested in the subject.

Verhalten der Wichtigsten seltenen Erden zu Reagentien. By Dr. J. VON PANAYEFF. Monographien über chemischtechnische Fabrikationsmethoden. Vol. XIV. (Halle a. S., 1909: Wilhelm Knapp. Pp. 83. Price 3.60 marks.)

The term "rare earths" or "rare metals" has been considerably modified of late, particularly since the enormous advances which have been made in connection with the employment of incandescent gas burners. It is now found that most of the rarer constituents of the earth are, if not largely distributed, at any rate widely distributed. It is, however, a matter of considerable difficulty to analyse the earthy mixtures of these elements, because their properties are in many instances very similar, and they invariably occur as

mixtures. The little book by Dr. v. Panayeff is practically a book upon analysis. The metals are taken in order, and their occurrence in the various minerals described. The properties, so far as they are known, are then described, their chief salts discussed, and then their reactions set out in detail. This little work is just what is required by all who are interested in the incandescent mantle industry.

It is a pity that there are no such books as this published in English, but as most chemists are able to read German, perhaps it does not matter so much, and we are afraid they would hardly pay the publishers—but we should feel their want were they not published.

The General Characters of the Proteins. By S. B. SCHRYVER, Ph.D., D.Sc. (London, 1909: Longmans, Green & Co., 39, Paternoster Row, E.C. Pp. 86. Price 2s. 6d. net.)

This book is one of the series of monographs on Biochemistry edited by Plimmer and Hopkins, and deals with the chief properties of the proteins, with the object of determining how far they are of value for devising methods of isolation and identification of individual members of the class. Of the three parts into which the book is divided, the first treats of the physical properties of the proteins, including the solubility in salt solutions and in organic solvents, coagulation by heat, optical rotation, the gold number, &c.; the second deals with the general chemical characters of the proteins, including chemical composition, salt formation, precipitation by salts of heavy metals, &c. The third section deals with biological methods for the identification and differentiation of the proteins, and comprises a brief discussion of the applications of the precipitin reaction.

The book meets in a satisfactory manner one of the objects aimed at by the editors of the series in being well up-to-date. As an example of this, the account of Zsigmondy's experiments on the "gold number" of protein solutions, and of Beckhold's investigations on fractional filtration may be mentioned. The description of methods is clear and adequate. The account of the combination of proteins with acids and bases is very full and complete. In the discussion of the salt formation of caseinogen, reference might have been made to the earlier experiments of van Slyke and of Robertson (1907), which must have been available when this section was written. The value of the book is greatly enhanced by a very complete bibliography.