

REVIEWS

The Stuff We're Made of. By Dr. W. O. Kermack and Dr. P. Eggleton. (Edward Arnold & Co., London), 1938. Pp. 342. Price 7s. 6d. net.

"A preposition is a word that you must not end a sentence with", said the professor; but Drs. Kermack and Eggleton, supported by so high an authority as H. W. Fowler, evidently claim that the legitimacy of a prepositional ending in literary English must be uncompromisingly maintained. The excellence of their book entitles them to this dictatorship.

A very successful attempt has been made to delineate in detail the building materials of the body, and the chemical processes by which the body works. It begins with an appeal to the sense of proportion invoked by an ingenious yardstick of the universe in which the unit is the proton. Ascent of the scale by one unit corresponds to multiplying the previous number of protons by 10. Thus at 6 on the scale we have reached 10^6 , or one million protons; a red blood-cell stands at 14, a whale at 32, the world at 51.6 and the sun at 57 on the scale. This helpful idea is elaborated in the frontispiece, "From molecule to nebula", comprising six objects, each of which is about one billion times (10^{12}) as large as the next in series.

There follow chapters on the methods of pursuing a scientific inquiry, and the underlying principles of molecular architecture, leading to the nature and sources of energy with special reference to the animal body. On this compact foundation is developed the purpose of the book, namely, to portray the relationship between living and non-living matter, thus proceeding to an admirable account of recent biochemical researches in simple terms illustrated by intelligible formulæ.

From this we learn of the things we must eat, of the vitamins, of the enzymes—"Nature's stepping-stones"—and of the hormones in relation to reproduction and growing-up. A chapter entitled "Chemical Makeshifts in Nature" concludes with an illuminating survey of the skeletal kinship among the sterols, œstradiol, testosterone, calciferol, cholic acid, strophanthidin and

methylcholanthrene, one of the most active of the cancer-producing compounds. The chapter called "No-Man's-Land" is an enlightening discourse on the scale-region below 10, embracing bacteria, the viruses and bacteriophages; whilst the conclusion is pleasantly philosophical, showing that the development of general scientific study, of biochemistry and physiology in particular, tends to weaken the vitalistic view-point which claims that living matter displays phenomena basically different from those of inorganic nature.

The authors have contrived a most commendable art of exposition. They use diverting expressions and plain language to convey elusive ideas and complicated changes, thus producing an exceptional book which, at the very modest price of issue, constitutes a genuine mine of information and stimulation.

M. O. F.

Testing Television Sets. By J. H. Reyner. (Chapman & Hall, Ltd., London), 1938. Pp. vii + 128 with 49 figures. Price 9s. 6d. net.

This book on the testing of television receivers by an experienced radio engineer and writer like Mr. J. H. Reyner is an indication of the present status in Great Britain of the development of television as a public service. With advances in the transmission service, there has been a gradual increase in the number of television receivers in public use; and these have to be maintained in satisfactory working condition by efficient servicing.

Mr. Reyner's book is primarily designed for the service engineer who is at home with the basic principles of television transmission and reception. It is not just a bundle of notes but deals intelligently and briefly with the theory and design considerations underlying the troubles that normally arise in practice in a television receiver. Mr. Reyner analyses the causes of defective operation and failure occurring in each of its component parts and describes the methods of locating them and the measures necessary to set them right. In several cases, sample calculations have been worked

out to illustrate the method. A considerable part of the book is necessarily taken up with the cathode-ray tube—both electrostatic and electromagnetic—and its associated apparatus such as the time base and synchronising circuits. The excellent reproductions of the pictures on the screen bring out clearly the different types of distortion described in the text.

A word of praise is due to Mr. Reyner for the many practical hints and advice that he gives as well as for his emphasis on a number of precautions in testing. Amongst these are the damage to the cathode-ray tube screen by a stationary spot (page 25), the discharge of condensers through a resistance (page 23), the precaution against electrical shock by keeping one hand in the pocket when testing with the other (page 21). There are a number of circuit diagrams, the usefulness of which is enhanced by the values of the electrical constants of the component parts. And special mention must be made of the first and last chapters dealing with apparatus and technique necessary for testing television receivers.

Amongst so many good and useful features, there are a few minor defects. For example, what exactly is meant by the opening sentence in Chapter II? Such terms as "h.t. voltage" (page 32, line 20), "bottombending" (page 59), "shorting" (page 64), etc., are rather inappropriate in a book, whatever their justification in conversation. So also the technical jargon in the second para on page 57. One must demur against the statement that the charging current is proportional to the charge (page 55) and the definition of time constant on page 57.

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Ions, Electrons and Ionizing Radiations.

By J. A. Crowther. (Edward Arnold & Co., London), 1938. Seventh Edition. Pp. 348. Price 12s. 6d.

Every student of Physics is familiar with this book which has already gone through a number of editions. As the author himself puts it, as a result of the unparalleled outbursts of discovery, experimental and theoretical, of the past twenty years, the book has undergone many changes. Its purpose, however, remains unaltered.

The sections on Cosmic Rays and the chapter on the Nucleus are most interesting and instructive. They have been rewritten

and very considerably enlarged. The presentation of the subject is systematic and fully indicates the very rapid advances made in these branches.

The book is one of the best on this subject and as a study-book for the college student, it occupies a particularly very high position.

The conclusions of modern researches are mentioned in the text, without, in most cases, going into their mathematical details. This helps the student to be generally well-acquainted with the most important topics of the day.

A special chapter dealing with atmospheric electricity, specially dealing with the recent work on ionosphere and the like would considerably add to the value of the book.

One of the principal features of the book is the balanced treatment of all the different branches of the subject and the systematic plan which maintains the link between them all.

G. R. P.

An Introduction to the Chemistry of Cellulose. By J. T. Marsh and F. C. Wood. (Chapman & Hall, Ltd., London), 1938. Pp. xv + 431. Price 21s. net.

Considering the technical importance of cellulose and its derivatives, there are few books on the subject and the present volume is an extremely valuable addition. Written by two members of the research staff of the Tootal Broadhurst Lee Co., Ltd., a firm which has been one of the pioneers in the application of chemistry to the processing of textiles, the book is an authoritative survey of every aspect of the chemistry of cellulose. Almost the only criticism that one might offer is that, in common with several other recent books on chemical technology (particularly of American origin), clarity is sometimes sacrificed in an effort to be comprehensive in the citation of literature. One might also add that in an *Introduction to the Chemistry of Cellulose* experimental details are best omitted, unless these relate to methods which have been accepted as the standard; in a subject such as this, in which the bulk of the work has been very recent and in which a great deal of the published material is of an inconclusive and empirical character, few procedures could claim to have attained the status of standard methods. Although the original literature on cellulose is vast and

complex, the research worker in the field will perforce have to wade into it, so far at least as his immediate problem is concerned, and there is little to gain by attempting to include in a general and introductory survey a detailed account of experimental procedures. Further, in making a choice of methods meriting full description, a slight tendency towards insularity seems difficult to avoid.

A very pleasing feature of the book is the stress laid on the practical applications of cellulose chemistry. The references to patent literature are extensive and every important development in the preparation and utilisation of cellulose derivatives has found a place. For any one desiring to undertake a study of the esters and ethers of cellulose, there could be no better starting point than Part IV of this book.

A few minor omissions may be noted. In dealing with the dispersion of cellulose, no reference is made to a commercially available organic solvent marketed by Röhm and Haas. The expression "degree of mercerisation" is loosely employed; while there are tests for characterising mercerised cotton, of which the baryta number is the most reliable, none has yet been shown to be adequate for a quantitative estimation of the "degree of mercerisation", apart from a photometric assay of the lustre. Edelstein's very useful work on the influence of temperature and other factors in mercerisation has escaped notice. So have Sauter's conclusions on the unit cell of cellulose, preferring the Sponsler lattice to that of Meyer and Mark. Hudson's researches on the graduated fission of carbohydrates by means of periodic acid might have received fuller treatment than the brief reference to "the interesting speculations on the chemistry of oxycellulose formation".

This is a book for every textile chemist and every cotton mill in the country to possess.

K. V.

Life-Histories of North American Birds of Prey (Part 2). By Arthur Cleveland Bent. (*Bulletin 170 of the Smithsonian Institution, United States National Museum, Washington*), 1938. Vol. 8. Pp. viii + 482, 92 plates. Price 60 cents.

This is the eleventh of the series of bulletins on the life-histories of North-American

birds, which so far includes Wildfowl, Marsh Birds, Shore Birds and Gallinaceous Birds. The excellent manner in which Mr. Bent has sifted, collated and marshalled the wealth of information at his disposal makes these publications of the highest value to students of birds, not only in America but also throughout the world, particularly to those interested or engaged in conducting research in Economic Ornithology. It was precisely such comprehensive investigations on the life-histories of Indian birds, as a groundwork for more specialised studies, that were contemplated in a scheme for research in Economic Ornithology submitted by the Government of Bombay to the Imperial Council of Agricultural Research about three years ago. After some deliberation, the scheme was turned down by that body, ostensibly for financial reasons, since it was made clear at the outset that the work would, of necessity, have to remain unremunerative in its early stages. It is not heartening to workers to find facilities blocked due to such a short-sighted and commercial view of scientific research not uncommonly taken in this country. The ever-ready—and often convenient—plea of "financial stringency" is an argument which it is always difficult to meet!

The present volume deals with 20 species and subspecies of the Order Falconiformes, all belonging to the Family *Falconidae*, and 56 species and subspecies of the Order Stringiformes comprising the Families *Tytonidae* and *Strigidae*. As full a life-history as possible has been given of the best known subspecies of each species. Duplication is avoided by writing briefly of the others and giving only the characters of the subspecies, the range, and any habits peculiar to it. "Life-history" covers: Courtship, Nesting, Eggs, Nestling, Young, Plumages and Moults, Food, Behaviour, Voice, Enemies, Seasonal Movements, Spring and Autumn Migrations, Range, Breeding Range, Casual Records, etc.

The compilation of such a comprehensive manual—and the others of this series—has naturally only been made possible by the co-operation of a large number of scattered observers. The magnitude of the task will be appreciated when it is realised that receipt of material from close on 400 contributors has been acknowledged. The distribution paragraphs have been compiled from the matchless files of the Bureau of

Biological Survey and are as authentic and up-to-date as it is possible to have them.

The 92 plates accompanying the volume are well-chosen and depict nests, eggs, nesting sites and young of falcons and owls in their various plumage stages. The very full and useful bibliography, covering 22 pages, is another feature for which students will be thankful.

There is a great deal that workers in India will find suggestive in this monumental series of life-histories of American birds. The volumes cannot but serve as an inspiration, and must form a very desirable adjunct to every ornithological library.

SALIM ALI.

Chemical Tables from Handbook of Chemistry and Physics. (Published by the Chemical Rubber Publishing Co., Cleveland, Ohio). Price \$3.

The original *Handbook of Chemistry and Physics* published by the same Company, has been a well-known reference book of proved utility to many individual physicists and chemists. The wide range covered by its contents and the very reasonable cost at which the book has been available are its significant features. In its succeeding editions, however, including the last 22nd edition for 1937-38, the book has grown to over 2,000 pages and this has tended to make the handling of this *Handbook* somewhat inconvenient. At the suggestion of several prominent users, the publishers have now separated out the portions immediately useful to the chemists, into a convenient-sized volume of "Chemical Tables", while, at the same time, incorporating some additional features such as Melting point and Boiling point index, tables of Free energies, Ionisation potentials, etc.

This new form of the well-known *Handbook* will, no doubt, be even more welcome to the large circle of chemists. The price of this volume in India is only 3 dollars; and for this price, the fare provided is, indeed, very liberal.

M. A. G. Rau.

Modern Atomic Theory. By J. C. Speakman. (Edward Arnold & Co., London), 1938. Pp. 207. Price 6s. net.

In the *Preface* to this book the author says that it has been written with a view to its being useful to science students in

universities and colleges and in the upper forms of schools and possibly to the general scientific readers as well. The reviewer has no hesitation in saying that this object has been amply fulfilled. A logical treatment of a subject that is progressing rapidly, is in the nature of things, a difficult process but the author's efforts in this direction have been very successful. Stress has been laid on the physical principles underlying the atomic phenomena and the treatment is non-mathematical. A student desiring to specialise, is enabled to build up the proper perspective necessary for the study of a subject of such fundamental importance. The tables given, make the book useful for ready reference as well. The very clear presentation of the whole subject makes it easy for the general scientific reader to acquaint himself with the nature of atomic processes. The treatment is accurate and agreeably concise. A bibliography of select books has been given in the end for the benefit of those who desire detailed information. The illustrations and the index add to the value of the book.

D. S. R.

The German Primer for Science Students.

By H. Biswas. (University of Calcutta), 1938. 9½" × 6". Pp. 258.

While science is international the language in which its results are expressed is not so. This is an unavoidable obstruction which can only be got over by a student of science by learning several languages. It is a known fact that nowadays German is the medium in which the largest quantity of research-output is expressed in any single language. Hence the minimum equipment for a student of science should include a knowledge of German. But the chief modern language which an Indian student learns at school is English. Hence he has usually to pick up German at the post-graduate stage, when he has hardly time or inclination to take a formal course.

The value of Biswas's *German Primer* is best seen in this setting. It is pre-eminently "German self-taught". It has all the merits due to its being based on the concrete experiences of a student of science who had struggled to acquire this language and has achieved full success. It is indeed very good of Biswas to place the benefit of his achievement at the disposal of other students of science.

After developing the essentials of grammar in a human way in the first 59 pages the author has devoted a section to literature and one to each of the important sciences. These sections contain the special vocabulary of the field covered and illustrative passages with English translation. The book ends with about 50 pages of a select vocabulary of words common to all sciences and literature. The illustrative passages chosen are so interesting and are here and there illustrated with Sanskrit parallels in such a dextrous way that one is led on by the thought-content of the passages, incidentally picking up the language with the least conscious effort. This no doubt is the correct way of introducing grammar and I should like to congratulate Mr. Biswas on his success in this difficult art.

The book is rightly dedicated to the memory of Sir Asutosh Mookerjee who has perhaps done more than any other Indian in recent years to put his countrymen abreast of others in matters of scientific research. It is also fitting that the University of Calcutta, which has done pioneering work in the furtherance of research under the inspiration of Sir Asutosh, should have come forward to make this one of its publications and thus extend its services to students of science in all Indian Universities.

S. R. RANGANATHAN.

Manufacture of Soap in India. By A. K. Menon. (*Bulletin of the Indian Industrial Research Bureau*, No. 12. Government of India Press, Simla), 1938. Pp. 63. Price Re. 1.

The Industrial Research Bureau has been publishing a number of bulletins of technical importance to Indian industries. On the subject of Indian Vegetable Oils and allied products, we had an excellent Bulletin (No. 10 of the series, by Mr. N. Brodie, M.Sc., F.C.S., A.I.C.) and we were looking forward for the logical outcome of this Bulletin, viz., those dealing with the industries that utilise the oils and fats available in India. Appropriately enough the manufacture of soap in India has claimed the attention of the Bureau owing to the recent remarkable development of the soap industry in India.

Nobody could have been better placed to handle this subject in India than Mr. A. K. Menon, B.A., F.C.S., Superintendent, Kerala Soap Institute, Calicut. Few remember that Mr. A. K. Menon was a student in the famous laboratories of Dr. J. Lewkowitsch, the world renowned authority on oils, fats and waxes. This was nearly twenty-eight years ago. Since his return to India, Mr. Menon has been working continuously in Calicut in the Government Soap Factory belonging to the Government of Madras. Mr. Menon combines very happily the attributes of a research worker, a versatile professor and an able Chemical Engineer, accompanied by business acumen and enterprise. He has contributed several papers on Indian Oils and Fats; he has, since its beginning, been the Principal of the Kerala Soap Institute; and he has made a success of the Kerala Soap Institute from the business point of view. Therefore, any book on Soap-making in India from the pen of Mr. A. K. Menon will have a stamp of authority backed by unique experience.

Purely from the scientific and technical point of view, the Bulletin is a compendium of useful information to Indian Soap-makers. It is to be noted that Mr. Menon was not writing a text-book nor an exhaustive monograph on the subject from a purely scientific point of view. The Bulletin under review contains within a small compass an adequate amount of scientific, technical and business information which an industrialist in India may seek to have authoritatively for guidance before investing his money on it. There is a necessity in India to place before our political leaders, well-written, easily understandable and at the same time, scientifically accurate bulletins to supply them with a background of scientific and technical information that are necessary to guide them in their nation-building activities.

Students of General Chemistry who have no time to wade through either learned text-books or original research papers will get a bird's-eye-view of the Industry in this Bulletin which is neither too specialised nor too pedantic.

The Industrial Research Bureau should be congratulated on the production of this excellent Bulletin.

S. G. SASTRY.