

REVIEWS.

Carl Friedrich Gauss.—Inaugural Lecture on Astronomy and Papers on the Foundations of Mathematics. Translated and edited by G. Waldo Dunnington. (Louisiana State University Press), 1937. Pp. 91. Price \$1.00.

This little volume of about 90 pages, dedicated by the author to the Rector, Dean, Curator, and Profs. Hasse and Kienle of Göttingen University on the occasion of its Bicentennial Jubilee of 1937, contains a short account of the early life of Gauss put together by the author from study of new data, papers by Gauss on foundations of mathematics and an inaugural lecture by him on Astronomy. Both the latter are collected here for the first time.

The author is a great Gauss enthusiast. He has spared no pains in looking out numerous Gaussian *Archives* and other independent sources for material of his biography. In his own words "it is unnecessary to justify the publication of anything from the pen of a man who ranks with Archimedes and Sir Isaac Newton as one of the three greatest mathematicians of all time." As a result of the author's investigations many new incidents of the first twenty-six years of Gauss' life have been brought to light—in particular, the great friendship of Gauss and Bolyai is vividly portrayed here in its serious as well as gay aspects. A few interesting facts may be recorded here:

"From childhood to old age Gauss always used the empty pages and the inside of the book covers as writing paper, not only for the entry of formulas often used and of occasional minor calculations, but frequently also for abstruse researches."

"He (Gauss) was very modest and didn't make much showing; not three days as in the case of Plato, for years one could be with him without recognizing his greatness. What a shame, that I didn't understand how to open up this silent 'book without a title' and read it."

"Gauss never liked to teach, because it robbed him of time for research. According to his notions the ideal plan would be to lecture on research in which one might be

engaged at the moment or in which one might be specially interested. Nevertheless we know that Gauss was a great teacher."

The inaugural lecture on Astronomy is a masterpiece of presentation, of clearness and precision of thought and might well be taken as a model for an introductory lecture. Even after the lapse of 130 years the lecture appears quite fresh and could well be delivered (with minor alterations) to audiences of the present day to explain the importance of a study of Astronomy. In view of recent developments in Astrophysics the following short extract from Gauss' lecture appears extraordinarily interesting:

"nevertheless one finds that some writers to be sure only such ones for whom physical astronomy is a *terra incognita*—use the word physical astronomy in an entirely different sense and understand by it the little that we know about the physical constitution of celestial bodies, their surfaces, atmosphere, and about sun-spots, etc. The little, I say, that we know about these subjects and the much that is supposed and dreamed, feigned and blundered. It is always well to know this solecism because otherwise ridiculous misunderstandings can arise."

All lovers of Gauss—and all mathematicians will surely read this book from cover to cover.

B. S. M.

Scripta Mathematica Forum Lectures. (Published by Yeshiva College, New York, 1937. Pp. 94.

This is a collection of four lectures delivered before the Forum of the Friends of *Scripta Mathematica* by C. J. Keyser, D. P. Smith, E. Kasner and W. Rautenstrauch. The lectures are entirely non-technical in character and but for the fact that they deal with mathematics directly or indirectly they do not presuppose any knowledge of mathematics on the part of the reader.

The first lecture by Keyser on "Mind and Maker" is an essay due to William Benjamin Smith on the questions of Reality and

the World and discusses the philosophic bearing of the results of modern physics. It is remarkable as much for its brilliant and original ideas as for its powerful—almost thunderous—literary style. But for the extremely valuable *résumé* given at the end of the lecture it would be difficult indeed to understand what exactly are the author's conclusions. Here are a few characteristic statements "an absolutely hopeless equalitarianism of the atoms" when referring to the "Heat death"—"The highest conceptional ecstasy, the reverie of a mystic, the aspiration of a philanthropist, the musing of a sage, the imagination of an artist or poet, the observation or calculation of a savant—none has ought physical about it, . . . ; for the subject in each case the experience is purely psychic."—"We may liken Psyche to a boundless flag floating in the breeze, full of crinkles, in number infinite, endless in variety. Each of these flexures is itself and not another, each what is only as the others are what they are, each mysteriously joined with every other, so as for All to form One, the whole, whence one might say that Each is identical with the Whole, extending its being through Infinite." One can hardly fail to wonder if, in these last sentences, the author is really not translating into English some Sanskrit stanzas from out of our Indian Upanishadic philosophical systems!

The second lecture on a brief history of mathematics by such a well-known authority as D. E. Smith gives a rapid sketch based on the chronological order of the most striking contributions to mathematics. It traces the trends of mathematical developments in several countries and assigns the causes leading to such developments. It is very interesting to read "To what country should be credited the work of Lagrange who was of French descent, an Italian by birth, German by adoption and Parisian by choice?" Of particular interest to us is the statement "Is all this period (16th–19th century) the orient, and particularly Japan and India, did little except as it followed European leads." Contrast this with the three places assigned in Prof. Smith's roll of giants to three Indian mathematicians, *viz.*,

"510 : Aryabhata the Elder—850 : Mahāvīra—1150 : Bhaskara."

The third lecture on "New Names in Mathematics" by Kasner is, in our opinion, the best of the four. Prof. Kasner has dis-

covered a remarkable method of presenting to a lay audience some of the abstruse topics in mathematics. He has devised some very fine names like "turbine," "cycle," "par-hexagon" and the best of the lot "the googol" a short name for the big number 10^{100} . We are not quite sure if Prof. Kasner is right in saying that there is only one cycle touching three given cycles. We think it ought to be two cycles. We can add a few more names to his list—a street, a tree, a hole, a sink, a signature. To illustrate the abuse of the word 'simple' he cites a simple group which is a 'group without any self-conjugate sub-groups'. How much simpler this is when compared with "simple-algebra," *i.e.*, an algebra which is not nil-potent and has no maximal nil-potent invariant sub-algebra and in addition has no invariant sub-algebra!

The last lecture is on Science in relation to social growth and economic development and deserves to be read by every politician with great care. Only one striking sentence we shall extract here "our failure to apply the methods of Science to the design and construction of an economic system adapted to the requirements of this power age must be classed along with the declarations of war as among the major stupidities of the human race."

B. S. M.

Protective Films on Metals. By Ernest S. Hedges. (Chapman & Hall, Ltd., London), Second and Revised Edition, 1937. Pp. 397. Price 21*sh.* net.

The importance of a publication on the interesting subject of protecting metals against corrosion is easily gauged from the fact that there is hardly any industry or operation on a large scale in which metals are not employed. For a long time research workers in academic institutions have been aware of the part played by films in rendering certain metals immune from the corrosive action of air and chemicals. The most outstanding example of this behaviour is the phenomenon of passivity which has attracted a great deal of attention both from the academic and the practical scientist. These investigations have led to the introduction of new products which are of great interest and utility. As an example of this may be mentioned the following: stainless steel, decorative oxidised copper, and brass, chromium, nickel, silver and

gold-plated articles, and the tin plate container of the canning industry. Many new processes have been invented to achieve this object and to the old methods of electrodeposition may now be added the hot-dipping, spraying, cementation and sputtering methods, all of which find application in art and industry.

This monograph deals in a fairly exhaustive manner with the practical side of the subject in five chapters. Iron is certainly the metal which finds by far the greatest use in industry and its protection has been one of the oldest problems in chemistry. One is familiar with the use of inhibitors such as sodium hydroxide, carbonate, silicate or oxide and ordinary agents such as potassium chromate which impart resisting qualities by forming a protective film. This monograph gives a detailed account of various other methods such as case-hardening by nitrogen, the coslettising process, the parkerising process and the bonderising process and deals with various methods of obtaining stainless steel. The other metals which have been dealt with are aluminium, magnesium, copper, tin and silver.

The metals, aluminium and magnesium and their alloys, have acquired special significance owing to their use in air-craft and marine air-craft. The protection of aluminium owes much to the early investigations of Seligman and Williams. They showed in 1920 that this metal acquired enhanced resistance to corrosive action when treated with ammonia, sodium phosphate and sodium carbonate. They further showed that the cleaning of aluminum utensils by soda can be accomplished without much harm to the metal if a small quantity of sodium silicate is added to it. This is probably due to the formation of a protective film of aluminium silicate. Amongst the more well-known processes for this purpose are the Jirotko process and the modified Baur-Vogel process popularly known as the M. B. V. Process. In the Jirotko processes the films are obtained by the use of aqueous solutions of chromates and salts of heavy metals and in the Baur-Vogel process the use is made of a hot solution of potassium carbonate and sodium and potassium bicarbonates in presence of suitable catalysts.

The book deals with technical matters of this kind in a language easily understandable even by the layman and the chemist not familiar with works practice. The book

is not intended to be a dictionary, but one would have been pleased to see in this book some references to the corrosive action of acetic acid on copper and the exhibitors which have been proposed besides the nitrogen blanket. This corrosion has acquired some importance owing to the phenomenal developments in artificial silk industry and the use and recovery of acetic acid involved in the manufacture of this commodity.

The theoretical treatment of the subject is also refreshingly simple and no chemist can say that mathematical or engineering complexities have been introduced to make the reading boring or cumbersome. What is more, the treatment is sufficiently detailed so that real knowledge is imparted to the reader. The anodic passivity, a phenomenon of baffling interest has been treated beautifully and is specially commended to the intending reader. It is altogether an excellent addition to physico-chemical literature dealing with industrial problems.

S. S. B.

The Low Voltage Cathode-Ray Tube and its Applications. By G. Parr. (Chapman & Hall, Ltd., London), 1937. Pp. 177. Price 10s. 6d.

This book is intended to give an insight into the tube and its technique. It is written by a member of the Radio Division of the Edison and Swan Electric Company.

The deflection of a cathode-ray beam by a charged plate enables the potential of the charge on the plate to be determined if the potential drop used to produce the beam is known. The potential drop is a measure of the energy of the electron beam. In high voltage tube, the potential drop is some 60 kilovolts. The tube in this case is generally permanently connected to a pump system to produce the necessary high vacuum, and is provided with an arrangement for holding photographic recording plates. In medium voltage tubes the potential drop is from 1 to 3 kilovolts. No provision is made for insertion of photographic plates in these. The energy giving device, the deflecting plates as well as the sensitive fluorescent screen are all contained in vacuum in a sealed glass vessel of conical shape and long neck. The low voltage tubes work with energising potentials of about 500 volts and contain traces of gas which enable a sharp spot

(focussing) to be got on the sensitive screen in the flat part of the conical flask, at the place where the beam strikes the screen. These tubes are called "soft" as contrasted with the medium tubes which are sometimes referred to as "hard", *i.e.*, not containing gas.

The cathode-ray beam passes through two pairs of parallel deflection plates, sometimes called deflector plates, placed one behind the other in planes at right angles to each other. In Chapters I and II are discussed the details of construction, the principles and the various methods employed in the production of narrow beams of the ray. Details are given of the focussing by the magnetic and electrostatic methods in addition to that of gas focussing referred to above.

Chapter III is devoted to an account of the pattern described by the cathode-ray spot on the fluorescent screen when various deflecting voltages are applied to the two pairs of deflectors, the deflecting potentials are sinusoidal and of the same frequency but of different phases and amplitudes, or sinusoidal in one pair and non-sinusoidal in the other, or sinusoidal in both of different frequencies; these are discussed with a view to enable the tube to be used as a frequency meter.

The observation of potential variations in their true relations to time, requires a uniform movement of the beam in a horizontal plane with a rapid return to its initial position at the end of its travel, *i.e.*, a linear time base (L.T.B.). The majority of the L.T.B. circuits depend for their action on the charging of a condenser through a resistance, the condenser being discharged at given intervals of time by short circuiting. The horizontal deflectors of the tube are connected across the condenser and thus have, applied to them a gradually increasing potential which abruptly falls to zero. Neon lamps (with or without amplification) and other gas-filled tubes as well as mercury vapour relays called thyatron (triode valves filled with mercury vapour) are used for short circuiting. Circuits are given in Chapter IV for varying the range of the L.T.B. and for synchronising or locking of the test voltage impulses with the time base.

Time bases other than linear are sometimes useful as in the study of audio-frequency wave-forms where a sinusoidal

time base obtained from an A.C. supply is used. Elliptical movement of the beam can be obtained by applying the voltages to the two sets of deflectors, for one directly and for the other through a phase splitting device got by the use of a high resistance and a condenser in series, the ends of the condenser going to the second pair. The unknown frequency can be superimposed on one of the pairs of plates and a ripple like variation will be superimposed on the elliptical trace. The number of the ripples will give the factor by which the known frequency has to be multiplied to give the unknown frequency. By making the high resistance equal to $1/C\omega$ the potentials applied to each pair of plates become equal and we get circles on which the superimposed ripples could be measured with greater ease, and with an accuracy surpassing that with Lissajous' figures since the number of ripples on the circumference are easily counted. The case of using magnetic deflection simultaneously is also discussed.

Arrangements are discussed for study of transient wave-forms or spark discharges. Beam traps enable the beam to be released for observation of the pattern just before the incoming of a transient, in that a deflecting field is cut off to enable the beam to traverse the hole in the anode. Double cycle wave recording is also possible. Chapter VI is devoted to the applications to Radio engineering and Chapter VII for applications in other industries, etc., as pressure gauges by piezoelectric means, for measurement of hysteresis of magnetisable materials, for recording of heart beats, etc. Chapter VIII is devoted to the use of the tube in television. There is a good Bibliography. The get-up of the book is excellent.

B. DASANNACHARYA.

Quantitative Analysis. By Willis Conway Pierce and Edward Lauth Hænisch. (Chapman and Hall, Ltd., London), 1937. Pp. 412. Price 15*sh.* net.

This book on quantitative analysis is to be confidently recommended for the beginners; its lucid exposition, simple, concise and unambiguous treatment of the subject-matter, careful presentation and judicious selection of topics make it eminently suitable for them. Theoretical principles involved, have been described clearly,

following a brief description of each method. Methods of calculation and description of laboratory procedures are added hereafter. A section of explanatory notes follows each procedure. This serves to correlate the theory and practice, explains the essential points and emphasises the precautions needed. Repeated stress is also given upon the details of laboratory technique in these notes. A list of probable general error is given in the preliminary discussion of each analysis and a list of special errors, that are likely to occur, is added after each procedure following the notes. Students are thus warned to guard against these in the actual course of analysis. Questions and problems at the end of each chapter forms a special feature of the book. This enables the beginners to gain a thorough grasp of the theory and the practice of each analytical method. Advanced theories have also been discussed after certain laboratory procedures in a way that is sure to appeal to the beginners.

The book is divided into four parts, each forming a unit by itself and can be studied independently of the others.

Part I, after giving some general directions, deals with the use of analytical balance. This is followed by a discussion on precision, errors, and significant figures.

Part II is devoted to volumetric analysis in all its aspects, *e.g.*, neutralization, oxidation—reduction and precipitation.

Gravimetric analysis is dealt with in Part III. After discussing the theory of precipitation, which includes the study of solubility product, properties of colloids and the phenomenon of co-precipitation, general operations of gravimetric analysis are described. This is followed by analysis of simple mixtures and a detailed account of the complete analysis of a typical rock like limestone.

As is to be expected in an elementary text-book, the authors do not aim at a comprehensive description of all types of mixtures and minerals. But a mastery of the technique and procedures of those described in the book will provide the students with sufficient equipment to carry out analysis for any other mixture or mineral with the help of a suitable reference book only.

Part IV, which constitutes the last section of the book, deals with certain special methods of analysis, such as analysis

by electro-deposition, electrometric titrations and colorimetry.

A chapter on the use of analytical literature and a very short general account of certain other special methods of analysis completes the book.

It is a pleasure to read a book of the type under review. It should serve as a companion book for students in the undergraduate course and a guide for the teachers. The authors, who are themselves teachers of considerable experience, have very successfully dealt with the difficulties that a beginner in analytical work often experiences.

The book cannot be too highly recommended for the undergraduate students of our Indian Universities.

Finally, the reviewer would like to draw the attention of the authors to a very few inaccuracies or ambiguities in this excellent book. These are enumerated below:—

On p. 82, "Moles of solute = Molarity \times Milliliters solution" should be Millimoles of solute = etc., etc.

On p. 148, the development of the conception of valence number and its explanation is not very happy and straightforward. To assign a valence number of 3 to the carbon atoms of oxalic acid sounds rather strange, if not confusing. Representation of the reaction between permanganate and oxalic acid in acid solution, appears also to be very complicated, and is likely to confound the beginners. A much better and clearer method of representing oxidation processes is to be found in many German text-books.

On p. 204, line 10 from the top, '5 m. mol. Fe^{+++} ' should be substituted by '5 m. mol. Fe^{++} '.

On p. 339, towards the bottom, it is stated that "the deposit should be bright yellow or orange in colour." We have never obtained a bright yellow deposit of copper by electrolysis.

On p. 369, line 8 from the top, it is written under gas analysis that carbon dioxide is absorbed by a solution of sodium hydroxide. Usually, however, potassium hydroxide is employed for the absorption.

These are, however, of minor importance, and it is hoped that they will be rectified in the next edition.

The printing and get-up of the book leave nothing to be desired, but the price is somewhat high.

A Text-Book of Qualitative Analysis.

By A. L. Vogel. (Longmans, Green & Co., Ltd., London), 1937. Pp. xi + 383. Price 7s. 6d.

There are many excellent text-books on qualitative analysis and the present volume is merely an addition to the list. The author of this work has produced no "startling new facts" to support novel methods of analysis or introduced anything new into his treatment of the subject.

The first chapter of the book contains a discussion of the theoretical basis of qualitative analysis. It is followed by a short chapter which deals with a description of the various analytical operations involved. Then come two chapters which give respectively the reactions of cations and anions. The next chapter is concerned with the systematic qualitative analysis of inorganic substances. There is then a chapter which is devoted to the modifications necessary in the usual course of analysis on account of the presence of interfering substances, like phosphates, borates, organic matter, etc. The last chapter gives a short account of the reactions of the rarer elements.

The book is well printed and free from errors. On the whole, the book is a good one, complete with a large number of useful tables, and suitable for university students, at moderate price.

R. C. R.

A Laboratory Manual of College Chemistry (Elementary Course). By H. G. Deming. (John Wiley and Sons, New York), 1937. Pp. 286. Price 8s. 6d.

The author's aim in writing this *Manual*, as stated by him in the preface, has been to provide a course of laboratory instruction to the college student in the first half year of his studies which will enable him to acquire a certain amount of manipulative skill and appreciate scientific method. The exercises, forty-eight in number, include manipulations of glass tubing, preparation of some gases, preparation of some simple, double and complex salts, tests for common anions and cations, study of important reactions of a few elements and compounds, determination of molecular weights by the lowering of melting point, studies in the nature of solvents, hydrates and hydrolysis.

The design of each exercise is very good. The theoretical aspects are well explained first, the exercise is stated and detailed instructions for manipulation are then given, a detachable record sheet—to be handed over to the instructor after the completion of the exercise—for the entry of observations and results by the student put in next and finally a list of questions bearing on the theoretical and practical aspects of the exercise is appended. The questions referred to here are to be answered by the student, after a certain amount of home study in a class specially conducted for the purpose (lecture quizz). This is a special feature of the scheme which is worthy of praise and acceptance. In this and in a few other details, the author has succeeded to a great extent in breaking away from the traditional methods of laboratory instruction.

There is, however, a good deal in this *Manual* that is clearly above the heads of students taking an elementary course—this *Manual* is sub-titled an elementary course—in the first semester of their college studies. For example, in the sections on hydrolysis, tests for common ions and double and complex salts, a good knowledge of the law of mass action and ionic equilibria is assumed and cross references to the author's text-books are given for a study of the subject. Again, to understand the section on polar and non-polar solvents and the structure of water the student must be familiar with the electronic concept of valence and the significance of dielectric constant. The experiments, quite simple by themselves, are the ones usually carried out by students undergoing an elementary course. The author's anxiety seems to be to illustrate the maximum that could be done from each experiment and hence the theoretical introductions have been made far too heavy for elementary students. This is an aspect which detracts to some extent from the merits of an otherwise admirably conceived plan of laboratory work.

The *Manual* contains plenty of matter to which a college student in the more advanced stage of his studies could advert with advantage for enlightenment.

A. N. K.

Reading, Writing and Speech Problems in Children. By Samuel Torrey Orton. (Chapman and Hall, Ltd., London), 1937. Pp. 215. Price 10s. 6d.

As reading, writing and speech are some of the most important problems of the intellectual aspects of education, a book of this kind is a welcome contribution to the educational literature of the present day. As rightly pointed out in the foreword, any disorder in the normal acquisition of spoken or written language may prove a great hindrance to academic advancement and it may often be the cause of serious emotional trouble. The studies here recorded may, therefore, be of great interest and use particularly to teachers and parents.

The use of some technical words at the very outset is rather disconcerting, but the author has anticipated this and provided a brief glossary of such words at the end.

The book consists of three chapters. The first chapter is mainly an exposition of problems, such as word blindness, word deafness and loss of ability to read or write. The second deals with certain disorders in the development of language in children and gives some good instances and illustrations in support of the points made out in the first chapter. The third is an interpretation and treatment of certain of those disorders. One finds in this chapter a clear and well-balanced discussion of the neurological interpretations of the children's disorders and a general review of the principles on which the author's experiments in retraining have been founded. The author's word of caution that "there is no general formula which will be applicable to all cases of any of the syndromes that are discussed" is an obvious proof of the author's objective outlook.

On the whole the book is a real contribution in the field and is well worth being read by all those interested in a study of those problems.

M. S.

The Scientific Journal of the Royal College of Science, London, Vol. VII. (Edward Arnold & Co.), 1936. Pp. 146. Price 7s. 6d.

The Journal contains extremely interesting and important papers, some of them presenting results hitherto unpublished.

The Chemical Society Section has contributed four papers, these being (1) "Applied

Science" by Prof. A. C. G. Egerton, (2) "Catalytic Activation of Hydrogen" by Prof. M. Polanyi, (3) "The Structure of Polish" by Prof. G. I. Finch, and (4) "The Natural Coumarins and their Effect on Fish" by N. Platzer.

The Natural History Section has four papers to its credit, these being (1) "Some Aspects of Clay Chemistry" by A. Brammal and J. G. C. Leech, (2) "Plant Poisons" by C. L. Mer, (3) "The Habits of Wasps" by O. W. Richards, and (4) "Virus Diseases in Relation to Strawberry Cultivation" by R. V. Harris.

The Mathematical and Physical Society Section has contributed three papers: (1) "The Development of the Photographic Latent Image" by Associate-Prof. R. Kingslake, (2) "Applications of the Thyatron" by C. E. Wynn-Williams, and (3) "Theories of the Photographic Latent Image," by Prof. N. F. Mott.

The printing of this journal is excellent and the binding very attractive. There is no doubt that this journal will be read with great interest by every scientific worker.

K. R. K.

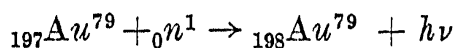
La Fin de la Physique mécaniste, par Philipp Frank. (Actualités scientifiques et industrielles, No. 414.) (Hermann et Cie, Paris), 1936. Pp. 57. Price 10 fr.

This is a vigorous protest against the unwarranted extension of purely physical ideas and phrases to other branches of knowledge. In agreement with Planck, the author assures us that modern Physics has not by any means proved the theory of Free Will, and its methods and equations are no more "organistic" nor any less "mechanistic" than before. What has been learnt is that the laws deduced from observations of large bodies with low velocities are not applicable to minute bodies and large velocities. Bohr's extension of the idea of 'complementarity' to psychology is shown to be of no value since psychologists have long before realised that experimental psychology cannot be based on introspection. The author concludes that such misconceptions are due to the loose usage of words having a definite technical meaning in one science in popular expositions involving excursions into other sciences. The remedy suggested by him is

to have a phraseology which has the same meaning in all the sciences. The book must be read by all who are interested in finding out the real significance of the discoveries of modern Physics in shaping our attitude to various problems of life.

Cinétiques des Réactions Nucléaires, par G. Gamow. (Actualités scientifiques et industrielles, No. 349.) (Hermann et Cie, Paris), 1936. Pp. 23. Price 8 fr.

This little book contains a useful discussion of various types of nuclear reactions. The theoretical expressions for the probabilities of the reactions are not derived but only discussed in a qualitative way. The value of the book would have been enhanced if a bibliography were included giving references at least to those papers where the theoretical expressions used are derived. Equations IV and IV' on p. 11 contain symbols having confusing positions for Z and N. Thus IV which reads



should be ${}_{79}\text{Au}^{197} + {}_0n^1 \rightarrow {}_{79}\text{Au}^{198} + h\nu$.
In Eq. VII on p. 13, ${}_7\text{B}^{11}$ should be ${}_5\text{B}^{11}$.
Eq. XII is wrong.

Théorie de l'Émission des Rayons Alpha à travers une double Barrière de Potentiel, par Théodore Kahan. (Actualités scientifiques et industrielles, No. 406.) (Hermann et Cie, Paris), 1936. Pp. 31. Price 12 fr.

This brochure contains a good account of Gamow's theory of the emission of α -particles from radioactive nuclei. A solution is also given of the somewhat academic problem of a double potential barrier traversed by an α -particle, with some simplifying assumptions. The application of this discussion to an actual case is not clear. Since the existence of α -particles inside nuclei is not usually admitted in modern researches on nuclear structure, we are not sure of the present position of Gamow's theory. Any new discussion of the problem should make this position clear, but the present account does not attempt this task.

Nouvelles Recherches sur la Lumière, par L. de Broglie. (Actualités scientifiques et industrielles, No. 411.) (Hermann et Cie, Paris), Pp. 55. Price 12 fr.

We must be grateful to the distinguished author for making his interesting theory of light accessible to a wider circle of readers. The theory is not yet entirely free from difficulties. In spite of the attention attracted by the alternative theory of Jordan and Kronig, de Broglie has elsewhere shown that that theory is difficult to believe in for various reasons, and his own theory retains its interest unabated. The present exposition incorporates a number of improvements over the earlier account in *Actualités scientifiques et industrielles*, No. 181, 1934.

Report of the Proceedings of the 13th Conference of the Association of Special Libraries and Information Bureaux, London, 1936, 8vo. Pp. 135. Price 5s.

This interesting annual keeps up its established standard. The papers, thirteen in number, are printed in extenso and are supplemented by a brief summary of the discussion that followed their presentation. As usual, a brief survey of the work of the Association is given at the beginning.

The main topic chosen for discussion at the Conference was school libraries. Accordingly, five of the papers deal with different aspects of that subject, in addition to the Presidential Address itself having been on "The Library in the School". All the papers start with the recently laid emphasis on "Individual Instruction" and "Education through Self-help and Experience" and work out the lines along which school libraries should organise their work so as to serve these ideas.

Other topics include classification and utilisation of Government publications and the indexing of abstracts and research data. Mr. M. R. Kalyanaraman, Librarian, Industrial Research Bureau, India, has sent up a paper entitled "Organisation of Industrial Intelligence in India", to which is appended a nearly exhaustive list of the periodical publications issued by the Government of India.