

## REVIEWS

**Living Mathematics.** By R. S. Underwood and Fred. W. Sparks. (McGraw-Hill Book Company, Inc.), 1949. Pp. x + 374. Price \$ 4.00.

This is the revised second edition of a book which was first published in 1940. It is not a book for the high-brow and by *Living Mathematics* the authors do not mean any of the rapidly growing branches of modern mathematics such as abstract algebra and topology. The treatment is split into two parts of which the first contains exercises of the matriculation standard while the second, though advanced, falls short of the intermediate requirements. The subjects touched in the book are arithmetic, algebra, trigonometry, calculus and analytical geometry. The last chapter of the book is called *Extended Analytical Geometry—A New Field of Mathematics*. It is elementary and at the same time both novel and stimulating. The young student for whom the book is intended will find its value increased by the tables given at the end and by the special treatment of certain topics such as annuities. The style is a bit too lively for the immature 'teener' and the interesting historical references and witty remarks, which vitalize the book, will be more appreciated by mature minds with an amateurish predilection for mathematics. But one danger of all such mixtures of words and symbols is that those who ought to be attracted by words are repelled by symbols while those for whom the symbolic operations are carried out find the running commentary brilliant but unhelpful. The book under review has been received well by the public in America and it will indeed be fortunate if we find in our country "businessmen, lawyers, doctors, painters and second-storymen who plead guilty to a mathematical flair" and who would read *Living Mathematics* with zest. At any rate the book can be read with interest and profit by many, particularly, in the training colleges for teachers.

It is in the best traditions of the McGraw-Hill Book Company that we find the printing and get-up of this book, and also the price. Many years ago, Stephen Leacock made fun of the ascetic simplicity of mathematical books. The colourful jacket of this book agreeably proclaims the arrival of the new æsthetic spirit in the mathematicians' camp.

V. V. N.

**Solid Analytical Geometry.** By Adrian Albert. (McGraw-Hill Book Co.), 1949. Pp. 162. Price \$ 3.00.

This forms an introductory course dealing with the equations of the straight line, plane and quadric surfaces. The treatment is lucid and refreshing, with a rigorous algebraical background for the introduction of co-ordinates, and the equations, of the curves and surfaces considered. One chapter is devoted to the study of the elementary properties of matrices and determinants and after introducing the matrices relating to orthogonal transformations and rotations about the coordinate axes, the reduction and classification of the quadrics and their "points and planes of symmetry" are discussed. The last chapter introduces homogeneous coordinates and the fundamentals of projective geometry. The last but one chapter dealing with "spherical coordinates" is an unusual feature. The commonly-called polar coordinates are called respectively *range*, *azimuth* and *elevation*, and are collectively designated as spherical coordinates. Rotations about the three axes of coordinates are respectively called *pitch*, *roll* and *yaw*, and their associated matrices are given. The chapter ends with the formulæ relating to gnomonic projections, and the idea of gnomonic charts.

A laudable though short work on geometry by a well-known algebraist, the book will receive the appreciation of algebraists as well as orthodox geometers.

C. N. S.

**The Real Projective Plane.** By H. S. M. Coxeter. (McGraw-Hill Book Company), 1949. Pp. 196. \$ 3.00.

This book presents the subject-matter of synthetic projective geometry in a very lucid and simple manner, developing the subject by a carefully chosen set of axioms of incidence and order. The development of the subject is primarily based on Von Staudt's definitions of projectivity and the conic. A projectivity between two ranges is a correspondence that transforms a harmonic set into a harmonic set. An involutory correlation or point-line correspondence is called a polarity and a conic is the locus of points that lie on their polars, or the envelope of lines that pass through their poles. The equivalence of these definitions with Poncelet's definition

of projectivity and Steiner's definition of a conic is worked out in a very elegant manner. There is a chapter dealing with "generalized projectivity" on a conic, and with the theorem that any projectivity on a conic determines a collineation of the whole plane. There are two brief chapters giving the fundamental ideas of affine geometry, which is projective geometry minus the line at infinity and Euclidean geometry which is affine geometry possessing an orthogonal involution. A list of properties of conics which can be considered as affine properties is worked out and properties of circles and some properties of conics are developed by the above conception of Euclidean geometry. The latter chapter fittingly ends with the proof of the focus-directrix property of a conic. In the last two chapters, "Analytical Geometry" is introduced in terms of the axioms and concepts of synthetic geometry, and is comparable to similar treatment in Veblen and Young's *Projective Geometry*.

The handy size of the book makes it a convenient text-book for explaining the fundamental concepts of synthetic geometry, after which the student can proceed to the vast sea of geometrical properties of the conic sections in other books wherein the methods of projective and metrical geometries are freely mixed up.

C. N. S.

**Monomers, Section I.** Edited by E. R. Blout, W. P. Hohenstein and H. Mark. (Interscience Publishers, Inc., New York, N. Y.), 1949. Price \$ 7-50.

This is a folder type volume of unbound fascicles, each containing anywhere from 30 to 60 pages and dealing with one of the following monomers: acrylonitrile, butadiene, isobutylene, isoprene, methyl methacrylate, styrene, vinyl acetate and vinyl chloride. All these substances, capable of addition polymerisation, have not only been employed in the study of the fundamental characteristics of the processes leading to the formation of high polymeric materials but are being utilised for the industrial production of fibres, plastics and rubbers of great technical value and practical utility.

Each monomer is presented, after a short introduction, under the following sub-divisions: methods of preparation in the laboratory and on industrial scale, the most convenient and economical methods being indicated; purification and analysis according to the best procedures available; precautions in the handling

and transportation of the material; physical properties with accurate quantitative data and graphs; pertinent chemical reactions the monomer can undergo alone and with other substances, and polymerisation under various, experimental conditions of temperature, pressure or concentration, reaction medium, catalyst, etc. There is a table of contents at the beginning and a list of literature references at the end of the section.

All the chapters have been written by the research workers of the Institute of Polymer Research, Brooklyn Polytechnic Institute directed by Prof. H. Mark, except the chapter on methyl methacrylate which is by Dr. Corley of Polaroid Corporation, Cambridge, Mass. Accuracy and thoroughness of treatment of the subjects are guaranteed by the fact that most of these monomers have been investigated at the Institute itself. The authors have drawn freely not only from the information gathered at the Institute but also from the published scientific and technical literature and data supplied by industrial concerns. Little needs to be said about the editorial board headed, evidently, by Prof. Mark, an internationally recognised authority in the field of high polymer research and industrial practice, who is also editing, with others, a loose-leaf literature and patent service on Resins-Rubbers-Plastics and on Natural and Synthetic Fibres.

The purity of the monomer is of the utmost importance in addition polymerisation which is a chain process very sensitive to the presence of impurities which may act either as retarders or as negative catalysts. The information presented in this volume on monomers of scientific and industrial value will be welcomed not only by the research worker in the laboratory but also by the production engineer in industry. The volume will be particularly appreciated by research workers in India who have to prepare the monomers for themselves since they are not easily available.

No typographical or factual errors have been noticed, and the printing is of the excellent standard generally associated with Interscience publications. By way of information to prospective buyers, it may be added that articles on additional monomers (acrylic acid, esters of acrylic acid and esters of methyl methacrylic acid other than methyl methacrylate) now in active preparation and on others which may soon find place in industrial practice, may be conveniently added in the folder of the present volume and may be obtained as soon as they are published provided a standing order is

placed for them at the time of purchasing the present volume.

L. M. YEDDANAPALLI.

**Tablet Making.** By Arthur Little and K. A. Mitchell. Published by the Northern Publishing Co., Ltd., 37, Victoria Street, Liverpool, 1. 1949. Pp. 121 with 41 illustrations. Price 15s.

During the last five or six years one is accustomed to come across frequently a new facile American expression, "The technical know-how". This expression really means a knowledge of the minutiae of process operations in a factory both from the point of view of theory and practice. The book under review, "Tablet Making" can truly be described as furnishing the technical know-how of all varieties of tablet making. A "high-brow" theoretical scientist may cynically lay aside this book as merely a compendium of catalogues of tablet-making machinery under the guise of a descriptive and practical text-book. We can conveniently ignore such critics and welcome this publication. That modicum of theoretical science necessary to serve as a background in the practice and art of tablet-making has been provided. Necessarily the mechanical and chemical engineering aspects of the industry have been given greater and detailed attention.

The various operations connected with tablet making like mixing, wet-granulation, drying, dry-granulation, lubrication, compressing, colouring and coating of tablets, etc., all have been dealt with lucidly and adequately. Since the use of tablets in confectionery, pharmaceutical and other trades has become enormous and since complicated "multi-punch" rotary tablet machines have come into use, complete details of the operations and care of such machines have been given. There are rotary tablet-making machines, for example, with  $\frac{1}{2}$ -inch tablets, to produce 500 per minute or 30,000 tablets per hour, uniform in size and weight! None the less, even to-day, there is a need for hand tablet making in small establishments and this aspect has also received attention. A very useful part of the book is a chapter dealing with processing of various chemicals giving twenty-five examples of tablets with their component ingredients.

Having described the essential points regarding the manufacture of tablets, the authors take, as an illustration, the preparation of an Iodised Throat tablet (p. 36). Its manufacture is described in detail. This has been well done.

Take another example, "Wet granulation". Authors state as follows:—

"Looking back to the earlier days in the granulating room with the slow moving process of hand granulation and then to witness the speedy businesslike performance of the present-day oscillating granulator, one is compelled to pay tribute to the chemical engineering industry for this contribution to the problem of speeding up production and eliminating the drudgery from the granulation process. . . . The end of the day in the past found operators with aching arms and a feeling of boredom with the drudgery of the process. . . Times have changed. The modern oscillating granulator has revolutionised the granulating process. The batch which took two people hours to granulate in the old days now can be processed in anything from 20 to 30 minutes. A machine can be operated by a junior who merely presses the starting button and feeds in the moist material gradually. The result is perfect granulation by mechanical means in approximately one-fifth of the time. The advantage to the manufacturer in reduced overheads is obvious. The advantage to the worker both physical and mental can be appreciated by any person who experienced the old methods."

The pharmaceutical industry specially welcomes this book. The illustrations are all from one source. There is nothing wrong in this, but other sources of supply of mechanical equipment might have received some attention. For example, recently, claims have been put forward that the Jackson-Crokatt No. 4 granulator, starting with moist or sticky powders, will have an output four to five times that of any other granulator. Some advances have been made in "infra-red-ray drying". Probably no mention has been made since it does not yet find general acceptance in the trade.

The book is well printed and bound. The illustrations are clear and well chosen. But the price is rather on the high side.

S. G. SASTRY.

**Annual Review of Physiology, Volume IX.**  
(Published by the Annual Review Inc., & the American Physiological Society), 1949.  
Pp. vii+643. Price \$ 6.00.

The present volume is a select and critical record of the latest advances in several branches of physiology, and maintains its usual high standard. Exhaustive bibliography given under each subject adds to the usefulness of the Review.

Limiting itself to classical physiology, certain chapters, included in previous issues (e.g., exercise, anoxia, etc.) have been omitted. All contributors have recognised the role of physiology as a co-ordinator and interpreter of the living organism in health and disease, and accordingly its scope has been enlarged, and sciences often previously separated have been fused. Developmental physiology, by Schechtman deals with the physiology of embryonic differentiation. Certain topics, such as histochemistry of the ovary, enzymes and reproductive control have been touched on in the review on "Reproduction", by Catchpole. The discussion on the metabolic function of the endocrine system by Barker includes the recent development in the mechanism of hormonal effects. Insulin and carbohydrate metabolism, hormonal effects on phosphatases and arginase and studies on thyroid, pancreas, and adrenal and pituitary have been presented in detail. A survey of the pertinent literature on visceral and somatic functions of nervous system, bioelectric potentials in nervous system and muscle shows that a great deal of interest has been shown in these fields. Several useful reviews of the various aspects of the "Electrical Activity of the Brain" have appeared and the survey by Walter and Walter reflects a widening prospect of more fertile field. The 'Physiological Psychology' is the subject of an extremely interesting review by Harlow. The reviewer has surveyed the relevant physiological facts and theories and has given a systematic orientation to the study of psychophysiology. Alexander Sandow has mainly dealt with the fundamental problem of the contraction of skeletal muscles and the topic has been brought up to date in his review of the subject "Muscle".

The reviews of the cardiovascular system under the headings "Hæmatopoiesis", "Heart", "Peripheral Circulation" and "Lymphatic System" are critical and comprehensive, and present a clear picture especially with respect to anæmia and indicate the future line of investigation. Wyss has covered only the external or somatic respiration, particularly lung-breathing, in his article on "Respiration," and the effects of respiratory and other gases on the body tissues and organs have been purposely omitted. The clinical application of anoxia and mechanical effects of barometric pressure have only been briefly mentioned. The review on "Kidney" by Philips covers mainly the renal function — from foetal life through infancy, discussion on renal blood flow,

glomerular filtration and experimental induction of renal damage and its treatment.

Considerable interest is shown in biochemical and physiological research with the help of radioactive isotopes. Nims has reviewed the action of ionising radiation on living cells and has discussed the subject of whole body radiation and its effect on blood and hæmopoiesis, skin and other tissues. From the work done so far in radiobiology, it is evident that greatest advances will come, not from the use of isotopes as source of internal radiation, but from the employment of tracer techniques for understanding physiological disturbances and pathological processes. Nims has not attempted to cover the whole field but only touches the highlights in a highly suggestive and critical chapter on 'Radiation'. Teorell has reviewed the field of biological permeability. The physical chemistry of permeability and the cell and tissue permeability have also been referred to. Recent advances in pharmacology, physiology of hearing, vision, liver and digestive system are also included in this volume.

The *Annual* will commend itself to all investigators interested in the critical appraisal of the progress of physiology in its most comprehensive sense, and will prove indispensable not only to physiologists but also to those engaged in medical research.

N. N. DE.

#### Selected Topics from Organic Chemistry.

By Karve, D. D. and Advani. Publishers: M/s. Dastane Brothers, Poona 2), 1947. Pp. vi×418. Price Rs. 10.

In this concise volume the authors have presented the salient features of many important topics in Organic Chemistry, chiefly from the standpoint of University Examinations of the Pass and Honours degrees of Indian Universities. Generally speaking, the treatment falls considerably short of the Honours standards. But if the less important chapters (24, 25, 27, 28 and 31) could be replaced by more important ones the book might perhaps be brought up to the level of the "Recent Advances" series by Glasstone and others.

The chapter on carbohydrates confines itself chiefly to the chemistry of glucose and fructose, the disaccharides being considered only in outline, while the polysaccharides are entirely omitted. Considering the importance at present of the production of organic chemicals by micro-organisms, a brief account at least of the manufacture of acetone, butyl alcohol, lactic acid, citric acid, gluconic acid, sorbose, etc., should have found a place in the chapter

on Fermentation and Enzyme action. Baeyer's Strain Theory has not received adequate treatment under Polymethylenes, particularly its limitations. Ruzicka's work on civetone and muscone could have been given in some detail as confirming Sachse and Mohr's theory of strainless rings.

Only a few terpenes regarded as important from the examination point of view have received attention. The interrelationship of carvone, terpineol and dipentene and their interconversion might have been indicated. Synthesis of terpenylic acid is better located on p. 62 than on p. 71. Synthetic substitutes of rubber deserve ampler treatment. The recent synthesis of nicotine is an unfortunate omission. There is a tendency to omit the names of chemists responsible for partial or total synthesis (Robinson's *Synthesis of Tropine*, p. 114, for example). It is gratifying to note that the recent synthesis of quinine by Woodward and Doering has found a place though the names of the authors have been omitted. Flavones, flavonols and anthocyanins form a natural group on account of their close relationship. The chapters on dyes and colour and constitution could go together. The chemistry of indigo should have been discussed at greater length giving the latest developments in manufacture and its use at present in the solubilised form. The newer method of manufacturing anthraquinone from o-benzoyl benzoic acid dispensing with anthracene as raw material might have been given. The chapter on drugs is good but a more detailed account of the sulfa drugs is necessary. Vitamins and hormones have been dealt with rather briefly. Students would appreciate a clear and lucid account of the theory of resonance and its applications in structural organic chemistry. The chapter on physical properties and chemical constitution may be restricted to such properties as are applied at present for solving problems of chemical constitution, with mention of specific cases where they have been of help in deciding chemical constitution. Electronic interpretations of some of the reactions or later ideas of reaction mechanisms should have been indicated in the chapter on condensations and other reactions.

On the whole, the authors have given as many useful facts as possible under each topic, to make it useful from the standpoint of examinations, but the more enterprising class of students would appreciate a fuller treatment. References to literature would enhance the value of the book and the errata list which is

really too long will no doubt be reduced to the minimum in the next edition. M. V. S.

**Botulinum Bacilli and Their Occurrence in Sweden.** By John Fahraes, Stockholm, 1949.

This beautifully got up monogram on *Botulinum bacillus* gives an exhaustive review of the subject since its discovery by Ermengem. One interesting feature of various strains, A, B, C, D, E, etc., is that their biochemical activities such as carbohydrate fermentation and proteolytic activity is a function of the locality of occurrence. The organism is anaerobic, spore forming gram-positive bacillus, the spores being highly heat resistant. The pathogenicity is due to toxin whose maximum titre was obtained in peptone broth or in coagulated protein and peptone at 25-30°C. The toxin is heat labile, acid resistant but sensitive to alkali, therefore is absorbed in the stomach and duodenum when ingested. Chickens, pigeons, cats, rabbits and guinea pigs are found to be sensitive to it. Chickens have been found to become paralysed and dying from consumption of food remains which have caused human intoxication. The organism has been isolated from the intestinal contents of birds dying of botulinum. The toxic effect is most marked on the central nervous system in the bulbar region of the pons nucleii and anterior horn of the cord. Some workers have observed noticeable effect on autonomic nervous system. A guinea pig dying from this toxin miliary necrosis of the parenchyma of the liver was observed by some workers. The toxic effect due to the toxin. The organism is a saprophyte found in soil and in excreta of pigs and birds, etc. Epidemiological data regarding mode of infection have been well described, the organism being imbibed through contaminated meat, pork, fish and even vegetables particularly beans manured with contaminated faeces. The toxin can withstand freezing, if incorporated in fruits and vegetables previous to freezing. Their distribution in different soils and epidemiological bearings are admirably described. Workers interested in food poisoning and similar clinical conditions will find this monogram is very valuable. K. P. MENON

**A Mathematical Theory of Shaded-Pole Motors.** By Erik Morath, *Transactions of the Royal Institute of Technology, Stockholm, Sweden*, Nr. 26, 1949.

The history of shaded-pole motors starts in 1894 when it was found that by short circuiting

a portion of the pole, a salient pole squirrel cage motor could be run on single phase. The saving in cost due to this winding and a centrifugal starting switch compared so favourably with the distributed field winding that the 'shaded' pole motor has held its field over all the other types of single phase motors below 1/20 H.P. W. G. Morill (*Trans. AIEE*, 1929, 48, 614-29) has done pioneer work in the field of fractional horsepower motors and has in his AIEE paper ably analysed their characteristics with the aid of the Double Revolving Field Theory. Interesting methods of determining the starting and running performance characteristics of the shaded pole motor both theoretically and experimentally has also been published by F. H. Trickey (*Trans. AIEE*, 1947, 66, 143).

In the present monograph Mr. Morath has successfully applied this two-rotating-field theory to the solution of shaded pole-motors.

The author has started with certain basic assumptions and presented the equivalent circuits of the motor, thus providing a powerful tool in the hands of the design engineer for studying the effects of motor constants. The first section of the analysis is confined to the fundamentals of the m.m.f. curves and then effects of harmonics are dealt with under a separate heading.

The analysis is supplemented by experimental curves and compared with computed values. The effects of coupling factor, shading coil arc, resistance of shading coils, etc., on the performance characteristics of the motor have been graphically represented. The author has not, however, indicated in his paper how the constants of the motor have been determined, except for the statement that these are determined in the usual way. None of the papers on the subject has indicated the method for the determination of the constants.

Although the shaded-pole motor is the simplest of all the single phase motors so far as construction is concerned, it is the most difficult to analyse from the mathematical standpoint. The author's approach to the problem marks really a milestone in the design of shaded-pole motors. The subject has been treated in an able manner. The material covered is of interest to the academic men as well as to the design engineers. The author is to be commended for this fine and useful work.

C. S. G.

**Pulses and Transients in Communication Circuits.** By Colin Cherry. (Published by Chapman & Hall Ltd.). Pp. 312. Price 32sh. net.

The study of television, pulse modulation, radar, picture telegraphy and similar subjects involves a thorough knowledge of transient response of networks. When dealing with these subjects one is generally confronted with the problem of waveform distortion. In such cases it is not sufficient to know only band-width but also the knowledge of the response to waves of given shape—pulse or steepedged waves—is essential. A great mass of literature has accumulated concerning the transient behaviour of communication circuits but most of the information concerned therein is expressed in the form and style of the professional mathematician. This creates difficulties for engineers accustomed to the ideas and practices of sine wave type technique and who want to supplement their knowledge of steady state circuit theory by a study of transients. This book which is an introduction to circuit transient analysis for communication engineers will serve to bridge the gap between the conventional method of a.c. theory and operational methods of analysis.

The first chapters after briefly reviewing some of the fundamental ideas, such as laws of network behaviour, impedance functions, free and forced oscillations in a mesh, etc., establishes the physical ideas behind the solutions of differential equations associated with linear circuits and explains the difference between initial impedance and steady state impedance. In a.c. vector theory both trigonometrical and exponential notations are used. Chapter 2 points out the convenience of using the latter notation. After explaining the conjugate vectors the chapter deals in more detail with the frequency spectra of modulated waves, pulses and transients by means of Fourier analysis. In practice all wave forms are produced by some types of electric circuits. The steady state characteristics of circuits form the subject-matter of the next chapter. After classifying the networks into different groups and dealing with several definitions such as transfer functions, transfer impedance, etc., system of conjugates is applied to explain the selectivity characteristics of communication networks. After considering the effects of dissipation on the steady characteristics, the chapter concludes by discussing the "low pass-band pass analogy".

The complete steady state characteristics discussed in Chapter 3 may be utilised to determine the response of communication networks to a transient wave, provided the magnitude and phase shift distortion of every Fourier component in the applied transient introduced by the network be considered. Chapter 4 is concerned with the response of networks. The spectrum of output response transient involves Fourier integral. In many cases, evaluation of Fourier integral becomes difficult. So the method of attack to determine the transient response of a network by means of steady state characteristics is limited. However, the ideas behind the method are of great importance and can be made useful for practical computations of transient response which can be extremely helpful for finding an approximate answer. Two examples, 'response of a network to a symmetrical driving waveform' and 'response of a network to a skew-symmetrical driving waveform' elucidate the usefulness of trigonometrical notations as they make more apparent the symmetry relations between the components of spectra and of network characteristics. The case of a resistance loaded tetrode amplifier with regard to its response to transients has also been considered by Fourier integral as an illustration. The response of a linear network to a transient having complex wave forms, which, if not possible to be expressed analytically, may be derived by considering the transient to consist of a number of step waves of suitable amplitudes and times of starting. By finding an analytical expression for the response of a network to a step wave, it is possible to find the response to other transients of known analytical form by means of Hamel's integral, provided the integral can be evaluated. The step wave is a basic wave form in circuit transient analysis and from this point of view, this method merits attention. The chapter ends with a consideration of the circuit response to an extremely short pulse. It is sometimes necessary to know the general points regarding band width or build-up time instead of exact transient response. Chapter 5 deals with the approximation which simplifies to a great degree the calculations of transient response. It is also shown how by assuming certain geometric shapes of characteristics, soluble Fourier integrals may be obtained and the relation between band width and build up time can be determined with comparative ease. In television and radar channels it is necessary to produce certain desirable forms of response characteristics with a number of amplifier

stages. Chapter 6 is concerned with the transient response of multistage amplifier consisting of tetrode or pentode valves with particular reference to accuracy of signal reproduction. At the end of the chapter, signal to noise ratio and band width is discussed. Chapter 7 discusses thoroughly the effects of unequal distortion of sidebands of an amplified modulated carrier and a method has been described by means of which distortion of steady state signal or transient wave with any depth of carrier modulation and any type of channel characteristics may be calculated. This chapter requires a careful study. In the last chapter response of communication networks to very short impulses has been dealt with. This chapter introduces the idea of echoes to explain clearly the physical meaning of signal distortion and gives a clear picture of Fourier Transforms, avoiding at the same time mathematical complexities. This book ends with an appendix on the probability function response characteristics.

It is hoped that this book with its careful and lucid expositions of a difficult subject, will prove to be a very important and useful contribution to scientific literature. The author is to be congratulated for his successful attempt in presenting a clear physical picture of transient analysis. This book is strongly recommended to those especially who are engaged in radar and television work.

S. K. C.

*The Floral Year.* By L. J. F. Brimble.  
(London: Macmillan & Co., Ltd.), 1919.  
Pp. xiv+622. Illustrated 30sh. nett.

*The Floral Year* is a book which may be appropriately described as nature's pageant of colour in print. It is a fascinating book which takes one closer to nature in a more pleasing way than many other books on natural history can do. It has the touch of an artist apart from that of a botanist. Mr. Brimble, the author, who is well known for the several popular books written on botany, will now increase his popularity by bringing out this book which is different in many respects. Even popular books on plants have to conform to some system or classification in their treatment but *The Floral Year* follows more the nature's calendar which is more flexible than the rigid calendar of an astronomer. It is nature's floral almanac which obviously cannot adhere too rigidly to say set rules but all the same appears to con-

form generally to seasonal influence in a broad sense.

The author's treatment of the floral march or procession commences with the winter season symbolically the quiescent or the passive period of nature, when nature reveals more of its bleaker aspect and progresses through the spring and autumn which bring forth the richness and grandeur of the plant world. The autumn culminates in the mellow and subdued aspect of nature, rich in its bounty of ripened seeds and fruits and the gathering harvest. The pageant reveals that there is colour almost the year round. Even at the peak of winter season there is enough colour observed in the dark green of the yew, the scarlet berries and the glassy green leaves of the holly and the snowwhite berries of the mistletoe which decorate the homes at Christmas-tide. The winter scene outlining the trees and shrubs shrouded in a mantle of white revealing the outline of every twig is something majestic and unforgettable.

This fascinating book is enlivened by beautiful verses from such great authors as Chaucer, Shakespeare, Wordsworth, Gray, Milton, Goldsmith, Shelley, Keats and Whitman, Coleridge Bridges, Sackville-West, Walter-De La Mare and many others. All this is beautifully blended with information on the season of the year, the general characteristics of the plant, the peculiarities of the habitat and the uses of the plants that flower in different months beginning with January.

In the introductory chapter the author gives in brief non-technical terms, the botany, to enable the amateur to get a knowledge of the different types and parts of plants, the life-cycle including the processes of formation of flower and fruit and lastly the classification.

The book contains a large number of good illustrations and 24 very beautiful coloured plates. This book should be welcomed by all lovers of plants, both amateur and professional and it should find a place on the library shelf of all colleges and schools.

The excellent get-up leaves nothing to be desired.

L. S. S. KUMAR.

**Essentials of General Cytology.** By R. A. R. Gresson (Edinburgh University Press, Edinburgh), 1948. Pp. ix+184. Price 21 sh. net.

The Edinburgh University Press have issued a book on the general cytology of plants and animals as No. 2 in the series 'Science and Mathematics'. The book has been prepared by

Dr. Gresson with contributions on plant cytology by Helena Heslop Clark. The book is intended to give a groundwork on both animal and plant cytology and deals with nuclear as well as cytoplasmic structures.

In a subject of such vast scope each author has to make his own choice as to what he is to retain and what to omit. The present book deals comprehensively with microscopic structure and omits much of physiology and biochemistry of the cell. A student who wishes to specialise in microscopy will find the essentials clearly presented, and as intended, the book will be helpful to teachers of this subject. Three aspects of cytology get detailed treatment, the chromosomes in relation to heredity, structure of Golgi material, and morphology of reproductive structures in plants. There are brief chapters on cytology of Protozoa and cytology of pathological animal cells.

The author's special subject Golgi Material gets detailed treatment, and in comparison to this topic, the other subjects are briefly discussed. The space devoted to reproduction in plants could have been better devoted to more rigorous treatment of connection between Mendelism and chromosomes, for, the first mentioned subject is fully dealt with in textbooks of Botany. The groundwork in Genetics becomes important if the chapters on chromosomes and evolution, and cytoplasm and heredity are to be useful. In this manner it is possible to mention other topics worth greater detail, e.g., chloroplasts, plant cell wall, or the enormous variation in differentiated plant or animal cells. However, Dr. Gresson's selection is a welcome addition to books on cytology.

The illustrations and plates of microphotographs are excellent and would be of great use to the student. As indicated in the jacket, the book represents the highest tradition of Scottish typography. Only error detected was in p. 161 para 5 where 10 grams is stated and 1 gram is probably intended.

C. G.

**A Study of the Influence of Impurities in the Solvent on the Induction Periods, and Rate of Formation of Grignard Compounds.**

Making a systematic study of the course of the Grignard reaction, H. Mackle (*Proceedings of the Royal Irish Academy*, Volume LII, Section B, No. 4, December 1948) has shown that when the reaction was carried out in commercial ether dried over sodium wire, the induction period was 14.3 minutes. With ether purified elaborately by successive treatment with

water, potassium bicarbonate solution, saturated mercuric chloride, strongly alkaline potassium permanganate and concentrated ferrous sulphate solution, and then washing with water and drying and distilling over sodium, the induction period was only 5.1 minutes. When ether purified as above and then once again distilled over MeMgI was used, in addition to the reduction in the induction period, the yield also increased considerably.

The author has confirmed that the Grignard reaction proceeds much slower in benzene than in ether.

A simple method for measuring the relative induction periods and relative rates of formation of Grignard compounds is described and the mechanism of their formation is discussed.

B. H. IYER.

## SCIENCE NOTES AND NEWS

### Hospital Section for P.A.S.B.

The Pan American Sanitary Organisation, which is also the Regional Office of WHO, is establishing a new section to deal with the problems of surveying, planning, equipping, and modern methods of administration and management of hospitals of the participating governments. Mr. Felix Lamela has been appointed its Chief, with offices at the P.A.S.B. Hqrs. at Washington D.C. The immediate programme of activities includes the organization of the Third Inter-American Institute for Hospital Administrators which will be held in Rio de Janeiro, Brazil, in April 1950. The Brazilian Government, through the Ministry of Education and Public Health, has appropriated the sum of 300,000 cruzeiros (\$ 15,000) as grant-in-aid to cover in part the cost of organization of this short, intensive academic course of study for hospital administrators of the Western Hemisphere. A prominent group of outstanding educators of the leading educational institutions will form the faculty.

### Decrease in Solar Activity

The Kodaikanal Observatory (Annual Report, 1948) observes that the sunspot activity reached its maximum by the middle of 1947 and declined in 1948; and that there has been an equatorial drift of the zones of maximum sunspot activity and a poleward drift of the zones of maximum prominence activity. Twice in 1948, the sun's disc was free from spots unlike the previous two years. Visual and photographic observations of the brilliant comet which appeared in the southeastern sky at dawn in November 1948 were made between November 11 and December 14. The magnetic observatory has a project to correlate solar phenomena with terrestrial magnetic disturbances.

### M.Sc. Degree Award

On the recommendation of the Board of Examiners the thesis entitled "Histological Study of Endocrine Organs of *Pteropus Edullis*" by Mr. C. Seetaramayya, M.B.B.S., has been declared to qualify for the M.Sc. degree in Physiology of the Andhra University.

### National Nutrition Association of India

The All-India Nutrition Board, founded in 1936, has been reconstituted into the National Nutrition Association of India. Its inauguration was held on 3rd September at Darbhanga Hall, Calcutta. Dr. A. C. Ukil, welcoming the delegates, referred to the import of 4-5 million tons of cereals costing about Rs. 250 crores.

The Honourable Rajkumari Amrut Kaur inaugurating the session discussed how the newer knowledge of Nutrition could help to improve the diet of the lower economic groups. She urged the greater use of subsidiary foods, like sweet potato flour, defatted groundnut cake and potato, with a view to conserve foreign currency.

During the session symposia on (a) Food processing and Food supplements, (b) Population, Production and Public Health, (c) Nutrition Research, were held.

### Award for Wool Research

Mr. T. MADHAVA MENON, M.Sc. (Leeds), Professor of Applied Chemistry, Maharaja's College, Ernakulam, has been awarded a Certificate of Merit and Silver Medal by the Worshipful Company of Woolmen of Great Britain in appreciation of his thesis on "The Supercontraction of Animal Fibres". Associated with this award is a money prize offered by the British Wool Federation.