

REVIEWS.

La Spectroscopie Appliquée. Par P. Swings.
(Paris: Hermann et Cie, 1935). Pp. 188.
Price 15 fr. Paper Cover.

The most important practical application of spectroscopy is to be found in the analysis of the chemical constitution of the source of radiation and has had spectacular success in giving information about the heavenly bodies. The more mundane question of the determination of the chemical constitution of different chemicals, alloys or minerals is no less successfully attacked by the methods of spectroscopy. Its greatest utility is due to the fact that constituents present in very minute quantities can be detected and the amount of the substance required for the analysis is also small. Local examination of intrusions in a metal, etc., is another domain where spectroscopic methods are supreme. Though qualitative analysis has been known to be a commonplace application for a long time, it is only recently that methods of quantitative analysis have been giving reliable results. Nowadays, however, many industrial laboratories employ spectro-analytical methods on account of their sensitiveness, rapidity and small demand on the amount of substance necessary. The book under review has been written by one who has made contributions to the study of band spectra. It is an admirable resumé of the methods of qualitative and quantitative spectro-analysis. The most recent researches have been taken into consideration and the practice made quite clear by definite instructions. The rationale of the methods, their advantages, fields of application and limits of error have been well discussed so that a careful choice of the most suitable technique in any case will be easy for any one who seriously studies the book. The discussions and instructions are always brief but clear and to the point. A number of tables not given in the book would be required in practice but the bibliography in the book makes it quite easy to find the required information. Applications to Biology and Medical Jurisprudence are touched upon and in the end a very brief summary of the theory underlying the unravelling of atomic and molecular spectra is given. With occasional reference to the larger treatises mentioned in the text, the volume will serve as an admirable handbook for the industrial spectroscopist.

Optical Rotatory Power. By Professor T. Martin Lowry, C.B.E., M.A., D.Sc., F.R.S. (Text Books of Physical Chemistry) (Longmans, Green & Co., Ltd. London, New York and Toronto.) 1935. Pp. xiii+483. 30s. net.

Professor Lowry and all chemists interested in optical rotatory power are to be congratulated on the appearance of this excellent book. It is a landmark in the study of optical activity, and is a record of work and progress in polarimetry, extending over a period of 120 years, from the original discovery of the optical rotatory power of Quartz by Biot in Paris (1813) to the recent theoretical work of Max Born in Cambridge, which has at last provided an adequate physical basis for the interpretation of one of the most difficult of optical phenomena.

Part I, Historical and General, besides describing the pioneer work of Biot and Fresnel, includes the epoch-making researches of Pasteur on Molecular Dissymmetry as well as those of Le Bel and Van't Hoff, which provided a firm foundation for the Science of Stereochemistry. This section also records the work of Pope and Werner. On the physical side, an account is given of Biot's Law of Inverse Squares, with its subsequent modifications culminating in the well-known formula of Drude, which suffices to express the rotatory dispersion of transparent media of all kinds with remarkable precision. Cotton's discovery in absorbing optically-active media of the twin phenomena of circular dichroism and of anomalous rotatory dispersion is also included. One of the most important phenomena of optical activity, namely, the Asymmetric Synthesis is also treated. The successful experiments of Freudenberg, Kuhn and Braun in realising for the first time, the preparation of an optically active compound under the influence of circularly polarised light is dependent on the utilisation of Cotton's discovery of circular dichroism. Just as Wohler's synthesis of urea shook the belief in the old vital force theory of the preparation of organic compounds, so, by the artificial making of a one-sided optically active substance in excess, a further advance is made on the road linking organic with inorganic nature. The significance of these results is enormous: they show that in principle no vital force is necessary for the

production of optically active compounds and thus refute Japp's dictum that "the absolute origin of compounds of one-sided asymmetry to be found in the living world is a mystery as profound as the absolute origin of life itself." The section closes with an account of Magnetic Rotatory Power and its application to studies of the chemical constitution of organic compounds. It is to be regretted that a very important and puzzling phenomenon of optical activity, the Walden Inversion, is left out and it is hoped that this omission will be rectified in a second edition of the book.

Part II, Polarimetry, is a very complete record of the development of polarimetric apparatus for the measurement of rotatory dispersion in the visible, ultra-violet and in the infra-red regions of the spectrum. The last chapter in this section is devoted to the measurement of circular dichroism, the significance of which is already pointed out in the foregoing paragraph. This section will doubtless be found very useful to workers in this field of optical investigations.

Part III, Special Cases, records the application of polarimetric methods to the study of the following substances: quartz, amyl alcohol, *iso*-valeric acid, tartaric acid, malic acid, lactic acid, sugars, camphor, borneol, nicotine, and some of Werner's coloured co-ordination compounds. This section also treats of a number of important problems of general interest, *e.g.*, Hudson's "iso-rotation rules", the phenomenon of muta-rotation, discovered by Dubrunfaut in 1846, anomalous rotatory dispersion and circular dichroism. The author has drawn largely from data published by himself and his students.

Part IV, Theoretical Considerations, gives an account of optical rotatory power of crystals, "liquid crystals" and solutions. This section is, however, devoted mainly to recent work on rotatory dispersion in transparent and absorbing media with a view to express the magnitude of their optical activity by means of mathematical equations. Kuhn, Gray, de Malleman and Boys have attempted to co-relate optical activity with other optical and chemical properties of a substance by using different methods. Boys finds a rather simple expression for the rotatory power, which contains nothing else but the refractivities and the effective radii of the chemical groups involved. This theory cannot explain the fact

that a strong absorption band may make a very small contribution to the optical activity and *vice versa*. "The real theory of optical rotatory power may be found by the mathematician, but is concealed from the chemist, in the papers of Born" says Prof. Lowry, "who recognised that *four* coupled electrons are required to produce optical rotatory power." A survey of Born's theory is included.

The book is well printed and illustrated. The number of mistakes is indeed very small in a book which contains so much matter.

BAWA KARTAR SINGH.

Elementary Electricity and Magnetism. By N. Robert W. Hutchinson, M.Sc. (University Tutorial Press, Ltd., London.) Pp. 475. Price 6/6.

In this excellent volume Mr. Hutchinson has set forth with great lucidity the elements of Magnetism, Static and Current Electricity. Within less than 500 pages of large print, the author has provided a wealth of theoretical and practical information that will more than cover the average Intermediate syllabus in India. In addition—and this constitutes the greater value of the book—he has brought the matter right up to the minute almost, by including brief but simple and clear accounts of the latest developments, *in theory and practice*, of physical science. The student of science as well as the "man in the street" hears so much about these developments that his curiosity is naturally aroused. In this book he can learn a good bit about X-rays, Wireless, Atomic theory, Transmutation of the elements, Radio-activity and even Television!

There are innumerable text-books for those who desire to learn just what is needed for examination purposes but here is a work which must be read by all students—if only for the stimulation of that curiosity which has been the foundation of most great discoveries in the past.

P. A. M.

Notes on Organic Chemistry. By F. Francis, Ph.D., D.Sc., F.I.C. (E. Arnold & Co., London, 1935.) Pp. 518. Printed on one side. Price 12s. 6d.

These notes have been written for the advanced students in the Honours Schools with a fairly sound background of organic chemistry.

In the Introductory portion such diverse

subjects as Theories of Radicals, Concepts of Valency, Isomerism, Rise, Growth and Development of Stereochemistry, Strain Theory, Tautomerism, Applications of Physical Methods to problems of Organic Chemistry, etc., have been dealt with in the space of 42 pages printed on one side. One cannot help feeling that the treatment is cursory and the value of the work is greatly diminished by absence of references to the original papers of the authors cited. For example, the subject of Infra-red Spectroscopy is dismissed in five lines without any reference even to the outstanding papers on the subject. It is doubtful if such treatment would serve any purpose except in merely informing the reader that Infra-red Spectroscopy is one of the methods used in the determination of the configuration of the molecule. Similarly the important subject of dipole moments does not receive any better consideration.

The book is badly revised as numerous serious errors of formulation occur throughout. It is particularly noticeable in Chapter II where the formulæ on p. 66 under 27, on p. 82 under II, on p. 84 under 21 and under III, on p. 86 under 23 are but examples of many similar errors.

The reviewer had some difficulty in understanding the logic of the arrangement of the subjects. It seems that a mass of facts are grouped together without a definite plan. Perhaps some consolation is to be found in the fact that the book is intended to be nothing more than mere Notes—a *vade mecum* for an aspiring organic chemist.

The author has not often been successful in stimulating the interest of his readers. For example, under phenyl hydrazine (p. 496), the three reactions that appealed to him are (a) the indole condensation, (b) pyrazolone formation, and (c) reducing action of phenyl hydrazine. The indole condensation is dismissed with the statement, p. 498: "To a certain extent the reaction is general although its mechanism is not clear". No references, of course, are given to Robinson's work on the mechanism of indole formation or Reddelin's work.

Notwithstanding the defects, the book contains a lot of useful information which would be of help if the reader finds out the proper references himself and makes notes of them in the alternate blank pages provided.

The Chapter on additive reactions of

unsaturated compounds gives a useful summary of the recent work on the subject.

One wishes "The Diene synthesis" had been a little more fully dealt with although the account given is excellent in many ways.

The book would be serviceable to the advanced students of chemistry. It is hoped that in the second edition the proofs would be better corrected and references to the original papers would be given where necessary.

J. N. R.

Introduction to Vertebrate Embryology. By Waldo Shumway, Ph.D. (John Wiley & Sons, Inc. New York, 1935.) Pp. xii+390. Price 20s. net.

The III edition of W. Shumway's *Introduction to Vertebrate Embryology*, is an addition to the literature in the field of Embryology. As the author rightly points out Embryology is not an easy subject, for the student must possess a capacity to imagine the changing conditions of the embryo and thus mentally reconstruct a three-dimensional picture of the embryo from stage to stage. The book is divided into five parts and each part contains a large number of chapters and each chapter concludes with a concise summary and a list of the more important reference papers. Part I, besides giving a brief account of the genesis of the study of Embryology, also describes the life histories of chordates like Amphioxus, Frog, Chick and Man in a very elementary way. The next two chapters deal with early Embryology and Organogeny. In Chapter IV on Chromosomes and Genes, brief descriptions are given of the Sex chromosomes, Linkage, Crossing over, Chromosomal aberrations, etc. Embryonic form and extra embryonic structures is the subject-matter of Chapter VI. How the form of the body is to a large extent governed by the shape of the gastrula as well as the extra embryonic structures is described. In describing the yolksac, it is said (p. 136) that "In other mammals (Fig. 68) the endoderm grows completely around the interior of the trophoblast and forms a larger yolk-sac." How about the yolksac in forms like *Cavia* where the distal wall is absent? It may be noted here that Fig. 6 refers to a sagittal section through early gastrula of pigeon. We feel that the author should have described in greater detail the formation of amnion in mammals and discussed the nature of the amniotic cavity in forms like guinea pig and Primates. On

p. 144 in a short paragraph on the "Allantois of man and other mammals," the author points out that "In most of the mammals there is a well-developed allantois, arising like that of the chick.... but the human allantois is rudimentary." A knowledge of comparative embryology tells us that no doubt the allantois arises as in chick and is well developed in mammals, but certainly as a rule in Primates (including man), it is rudimentary. A serious mistake is committed by the author in the paragraph on "The Placenta" (p. 145). It is said that "In *Perameles* (Fig. 93 B), an allantoic hemiplacenta is formed by the union of the allantoic sac with the trophoblast. Where this hemiplacenta touches the mucosa the epithelium of the latter thickens and is invaded by maternal capillaries. The trophoblast is said to be resorbed so that the capillaries of the allantois come into intimate connection with those of the uterus." When we say that the "epithelium of the latter thickens" it obviously gives us an idea that the cells increase in size and thickness, but really the cells become syncytial and again, the trophoblast is never resorbed, for it unites to form a large syncytial layer with the uterine mucosa. The next chapter on Experimental Embryology is interesting. The well-known rule that development is epigenetic is stressed; and given a suitable inheritance of genes and a favourable environment, it is noted that development proceeds normally. Development ceases due to over-dosage of Ultra-violet light, X-rays or radium emanations. A reference is also made to the works of Müller in describing the influence of agencies like X-rays, etc., on the rate of mutation of *Drosophila* genes. Part IV dealing with the anatomy of vertebrate embryos like Frog, Chick and Pig, assists the student in identifying parts easily. A good account of the various methods used in embryological studies for preparing slides by the ordinary and celloidin methods, reconstruction are clearly described in Part V. A glossary of nearly 15 pages is also given.

The get-up of the book is excellent and the book should find a place in the library of every embryologist.

R.

scientist. Part I which deals with the Forest Research Institute, Dehra Dun, is of more general interest and gives one an insight into the progress being made from year to year in the more technical aspects of Forestry. Further advances are recorded in Silviculture, particularly with regard to Sal, in statistical methods, in Botany, Mycology and on the economic side.

The study of "Spike" in Sandal has reached a stage when certain definite results can be confidently expected and it is therefore all the more regrettable that the experiments have had to be closed down for lack of support from the Madras Government. Interesting and conclusive results have been reached with experiments in sleeper seasoning and stacking, and a new and improved method of kiln-seasoning has been perfected. In this connection it is interesting to note that Deodar sleepers in the Punjab are to be treated with a wood preservative before use while, on the other hand, the soft-wood sleeper treating plant in Assam has been closed down for lack of support from the Railways concerned; this latter must mean a heavy blow to the marketing of the Upper Assam soft-woods. A heartening feature, however, is that soft-wood veneers from this area are gradually establishing themselves, particularly in the tea-trade. A notable achievement on the side of wood-preservation, has been the patenting by Dr. Kamesam of the "Ascu" process: a logical development of the Falkamesam process, by which both Arsenic and Copper are "fixed" in the wood. This will mean a considerable reduction in the cost of preservation with an increased degree of protection, although a supplementary impregnation with oil, to prevent splitting, will apparently be necessary. The technique for testing wood-preservatives has also been considerably improved upon marking a distinct advance on the old "graveyard" methods. Investigations into pulp-manufacture have also been continued with satisfactory results.

Turning to the Provinces, we find an extension in the Andamans of the new method of naturally regenerating mixed deciduous forests by removal of the cover from below upwards.

Assam is making steady progress in the regeneration of Sal, in spite of the inroads of *Eupatorium* and it is becoming increasingly the suspicion of some foresters there that the presence of grass is not absolutely necessary for the production of regeneration,

Forest Research in India, 1933-34. (Manager of Publications, Delhi.) Parts I and II.

A perusal of this booklet makes interesting reading both to the layman and to the

and that the latter would appear to be largely dependent on certain soil-factors. The working plan for the Evergreen forests of Upper Assam has been brought practically to a stand-still by the closure of the soft-wood sleeper-treating plant.

Bengal continues to experiment with the regeneration of Garjan (*Dip. Spp.*) and Sal; the latter continues to be the main problem in Bihar and Orissa and the U. P. In Burma stump-planting of teak and the influence of the origin of teak seed on growth and quality continue to demand attention, while in the C. P. the new systems of coppicing adopted in place of the selection and improvement systems have not produced entirely satisfactory results in the best teak forests. In Madras teak again is the species receiving most attention, and valuable results appear to have been obtained in planting and tending. In the Punjab Blue Pine regeneration continues to be difficult, while the Sal problem in the U. P. remains at a stand-still.

Coloured Plates of the Birds of Ceylon. By G. M. Henry. With a short description of each bird by W. E. Wait, C.M.G., M.A., F.Z.S., ETC. Part IV. 16 coloured plates. (Published by the Ceylon Government, 1935.) Price £1-10-0.

There is a Chinese proverb which says that a single picture is worth more than 10,000 words. Nowhere is its application truer than in the case of bird study in India, for one of our greatest handicaps is the paucity or almost complete lack of good illustrations of Indian birds. Not that we have a plethora of bird books; indeed the very opposite is the case, but without pictures bird books would be of little use to the beginner or the layman. Pictures to be really helpful must be coloured, and pictures to be coloured are necessarily costly, and to come back to our starting point in this vicious circle, it is the costliness of colour printing that has so retarded the publication of popular bird books in this country and acted as dead weight against the advancement of this fascinating study.

An effort has indeed been made in recent years to overcome this drawback, and the beautifully illustrated books on the Game Birds of the Indian Empire by Stuart Baker and the set of 5 wall charts depicting about 200 species of the common birds of this country, published at great expense and considerable financial risk by the Bombay

Natural History Society, and the *Popular Handbook of Indian Birds* by Hugh Whistler are the foremost examples.

Under the circumstances these coloured plates of the Birds of Ceylon are more than welcome, and the Government of Ceylon is to be congratulated not only upon its enterprise in undertaking their publication, but also upon its discovery of an artist of the accomplishments of Mr. G. M. Henry, an assistant in the Colombo Museum. It is not every artist, however masterful he may be, who can give a pleasing, accurate and lifelike rendering of a bird unless he is at the same time a naturalist and thoroughly familiar with his subjects *in life*. Mr. Henry obviously combines in himself both these attributes, and the plates which are the result of this combination are a real pleasure to behold.

In artistic merit, Part IV which is now before us, fully maintains the high standard set by its predecessors. It contains 16 plates, seven of which depict Passerine species, the remaining nine illustrating various non-Passerine forms.

It is perhaps unfortunate that while illustrating both the male and the female of the Ceylon Red-vented Bulbul, a species in which the sexes do not differ at all in colouration, only the male of the Ceylon Magpie Robin should have been shown. In the Indian race of this bird the black upper parts of the male are ashy-brown in the female, while the black in his lower plumage is replaced in the female by ashy-grey. In the Ceylon race the female is darker both above and below and sometimes indeed so dark that the correct sex can only be determined by dissection. Normally, however, there is sufficient dimorphism to have justified an illustration. We notice that Mr. Wait has attempted to supply this deficiency in his letter-press.

Sundry minor defects of undue accentuation of certain colours or *vice versa* are more or less inevitable in printing of this kind—for example there is too much blue in the back of the female Orange Minivet—but on the whole the reproduction of the plates is commendable.

The short descriptions of the birds by Mr. W. E. Wait, to whose well-known *Manual of the Birds of Ceylon* these plates are meant to be supplementary, touch upon the salient points in the distribution and habits of each species, but in our opinion measurements given in inches and such irritating decimals as "0.7" for example, are an

anachronism that is thoroughly inexcusable in a modern work even of a popular-scientific nature. We cannot help thinking that the present work suffers appreciably in scientific value from the adoption of the inch as the unit of measure rather than the more rational and universally accepted millimeter.

The ultimate scope of the work is unknown so we do not know how many further parts to expect. We can only hope, however, that we may still look forward to many more of Mr. Henry's beautiful drawings and that the Ceylon Government will continue its useful and munificent work of sponsoring a publication, which, by the very nature of its sumptuousness, they cannot perhaps look upon as likely to prove a financial success.

S. A. A.

Biochemical and Allied Research in India, 1934.

(Published by the Society of Biological Chemists, India. Bangalore Press, 1935.)

Pp. 107. Price Re. 1.

The Society of Biological Chemists, India, has just issued its annual publication *Biochemical and Allied Research in India, 1934*. At the moment, this publication is the only one of its kind in giving us, at least in part, a measure of the chemical research carried out annually in this country. We wish that other Societies will emulate this example in publishing such annual reports in other branches of chemistry as well. For this purpose, the birth of the National Institute of Sciences and the Indian Academy of Sciences is a very happy augury.

In the present publication, the fifth in its series, the reviews on different aspects of biochemistry, written presumably by experts in the field, are exhaustive without being critical. This tendency on the part of the reviewer to be complete has resulted in a repetition of themes. Thus the work on nutrition is dealt at length in three different sections, though there could be only one place for it. It is a little amusing to read about problems of fruit preservation being discussed in a section on animal husbandry. It was possible, as in the previous years, to have presented the matter more systematically. The publication afforded the best opportunity to the Society of Biological Chemists to have offered felicitations to its two sister-Societies—the Indian Society of Soil Science and the Indian Physiological Society—started during the year.

Despite the best endeavour on the part of the reviewers to include every reference, a few have escaped notice. Being at the mercy of the belated foreign chemical abstracts for getting at Indian work, the authors of the review could not have done better. But there can be no extenuating circumstance for certain flagrant omissions, as, for instance, of the publications of the Indian Lac Research Institute, Ranchi.

The section on Agricultural Chemistry, which could have started with acknowledgments to the Imperial Council of Agricultural Research for the researches sponsored by it during the year under review, rightly claims the largest space in the publication. The researches, discussed in this section, are those carried out in the various Government Agricultural Departments, including "quake-stricken" Pusa, and in the Department of Biochemistry, Indian Institute of Science, Bangalore. A finding by the last-mentioned Department, of special interest to the farmer, is the value of oxidising agents as fertilisers, resulting in one instance in a phenomenal increase of one hundred per cent. in the yield of tomato. Whether this finding, now having only a cloistered virtue, is capable of wide application in agricultural practice, is a matter deserving the attention of some co-ordinating scientific body. On another page of this section is described the work of Dhar and co-workers on the photo-chemical transformations in the soil wrought by metallic oxides, facilitating the oxidation of the organic constituents of the soil. Whether this is the cause of the phenomenon, of which the fertilising value mentioned above is the effect, is a question that an inquiring reader of the review is tempted to ask its author.

As with agricultural chemistry, the work reported in other sections of the publication is that carried out mostly in the different Government Departments. These departmental researches, being planned to meet special needs, are necessarily limited in their scope. In relief, stands the section on "Enzymes". The pure biochemist will still miss in this avowedly biochemical review of India a chapter on general biochemistry devoted to problems of fundamental interest. It is hoped that such a section, with the facilities and workers available in the country, will form the most conspicuous feature of the coming publications.

A short sectional title on each page and a subject index at the end would have

greatly added to the usefulness of the publication.

M. SRINIVASAN.

The Indian Sugar Industry. Lecture delivered by B. C. Burt, C.I.E., M.B.E., B.Sc., I.A.S., Expert Adviser, Imperial Council of Agricultural Research, *Journal of the Royal Society of Arts*, 1935, **83**, 919.

In a paper with the above title, B. C. Burt has traced briefly the development of sugar industry in India. The author has pointed out that India can be regarded as the original home of sugarcane and prior to the grant of fiscal protection to Indian sugar industry, India was still in the anomalous position of being at the same time the world's second largest grower of cane and one of the greatest importers of manufactured sugar. Within four years after protection the output of factory sugar increased enormously and it is expected to meet the whole of Indian demand shortly. Organised efforts at establishing the modern sugar industry in India date from the year 1910. The work of Mr. Moreland in arranging for a demonstrative miniature vacuum pan factory, the specific recommendations of the Board of Agriculture in India and the Government's prompt action on them have been outlined. The author then has surveyed the progress made since 1911 and has sketched the achievements of the

Coimbatore cane breeding station under the guidance of Dr. Barber. The work of the Indian Sugar Committee (1919-20) and the contributions by Rao Bahadur Venkateswara Raman to our knowledge of cane have been mentioned, the latter in somewhat great detail.

The rest of the paper is devoted to the development after the year 1928. The formation of the Imperial Council of Agricultural Research in 1929, the Tariff Commission's enquiry and the grant of protection to the industry are all briefly described.

The paper concludes with a mention of the effects of Bihar earthquake and the possible future of Indian Sugar Industry followed by a critical discussion.

This paper on the whole is a good survey of the historical development of the Indian sugar industry but the author has not touched some of the main problems confronting the future of the industry. The paper has amply dealt with the progress made on the agricultural side and described the achievements of the Coimbatore experimental station in improving the raw material. Besides the very important problem of molasses, the problem of utilising especially the by-products of the industry, especially molasses, is also looming. Topics of such vital interest must have been dealt with in the paper.

(G. G.)

Forthcoming Events.

Lucknow University Special Lectures—Session 1935-36.

PROGRAMME.

- *Nov. 16, at 6-30 P.M. Biology Theatre.
"Plant-Geographical Barriers." By Dr. B. Sahni, Professor of Botany and Dean.
- *Nov. 23 and 24, at 6-30 P.M. Chemistry Theatre.
"Alchemy or the Artificial Transmutation of Elements." By Mr. M. Raman Nayar, Lecturer in Chemistry.
- Dec. 7 and 8, at 6-30 P.M. Chemistry Theatre.
"Adsorption." By Dr. A. C. Chatterji, Lecturer in Chemistry.
- *Dec. 13 and 14, at 6-30 P.M. Physics Theatre.
"Recent Advances in Wireless and Television." By Dr. Wali Mohammad, Professor of Physics.
- *Dec. 21 and 22, at 6-30 P.M. Biology Theatre.
"Studies in Indian Liverworts." By Dr. P. P. Pande, Demonstrator in Botany.
- Jan. 4 and 5, 1936, at 6-30 P.M. Biology Theatre.
"Numbers." By Mr. R. D. Misra, Lecturer in Mathematics.
- *Jan. 17 and 18, at 6-30 P.M. Biology Theatre.
"The History of Helminthology." By Dr. S. Thapar, Reader in Zoology.
- Jan. 19, 20 and 21, at 6-30 P.M. Biology Theatre.
"Various Theories of Integration." By Dr. Lakshmi Narain, Reader in Mathematics.
- *Jan. 25 and 26, at 6-30 P.M. Biology Theatre.
"Cultural Variation in Fungi." By Dr. Das Gupta, Reader in Botany.

(*These Lectures will be Illustrated.)

Erratum.

Vol. IV, No. 4, October 1935.

Page 267, Line 24 under Spiral Structure of Chromosomes, *Read* "...the later stage the coils are fully stretched and during the later stage the threads divide."