

to travel in these countries, the facilities offered by them. If these service organizations could find the means for promoting and consolidating the intellectual sympathy and better understanding among the young men of different countries and abolish the mistrust and ignorance which separate them, then the cause of World Peace will be on the high road of accomplishment.

B. R. S.

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Rao Bahadur Professor B. Venkatesachar, M.A., F.Inst.P., has been invited by the Annamalai University to deliver a course of five lectures on "Atomic Nucleus and Hyperfine Structure of Spectral Lines". These lectures which are intended mainly for Honours Students will come off on Monday, the 6th February 1933 and terminate on Friday, the 10th February 1933 commencing each day at 5 P.M.

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Under the joint auspices of the Society of Biological Chemists (India), Bangalore, the Association of Economic Biologists, Coimbatore, and the Madras Branch of the Indian Chemical Society, a three-day meeting was held at Coimbatore on the 7th, 8th and 9th October. The Conference began on the 7th with a Symposium on "Utilization of Waste Products" presided over by S. V. Ramamurthy, Esq., I.C.S., Director of Agriculture, Madras. The following papers were read and discussed:—

"Sewage and Domestic Wastes." By Dr. Gilbert J. Fowler.

"Utilization of Farm Wastes." By Mr. K. S. Viswanadha Iyer.

"Utilization of Waste Vegetation." By Dr. V. Subrahmanyam.

"Waste Products of Paddy and Sugarcane Crops." By Rao Bahadur B. Viswanath.

"Waste Products of Dairy." By Mr. T. Lakshman Rao.

"Some Industrial Wastes." By Mr. M. Sreenivasaya.

On the 8th Mr. M. Sreenivasaya delivered an address on the "Present Status of the Problem of the Spike Disease of Sandal".

An interesting discussion followed which was continued on the 9th and which clearly proved that Spike was a disease due to some infective principle and not a physiological condition of the plant.

In the afternoon of the same day several original papers were read under the presidency of Dr. Fowler.

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We acknowledge with thanks the receipt of the following:—

"The Indian Forester," Vol. 58, No. 10, October 1932.

"Chemical Age," Vol. 27, Nos. 690-693.

"Brooklyn Botanic Garden Record," Vol. 31, Nos. 1-4.

"British Association for the Advancement of Science—York Meeting," July 1932. Addresses, Journal and Transactions.

"Archiv Für Zoologie," Heft 23, Nos. 1-4.

"Bulletin of the Madras Government Museum," Vol. 1, Part 2.

"Transactions of the Mining and Geological Institute of India," July and September 1932.

"Nature," Vol. 130, No. 3284.

"Canadian Journal of Research," July 1932.

"Natural History," Vol. 32, No. 5.

"Journal of Urusvati Himalayan Research Institute," Vol. II.

Reviews.

MAXWELLIAN OPTICS, *Theory of Light*. By Professor Max Planck, translated by Prof. H. L. Brose. (MacMillan & Co., 1932, 8 vo. pp. 213.) Price 10s. 6d.

In the volume under review, which is a translation from the original German, Prof. Planck has given a very clear, compact and comprehensive treatment of "Classical" optics from the standpoint of Maxwell's theory of electromagnetic wave-propagation. In the concluding chapter, the connections between classical optics and quantum mechanics are set out. It is obvious to any one who has been a teacher of the subject that there is a great gain in treating physical optics from such a unitary point of view. The following though of a coherent train of thought is the essence of a good course of lectures, and, it may be added, also of a good book. The serious student who desires to obtain a grasp of optical principles without wasting time on details of minor importance must feel grateful for having

such a volume as this put into his hands. The mathematical apparatus employed is comparatively elementary and is such as should be well within the capacity of B.Sc. (Hons.) and M.Sc. students of Indian Universities to understand.

The fact that the present book is the fourth of a series of five volumes by its distinguished author suggests certain reflections on the subject of the teaching of physics in Indian Universities which may not inappropriately find a place here. The astonishing rate of development of physics of recent years has made the adequate teaching of the subject a task of peculiar difficulty. It is quite natural and appropriate that much attention should be paid to the study of "modern developments" and that the more promising students should exhibit enthusiasm for taking up "research" as part of their syllabus of study. At the same time, it should be remembered that an edifice of ill-digested knowledge erected

on an insufficient foundation of preparatory study is worse than useless. A broad-based knowledge of mechanics, thermodynamics and electromagnetism with an adequate mathematical discipline such as is furnished by the published lectures of Prof. Planck should be compulsory for every advanced student of Physics. Only on such a foundation of knowledge, can the study of modern developments and the participation in research possess any real educational and intellectual value.

SIR C. V. RAMAN.

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Annelida Polychaeta of the Indian Museum, Calcutta.

A monograph on the Polychaete worms of the Indian Museum collection by Prof. Pierre Fauvel, the distinguished French specialist which has recently been published in Vol. XII of the *Memoirs of the Indian Museum*, deserves special mention. Though primarily a systematic account of the collections in the Indian Museum, the work is really the first monographic attempt of the Indian species of this very difficult group of marine worms. The author has published in this work detailed synoptic keys of the families, genera and species of almost all the Indian Polychaetes and thus made it possible for future workers to identify their material, to some extent, without having to search through the very scattered and extensive literature on the subject. Some of the outstanding general conclusions of the work to which attention may specially be directed are as follows:—The Polychaete fauna of Indian waters does not materially differ from that of the Red Sea, the Persian Gulf, the Malay Peninsula and the Philippines, but many forms which are known in New Zealand, New Caledonia and Australia are also found in these waters. As a result of critical studies of the Indian material, 67 of the Indian species have been found to be identical with forms found in the Atlantic Ocean, English Channel and the Mediterranean. The coastal fauna, as might be expected, is generally richer in species than the deep-sea fauna where the biological conditions are much less variable and the animals are less influenced by extraneous factors such as influence the life in the inshore waters. The forms recorded and described from the brackish water areas, such as the Chilka Lake, the Cochin Backwaters and the Gangetic Delta, were found to be specially modified and peculiar. A further factor of

interest about these forms was that identical species were found in collections from the Indian brackish water areas and the Taléh-Sap or the Inland Sea of Singgora, a brackish water lake connected with the Gulf of Siam.

B. P.

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The Practice of Absorption Spectrophotometry. By F. Twyman, F.Inst.P., F.R.S. (with the collaboration of the staff and advisers of Adam Hilger, Ltd.) (Adam Hilger Ltd., London.)

The subject of "Absorption Spectrophotometry" is of late finding such high favour among an increasing army of scientific workers—Bio-chemists in particular—that Messrs. Adam Hilger, Ltd., have, by publishing this useful little volume, earned the gratitude of many workers in this field. The first five chapters have been written in a lucid style by F. Twyman, F.R.S. and deal with the nature and laws of absorption, the apparatus and technique of absorption spectrography in the ultra-violet, visible and infra-red regions, and the application of Photo-electric methods to Spectrophotometry. Detailed instructions regarding the use of the Hilger instruments, their adjustment and alignment, selection of exposures, taking and recording of results, etc., are also carefully given that an adherence to the instructions given is bound to be valuable in this line of investigation.

The staff and advisers of Messrs. Adam Hilger, Ltd., have contributed the following three chapters in which are outlined the salient features of "Absorption Spectra and Molecular Constitution", "Biological Applications of Spectrophotometry" and "The Detection and Investigation of Poisons and the Control of Purity in Foodstuffs". A review of the present knowledge on absorption spectrophotometry as related to Vitamin D and allied topics is contained in section (b) of the chapter dealing with Biological Applications and should be able to convert a large number of vitamin specialists to the adoption of spectrophotometric methods in their work. A brief outline of emission spectrography as applied to the study of the above problems forms the subject-matter of appendix A, while in appendix B is given a short and general outline of the Raman Effect.

P. S.

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Recent Applications of Absorption Spectrophotometry. (Adam Hilger, Ltd., London.)

This is an extensive collection of Bibliographical references to the subject of absorption spectrophotometry and serves as a companion volume to the previous book. It is needless to stress the usefulness of such a list of references.

P. S.

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Indian Caste Customs. By L. S. S. O'Malley (University Press, Cambridge, pp. ix+190. 6s. net.)

The present volume on the fascinating subject of "Indian Caste Customs" contains nine chapters, each of which is devoted to a special topic on caste. Leaving the endless discussions on the origin and evolution of caste to the arm-chair philosophers of Europe, the author gives in the first four chapters a brief summary of the caste system, caste government, its controls and penalties.

Hindu society is divided into a number of divisions known as castes which are graded in order of social precedence and each caste again is divided into a number of sub-castes. To a student of Social Anthropology the modes and formations of castes and sub-castes which are taking place all over India are of peculiar interest.

The caste system is least precise on the northern borders of the Indian Empire, in Assam, the Panjab, the North-West Frontier Provinces, Kashmir, Sind and Nepal and very strict in South India. Regarding the caste government the author mentions the salient features of the old Panchayat system assisted by the elderly members. The lower castes are much better organized than the higher ones whose machinery for the regulations of their affairs have already become lax. Ordinarily it deals with all questions arising within its jurisdiction and its permanence and authority do much to promote the solidarity of the castes and to preserve the discipline among its members. But for grave and important matters, it gives place to a general assembly of male members of the caste. Even then the members of the council guide the discussions and have a large voice in the final decision. On grave offences of caste the rulers of the Indian States are the final authorities. There is a regular code of punishments for the

delinquents which are graded according to the gravity of the offences. The next four chapters deal with the marriage, morals, food and drink, occupation and the untouchability. It is sometimes said that the caste institution exists more for its regulation and maintenance of marriage customs and for preservation of chastity. Marriage must take place within the caste or sub-caste. A girl may be married within her caste and must be among members who are not related but never below. Here the elaborate rules of prohibition are in force to prevent marital relations among those who are closely related. Any violation of these rules will result in expulsion from caste. Thus caste preserves chastity in women. Equally important are the rules connected with food and drink about which the caste men are very particular. To a large extent occupation is the basis of caste and under modern industrialism based on mechanical inventions, traditional occupations of caste are declining and the caste men either relinquish their traditional occupation in favour of more lucrative ones or take to another to supplement their income. Regarding the untouchables it is curious to note that they constitute a well-defined distinct caste with sub-divisions of its own. Its peculiar usages and traditions as also its own jealousy of the encroachment of the castes which are above and below it. They are equally with the higher castes filled with that compound of pride of birth, exclusiveness and jealousy called "caste feelings". Regarding the caste organization of India there are scholars who condemn it as "the most disastrous and blighting of all human institutions", and one has described it as "a gigantic system of cold-blooded repression", while others have opined that caste has been useful in promoting self-sacrifice, in securing subordination of these individuals to an organized body, in restraining from vice, and in preventing pauperism. It must be said that caste has been a marvellous discovery, a form of socialism which through ages has protected Hindu society from anarchy and from the worst evil of industrial and competitive life.

Mr. O'Malley has to be congratulated on the production of an interesting volume which all students of Social Anthropology and the layman will much appreciate.

L. K. A.