

REVIEWS

The Travancore Tribes and Castes, Vol. 2.

By L. A. Krishna Iyer. (Government Press, Trivandrum), 1939. Pp. 344.

Eight tribes of the Travancore State are described here in the same schematic manner that was followed in the first volume of the series reviewed in these columns (*Curr. Sci.*, 1938, 7, No. 6). This synoptic treatment which pigeon-holes the data has just one advantage, namely, that it makes references easy, but the disadvantages are that no analysis is possible, and readers cannot hope to have any concrete impressions of the tribal cultures. But this method was found to be good for the purposes of the ethnographic survey initiated by Risley at the beginning of the present century. The intention of the organisers of the survey then was that the preliminary work of the survey should be followed up by detailed monographs on each tribe. We hope that the short accounts that have now been published will be amplified by more intense field work. A good example has been set in this direction by the Government of Assam.

Any one who understands the difficulty in collecting authentic ethnographic data in the tropical jungles, will give credit to the author for the industry and enthusiasm that he has brought to bear on this piece of work.

Prof. E. von Eickstedt of the Breslau University contributes an introductory essay on the history of anthropological research in India which he uses mainly to answer Dr. Guha's criticism of his scheme of racial classification of the peoples of India. It is difficult to understand the relevancy of this extremely controversial contribution to the main theme of the book which it is supposed to introduce. The author has, moreover, accepted in the last chapter of his book those very terms which have been criticised by the German professor (see pp. 290-94). Several passages of this introduction are unreadable and obscure. A specimen is quoted here:

The difference between a people and a race therefore is that the people show many different zoological types of same and very near descent, but the race exhibits only one single zoological type of same and more distant descent. Both have same descent—no wonder that they are confounded or the

people, this group of same descent, language and history, called "race". (p. xvii).

Good taste is obviously lacking when Eickstedt himself writes of his expedition—it consisted of himself and his wife—as "the greatest expedition which ever studied a foreign country from only the bioanthropological point of view".

In spite of all the published evidence to the contrary, Eickstedt persists in his belief that "genuine frizzly hair has therefore naturally been never found in India". While he rules out the *negrito* strain, he has no difficulty in admitting a *negrito-like* strain in the jungle tribes of the Peninsula!

The problems of racial nomenclature raised by Eickstedt are too complex to be solved in an introductory essay like the one he has contributed to the volume under review. A good deal more of data and discussions will be necessary for their solution. It is doubtful if Eickstedt will find supporters in creating new subspecies, as it is against modern taxonomic trends. The reviewer feels that Mr. Iyer has added very little to the value of his excellent book by this irrelevant introduction.

The illustrations are more carefully selected than in the first volume and the get-up is definitely better.

A. AIYAPPAN.

Mechanics Applied to Vibrations and Balancing. By D. Laugharne Thornton. (Chapman & Hall, Ltd., London), 1939. Pp. 529. Price 36sh.

The book is written primarily for Engineers and each chapter has been developed from the simplest beginnings, the fundamental principles being expounded as clearly as possible. A fairly good knowledge of mathematics is assumed on the part of the reader. A major portion of the book is devoted to demonstrate the bearing which unbalanced machinery in general and engines in particular have on the vibration of the foundations or supporting structures. In the first and second chapters this is exemplified with reference to the balancing of steam and internal combustion Engines and of Locomotives. Lagrange's equations have been enunciated and employed in these two chapters. This makes it easy for one to follow

the more advanced theory of vibrations in Chapter III. Investigation of the vibration of structural systems having a definite number of degrees of freedom is made extremely simple by Lagrange's formulæ. The main points in the design of an engine as a whole and of the various components as the governor, valve gear, etc., can be easily followed by the information provided in Chapters III and IV which deal mainly with the propagation of stress through elastic materials. These chapters are full of interest to the Engineer. Stresses induced while driving a pile, in winding ropes, in materials used for construction, in reinforced concrete, in propagation of torque in a shaft, in water hammer, in earthquakes, in impact, etc., are clearly brought out and illustrated by numerical examples where possible. The study of continuous wave motion, transmission of energy by pressure waves, and the application of pressure waves to study the fuel system of internal combustion engines are also very ably developed in this chapter. Problems arising from the vibration of beams under various conditions of support for the ends, of struts and ties, of continuous beams and of framed structures with rigid joints are discussed at length in Chapter V.

In the same chapter the more difficult problem of the vibration of a thin plate of rectangular and circular sections is introduced and this leads the reader on to an understanding of the behaviour of beams of non-uniform cross-section and of combined transverse and torsional vibrations. The significance of the several results obtained in this and the previous chapters is further brought out by a discussion of the possible causes and the general character of the vibrations in the fuselage of aircraft, specially when executing manoeuvres, at the end of the chapter. A detailed analysis of the vibration of rotating shafts and discs, is given in Chapter VI and the results are applied to the study of the wheel and blading of a turbine and the gyroscopic action of rotating bodies is here illustrated with reference to the influence of the gyroscopic forces on the disc wheels of marine turbines caused by 'pitching' or 'yawing' motion of the vessel. Under the heading 'General Survey' the last chapter in the book is made probably more interesting than the previous ones, to the lay reader, as it is completely devoid of any mathematics. It

deals with the vibration met with in ships, propelled by oil engines and turbines, with the appliances for the purpose of damping vibration caused by machinery in general and engines in particular, with the torsional vibration of crankshafts, with the vibration of a railway bridge when a locomotive passes over it, and with traffic and vibration of roads; also with the application of wave forms in Geophysical, Marine and Aerial Surveying and finally with the design of buildings to withstand earthquakes.

An engineer engaged in design work cannot afford to lose sight of the very valuable information contained in this chapter and in the whole book if his design is to be a practically sound one.

E. K. RAMASWAMY.

An Elementary Text-Book of Zoology.
By B. L. Bhatia. Third Edition. (Macmillan & Co., Ltd., London), 1940. Pp. 655. Price Rs. 8.

The third edition of this book, specially intended for the use of Intermediate students in India, has just been published. The popularity of this book can be judged by the fact that, though the second edition was printed in 1938, a new edition had to be brought out now, and there is no doubt whatsoever that this popularity is well deserved. Based on Parker and Parker's *Elementary Course of Practical Zoology* and adapted as far as possible to the needs of the Indian student, the book incorporates much of what is known of Indian Zoological types. *The Indian Zoological Memoirs*, which have so successfully contributed to our knowledge of the Zoology of Indian animal types, have been used to much advantage, and the book has made Zoology a more familiar and easily understandable subject to the Indian student.

To meet and fulfil the needs of the Intermediate student throughout India is an ambitious programme, and there are bound to arise variations and deficiencies, which in the nature of things, cannot be completely avoided. These difficulties become the more numerous, if the author keeps in his view a published book and sets out to adapt it to the needs of the students of a country different from those for whom the original book intended. Dr. Bhatia has endeavoured to overcome these difficulties. The type system followed by the Parkers in their book has been slightly altered to make it a general

text-book by the addition of the characters of the class to which the type belongs.

Nearly a third of the volume deals with the frog. The invertebrates are covered in about 200 pages. The sponges, Echinoderms and the parasitic worms are included in "other phyla" covering less than fifteen pages. The lower vertebrates are also treated scantily in about 30 pages while the Rabbit is dealt with in detail covering nearly a hundred pages. It should be possible to accord a more uniform treatment to some of the phyla and in many Indian Universities, the frog and the rabbit are not the only animals which are dealt with in detail. The parasitic worms can be included for a fuller treatment with advantage and interest to the young student, and so can many of the lower vertebrate groups. The third part of the book incorporating certain general principles in Zoology forms a useful and interesting adjunct.

In a book intended for Indian students it is to be expected that Indian examples are cited wherever possible, and this could have been done in the author's classification of the Amphibia on page 202. *Tylototriton* occurs in Darjeeling and at least four genera of Gymnophiona are reported from India.

While we do not doubt that this book will see an Indian student through his Intermediate examination, much of it can be learnt at a later stage, while a little more is needed to equip him for it. B. R. S.

Elementary Microtechnique. By H. A. Peacock. Second Edition. (Edward Arnold & Co., London), 1940. Pp. vii + 330. Price 9sh.

We welcome the second edition of *Elementary Microtechnique*, in the compilation of which the primary object of the author has been, besides discussing the chemistry of the various processes of fixing and staining, to provide an inexpensive ready-reckoner to students of Biology. A graded selection of type methods for making microscopic preparations has been added. In describing the dehydrating agents like alcohol, cellosolve, and slovax, dioxan is also described; however, since the dioxan vapour is considered to be deleterious, the beginner may not be recommended to try it. A detailed method is described for making permanent preparations of nephridia of *Lumbricus* and the same method will not hold good for leeches. It would have been

well if the author had also detailed a special method of making whole mounts of the excretory organ of hirudo.

In High Schools and Intermediate Colleges, where microscopic preparations are demonstrated, a book like this will be of immense use, the prohibitively costly treatises being out of question. L. S. R.

Intermediate Botany. By L. J. F. Brimble. Second Edition. (Macmillan & Co., Ltd., London), 1939. Pp. viii + 562. Price 8sh. 6d.

This is the second edition of the author's book, well known for the very desirable and welcome departure from the traditional method of writing text-books. By including topics of economic significance and human interest, the author has made the treatment more truly *educational*. Thereby he has not only given a refreshing orientation to and served to vitalise the study of plants, but has also succeeded in liberating the subject from the shackles of the stereotyped method of writing botanical treatises, hitherto dominantly in vogue. One must confess to a feeling of surprise at this consistent indifference to and avoidance by the authors, of the inclusion of topics of interest and utility to mankind, notwithstanding the immense importance of plants in the human and world economy, and the dominant, almost exclusive control which they have on the maintenance and the advance of civilisation. Such an attitude, moreover, has had a very baneful effect on the promotion of the study of Botany, which is generally relegated to an inferior and backward position in the educational curricula, at least in this country, or is at best tolerated as a necessary evil, having no redeeming feature much less any value. The contrast becomes only too obvious when one compares text-books on Physics and Chemistry, which deal not only with purely academic aspects, but have invariably included in their treatment numerous topics of daily interest and utility to man, exemplifying the applications of the findings of these sciences to the amelioration of the conditions of mankind and to the various industrial and manufacturing processes which have contributed so much to the advancement of civilisation. It was high time, therefore, that some one should usher a new era in the preparation of the botanical text-books also. All students and teachers, as well as the general reader, have reason

to feel profoundly grateful to the author for producing a book which makes good this deficiency and, moreover, is written in a manner which at once makes it informative and readable.

For the rest the book follows in detail the lines of treatment of the earlier edition. As in it, there are 30 chapters covering 562 pages, including an appendix of Questions and Exercises. *Little new matter* has been added. In spite of the words of the author: "Advantage has been taken . . . to correct errors or incomplete statements and to make improvements wherever possible" certain relevant suggestions and criticisms offered on the first edition remain unattended to. For example, the necessity of indicating the mother axis in the floral diagrams (p. 321); the statements: (1) "the most changeable organ of the plant is the flower" (p. 500) and (2) "the classification of Linnaeus is still the basis of the present-day classification, but much modified" (p. 500-1). There is no doubt that these statements are involved, if indeed not incorrect, as they stand, and the value of the book would greatly be enhanced if these are rectified. It may also be pointed out that in the list of the points of difference between animals and plants (p. 7) no mention is made of two of the most important and fundamental features, *viz.*, (1) the presence of chlorophyll in plants and its absence in animals and (2) the presence and absence of a mouth in animals and plants respectively. In a way these underlie all the other differences between the members of the two great kingdoms, and, furthermore, are so obvious. In connection with the life-history of *Phytophthora* (p. 396) no account is given of the sexual mode of reproduction. This phase is now fully worked out, and without it the life-history remains necessarily incomplete. The plant is stated to be 'multicellular', but the hyphæ are mentioned as 'non-septate'. This discrepancy should be corrected.

While every author has his own notions of, and reasons for what to include and what to exclude—and opinions in this respect will continue to differ—it will be readily admitted that Mr. Brimble has produced a well-balanced work, in which every aspect receives its due share of attention, and in which the academic and the utilitarian points of view are happily blended. Certain topics like the historical survey, enzymes, irregular nutrition, length of life, hormones,

uses of plants and plant products to man, vitamins, beverages, to mention only a few, which are either not included at all in textbooks, or are treated purely academically, are dealt with by the author with an attractive covering of related phenomena and wider applicability. Such a treatment enriches information, enlivens the study, as well as focusses and stimulates the attention of the reader.

Altogether the book is very well planned, written attractively and is sure to benefit those who may turn to its pages for information and instruction.

The author as well as the publishers are to be heartily congratulated. N. K. T.

Botanisk Genetik Sartryck ur "Vaxternas LIV, Populärvetenskapling Handboken". Band III och IV. By K. V. Ossian Dahlgren. (Nordisk Familjeboks Förlags A.-B., Stockholm), 1936-38. Pp. 502-692, 1-249.

The book is divided into two large parts each one having 16 chapters thus covering all principal and some more special problems in the field of plant genetics. The field of polyploidy and plasmatic inheritance are broadly discussed. Even such important problems as the origin of the species and the improvement of the plants (plant breeding) have found consideration. Plant geneticists have felt the lack of such a book for a long time. It is very well illustrated with photographs, drawings and diagrams and even with colour plates. Good photographs are given of prominent geneticists, cytogeneticists and plant breeders. It is to be regretted that the book is published in Swedish. The desire of the geneticists of several parts of the world is that the second edition of this book should be published in English or German, serving thus the needs of a larger number of students. It is also hoped that all the more recent discoveries in the field of plant genetics will be considered.

DONTCHO KOSTOFF.

Non-ferrous Foundry Practice. By J. Laing and R. T. Rolfe. (Chapman & Hall, Ltd., London), 1940. Pp. vii + 336. Price 21s.

Successful production of castings in the non-ferrous metals and alloys is the realm of the expert. The knowledge of the expert has been made available to us in the present book. The first two chapters deal with moulding sands and melting furnaces in the founding of non-ferrous metals and alloys

and are very instructive from the point of view of the foundry foreman. Recent data as to the various non-ferrous alloys given in the book should help every designer and engineer in the line, to keep himself informed of the latest advances. The use of fluxes in the melting of non-ferrous alloys is a very interesting and intricate problem and the authors have given due consideration to this aspect. Some examples of difficult design of castings make the book very useful.

During the past 15 years or so, the aircraft industry has been responsible for the development of light and strong alloys containing aluminium and the authors have taken care to deal with this subject in sufficient detail. The chapter on magnesium alloys is instructive.

As the authors remark, books on foundry practice, especially of the non-ferrous type, where recent years have seen very great advances, are very few and the present one, written with great care will be very valuable to persons engaged in non-ferrous foundry practice.

K. B. K. R.

This Strange World. By A. E. Trueman. (The Scientific Book Club, London), 1940. Pp. xiv + 240. Price 3sh. for members.

Each month, the "Scientific Book Club" brings to its members, as claimed in its prospectus, the fascinating story of the march of modern sciences told in thoroughly dependable books by the front-rank scientific writers of our time. One of such recent issues, dealing with the science of the earth, forms the book, *This Strange World*, by Prof. Trueman.

This Strange World, while in no way claiming to be a regular introductory textbook on Geology, gives a delightful outline of what that branch of Science is after, what it has achieved so far and what the problems are with which it is concerned at present. It includes, though, enough introductory matter to make it intelligible to a reader with no previous knowledge of Geology. Very few unfamiliar names and technical terms are introduced in the book and the reader is not pestered with unnecessary details relating to those branches of Geology which deal with fossils, and the study of rocks and their structures.

Indicating the several views which have been held, from time to time,—on the antiquity of the earth, its origin and subsequent changes and similar other particulars—the

author gives a short account of the history of the science in Chapter I; and in the next chapter he describes briefly the nature of materials of which the earth's crust is composed,—the sedimentary rocks and their mode of formation and arrangement, and the igneous and metamorphic rocks, their origin and distribution. Furnishing a brief account of the Geological History of Great Britain in Chapter III, in the next eight chapters, the author gives a lucid summary of the results of all recent investigations, on every important problem, relating to the earth science, which are now engaging the attention of geologists, all over the world. The account includes the latest researches on the age of the earth; the conditions of its interior; the nature and mode of origin of earthquakes; the application of geophysical methods of investigation relating to earth structure; the origin of mountain ranges; isostasy; past climates and ice ages; and the burning question relating to continental drifts and oceanic basins. In the final chapter, the author gives an interesting account of how the influence of environment on the mankind, led the pre-historic man to his searching for stones, for his primitive implements; and his later descendants, with their advance in civilisation, to the search for other material like suitable soils for cultivation; and to the search for water, mineral oils and various minerals, etc., required for their purpose.

From first to last, *This Strange World* forms a fascinating reading and, contributed by an eminent geologist, it has all the impress of an authoritative account of our present knowledge on various problems of the science of the earth, which are dealt with in this delightful book. The book contains several illustrations and its general get-up is very good. The educated lay-readers will find the book very instructive and interesting, and even those who have studied, or are studying, Geology will be considerably benefited by a careful glance through its pages.

B. RAMA RAO.

The Rice Problem in India. By W. R. Aykroyd, B. G. Krishnan, R. Passmore and A. R. Sundararajan. (Indian Medical Research Memoirs No. 32. Thacker Spink & Co., Ltd., Calcutta), January 1940. Pp. 84. Price Rs. 3-8-0 or 5sh.

The publication deals with the nutritional, commercial and economic aspects of the Rice Problem in India. The authors have

presented data concerning the production and consumption of rice in India and have examined the proximate nutritive principles in rice and the changes brought about by parboiling and milling, particular attention being given to the changes in vitamin B₁. The ætiology and endemicity of *beri-beri* and the human requirements of vitamin B₁ are discussed, and the results of experiments carried out with rice diets in order to discover the most important defects of such diets and the means of improving them have been furnished. An interesting chapter on the economic and social sides of the rice problem studied by means of questionnaires and field enquiries has been provided and the *Memoir* concludes with a general summary of the entire problem.

Attention is drawn to the fact that milled rice is poorer than unmilled rice in the most important constituents, e.g., vitamin B₁ or nicotinic acid and that their loss in milling is mitigated when rice is parboiled. Based on the Williams-Spies standard that the ratio, vitamin B₁:calorific value of food should be at least 0.25 to prevent the occurrence of *beri-beri*, the authors are of opinion that rice, to afford protection against *beri-beri*, must have 1.4 to 1.7 micro-gram per gram of vitamin B₁. Nearly all samples of home-pounded or parboiled rice examined are above this minimum. On the other hand, all samples of raw milled rice are deficient in this respect.

And yet over 70 per cent. of the rice-eating population of the Madras Presidency consume machine-milled rice; elsewhere in Bengal, Assam, Bihar, Orissa, U.P., and Hyderabad, the percentage is less. From the results of a questionnaire issued, it is revealed that a false sense of economy has been the chief cause for the milled-rice habit. Actually, home-pounded rice does not entail greater expenditure than the machine-milled product. Besides, bulk for bulk, unpolished, cooked rice has more solid matter and can provide greater sustenance than polished rice.

On the subject of legislative action to prevent further erection of rice-mills or to do away with existing mills, the authors are emphatic that this cannot be recommended because "historically, attempts to encourage handicrafts at the expense of machinery have rarely been successful". On the other hand, the production of *highly* milled *raw* rice can, they consider, be prohibited by legislation. Under-milled or 'once-polished'

rice is considered satisfactory in this respect. The number of large mills in South India, where alone such 'once-polished' rice can be produced are, according to the figures given by the authors, only about 550. Over 86 per cent. of the total number of rice mills are *small* mills and it is these small mills that have spread into rural areas and, in these, it is not possible to have any controlled polishing such as is advocated by the authors. This would obviously necessitate the establishment of suitable milling standards.

The authors are not in favour of taxing imported rice as they fear that "this might be at the expense of the very poorest population groups". The authors are of the opinion that the agricultural research worker should chiefly aim at the production of high-yielding strains and that he "need not concern himself with trying to change their composition". This is, no doubt, based on the finding that rice is of no importance as a source of protein in the diet.

The authors state in this connection that an improvement in food value can be more easily achieved by preventing the losses occurring during milling and preparation.

Among the suggested practical ways of improving the poor rice-eater's diet are the partial substitution of rice by one of the millets, particularly *ragi* and the increased use of pulses, milk, calcium salts and green and leafy vegetables. The use of skimmed milk powder or of calcium lactate is especially emphasized, but it would be infinitely better for us to turn our efforts at improving the country's milk supply and making milk a commodity within the reach of every purse.

The *Memoir*, on the whole, presents the results of a planned investigation into the problem of rice, its nutritional value, the defects of the rice-eater's diet and some practical methods of overcoming them. Not the least interesting and informative part of this enquiry is the chapter on the economic and sociological causes leading to the increasing displacement of hand-hulled or home-pounded rice by the machine-milled product.

A. SREENIVASAN.

Progress of Education in India, 1932-37.
By John Sargent. (In two Volumes.) 1940.
Price: Vol. I, Pp. 285, Rs. 3-2-0; Vol. II,
Pp. 269, Rs. 4-4-0.

This publication, which is the eleventh, quinquennial review of the progress of

education in India, is one which is familiar to all educationists and public men who desire to be posted up with the latest authoritative information in this field. The Report deals with the period of five years ending March 1937, and consists of two volumes. The first volume contains certain general observations on the main features of educational development during this period, followed by chapters on administrative arrangements, university, secondary and primary education, education of girls and women, professional and vocational education, and lastly, education of certain special classes and communities. The second volume is one of statistics. The figures have been collected with much care and labour, and the tables are intelligently presented.

There can be no question as to the utility of this quinquennial survey. It provides us with a means of understanding and evaluating the progress of education in this country over a convenient unit of time. The Hartog Report of 1929 was long, and perhaps even now, considered as the most comprehensive and valuable official document on educational matters. But much water has flowed under the bridge since that Report first appeared. It is therefore important that we should have an authoritative summing up of the educational situation from time to time, such as the one provided in the publication under review. Unfortunately, however, the Report has appeared three years after the quinquennium with which it deals; and in spite of the explanation offered in the Preface for this inordinate delay, one would wish that the work had been expedited.

The Report throws much light upon many of the problems which are now agitating the minds of educationists and others. At the very outset it refers to a criticism which attacks the very foundations of the Indian educational system namely, that it does not satisfy the needs of the people; that it lays too much stress upon literary studies without developing the practical side. In this connection reference is made to the Abbott-Wood Report and the Sapru Report both of which had suggested certain suitable modifications in the present system.

Educational expenditure, which had been adversely affected by financial stringency, showed a tendency towards recovery during the quinquennium. Nevertheless, education as a provincial transferred subject, under the

charge of Indian ministers, has not appreciably prospered for lack of funds. Nor has the devolution of responsibility upon local bodies, for the lower grades of education, been more successful.

The universities seem to have developed in all directions, but still, the remark must be made that their contribution to national culture and material well-being may be considerably increased. The reorganization of secondary schools, so as to weed out the unsuitables and redirect their training into practical channels, is still an unsolved problem on the whole. So also is the problem of providing an appropriate atmosphere for those just entering upon their college studies. In regard to the adoption of Indian languages as media of instruction in the high school and above, consensus of opinion among universities seems to be in general favour, although practice lags far behind theory in this matter.

Primary education has made very little headway during the quinquennium. It is always the old story of wastage and lack of funds. Free and compulsory primary education on a nationwide scale is still a long way off. Certain attempts, however, have been made to recast the curriculum of the existing primary schools and to lengthen the period of instruction in them. The education of girls and women shows some improvement, but this has been largely in higher institutions of learning. Moreover, no substantial attempt has been made to devise a separate curriculum for the fair sex more in accordance with its peculiar needs. In regard to the professional qualifications of teachers much advance has been made, but the rate of this advance has not been uniform throughout India. The education of Muslims shows rapid growth. The school-going population in that community has nearly doubled itself during the past two decades. The education of the depressed classes seems to be well under way, and larger numbers of these children are being admitted into the ordinary schools.

To an educationist who looks for rapid and all-round progress in the education of this country the Report must be very depressing reading on the whole. There are few bright spots; and one is tempted to think that if the progress is as slow as this, there is hardly any need for a quinquennial auditing of it.

D. S. GORDON.