REVIEWS

Methane, Its Production and Utilisation. By J. P. Lawrie. With a Foreword by Lord Strabolgi. (Chapman & Hall, Ltd., London), 1940. Pp. 66. Price 6*sh*.

This book is a publication of topical interest. Frequent attempts have been made to use methane as an alternative to petrol in countries which do not command natural resources in mineral oil. It is stated that in Germany alone 22,000 vehicles have been converted to operate on methane gas in the last two years. French manufacturers have developed a gas container weighing 245 lbs. which can hold 700 c.ft. of methane gas at 3,000 lbs. per square inch pressure equivalent to 5 gallons of petrol. The use of this gas as fuel for stationary engines is also rapidly increasing.

Dr. Lawrie has made out a very good case for the development of the potential supplies of the gas from collieries, coke-ovens, and also from the biological treatment of sewage. In India, this biological process has a special significance for national economy both in times of peace and war. In this connection the work of Barker on methane producing bacteria is stated to be quite promising. Figures from one of the largest sewage works in Europe—The Mogden Works of the West Middlesex Drainage—indicate that it is possible to produce 1,350,000 c.ft. of this gas per day for a population of 1,250,000 and use a large portion of this gas for the generation of power. This book is commended to industrialists and public health authorities for careful perusal. J. C. G. and S. C. P.

The Travancore Tribes and Castes. Vol. III. *The Aborigines of Travancore.* By L. A. Krishna Iyer. Trivandrum, 1941. Pp. 176 + x. Price Rs. 5.

With the present volume the work on the ethnography of Travancore which the author undertook some years ago comes to its conclusion. What his father, the late Dr. L. K. Anantakrishna Iyer did for Cochin and Mysore, Mr. Krishna Iyer has now done for Travancore, and he has done it with an enthusiasm which is specially required in a rapidly expanding science such as Anthropology, and with a receptiveness to criticism which is not a very common virtue among the tribe of scribes. In the present volume he gives a generalised summary of such topics as tribal traditions, racial affinities, megalithic monuments, domestic life, exogamy, marriage, taboo, inheritance and social organisation, disposal of the dead, religion, occupation and clash of culture, most of which have been discussed separately under the different tribes in the previous two volumes. The last chapter on clash of culture is of special importance as it deals with some of the most crucial problems intimately connected with the future of these tribes. Apart from its value to the academic anthropologist, books like this are "of inestimable value in pointing out to the Hindu majority the condition of their less advanced fellow country-men and, even of greater importance, those elements of tribal culture which are of permanent survival value".

Prof. Marett contributes a brief but interesting introduction with several suggestions for the benefit of the educated youth of India. In commending a closer study of the diverse types of Indian communities to young Indians, he remarks how ignorant he has found the brilliant young Indians who find their way to Oxford to be, of "their own country and its inhabitants, apart from their own home quarters and home-circle". He prescribes anthropology as a remedy against the narrowness of social outlook prevalent in India. A. AIYAPPAN.

A Manual of Aquatic Plants. By Norman C. Fassett. (McGraw-Hill Publishing Co., Ltd.), 1940. Pp. 382. Price 26*sh*.

The aim of the book is to enable the identification of aquatic plants in a sterile as well as in a flowering or fruiting condition. The region covered is from Minnesota to Missouri and eastward to the Gulf of St. Lawrence and Virginia in the United States. The aquatics of this area when thoroughly dealt with easily serves a much wider area since there is a great similarity or even an identity in the case of several of the aquatics with those of the neighbouring areas. The book is illustrated with good photographs and line drawings of the different plants.

In the first part of the book an excellent key is given, with the aid of which it is possible to run down the names of the plants to be identified. In this key the vegetative structures of the plants are very largely used to help one in the identification, while at the same time the distinctive features of the flower or the fruit are also referred to wherever necessary.

The second part forms the descriptive portion of the plants. In this part, the various plants are dealt with under the different families. Under each family a key is provided for the different genera and under each genus a key is given for the different species.

In the third portion of the book very interesting and useful information—the results of careful field observations—is given regarding (1) the uses of aquatic plants by birds and mammals, (2) the relation of plants to fish and (3) a general animal index in which is indicated the species of plants eaten by each animal. A good bibliography, a glossary and an index are given finally at the end.

The book will form a very useful reference book to the systematist or the ecologist who is interested in aquatic plants. Though the book deals only with the aquatic flora of a portion of the United States, the Indian reader also will find much to interest him owing to the many common features seen in the aquatic flora of our country.

M. O. P. I.

Chemical Composition of Foods. By R. A. McCance and E. M. Widdowson. (His Majesty's Stationery Office, London), 1940. Second Impression. (Medical Research Council, Special Report Series, No. 235.) Pp. 150. Price 4*sh.*

The recent rapid progress in the field of nutrition has brought home the fact that a knowledge of the chemical composition of foods is the first essential in the dietary treatment of disease or in any quantitative study of human nutrition. Sherman's Tables of Food Values, with their many limitations, have constituted so far the most important source of information. Drs. McCance and Widdowson have placed the world under a deep debt of gratitude by bringing out an extensive and authoritative book of great utility. Their book represents the solid and unostentatious work of a team of investigators working for fourteen years under the auspices of the Medical Research Council. Nearly 670 foods have been exhaustively analysed, and more information has been made available by them than that contained in Sherman's Tables. The foods have been analysed not only in the raw state but also as prepared for the table; the analytical figures have been rendered more valuable by the inclusion of the percentage of edible matter in the cooked food. Tables include a description of the food, nature of edible material, edible matter, water, unavailable carbohydrate, sugar, starch, total nitrogen, protein nitrogen, fat, available carbohydrate, calorific value, sodium, potassium, calcium, magnesium, iron, copper, phosphorus, sulphur, chlorine and acidity or alkalinity. In the case of flesh foods, purine nitrogen values are also given. Analysis has also been made of a number of cakes, pastries, puddings, etc., made to standard recipes and described in 14 special pages.

A few pages have been devoted for figures of the various ingredients contained per ounce of the food; this is in addition to the more commonly expressed values per 100 grammes. Figures per ounce have a greater appeal to the laity than percentages. Available phosphorus expressed as a percentage of the total phosphorus and "available" iron also expressed as a percentage of total iron for a few of the foodstuffs are included at the end of the book.

The book should equally prove an invaluable guide to those interested in the dietary treatment of disease and to those engaged in the serious study of human nutrition. This phœnix of quantitative knowledge condensed in 150 pages will undoubtedly constitute what must remain for many years to come the most authoritative Tables of Food Values. The format of the book leaves little to be desired. S. R.

An Inorganic Chemistry. By H. G. Denham. Third edition. (Edward Arnold & Co., London), 1939. Pp. 694. Price 12*sh.* 6*d.*

The book is written in a simple and lucid style. It contains sufficient information for those taking intermediate science in chemistry. The subject is divided into three groups, theoretical, non-metals and metals. The fundamental principles which an

intermediate student ought to learn at this stage are clearly explained with appropriate illustrations. The inorganic chemistry proper under non-metals and metals has been dealt with great discrimination. The experiments which have been described under the study of non-metals and metals are just the experiments which a lecturer requires for demonstrations. The book would have been more appreciated if it had included a chapter on recent advances treated in a popular manner. S. V. R.

The Grasslands of the Argentine and Patagonia. (*Herbage Publication Series, Bulletin* 30.) (Published by the Imperial Bureau of Pastures and Forage Crops, Aberystwyth), 1940. Pp. 49. Price 2*sh.* 9*d.*

This bulletin is the report of a tour of South American Grasslands undertaken during early 1938 by a well-known agrostologist.

A wide range of climatic types have been covered ranging from sub-tropical in the north to cold temperate in the south.

Eight pastoral zones are described in simple non-technical language with a covering map showing their distribution, and each zone is briefly discussed in relation to its vegetation, agricultural or pastoral practices and potentialities.

There follows a series of notes on 23 individual stations visited. Nineteen, rather mediocre, illustrations help the reader in reaching a proper appreciation of the variety of conditions met with.

Dealing as it does mainly with a description of professional large-scale ranching conditions and practices on pastures whose botanical composition differ vastly from our tropical pastures the *Bulletin* is of only limited interest to Indian readers.

It is however worth more than a passing glance if only to bring home once again the ever present menace of soil erosion where mismanagement of land takes place in the struggle to realise immediate profits.

In this case it is very striking that the intensive raising of lucerne leys which have to be reconstituted at frequent intervals has resulted in considerable loss of fertility through failure to return soil losses by adequate manurial treatment and in wind erosion on an extensive scale. 70 years ago the average area under lucerne was 250,000 acres. 20 years ago it had risen to 21,000,000 acres, but during the last few years this tremendous area has shrunk to 13,500,000 acres in 1933–34 owing chiefly to the compulsory retirement of lands once cultivated through drifting sand. When it is realised that the Argentine is dependent on lucerne for final fattening off of her vast herds, the loss of these areas becomes a serious matter, for their recovery is usually beyond the pocket of the private owner and has to be left to the State.

Such examples as this cannot receive too much publicity in India, where erosion is already depleting the basic national capital —soil fertility. J. A. WILSON.

The Breeding of Herbage Plants in Scandinavia and Finland. (*Herbage Publication Series, Joint Publication* No. 3.) (Published by the Imperial Bureau of Pastures and Forage Crops, Aberystwyth), 1940. Pp. 124. Price 4*sh.*

This joint publication of the Imperial Agricultural Bureaux presents the translations of seven papers on the breeding of herbage plants (grasses and pasture legumes) by seven authorities from Sweden, Denmark, Norway and Finland.

This type of work has been in progress in both Sweden and Denmark since the early years of this century, while in Norway and Finland a start was made some 20–30 years later.

Covering these translations is a rather lengthy summary, indicating the lessons to be drawn from breeding work in these northern countries. Each individual crop is dealt with separately.

The highly technical nature of the work described makes it impossible to avoid the extensive use of that technical jargonese which has now become standardised and which—rather unfortunately in my opinion —renders the intelligent assimilation of the subject-matter difficult to the lay reader.

To the plant breeder, however, the publication is of great interest in indicating the aims and objects kept in view in respect of each crop, the methods employed, and the results obtained.

In India, where the breeding of pasture grasses and pasture legumes is almost an unexplored subject, basic issues will have to

be dealt with before proceeding to the more technical work, and such work receives only passing mention.

An interesting account of cytological work done in Sweden during the past 10 years is given. This had for its main object, a systematic endeavour to alter the chromosome number in crop plants so as to obtain more valuable types for cultivation, and was based on various findings, chief among which are those of Müntzing, who found that both auto- and allo-polyploid types *as a rule* are remarkable for a more vigorous type of growth than original types, and that when the chromosome number varies within the cultivated forms of one and the same species, the high chromosome types are universally the most valuable. The four methods by which a change in chromosome number has been brought about are briefly described and this paper is of particular interest to the plant breeder, though it may not belong strictly to his sphere of work.

J. A. WILSON.

THE INDIAN STATISTICAL INSTITUTE

STATISTICAL method and statistical studies have now, without doubt, gained place of importance in academic thought as well as in administrative work. They have even bifurcated themselves already into two almost distinct branches, one chiefly descriptive and enumerative which is connected with economics and administration, and the other primarily analytical which is as much a branch of positive science as applied mathematics. In Europe statistics became a serious subject of study with the rise of modern States and for a long time almost exclusively associated with economic studies. Not until the mathematical theory of errors based on normal distribution was employed in reduction of observations in astronomy (Gauss), anthropology (Quetelet), or even until the ideas of correlation P, χ^2, and exact distribution were extensively used (Galton, Pearson), was a revolution brought about in the world of statistics. Even more recent work such as at Galton Biometric Laboratory in London, Lawes Institute at Rothamsted, Lund Observatory in Sweden, with which many living statisticians are associated, has definitely enthroned statistical analysis as the touchstone in all experimental work in which a *multiplicity of factors is a predominant* feature. Societies for the scientific study of statistics exist in all important countries, and the oldest among them, the Royal Statistical Society of London, has already celebrated its centenary.

Statistical studies in India may be traced to classic period of Sanskrit Culture, and to Kautilya's *Arthasastra*, or *Ain-i-Akbar*, and brought down to 1871 when the Government of India opened a separate Commercial Intelligence Department. In modern times the Government of India have made extensive arrangements for the collection of a large amount of primary statistics relating to agriculture, population, public health, vital statistics, finance, trade and commerce, transport, meteorology, and various other things of departmental or semi-analytic kind. On *ad hoc* basis advanced studies and researches particularly in analytic statistics were being done by various persons in the country, and not until 1931 was the question of starting a society even discussed by the workers. In that year a draft constitution for an All-India Statistical Institute was printed and received favourably, and on the 29th February 1932, it was actually put into operation with the Headquarters of the Society at Calcutta. The Ninth Report of this Society embodying the work for 1940–41 has just been published.

As in previous years the work of the Institute consisted of four distinct departments, Statistical Inquiries, Training and Examinations, Research, and Annual Conference.

A large number of enquiries from all parts of India was attended to during the year under review. The distribution by subjects and by provinces is given below:—

By Subjects: Agriculture 81; Anthropology 3; Economic and Business Statistics 30; Education 17; Forest Research 7; Industry 11; Mathematical Statistics 12; Medical 20; Meteorology and Irrigation 14; Miscellaneous 20. Total 215.

By Provinces: Assam 10; Bengal 86; Bihar 2; Bombay 9; C.P. 6; Central Government 31; Madras 6; Orissa 5; Punjab 7; Sind 8; U.P. 33; Others 12. Total 215.