

THURSDAY, FEBRUARY 11, 1909.

A NEW ENCYCLOPÆDIA OF AGRICULTURE.

Encyclopædia of Agriculture by the Most Eminent Authorities. 3 vols. Edited by C. E. Green and D. Young. Vol. i., pp. xii+582. Vol. ii., pp. vii+536. Vol. iii., pp. viii+633. (Edinburgh and London: W. Green and Sons, n.d.) Price 20s. net per volume.

THE increasing interest taken in agricultural matters is in no way better shown than by the number of books that have recently been issued. Apart from a host of text-books, at least three large and expensive works of reference have been published within quite a short period. It is a good thing that the demand for such works exists; certainly the present-day farmer stands in need of all the assistance he can get. "There never was a time," say the editors very truly in their preface, "when accurate systematised knowledge regarding the best agricultural methods was more urgently required than now." The increased cost of labour, and the rising charges on land, make it absolutely essential that the farmer should adopt every labour-saving device, and every scheme for reducing the cost of production and for getting the maximum return from his land or his beasts. The object of the volumes before us is "to serve a great use in the way of spreading an accurate knowledge of agricultural science and of the best methods of agricultural practice."

A careful perusal of a number of the articles shows that the work is intended for those taking a general interest in the subject, rather than for the student who is specialising or the expert. The articles are usually too short to allow of much detail, and in some cases the writers have aimed chiefly at showing the bearing of the subject in hand on ordinary farm practice. As a rule, the articles are written in a style that will appeal to the practical man, and they are eminently calculated to arouse his interest in the subject; in some instances a list of standard works is given from which fuller information can be obtained.

The practical matters are in the hands of such capable men as Messrs. Primrose McConnell, John Speir, John Wrightson, W. J. Malden, and others, and are clear, concise, and to the point, giving good accounts of the best practice; we need only mention the articles on ploughs, drainage, forage crops, and potatoes. Live stock receives due attention, and in addition to the ordinary descriptions, we are given admirable reproductions of photographs of good beasts; indeed, these illustrations are quite a feature of the work. The principles of breeding are ably dealt with by Prof. Cossar Ewart, and the bearing of Galton's and Mendel's laws on breeding practice is indicated. There are probably no more skilful stock breeders in the whole world than those of the British Isles, but their success has hitherto been more the result of inborn genius than of education; indeed, the stock breeder will commonly assert

that science is of no use for his work. Prof. Ewart shows the fallacy of this position, and gives some illustrations of the value of Mendel's laws in practice. It has long been recognised, he states, that blue Andalusian fowls never breed true. However carefully bred, only about half the offspring are blue, while the other half are pure black or white with black splashes. Yet when the blacks and white splashed are crossed, they yield blue Andalusians. These facts, at one time thought so contradictory, are, of course, in strict accordance with law, and indicate the hybrid nature of the blue Andalusian.

Direct practical application of Mendel's law is suggested in rejuvenating strains showing signs of deterioration. It has hitherto been customary to bring in new blood from a closely related breed, so that the first crosses resemble the parents, e.g. in rejuvenating the Chartley herd a Welsh race was used, and the crosses were very like the old Chartleys. A certain number of the Chartleys were also crossed with white Highland cattle, and the first crosses did not resemble Chartleys, so that this method was not regarded favourably by the practical man. However, by mating Highland-Chartley bulls with Highland-Chartley heifers it may be confidently anticipated that a certain proportion of the offspring will resemble the Chartleys but have some of the Highland stamina. Prof. Ewart also goes fully into telegony, and into the persistent hypothesis of "maternal impressions," and shows that no experimental evidence can be adduced in favour of either.

The botanical subjects are dealt with by Prof. Percival, and, needless to say, his treatment is admirable. Insect pests are described by Dr. MacDougall.

On looking down the list of contributors we notice some very curious omissions; it includes no bacteriologist, no chemist except the dairy chemist, and no geologist. The articles on these subjects have been written by practical agriculturists. The experiment was a bold one to make, and has not turned out a success; it has resulted in several poor articles and in a host of errors which greatly mar the value of the work. The general article on bacteriology, for instance, is obviously the work of an amateur who has "got up" the subject from a text-book; there is a good deal of talking round the subject, but we never get anywhere; the reader feels unsatisfied, and if this were a fair presentment of the subject, would be disposed to agree with the statement that "the subject of soil bacteria is not likely to enlist the attention of practical men." The bacteriology of the manure heap has been altogether too much for our author, and after a vain struggle with "aerobic and anaerobic, nitrous, nitric and ammoniacal bacteria, desulphuricans and ferricans," he gives up the unequal contest. We are told that bacteria "multiply with extraordinary rapidity, and occupy the entire bulk of the invaded material in a few hours, or even minutes."

There is an equal lack of treatment about the chemical articles, but the text-book used is older; sulphuric and phosphoric acids are said to "contain

the elements of water, until they combine with a base which supplants the basic water" (vol. i., p. 26). A large number of mistakes are made. "In the process of digestion the carbohydrates are converted by the saliva into cane sugar (maltose, $C_{12}H_{22}O_{11}$) and further into dextrose and levulose," both of which are regarded as varieties of glucose (vol. ii., p. 268). Fish oil is said to be a hydrocarbon. There is a considerable amount of confusion. Dyer's solvent in soil analysis is variously stated to be 1 per cent. nitric acid, 1 per cent. ammonium citrate solution (which is in one place said to be a weak acid and in another an alkali), and 1 per cent. citric acid. The bacterial reduction of nitrates taking place in absence of air, and the evolution of nitrogen from organic matter decomposing in presence of air, get hopelessly confused in the article on denitrification. In describing calcium cyanamide, "the form of lime-nitrogen in which the nitrogen is derived from the air," no distinction whatever is drawn between this substance and the Notodden calcium nitrate; the writer evidently regards them as one and the same thing. Contradictions are not infrequent; under nitrate of soda it is stated that "soda never has been found to be of appreciable manurial value," yet the same writer sixty pages back was insisting on the advantage of manuring mangolds with salt! The author has not much faith in his own chemistry; he impresses on us that there are "forces of vitality which in many cases modify the action of chemical laws and even render them abortive."

It would be easy to multiply instances. The result is all the more regrettable since it conveys an impression of general carelessness and inaccuracy which would not be justified. These unfortunate mistakes make the book an unsafe guide for the student, and prevent it from taking a high place in agricultural literature. It cannot, however, be urged that they are likely to mislead the farmer in his practice. Even with all their errors these articles make interesting reading, and are calculated to show the farmer, if he still needs showing, that there is something in the application of science to practice, and thus to clear the way for the county council lecturer or the agricultural college.

E. J. RUSSELL.

THE CAMPAIGN AGAINST TUBERCULOSIS.

The Prevention of Tuberculosis. By Dr. Arthur Newsholme. Pp. ix+429. (London: Methuen and Co., n.d.) Price 10s. 6d. net.

THE native races of the tropics have their various plagues and pestilences; tuberculosis is generally regarded as the white man's scourge. The incidence of tuberculous diseases among the inhabitants of the British Isles is indeed a heavy one, as shown by the statistical data contained in the opening chapter of the book under review, but it may not be so generally known that tuberculosis has been introduced by the colonising white man among many native races, among whom in some instances it is assuming alarming proportions. On these grounds, therefore, there is ample justification for the publication of this work,

which deals first with the causes, and then with the prevention, of this disease.

The first paragraph of the book strikes the keynote of the subsequent matter:—

"Tuberculosis is a disease caused by the destructive lesions set up in the lungs or in other parts of the body by a special bacillus or microbe. The disease is infectious, *i.e.* is communicable from man to man and from animals to man; and it never originates in the body apart from the invasion of the special bacillus."

Tuberculosis, therefore, being placed among the infective diseases, it is natural to compare the death-rate due to it with that of the chief infective diseases—measles, whooping-cough, diarrhoea, enteric, scarlet and typhus fevers, small-pox and diphtheria. We learn that in 1904 the number of deaths in England and Wales from all these were 67,154; from tuberculous diseases there were 60,205, or, in other words, tuberculous diseases in 1904 caused sixty deaths for every sixty-seven caused by the aggregate of the chief acute infectious diseases!

In chapter ii. the magnitude of the evil is discussed from the economic point of view. Thus, taking the statistics of the phthisis (consumption) admissions to the Brighton workhouse infirmary from July 15, 1897, to May 23, 1905, Dr. Newsholme calculates that the cost to the rate-payers amounted to more than 1000*l.* per annum, and on this basis the indoor relief expended on the treatment of consumptives in the workhouse infirmaries of England and Wales amounts to 331,000*l.* per annum. A brief but sufficient sketch of the history, morbid anatomy, and symptoms of phthisis and an account of the tubercle bacillus follows, and then in chapters vii.-ix. the important question of the infectivity of tuberculosis is discussed. Of this the author has no doubt, and the portals and channels of infection are considered in succeeding chapters. It is satisfactory to find that tuberculosis is declining, and in part ii. the causes of the reduction in mortality from phthisis from 281 per 100,000 living in 1850-4 to 123 in 1901-4 are surveyed. The argument and conclusion are that *institutional segregation* is the predominant cause of the decline of phthisis in this country.

Finally, in part iii. the measures for the reduction and annihilation of tuberculosis are discussed. The author favours the view that the diminution of infection outweighs in importance the diminution of the conditions favouring infection, and therefore the early recognition of the disease together with notification are of importance, for then institutional segregation and sanatorium treatment may be secured at that early stage so essential if a cure is to be hoped for, so necessary for the prevention of infection. The various preventive methods are discussed in some detail, and the administrator will gather many valuable hints from a perusal of this portion of the book.

Although, as stated in the preface, written almost entirely from the standpoint of the public health administrator, and intended primarily for medical officers of health, the book is free from technicalities,