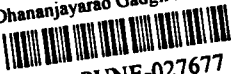


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THEORETICAL AND PRACTICAL

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AGRICULTURE

THEORETICAL AND PRACTICAL

A TEXTBOOK OF MIXED FARMING FOR LARGE
AND SMALL FARMERS AND FOR
AGRICULTURAL STUDENTS

BY

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PRUNING", "AGRICULTURAL ARITHMETIC", "AGRI-
CULTURISTS' DIARY", ETC., ETC.

WITH AN INTRODUCTION BY THE
RIGHT HON. THE EARL OF NORTHBROOK



LONDON:
CROSBY LOCKWOOD AND SON
7 STATIONERS' HALL COURT, LUDGATE HILL, E.C.
and 5 BROADWAY, WESTMINSTER, S.W.

1915

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STEPHEN AUSTIN AND SONS, LIMITED

INTRODUCTION.

I COMPLY very willingly with the request of Professor Wrightson and Mr. Newsham, that I should write a few lines of introduction to their textbook on *Agriculture, Theoretical and Practical*.

It may be said, and with some force, that there is no lack of manuals and other excellent works on the subject already in existence, but, while it is easy to obtain exhaustive information on some one phase of farming practice, and on the sciences affecting it, there are few, if any, up-to-date textbooks holding precisely the position this book is intended to fill.

A technical manual on the theory or practice of agriculture, designed with a definite aim, may fill two very useful and necessary functions; namely, those connected with the instruction of pupils at Agriculture Colleges, Farm Schools, or similar institutions, and those attached to a book of reference which the farmer or small-holder may consult, when, from time to time, he is in need of advice based on practical experience and scientific knowledge. The school purpose and the farm purpose, though allied, are quite distinct, and it is the aim of the authors to provide a book that will serve both.

There is another reason for hoping that such a book will find a place both in the classroom, and the houses of small as well as the large farmers.

We are just at the beginning of a great movement in agricultural matters. Small-holdings may be expected to increase in number in suitable districts, and Farm Institutes, under the encouragement of the Board of Agriculture and financial support from the Development Fund, will no doubt spread over the country.

These Institutes will find an important place in our educational system, and become the training-ground of the young farmer, and may be expected in the future to cater for a large and increasing number of the sons of smaller farmers, that is those farming from 50 to 200 acres of land.

Undoubtedly the coming years must see more and more of an organized system of education and greater attention paid to the thoughtful treatment of the land if it is to provide a living to those engaged in its cultivation, and this can only be secured by the application of exact knowledge: sound practice and reliable theory.

This book is also eminently suggestive as to the best methods of applying science to practice. It lays stress upon many problems which are destined to produce far-reaching consequences on fertility, land cultivation, and rural economy. The subjects treated are very numerous, and include, not only cultivation, but such important matters as farm-buildings, book-keeping, and the relative merits of grass and arable land. To give in a textbook such as this, which is necessarily restricted in size, an idea of farming matters in general, and to provide precise and reliable information on the cultivation and treatment of land, labour, machinery, live stock, dairying, and the many subjects connected with the industry of agriculture, is not an easy undertaking.

The authors may claim to have exceptional qualifications for the task. Professor Wrightson, who was for so long a period associated with Downton Agricultural College, has established for himself a wide reputation as a sound and practical farmer, while Mr. J. C. Newsham most successfully filled the post of head master of the Hampshire Farm School and County Lecturer on Agriculture for many years. Both authors may therefore be considered to possess not only the necessary scientific and practical knowledge, but to have had long experience in the needs of agricultural students and small farmers, and in imparting information in a form that is clear, concise, and attractive.

Although I have for many years taken an interest in the subject of farming, I lay no claim to the position of an expert, and I must leave this book to speak for itself, feeling confident that it will prove successful in meeting the needs of those for whom it has been written.

NORTHBROOK.

PREFACE.

THE title of this book may appear ambitious, but has been well considered by the authors. Their object has been to present a concise view of the Practice of Agriculture, both from an extensive and an intensive point of view.

Much has been written of late years upon the comparative merits of large and small farming, and the suitability of the land of this country for the cultivation of vegetables, fruit, and flowers, rather than of corn or grass. Market-gardening has encroached upon ordinary farming, but it is also true that various forms of perishable produce have attracted the attention of extensive farmers—so that fruits and vegetables are now found side by side with corn and roots, live stock and dairying.

There are, however, well-defined limits as to soil and situation; for, as a rule, the cultivation of the more or less perishable crops is confined to good land, in close proximity to markets; while that of corn is largely pursued upon thinner and poorer soils, in more remote districts. There is room for both, and they must not be considered as antagonistic. Dairying occupies a middle position, for it may take the form of retail milk selling, wholesale dispatch of milk to a distance, or cheese- and butter-making, according to locality.

It will be found that each of these aspects is considered in the following chapters, and that the entire work is divided into sections dealing successively with the Soil, Agricultural Crops, Manures, Live Stock, Dairying, Horticulture, Market-gardening, Poultry, Rabbits, and Bees.

As to what is usually called theory or science, this volume does not pretend to be a manual of chemistry, nor yet of biology; neither does it profess to treat of everything. It was felt by the authors that there are abundant sources of

information of an expert character on all branches of agricultural knowledge, and that they would be placing themselves in a false position if they attempted to deal, as experts, with certain topics of undoubted interest. They therefore confined themselves to things of which they had practical knowledge, and upon which they could write with confidence, if not with authority. The boundaries between theory and practice are, however, by no means clear, and, in certain cases, they have consulted first-hand authorities upon such matters as bacterial life, nitrification, heredity, and Mendelism, in order to show the bearings of these subjects upon the practices of agriculture and stock-breeding—not to say of cheese- and butter-making. Sections will also be found on diseases, and plant-life, in which the treatment is meant to be practical, or to bear upon the necessary conditions for success.

Viewed as a textbook for examinations, this book will be found suggestive rather than exhaustive, and will, it is hoped, open the mind of students to many problems involved in practice, and sometimes obscured by technicalities. There has of late years been a marked approach on the part of agricultural scientists to the teachings of practice, i.e. in such things as the importance of water and mechanical processes (tillages) as affecting the entire economy of plant-life. The chemical composition of soils, which was at one time thought to be the secret of fertility, is now relegated to its proper position, as only one among many of the necessary conditions. So is it with the composition of plants and foods, for they also are found to vary with the circumstances under which they are produced, rather than the species to which they belong.

Farmers, as a body, have recognized the incongruity between the teachings of science and the results of practice, and consequently have sometimes regarded theorists somewhat coldly. All this is, however, changing, or has already changed, now that the leading chemists look upon rainfall and tillage as of primary importance, even from a theoretical standpoint. Perhaps this change is more apparent than real; but it cannot be denied that in recent writings of a scientific kind greater attention is bestowed upon what the farmer has always felt to be the essentials of his art.

Take, for example, the relations of block geology to agriculture. That they are important no one will deny, but closer inspection has shown that surface geology is the principal point, and that surface-maps are infinitely more useful than predictions as to the character of a soil based upon the main formation of the district. So, also, may be regarded the increasing attention to rainfall; to means of eradicating weeds; to root action on the subsoil; to the effects of tillage upon soil exhaustion; to dry farming; and many other topics occupying the following pages.

It is felt by the authors that great changes and great improvements are imminent, such as the cheapening of nitrates, the combating of plant diseases, the introduction of sugar-beet, and possibly of tobacco; intensive cultivation, the production of new varieties, applications of electricity, the making of artificial soils, etc. New vistas are opening out, and it is necessary that farmers should be alive to them. One great hindrance to the progress of scientific agriculture is the enormous area of inferior grass, and the time-honoured custom of leaving land down in sainfoin, or old, and temporary pastures, instead of actively cultivating it. It is, after all, an economical question; but the system is being steadily encroached upon, and is, no doubt, destined to disappear. The question which cannot be avoided in all such cases is, "Will it pay?" and there is too much disposition on the part of social writers to look upon food-production as a "duty". It is not a duty, but a means of livelihood; and can only be stimulated (apart from increased knowledge) by a sense that it is profitable to the cultivator himself. No one can be expected to produce food for the nation on philanthropic grounds; and this is the underlying reason why we see extensive tracts lying waste, subjected to a low type of cultivation. It is the object of this book to show in what directions improvement can be effected and extended.

Lastly, it will be observed that the student is constantly urged to make use of his own powers of observation instead of relying too much upon books and lectures. He is advised to watch the processes of germination of seeds for himself; to take apart and re-assemble the parts of implements; to frequent markets and notice the prices offered for different classes of live stock; to visit agricultural and poultry shows, and, if possible, to spend

PREFACE.

some time with poultry farmers, fruit growers, and those who devote themselves to the cultivation of flowers or of fruit for market. Attention is also directed to the most approved methods of packing fruits and flowers for market. The work is illustrated with a special view to enabling the student or beginner to practise his art, and he is continually reminded of the importance of seeing how things are done and doing them, as well as of reading *about* them.

The authors desire to acknowledge the kindness of Messrs. Cooper and Nephews, of Berkhamstead, in supplying illustrations of live stock ; their thanks are also due to Messrs. Sutton & Sons, Reading, for illustrations of grasses and clovers ; and to Messrs. Garton, Warrington, for photographs of plant breeding. They would also thank the many manufacturers, illustrations of whose machinery and implements are reproduced in this book.

JOHN WRIGHTSON.
J. C. NEWSHAM.

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