

are thus not fully acquainted with the literature of the subjects involved.

Particular attention should also be called to Chapters XVIII., XXVI. and XXVII., concerning 'Humus or Vegetable Mould,' 'Lime and Lime Compounds,' and 'Sodium Compounds.' It is eminently desirable that the information given in these chapters should be more generally disseminated, in view of the useless dissertations on these subjects by irresponsible writers. Humus, particularly, is an engaging topic for discussion by those who do not understand what it means. The same is true of lime—fruitless discussions are entered into, largely because of the lack of knowledge concerning the principles involved. So, too, with the matter of sodium as a fertilizer; papers teem with articles that are calculated to lead astray rather than to fix valuable truths in the mind of the farmer. Such articles also seem to possess a peculiar attraction for the general reader, and the result is 'confusion worse confounded.'

In Chapter XV. of Volume II. the subject of 'Symbiosis, or Blended Growth,' is discussed in the light of the recently acquired facts concerning this very important subject

That the legumes may and do, under proper conditions, use atmospheric nitrogen, is one of the most important recent discoveries in agricultural science, and the matter in its scientific and practical relations is fully and clearly set forth.

Volume III. contains fourteen chapters. It treats more particularly of 'The Theory and Practice and Systems of Crop Rotations,' the principles involved in and the advantages of 'Irrigation,' 'The Use of Sewage,' and 'The Growth and Management of Cereal Crops,' hay and pastures and the 'Making of Silage.' In the handling of these subjects, not only are the principles of chemistry as applied to agriculture well traced and made plain, but important practical suggestions are made concerning the economical principles involved in the general management of farms and in the growth of the various crops. The chapter on irrigation, while written from 'the point of view of a New Englander,' is, in view of the necessity of fully utilizing the natural advantages of the East,

very timely, since it calls attention to the subject and points out conditions which are necessary for successful irrigation. Much of historical interest is included, also. The chapter on 'Ensilage'—it should be 'Silage'—is also up-to-date and includes much of value not otherwise readily accessible.

On the whole, the work may be regarded as of very great value to students and farmers alike, and should be in the library of every progressive man. The reader or student who takes up these volumes cannot fail to be impressed not only with the vastness of the subject included under the title 'Scientific Agriculture,' but also with the very great necessity to farmers of the present day of a knowledge of the principles upon which agriculture is based.

It may, perhaps, seem strange to the average person, that so little of the work of American investigators is cited by the author, for, with the exception of the Chapter on 'Silage,' comparatively few references are made to experiments conducted in this country. This is, doubtless, due in part to the fact that our experiment stations are comparatively new institutions, and that thus far but few workers are engaged upon purely scientific problems; much, however, of scientific interest, and that would add to the value of the work, has been overlooked.

While the work is a veritable storehouse of information, there is a profuseness of statement and an elaboration of details which seriously detracts from its usefulness, either as a ready work of reference or as a text-book for the student or progressive farmer. Sharp, clear-cut statements of principle and of fact are attractive, and appeal quite as strongly to the general reader in works of a scientific nature as in other lines of literature.

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*The Sense of Beauty, being the Outlines of Aesthetic Theory.* GEORGE SANTAYANA. New York, Charles Scribner's Sons. 1896.

So much has been written upon the theory of Aesthetics which, from the point of view of the trained intelligence, is nonsense pure and simple that the appearance of so noteworthy a

book on the subject as that of Dr. Santayana ought to receive special mention in the pages of SCIENCE. For the scientific man must ever have before him as a warning, the sad loss of the æsthetic and literary sensibilities which befell Darwin—a loss which, however much one may be given up to an absorbing pursuit, it is easily possible to prevent if one will but give oneself now and then a full and unrestrained bath, of short duration it may be, in some form of æsthetic enjoyment or of æsthetic speculation. If the college professor can spend his summers in painting pictures, as more than one college professor in this country is known to do, he will be reasonably sure to keep himself a happy human being and at the same time to detract nothing from his sum-total of scientific energy. But without so much of a draft upon time and native powers as this implies, a degeneration of the æsthetic faculty can be warded off in simpler ways—by a few months' absorption now and then in European picture galleries or in Swiss mountain scenery, by attaching to oneself a few artist friends if opportunity permit, by a breath of vigorous English poetry before going to sleep at night, or by many another similar device. While Darwin is the great example of a confessed total atrophy of the æsthetic feeling, it cannot be denied that in England the scientific man is more frequently a man of wider culture and experience, that scientific society is less likely to be unbearably monotonous and dull, than in this country. No doubt there is a larger number of cultivated families in England out of which the scientific contingent may be recruited, but at the same time that peculiar American energy which enables many a poor boy to become a master in his chosen field of intellectual activity would enable him at the same time to do something more, if he were once to be convinced that the charm of living, and hence the only pleasure of living (aside from the low pleasure of a gratified ambition), is indissolubly connected with the development of the æsthetic sensibilities.

The point to be particularly insisted upon in connection with the book before us is that *reading about art* is sometimes no less effective than the work of art itself, not only in turning the attention to such appeals to artistic enjoy-

ment as may fall within one's field of view, but also in producing an actual sharpening of those senses through which the art appeal is made.\*

The follower of scientific pursuits will do well, therefore, if he does not fail to make himself acquainted with so keen and luminous an imparting of the nature of the feeling of the artist in the presence of the work of art as this book contains.

In gratitude for so much that is of value, the dispassionate reader will doubtless be able to overlook, or at least not to lay up against the author, the passages of a silly and sickly sentimentality, in which he maintains, that a zealous philanthropy and a pure love of science are but the fires of stifled sexual passion bursting out in a different form. A thesis so wide of the mark as this will be as repugnant to the true artist as it is to the clear-brained psychologist, and it will find its audience only with those who have been made blind to the healthy aspects of human life by the novelist of degenerate France.

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\* The present reviewer has a definite experience to communicate upon this point. Upon one occasion I had spent the whole afternoon in reading Charles Auchester (a marvellous book, when we consider that its author was only seventeen years old when it was written). I had been completely absorbed in the book, and had had no other thoughts for several hours. I then dressed quickly, and went out to dinner. The people at the dinner table were all well known to me and I was not expecting anything unusual, but I found to my surprise that I heard them with new ears. I perceived that their voices had a thousand shades of meaning, revealed a thousand qualities of character and mood, that I had hitherto been deaf to. It even seemed to me a kind of immodesty to perceive their bare souls so plainly as I now did through their voices. I had to use, in order to describe this experience, phrases similar to those which are common for vision—my ears were opened; I felt that hitherto I had heard as through a fog dimly; my ears had become unveiled; it seemed as if a lot of obstructing layers had been peeled off from my organ of hearing. If I could only have kept up this high tension of the aural intelligence and the aural sensitiveness I should, no doubt, have become easily a person of better capacity for the enjoyment of music than I am now, as well as a keener critic of my fellow men.