

The New Agricultural Text-Book.

REVIEWED BY MR. JOHN DEARNESS, INSPECTOR OF PUBLIC SCHOOLS FOR EAST MIDDLESEX.

By the favor of the publishers we have before us a copy of the Public School Agriculture. This is a new text-book on the "First Principles," written by Messrs. James Mills, M. A., and Thomas Shaw, of the Agricultural College, Guelph, and published by the J. E. Bryant Co., Toronto. It is a handy volume of 250 pages, small octavo, substantially bound, nicely illustrated and well printed in type that is too small for a school book, otherwise the publishers have done their part remarkably well. The size of type was probably chosen to pack the largest quantity of letter-press into the limits of a forty cent text-book. The work is a veritable *multum in parvo*. Even with the small type the authors again and again bewail the lack of space. Some idea of the extent to which condensation obtains is given by the fact that the opening chapter, in the compass of six pages, defines and explains the different kinds of bodies, solids, liquids and gases, chemical affinity, simple and compound substances, oxygen, nitrogen, carbon-dioxide, ammonia, composition of the atmosphere, the Linnaean division of natural objects, and the balance maintained in nature between oxygen-respiring and carbon-dioxide-respiring organisms.

The topics just enumerated are to be studied by children in the third and fourth classes of the Public Schools. It would not be difficult for a child to commit the six pages to memory, but time used in storing the mind with words divorced from ideas is worse than wasted, and unless this and most of the other chapters are much enlarged, simplified and illustrated by experiments and object-lessons, the purpose for which the subject is placed upon the curriculum will not be effected.

Agriculture is a science. Its principles are based on the sciences of chemistry, botany, geology, zoology and physiology. The same methods that have been successfully employed in the teaching of such sciences should be tried in the teaching of agriculture, and the methods that have failed in those may be expected to fail in the latter also. What a waste of precious time took place in our High Schools when botany was taught from books without plants, or when chemistry was taught outside of the laboratory. When Roscoe's manual, good as it was, gave place to Reynolds's experimental text-book, a new era dawned in the teaching of chemistry; and, before the teaching of agriculture in the Public Schools becomes worthy of the name, we fear that the book before us, good and beautiful as it is, will, like Roscoe, retire for one written upon a method that will cause the pupil to learn by skillfully directed inductions, and train him to a mental habit of inquiring the reasons of every phenomenon and operation that may come under his attention.

An ideal text-book would suggest a large number of experiments, the performance and examination of which would lead to the pupil's personal discovery of the principles to be taught. For example, to show the causes why deeply buried seeds fail to grow, the experiment of planting them (certain kinds to be recommended) at varying depths in pots or boxes might be suggested, and the children led to observe that the deeply planted ones lie dormant or die before the plumule reaches the light. By watering flower pots, each containing a different sample of soil, lightly and copiously, some from above, others from the saucers, results would be obtained bearing on the need of drainage, baking of the soil, filtration and evaporation. Experiments with culture fluids are practicable; these could be used to illustrate the lessons on "The Plant-Food of the Soils."

Agriculture is an art as well as a science. We agree with what the authors' work implies, that a school text-book on the subject should concern

itself chiefly with the science, but we would go further than they. For example, we would teach, by the scientific method, if we could, the meaning of drainage, what soils it benefits and the kinds of benefit it confers, with the reasons therefor, but should have less than they to say about silt-basins, junction-tiles and snipe-bill scoops; by the time boys now in the Third Book are engaged in draining their farms these may all be superseded. In this age of invention it is not safe, for example, to say, "In stony land they (ditching machines) cannot profitably be used." The day may not be distant when more ditching will be done by machinery, even in stony land, than with the hand tools described and illustrated in the text-book.

But the criticism that teachers will likely most frequently make is that much of the book is couched in language too technical and difficult for public school children. The book is supposed to be written for third and fourth classes, yet the opening chapters (second and third) state that nitrogen forms " $\frac{1}{2}$ to 4 per cent. of the dry combustible part of plants" and "about $\frac{1}{2}$ to $\frac{1}{3}$ per cent. of good, rich soil, and perhaps $\frac{1}{10}$ per cent. of clay sub-soil." Children in the third class are not supposed to know either fractions or percentage. Examples might be taken from almost any of the chapters to show that the phraseology is beyond the children for whom the book is supposed to be written. Almost the whole of the thirteenth chapter, the longest (fifty-one pages) and one of the most important in the book, is expressed in language much too abstruse for public school pupils. For example:—

"A feeding standard is simply a statement of the proportionate amounts of digestible nitrogenous and non-nitrogenous substance which experience has shown to be best suited to effect a given purpose in feeding, such as mere maintenance, or the production of work, or of flesh, or of fat, or of milk."

"Experience has shown that the proportion of protein deposition to protein consumption is greatest (that is, that the greatest gain of flesh is made) when the food ration is so constructed that the proportion of carbo-hydrates to albuminoids in the food (that is, of non-protein to protein substance) is large. But the proportion must not be too large, or else there will not be enough of protein substance in the food consumed to supply the albuminoid material required for the new flesh tissue."

These quotations give a somewhat exaggerated idea of the technicality of the language, because most of the terms used have been previously briefly explained; nevertheless, they show a style of composition suited to minds much more mature than those of school children. Doubtless much is expected of the teacher. But was it forgotten that the majority of the teachers in the rural schools are young ladies who have spent more time in the high school than in observing farm operations, and many of whom did serving farm operations, and many of whom did not even study science for their certificates, not even French instead? We commend the undertaking French instead? We commend the undertaking French instead? We commend the undertaking French instead?

As one reads, the impression grows that the fathers, instead of the children, were in the mind of the authors. Else, of all the buildings needed on a farm, why should the silo be singled for description? The principles of ventilating for description? The principles of ventilating for description? The principles of ventilating for description? The principles of ventilating for description?

Were we speaking of this little work as a farmer's manual, instead of a text-book, we could praise it very highly. Were the chapters it contains extended, and others on the orchard and garden, on farm buildings and fencing, on poultry raising, and on the care of sick stock added, we should have the best manual of agriculture extant. Even as it is we can confidently recommend every farmer to procure the book and carefully peruse it. Next month we shall cull a column of pointers and thought-starters that will give readers who do not in the meantime get a copy a desire to possess one.

Stock.**"How to Get There."**

BY J. C. SNELL.

The uncertain and, in most cases, unsatisfactory returns received by the farmers of the older provinces of the Dominion from the growing of grain as the principal dependence, should, it seems to me, lead them to turn their attention more generally to the raising and feeding of good stock. It must be patent to all that we cannot reasonably expect to compete with the newer provinces and the Northwest in the production of wheat, which is a very uncertain crop in most sections of Ontario and the Eastern Provinces. In those sections where barley has been made the principal crop, a combination of unfavorable circumstances has made it more and more unsatisfactory. In the first place, a continual cropping for many years, mainly with the same crop, has had the effect of depleting the soil of the elements necessary to the production of that variety of grain, and the result is that on very many farms where, twenty years ago, 50 to 60 bushels per acre was an average crop, probably these same counties do not now give an average of more than twenty five bushels. The small amount of straw produced leaves but little to be returned to the land in the shape of manure. The straw is not such as can be profitably utilized for feeding purposes. The grain is almost invariably sold off the farm, and in the great majority of cases but little grain is fed to the stock kept. Such a course readily accounts for the diminished yield; but in addition to this there is the fact of considerably lower prices than formerly received. With prices ranging in the neighborhood of seventy-five cents per bushel, and the yield well up to fifty bushels, there was money in the business; but those days have evidently gone, probably never to return, and now the McKinley tariff has so completely paralyzed this branch of farming, that for the present the outlook for those who have placed their dependence on barley is gloomy indeed.

To an observing mind one of the worst features noticeable in the general system of farming in Ontario, at this season, is the very large proportion of plowed land, the consequent small proportion of grass, and the small amount of stock kept. If, to any considerable extent, clover sod were being plowed down, the state of things would not be so bad; but in too many cases it is almost entirely stubble land, and land that has been cropped continuously for years, till the wonder is, not that slim crops are reaped, but that anything like a decent crop is obtained. But the question may be asked, Is the prospect for profitable returns from stock-raising and feeding much better or surer than from grain-growing? Well, it seems to me it cannot be worse, for it is certain that unless some system is adopted whereby the fertility of the land is increased, it is folly to go on cropping. It is true that prices for cattle are low at present, especially low for ill-bred cattle. Good ones, well bred and well fed, always bring the highest prices, and are always wanted. Scrubs seldom or ever raise a boom. One thing is certain, he who raises and feeds cattle is constantly receiving a valuable return in the way of manure to enrich his farm, so that he has less need to plow and crop an undue proportion of his land, as land in good condition as to fertility will