

The chapter on the military applications of cellulose derivatives is limited to eighty-five pages, but these contain a vast amount of information which, although familiar to those associated with this branch of the subject, is an excellent condensation of information.

So wide are the applications of cellulose derivatives and so admirably is the subject treated by the author that his two volumes should find a place in every technical and scientific chemist's library, and, further, will prove an invaluable reference book for the large number who are regularly employing many of these important bodies in their everyday work.

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EDUCATION FOR THE COUNTRY LIFE.

The Teaching of Agriculture in the High School. By Garland A. Bricker. Pp. xxv+202. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1911.) Price 4s. 6d. net.

STUDENTS of rural affairs have long realised that much dissatisfaction exists in country districts with our present system of education. In whatever way it is judged, according to its critics, it has failed; the children sent out from the country schools are not better fitted for work on the land than their fathers were; on the contrary, they are kept at desk work during the period when it is supposed that their receptive faculties are at the best, and when they would, on the land, most rapidly learn the ways of animals, of plants, and of soils. Even the friends of the system will concede that it has been evolved without any special regard for country requirements, and without taking account of the fundamental differences in habits of thought and in points of view between the dwellers in the town and those in the country.

More and more it is being realised that the future development of the rural district, or to put it still more widely, of the country civilisation, must run on different lines from that of the city, and experiments are therefore being made to evolve a system of education that shall train children to lead the life of the country. The experimental scale is largest in the States, as one might expect, and in the book before us Mr. Bricker has collected such of the material as is at present available, thus usefully filling a gap in our education literature. It is, of course, as yet too soon to speak about results, but during the experimental period it is useful for educationists to know what their American *confrères* are doing.

Of the elementary school but little is said. The nature-study idea is for the present the best we have, and has already a copious literature of its own. The work of the elementary schools, according to the author, should confine itself to an elementary study of the common things of the farm, field, and forest. Something of the relative importance of these things to man should be studied and fixed in the mind of the child before he leaves school. It is in the secondary school, or, as it is here called, the high school, that the scholars will take up agriculture as such, but there is no break in the sequence of studies because agriculture will be looked upon as nature-

study *plus* utility. But the study of agriculture is to be an education and not simply a manual training.

"If the essence of true culture is to see the fundamental and eternal shining out through the seemingly trivial and transitory, there is no subject better adapted to provide culture than the subject of agriculture."

To be treated in this broad way, agriculture requires a larger place in the school curriculum than the established secondary schools are able or willing to give it; hence the necessity for separate agricultural schools. Two possible dangers are indicated; specialised schools may emphasise class distinctions unworthy of a democratic country; education that makes a strong appeal to economic motives may be harmful if it places its powerful sanction on self-seeking ideals. The purely practical man, of course, will ask: Of what use are culture and adornment if the power to earn a livelihood is lacking? But this must not be the point of view of the agricultural teacher. He must rather insist on the other question: Of what use is the best capacity to make a living without a corresponding power to make life worth while? and make agriculture a cultural as well as a vocational subject. In short, the agricultural secondary school is to be the directive and constructive agent of the new rural civilisation that the best men in the States (and, for that matter, in this country also) are endeavouring to foster.

A chapter is devoted to the description of schools already established. They are, as one would expect, of several types, but in all of them boys and girls are educated together, entering at the age of thirteen or fourteen, and remaining for three or four years. Agriculture for the boys and household science for the girls form the respective centres of the courses, and the education is made as real as possible, *i.e.* the thing itself, whether a horse, a maize seed, or a growing crop, is before the class, and not simply a picture.

The author then proceeds to a discussion of methods. The logical arrangement of subjects followed in a college course is not the best for the boy with his limited experience and his incomplete and unorganised knowledge. It is necessary to adopt a psychological arrangement, *i.e.* a sequence of studies adapted to the changing and developing powers of the scholar. That the subject generally accords with the instincts and the impulses of the average boy is a tremendous help, and yet, unintelligently directed by the teacher, this help may prove a great danger. Into the psychological discussions we need not enter. The author's aim is to show that pedagogic principles can and should be applied to the teaching of agriculture, and that the subject can and should be made cultural as well as vocational.

The book affords a striking illustration of how much further the Americans have got than we ourselves. We are only commencing—if indeed we have seriously commenced—to apply the science of education in our agricultural teaching. Those who propose to essay the task will obtain useful help from this book.

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