

### AGRICULTURAL EDUCATION AND RESEARCH IN THE UNITED STATES.

IN the latest bulletin of the Carnegie Foundation for the Advancement of Teaching<sup>1</sup> an elaborate account is presented of the course of legislation in America which led to the foundation and endowment of the agricultural colleges and experiment stations. The former are known as the "land-grant" colleges, and this publication explains how this name arose. The foundation of these colleges, of which each of the States in America possesses at least one, dates from 1862, when the Morrill Act of that year appropriated the proceeds of six and one-third million acres of public lands for the purpose of founding in each State of the Union a College of "Agriculture and the Mechanic Arts." For many years after their foundation the land-grant colleges did not confine themselves to agriculture, and up to the close of the nineteenth century the number of students who graduated in agriculture was comparatively small.

In 1890 further endowments were voted by Congress, which by annual increments finally reached 5000*l.* per annum for each State in the Union. Again, in 1907, the annual subvention to each State was raised to 10,000*l.* per annum. In the meantime a step of great consequence was taken, one which has done much to stimulate agricultural education and research in the United States. This was the establishment of experiment stations in connection with the land-grant colleges as a result of the famous Hatch Act of 1887, which appropriated 3000*l.* per annum for each of these stations. By 1906, when an Act was passed raising the appropriation for each station to 6000*l.*, forty-eight of these stations had been established. Again, in 1914, further appropriations were voted for college "extension" work, beginning with 2000*l.* for each State, to be followed by annual increments of indefinite amount until the aggregate appropriations for this purpose in the whole country should reach a sum of 800,000*l.* But still Congress was not satisfied. By an Act passed this year further appropriations were sanctioned for the furtherance of agricultural education, which by 1926 will amount to 600,000*l.* per annum. Excluding the appropriations in aid of extension work, the aggregate Federal grants in aid of higher agricultural education and research are now 1,175,000*l.* per annum. The individual States of the Union have also increased their aid *pari passu*, so that in 1915 the total income of the colleges and experiment stations had reached the astonishing figure of 7,200,000*l.* The expenditure on higher agricultural education and research in England and Wales has a sorry appearance if contrasted with these remarkable figures. The normal State expenditure per annum in England and Wales is about 20,000*l.* for higher education and 35,000*l.*

<sup>1</sup> Bulletin No. 10, "Federal Aid for Vocational Education." By Dr. I. L. Kandel. (New York City: Carnegie Foundation for the Advancement of Teaching.)

for research, not much more than what one State in America receives for similar purposes.

The author of the bulletin under notice expresses some alarm at the rapidity of recent developments. He appears to think that there is still too much fluidity of opinion in regard to the scope and methods of vocational education, and that the money available will be squandered on unfruitful educational experiments. However that may be, it is surely a healthy sign that public opinion, as reflected by the Legislature, recognises the need for better scientific and technical training.

It is somewhat remarkable to find that attention has been given to military training in the land-grant colleges ever since their foundation. Special officers are detailed to take charge of the instruction in military subjects.

A remarkable feature of the development of agricultural education in America is the sudden leap upwards which the number of students of agriculture has taken since 1906. In that year the total number of students was nearly 3000; in 1914 the figure was nearly 15,000. The bulletin fails to give any satisfactory reason for the suddenness with which the change set in. We venture to suggest that the demand for higher education in agriculture may have been stimulated by the extensive programme of demonstration fields upon which many of the States have recently embarked. These demonstration fields are designed to provide object-lessons of improved practice, and the extent to which they have been scattered over the country far surpasses anything that has ever been attempted here.

What is the lesson for this country from this record of American experience and progress? Surely, that we, too, should have faith and the courage to spend, especially on research. To begin with, some of the expenditure might be unfruitful, but one of the main obstacles to progress in the past has been the failure of agricultural research to attract the best scientific talent, a failure in large part due to the fact that the study of the sciences bearing on agriculture offered no career. Even as matters stand, the salaries of the teaching and research posts are inadequate, and in view of the rising demand for scientific work in the industries generally, the inadequacy is becoming more acute.

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DR. ARTHUR MATTHEW WELD DOWNING, whose death was announced in NATURE of December 13, was born in Ireland on April 13, 1850, being the youngest son of the late Mr. A. M. Downing. He graduated at Trinity College, Dublin, where he gained the gold medal of his year in mathematics. He went soon afterwards to the Royal Observatory, Greenwich, where he was an assistant for twenty years. He was elected a fellow of the Royal Astronomical Society in 1875, and of the Royal Society in 1896.