

guinea pigs, does not mean that it does not equally apply to our larger farm livestock. From what knowledge we have gained, we have proof that it does. It is our duty to apply this work along practical lines and thus "mak' siccar." (From the Scottish Farmer dated 14th November 25.)

Agricultural Education in the United States.

During the last half-century the importance of agricultural education has been increasingly recognised in America, until now every state has one or more Agricultural Colleges, forming a group of institutions occupying a prominent position in the field of education. During the decade 1910-20 development was extraordinarily rapid, and very large sums of money were appropriated in many states for the provision of new agricultural buildings, the purchase of land, and the endowment of educational programmes. The colleges have had a long struggle for recognition, but have demonstrated their value and are now in such a position, financial and otherwise, that their future usefulness is assured. The immediate need is for trained teachers, investigators, and administrators, and in response to this, graduate work in agriculture has developed with amazing rapidity during recent years, though in certain colleges it is still seriously handicapped by lack of funds and accommodation. At present the full agricultural course extends over 4 years, but there is a suggestion to extend this to five in some cases for the purpose of specialised training. In many colleges the curricula have been steadily changed in order to keep abreast of the modern requirements of agricultural education, though there are still some in which the work is too largely restricted to methods of production, resulting in a narrowed outlook.

The field of work covered is very wide, ranging over at least a dozen branches, which, however, are not rigidly separated but devetail into one another to some extent. All branches have developed from small beginnings shaping themselves according to the needs of the time, with the result that some subjects which were originally an integral part of one branch are now dealt with more fully and adequately by others. Agronomy was initially defined as covering that part of the general field of agriculture devoted to climate, soils, fertilisers, and farm crops, but it now tends to deal with the more fundamental and far-reaching problems of soil physics and chemistry, plant physiology and plant genetics. It is

claimed that the instruction in agronomy has had much to do with securing the improved crop production of the United States in recent years. Horticulture has almost always had a separate existence in the colleges, but with the growth of various interests, certain branches have developed until now they are treated independently, pomology and vegetable gardening being notable examples. With the better recognition of the importance of the forests to the nation, the instruction of forestry has advanced from exclusive concern with questions of afforestation to consideration of the vital problems of the proper protection, management, and perpetuation of existing stands of timber. The land grant colleges recognise their opportunity and responsibility to train the leaders with the necessary technique and with the broad outlook which will enable them to develop some public policies of dealing with the forests and to establish right standards of practice. The general scheme of education keeps in view both the scientific and practical aspects of agriculture, and endeavours to emphasise the entire interdependence of the two. In addition to the branches already mentioned, special sections are devoted to soils, and fertilisers, plant pathology, entomology, animal-dairy and poultry husbandry, veterinary education, and agricultural engineering. It is recognised that the four year college course is not sufficient to supply the demand for trained workers on the land, partly because so large a percentage of graduates draft off into other occupations, as teachers, country agents, scientific workers, etc., and partly because a large proportion of those intending to farm cannot afford the time or money for a full college training. To meet the needs of the latter class, various types of short courses have been developed covering the various sections of the community concerned. The older boys and girls are catered for by special agricultural schools, farmers are provided with short courses extending over a few weeks only, at the slackest time of the year, and short schools are held for training specialists in such subjects as dairying, cotton culture, and ice-cream manufacture. In addition, courses in agriculture and horticulture are run for one, two, or three years, primarily for young men and women who intend to make farming their life work. Many problems have arisen in the development of these short courses, and special endeavours are made to solve them in such a way as to render the courses an integral and valuable part of the whole educational scheme.

During recent years a very marked development has taken place with regard to the professional training of teachers in agriculture. Special legislation has provided grants from Federal funds for the purpose, on the condition that equal sums are found by the States participating. The expenditure in this respect increased from 121, 244 dollars in 1918 to 651,702 dollars in 1921, the growth of the work being so rapid that it was difficult for the land grant colleges to secure adequately prepared instructors for the purpose. Still more recently a demand has developed for courses in education designed to meet the needs of college instructors, and there seems little doubt that this part of the work will increase in relative importance. The same may be said of the agricultural extension work, which has steadily increased until in 1921 more than 18 million dollars were expended thereon, directly aiding the improvement of the farm and home practice of more than two million workers directly connected with the land, the whole of the extension work in 1920 costing 75 cents for each 1000 dollars of gross returns from agricultural production in the United States.

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Personnel of the Royal Commission on Agriculture in India.

Chairman:—Marquess of Linlithgow, D. L.

Members:—(1) Herbert Calvert, C. I. E; M. L. C; I. C. S; Registrar of Co-operative Societies. Punjab.

(2) Prof: Nagendranath Gangulee, Professor of Agriculture and Rural Economy. Calcutta University.

(3) Dr. Lodi Karim Hyder, M. L. A; Professor of Economics, Aligarh University.

(4) Balakrishna Sitaram Kamath, Member of the Bombay Agricultural Board.

(5) His Excellency Sir Henry Staveley Lawrence, K. C. S. I; Ag. Governor of Bombay.

(6) Sir James MacKenna Kt. I. C. S; Late Development Commissioner. Burma.

(7) Sir Thomas Middleton, K. B. E; C. B; Commissioner under the Development and Road Improvement Funding Act.

(8) Raja Sri Krishna Chandra Gajapathi Narayana Deo Garu Rajah of Parlakimedi, Madras.

(9) Rai Bahadur Sir Gangaram, Kt. C. I. E; M. V. O; late of the Public Works Department.