

plants have been most important in oriental economies. Among the most important products is agar, which can be made from a number of red seaweeds. In addition to its use as food, agar has come to be indispensable in the textile and leather trades, in making high-grade adhesives, photographic films and shatterproof glass, in medicine and pharmacy and as a medium on which fungi and bacteria can be grown. It is an essential product in all scientific laboratories for culture work, and during the Second World War it was imperative that all countries should have a sufficient supply for the preparation of protective vaccines both for the civilian population and the armed forces. The need was met in different countries in a variety of ways. In Britain an excellent agar was made from two red seaweeds, *Chondrus crispus* and *Gigartina stellata*, known collectively as carrageen; these seaweeds were located and harvested mostly by enthusiastic voluntary labour.

Co-operation is needed not only among research workers in many branches of science but also between scientific workers and the commercial world if the best use is to be made of the vast potential resources that are being rhythmically and unceasingly produced in the waters that surround our shores. The work of the surveyor, the engineer, the economist and the manufacturer must be based on the sure foundation of the detailed study of the plants themselves if it is to stand effectively.

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THE WIDENING SCOPE OF THE STUDY OF EDUCATION

IN his presidential address to Section L (Education), Sir Fred Clarke remarks that it is now better understood how we have reached a stage where education has become a major instrument of national policy. Some light is thrown on the matter, so far as Great Britain is concerned, by a glance back over the last two centuries or so. Two phenomena are particularly noticeable: first, that in both content and methods education was overwhelmingly a matter of tradition; and second, that the golden age of liberalism was also an age of maximum security.

In spite of some variants and breakaways, tradition still ruled even after education had ceased to be selective and had become compulsory for all alike.

The liberalism of the nineteenth century brought less change in this than might have been expected. But it did bring two important contributions. One was science, the other was the idea of the autonomous, self-sufficing individual.

The introduction of science into the curriculum was slowly achieved and very soon it, too, tended to fall under a tradition of its own. Perhaps more important was the application of scientific methods to the study of education itself, and particularly to problems of child-care and teaching.

A growing body of knowledge was the result. But, until recently, the 'individual' was still conceived too abstractly, and the studies took little or no account of the profound changes in social and cultural environment which even then were exerting such influence both upon the growing child and upon his teachers. Persistence of the nineteenth-century notion of the individual is insufficient to account for this. Society and its influences could be so taken for granted because of the peculiar conditions of security that the century enjoyed.

Two influences in particular helped to bring about the changed outlook of our time. One was the thrust of the working-people for wider opportunity, affecting education as it did. The other was that increasing concern for the national future which became so marked towards the end of the century, particularly among the governing classes. It was, perhaps, a fortunate thing that these two influences tended to the same result, an increased concern for general education and a heightened sense of the historical and sociological factors which determined educational thought and practice. Thus there can be little doubt that many of the studies now undertaken were influenced by consideration of the needs of the elementary school, to which the great majority of the population went. The transformation of the elementary school during this century is an achievement that owes much to the new outlook.

To-day we are reaching, if we have not already reached, a conception of education for which little or nothing in the life of society is wholly irrelevant. Studies have broadened out accordingly, and the lengthening of the period of organised educational care has contributed to the same result. Psychology, for example, is concerning itself more and more with the characteristics of adolescence, and social psychology has come into its own.

To illustrate the kind of provision for which this broadened outlook calls, the example of arrangements in the University of London may be cited. At least five essential professorial chairs are now established, each representing a distinct line of approach. These are: philosophy (the most fundamental of the studies), psychology, history, sociology, and comparative education. As provision along some such lines as these is made in the new university institutes of education throughout Great Britain, it may be expected that stimulating and bracing influences will be brought to bear both upon the work of the schools and upon the training of young teachers for work in them.

If there is any danger that studies may become too detached from actuality, too purely theoretical and self-absorbed, we may hope that the play of informed critical opinion, coming mainly from the schools and colleges but also from an interested public, will supply the necessary corrective.

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FARMING, SCIENCE AND EDUCATION

PROF. N. M. COMBER in his presidential address to Section M (Agriculture), first deals with the lost appreciation of the status and prestige of farming. In peace-time and times of plenty, the majority of people use their food not merely as necessities of life but also as tokens of goodwill and friendship. Men do not dine together for merely utilitarian purposes; but they are largely oblivious to the reason why the products of the farming industry are used (as the products of no other industry are) to betoken the spiritual as well as the physical well-being of mankind. In times of war, when all minds are on farming, it is the necessity and not the glory of farming which is brought home to everybody. At no time, therefore, in the modern era are the majority of people able to appreciate the status of farming, which lies in the fact that it is inextricably connected with the status of human life itself and is fundamental in a way that no other industry is. In the midst of

all the divergent opinions about the origin of human life, it has to be agreed that whatever the amount of divine authority by which men were created to be men, they were commissioned to be farmers by exactly the same amount of authority. Farming is all the time a fight against Nature, which itself does not provide human food, and it is in pursuing this life more than in any other way that the high qualities of human character have been developed.

Coming to the application of science to farming, Prof. Comber stresses that farming must always be fundamentally an art and a craft. It has worked for untold centuries, with no scientific knowledge of it until a little more than a century ago, and how it works is still only very partially understood. Agricultural science is still only young and immature compared with the industry of farming itself, and taking the long view it is a good thing that the introduction of science into farming has had to contend with criticism and opposition.

It is in the nature of things that the successful teaching of agriculture is dependent upon the teacher's personal experience in the industry, and no one reading a text-book of agriculture can be unaware of the fact that farming cannot be taught by book. Because of this the association of advisory work (with its personal experience of farming problems) with teaching institutions was invaluable, and the separation of this advisory work from teaching centres in 1946 is to be deplored more than anything in the history of agricultural science in Britain.

A little more than a century ago scientific knowledge and understanding of crop and animal husbandry were almost non-existent. At that time the need for new knowledge was paramount. That, however, is not the position to-day. The limiting factor now is the education of people going into the farming industry. This need differs from the need of education in almost every other industry because of the fundamental character of farming. There are people who are manifestly born farmers who could not easily make a success of any of the existing types of courses, and there is need for special informal and, some may say, unorthodox types of courses for those people with a strong practical aptitude with no conventional appreciation of science. Educationists cannot prescribe the qualifications of farmers as they can those of other industrialists.

Finally, Prof. Comber urges that there is too much confusion and blurred overlap between college courses leading to diplomas and university courses leading to degrees. It is high time that the existing subject-matter be used with a full realization that in twenty years a lot of it will be out of date and subject-matter hitherto unknown will have arisen: it is time that it was realized that education is the training of personal qualities and that in the agricultural degree courses a large amount of what is supposed to be utilitarian matter is suppressed to make place for philosophical and cultural subjects (along with agriculture), and to make place, too, for time in which undergraduates can engage in university life.

THE PRESERVATION OF NATURE

SO great has been the advance made recently in Great Britain and abroad in the recognition of the need for the preservation of Nature that it is opportune to look back on the course of events. Dr. G. P. Herbert Smith points out in his presidential

address to the Conference of Delegates of Corresponding Societies that it needed a tragic war to make urban dwellers realize that food did not automatically arrive in the shops. The problem of the best use of the land in a small and crowded island like Great Britain is difficult. Care should be taken to assure that in new schemes nothing of scientific importance is destroyed; in this respect local societies can render valuable assistance.

Although we know that species of plants and animals have come and gone, it is only during recent centuries that their extermination has been due to man. Until he acquired weapons and machinery, he did little harm and fitted in with his environment. The earliest loss to attract general attention was the large and clumsy bird, the dodo. The bison in America and in Europe was only just saved, almost at the last moment. National parks, which safeguard scenery and wild life, while providing ample opportunities for recreation, originated in the United States and have spread all over the world, and they have been accompanied by the smaller areas known as Nature reserves. Even in Britain, thanks to the activities of various societies, Nature reserves have been established, and a welcome feature has been the development of local naturalists' trusts. In 1941 a conference met to consider Nature preservation in post-war reconstruction, and from it the Nature Reserves Investigation Committee arose and made a careful natural history survey of England and Wales. Its two reports appeared in 1945, just in time for the use of the Wild Life Committee appointed by the Ministry of Town and Country Planning. The report of the latter was published in 1947, together with a similar, but less complete, one for Scotland. As the result, the Government established the Biological Service, with the Nature Conservancy to supervise it. The National Parks and Access to the Countryside Bill now before Parliament has a section dealing with Nature conservation.

International co-operation to any general extent began with whales, and various regulations have been agreed to, but are not completely successful in the absence of policing. A flourishing International Committee for Bird Preservation has been established by private effort, and has sections in thirty-five countries. The general movement to encourage the protection of Nature began about 1905, and progressed as far as the establishment of an International Advisory Commission in 1914; but the outbreak of war prevented it from functioning, and it was never revived owing to the political difficulties after the War. Following upon the International Congress at Paris in 1923, an attempt was made to form an international committee; but the time was not ripe, and only the International Office for documentary purposes resulted. After the Second World War, the Swiss League for the Protection of Nature convened in 1947 an international conference with the object of reviving the International Advisory Commission of 1914. It was, however, decided to ask Unesco to summon an official conference in 1948 with the object of establishing an International Union for the Protection of Nature. The Union was duly established, with its seat at Brussels. It may be anticipated that its attention will be devoted mainly to the preservation of Nature and not merely to the safeguarding of species threatened with extermination. The relation of the size of the population to food supplies may present a difficult problem.