

NATURE

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BRITISH COLONIAL DEVELOPMENT

THE announcement by Mr. Creech Jones in the House of Commons on June 25 of the Government's proposal to establish a Colonial Development Corporation marks a definite stage towards the establishment of a new Colonial system aimed at raising the standard of living in British Colonies, which has been implicit in such recent proposals as Dr. E. B. Worthington's Development Plan for Uganda, and the plan for the production of ground-nuts in East Africa. The Ground-nut Corporation scheme is concerned primarily with foodstuffs; but its contribution to the raising of the standard of living in Tanganyika, Northern Rhodesia and Kenya may well far outshadow its contribution towards meeting the world shortage of fats. The twenty-five million pounds required for this Corporation is indeed to be provided separately; but it will none the less be as distinct a contribution to Colonial welfare as the capital of £100,000,000 of the Colonial Development Corporation now announced.

Mr. Creech Jones said that the Corporation would operate on commercial principles, and that its object would be to establish or assist any enterprise in the Colonies which is designed to increase their general productive capacity. While these enterprises might be mainly agricultural, the Corporation would be able to undertake any enterprise which served the general object either itself, or through subsidiary organisations for individual projects, or by assisting existing enterprises. Unlike the Development Board for the Colonies canvassed unofficially a few years ago, the new Corporation will be subordinate both to the Colonial Office and the Colonial Governments. The intention is that the Corporation and its subsidiaries should operate generally in close consultation with Colonial Governments, to ensure that their activities are conducted in the way best suited to promote the welfare of the Colonial peoples.

It was made clear that the Corporation is intended to supplement, not supplant, private enterprise. The Government would continue its policy of encouraging public utilities and other suitable forms of public enterprise; but it would also welcome private enterprise and investment so long as they are in harmony with the plans of Colonial Governments for social and economic development. Mr. Creech Jones, in reply to questions, indicated that the Government is alive to the importance of decentralization, and that although the head office must be in London, certain concerns and enterprises would have their principal offices in the territories with which they are strictly concerned.

The scheme as outlined by Mr. Creech Jones is thus based on the realization that capital on a far larger scale than is made available under the Colonial Development and Welfare Act is needed to raise the standard of living in the British Colonial Empire. What is equally important, there appears to be visualized co-operation with other Government departments besides the Colonial Office, such as the Board of Trade and the Ministry of Food. Several Departments are in fact already working together on

a survey of opportunities for new commodity production in the Colonial Empire. Success may largely depend on the extent to which there is stimulated on a much larger scale that two-way flow of ideas, already to be seen on a modest scale, resulting from the work of the Colonial Research Committee and the Colonial Products Research Council. It will certainly depend largely on the extent to which there is secured the co-operation of scientific workers in the way that is so conspicuously a feature both of the ground-nuts project for East Africa and the development plan advanced by Dr. E. B. Worthington for Uganda*. The feature of Dr. Worthington's plan is the suggestion that pilot development schemes should be used to try out ideas of land use and social services which later can be applied to large parts of the Protectorate. They should also be areas of intensive production, at first by State enterprise, in country which is at present largely undeveloped. In this way, Dr. Worthington contends, about twice as much expenditure on public services per head of population as is possible in the country as a whole will pay dividends after ten years.

Dr. Worthington recognizes and states the fundamental problem in Colonial development and welfare which the general schemes under the new Corporation will equally have to face. The average standard of living cannot rise and public services cannot expand unless production increases at a greater rate than population. Ten years, he suggests, should be devoted to a production drive while increasing social services at a rate greater than population increase. If success is achieved, Uganda will be able to support mass education and a mass health scheme during the following decennium.

In the production drive, the great asset of Uganda is not man-power but undeveloped land and water. The chief factors which limit development are the lack of fundamental formation about the country and the people; a system of production incompatible with the full use of natural resources; lack of capacity of the African for physical work; and power based on the most inefficient of fuels. Dr. Worthington's plan aims at solving the fundamental problem of balance between population and production by reducing these limiting factors, although he is doubtful whether adequate results can be achieved without some degree of compulsion, possibly the equivalent of that which is applied in Britain to-day.

The pilot schemes suggested are for the development of a self-contained piece of land, preferably a catchment area of say 500 square miles, sparsely inhabited on account of tsetse fly. Settlers up to 6,000 families would be employed for the first few years, while the whole area was being developed as a Government estate. At this stage there would be only six Europeans as against 42 Europeans to about 1,800 Africans in the resident units of the ground-nut scheme. Later, most of the settlers would become tenant farmers under close supervision, a part of the unit being retained as a Government farm. Initial clearing and subsequent cultivation would be under-

taken with mechanical assistance, where possible. Communications, forestry, water-control, agriculture, fisheries and social services would be organised for the efficient development of land, water and people, with an emphasis on productive services.

The scheme is finely conceived and represents a scientific approach that might well be adopted more widely. It is not only in research in applied biology, in animal husbandry, forestry, fisheries, hydrology, meteorology, agriculture and the like that science can contribute so much to Colonial development and welfare. It is becoming more and more clear that the scientific approach is the only one that holds out real hope of a solution to the all-important human problem. Although Dr. Worthington makes like reference to the contribution of the social sciences, his scheme, like the ground-nut scheme, is in keeping with the idea that Mr. Aldous Huxley outlines in his recent book, "Science, Liberty and Peace"*, of developing regional self-sufficiency as a decentralizing and stabilizing factor in world order. It is equally in line with ideas which Col. W. R. Crocker emphasizes in his penetrating commentary†, "On Governing Colonies", of concentrating less on what is ideal from the European point of view and more on what is practical from that of the African, on the preventive rather than the remedial aspect of public health and the essential idea of the Tennessee Valley Authority, in which the association of the ordinary people affected by the scheme is first secured. Similar ideas are stressed by Sir J. Hawthorn Hall, the Governor of Uganda, in some notes on the economic development of Uganda which preface Dr. Worthington's report.

That the regional aspect is present in the mind of the Colonial Secretary is shown by his recent comments on the eighteen months work of the Colonial Economic and Development Council. Nearly all the thirty-five territories concerned have submitted ten-year development plans, although some plans have been referred back with comments or suggestions. But Mr. Creech Jones has stressed the importance of regional planning and development in contiguous Colonial territories such as East, Central and West Africa, and also in the West Indies. In a memorandum accompanying his dispatch of February 14, 1947, on closer association of the British West Indian Colonies, he refers to the manifest need in all the Colonies concerned for improved facilities for research, including surveys and statistical services, in order that plans for economic development and social welfare may be soundly conceived and wisely executed. Except in co-operation, the Colonies will not generally be able to afford or fully to employ the services of the experts required to fulfil those functions. It was announced in this dispatch (Cmd. 7120. H.M. Stationery Office, May 1947. 9d. net) that a conference is to be held at Montego Bay, Jamaica, in September, and its outcome will be watched with great interest by all who are aware of the potentialities which have already been revealed in the Caribbean.

* Science, Liberty and Peace. By Aldous Huxley. Pp. 64. (London: Chapman and Hall, 1947.) 3s. 6d. net.

† On Governing Colonies. By W. R. Crocker. Pp. 152. (London: Allen and Unwin, 1947.) 10s. 6d. net.

* Uganda Protectorate. A Development for Uganda. By Dr. E. B. Worthington. Pp. xii+112. (Entebbe: Government Press, 1946.) 2s. 6d.

There are other aspects of the man-power situation which are of fundamental importance in all these proposals. Inevitably the formation of a Colonial Development Corporation, like the Ground-nut Corporation, with its various subsidiary schemes and ramifications, tends to widen the range of opportunities which the Colonial Service offers and to call for more varied abilities among the members of that service. No thoughtful reader of Col. Crocker's recent comparative study of British, French, Belgian and other Colonial practice and experience can doubt the need for recruits of high quality to the Colonial Service, the great scope for initiative and responsibility which that service offers, or the need for a new outlook in some quarters and for drastic changes in organisation, practice and the transfer and promotion of staff. Ultimately, it is on the quality of the staff by which the Development and Welfare Schemes are administered, their vision and understanding of the needs and minds of the native peoples, their appreciation of the contribution of science, of the problems and opportunities of the private and public corporations seeking to serve the needs of the native peoples and of the world, that success will depend. Nor will the ablest men and women be forthcoming and their zeal and enthusiasm maintained unimpaired unless the conditions of service are such as to call forth their best efforts and to give them the continued stimulus and incentive that will spring from manifest participation in the high task not merely of serving the material and social needs of the Colonial peoples, but even more of training, inspiring and guiding their future leaders in accordance with those new conceptions of imperial responsibility which mark the third Colonial Empire now developing. It should be a first pre-occupation of the Government to see that no timidities or inhibitions of Colonial administration are allowed to hinder the full use of all the expert knowledge of Colonial resources and methods of treatment that have been accumulating in the last four years, or the vigorous prosecution of the fresh researches still required. Above all, nothing must be allowed to frustrate the boldness of imagination with which these new opportunities must be served.

CHEMICAL CRYSTALLOGRAPHY

Chemical Crystallography

An Introduction to Optical and X-ray Methods. By C. W. Bunn. Pp. xii+422+13 plates. (Oxford: Clarendon Press; London: Oxford University Press, 1945.) 25s. net.

PROF. VICTOR GOLDSCHMIDT used to say that, over the door of his laboratory in Heidelberg, he would like to have written "Die Kristallographie ist die Königin des Wissenschaften"; and while he said this chiefly because he personally was fascinated by the external shapes of crystals and their formal geometry, he may perhaps also have thought of crystallography as holding a distinctive place among the sciences, at once isolated and yet pervading. Indeed, crystallography as we know it to-day is in many ways a curious subject. It has come to be

principally concerned with the use of X-ray diffraction effects to study, to varying degrees of precision, the arrangement of the atoms in substances, many of which can scarcely be called crystalline at all. The techniques employed belong largely to mathematics and physics, and the information derived is of fundamental importance to subjects so far apart as metallurgy and biology, and particularly to chemistry. There seems, perhaps, something unsatisfactory in the way we cling to so precise a term as 'crystallography' to cover all these developments. Yet, as the combined international body of 'crystallographers' discovered in recent discussions, it is difficult to find any other term to which we can give all the meanings we associate now with the word 'crystallography'.

There is more than one reason for this situation. Without the early classification of the geometrical form of crystals and the mathematical developments of space-group theory, the problem of structure analysis by physical methods is at least much more difficult. Far more of the kind of exact data on which most interest centres—the details of the arrangement of atoms in space and the exact distances between them—can be got once a really crystalline substance is available (some justification for all the hours that have been spent in chemical research in the preparation of 'a crystalline derivative'). But the apparently complex background of knowledge, mathematical, physical and crystallographic, which is required for the proper use of X-ray analysis, makes the subject too often seem too difficult just to those who should find its applications most useful, and particularly to students and research workers in chemistry.

It is the great merit of Mr. Bunn's book that it does very largely attempt to develop a new approach to the study of crystallographic methods based on the use in chemical research of a variety of ways of observing crystals and their structure, both new and old. This new approach is extremely practical. It is designed to meet the needs of those who wish to know, in the first place, what types of chemical information can be gained by using crystallographic methods, and secondly, the essential practical and theoretical details necessary for operating these methods. The relations between these different aspects of the subject are outlined in a very clear general survey of the field which forms the opening section of his "Chemical Crystallography". This survey indicates the limitations as well as the applications of X-ray methods; it also describes the general division of the subject-matter of the book into different, more specialized sections.

The primary purpose in chemical research of getting a 'crystalline derivative' is usually for the identification of different chemical individuals. The assistance which can be given in this direction by crystallographic techniques, particularly crystal morphology and optics and X-ray powder photographs, forms the subject of the first major division of the book. Around this theme is developed the necessary formal information on the types of crystal symmetry possible, on the examination of optic figures and the measurement of refractive indices, and also elementary theory of X-ray diffraction. Here there are important contributions to the presentation of the subject as a whole. For example, the indexing of crystal faces is notoriously difficult for the non-specialist to appreciate. Mr. Bunn begins by showing excellent photographs of crystals growing, and leads by easy stages through the relation of the observed crystal layers to the packing of atoms in space, and so to a