

## SOME BIOLOGICAL ASPECTS OF COLONIAL DEVELOPMENT\*

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CONSIDERABLE interest is being taken by the people of Britain in Colonial development at the present time, and great importance is attached to the further development of Colonial territories in the interests of their inhabitants, the Commonwealth and the world.

In some quarters, extravagant views have been expressed as to the extent and the speed at which deficiencies of foodstuffs and raw materials in Europe can be met from the Colonies; but such views display ignorance of Colonial food requirements, social customs and habits, the poverty of their soils, the vagaries of rainfall, and the hazards from pests and diseases of crops, animals and men. Many of the Colonial peoples themselves are anxious to see the execution of projects which will develop the natural resources and provide them with a wider field of occupation and standards of living; but the road to achievement will only be traversed successfully if there is careful and sympathetic planning and persistent efforts to overcome difficulties.

### Government Policy

Government policy is designed to improve and extend the public services and encourage economic progress so far as natural conditions and resources permit. Twenty years ago, a Colonial territory could only obtain financial assistance for active development through a guaranteed loan, but the Colonial Development Act of 1929 and the subsequent Colonial Development and Welfare Acts of 1940 and 1945 provided increasing State help for Colonial territories for post-war plans and centrally administered schemes of research, education and training, and these plans were designed to lead to better nutrition, water supplies, housing and communications, and in turn to better methods of production and higher standards of life.

To secure expanded economic development, the Overseas Resources Development Act was passed in 1948 establishing the Colonial Development Corporation with a capital limit of £110 million, and the Overseas Food Corporation, capital £55 million. The latter is charged with the execution of the East African Groundnut Scheme, and the former is to undertake projects to aid Colonial development generally, its activities covering agricultural, fishing, forestry and mining enterprises as well as industrial, processing and manufacturing undertakings. All projects must be financially sound, and it is the Corporation's intention to supplement, not supplant, private enterprise. It has already a considerable number of projects under consideration, and several have been investigated on the spot. It will start some projects this year, although shortages of basic materials must involve some delays.

### Biological Factors

Biological factors have to be taken into account in Colonial development—particularly in Africa.

*Population Issues.* The increasing populations, their irregular distribution and the drift to the urban

areas, emphasize the need for increased production of foodstuffs for local use; and greater occupational diversification is necessary in order to secure a more balanced economy.

*Tsetse.* Several species of tsetse flies occur on the African Continent and are responsible for the transmission of diseases to man, game, and domestic stock—accounting to some extent for the uneven distribution of populations and domestic animals. The area in which tsetse occurs is estimated to be seventy-five times the size of the United Kingdom. Tsetse flies are found in more than two-thirds of Tanganyika, and outbreaks of trypanosomiasis still occur. Whereas trypanosomiasis is under better control, thanks to increased knowledge and the production of better organic compounds with prophylactic and curative properties, the movement and resettlement of villages is still necessary. Tsetse research work of the past twenty years, including the study of the bionomics of the species and the ecological factors governing their control, has gradually built up a mass of information of the greatest value. It has been established that tsetse flies are susceptible to changes in environment brought about by clearing or thinning the bush, and successful reclamations of areas from tsetse have been achieved by bush clearing, provided that the subsequent tree-growths in the areas so dealt with have been kept in check. Progress, however, is slow, and large-scale clearing operations, such as those being undertaken by the East African Groundnut Scheme, may show the way to bring tsetse-infested country more rapidly into economic production; but no one can be satisfied about the present position. This is recognized by the authorities. Steps have recently been taken to place tsetse research under central direction, and international collaboration is also being secured on trypanosomiasis. Plans are also well advanced for insecticide dissemination by aircraft and helicopters, though the wholesale use of the new insecticides is not without danger, as many useful insects may be eliminated.

*Livestock Diseases.* In many parts of Africa these remain a factor which controls the development of animal industries and more satisfactory systems of agricultural husbandry. Rinderpest, the most serious of cattle diseases, still occurs in several territories; and although it had been hoped that in East Africa a check had been made on the disease, there have been recent outbreaks in Tanganyika, all the more serious because of the small number of veterinarians at work in the field.

*Locusts.* Crop losses of considerable magnitude have been experienced in the past in Africa from swarming locusts; but the extensive campaigns for the control of the desert locust in East Africa, and the successful control of the red locust in Tanganyika, have established the fact that locust plagues can be checked before they assume dangerous proportions provided the outbreak areas are supervised and timely action taken against incipient swarms. Spraying from aircraft can be applied effectively, and it has been clearly established that the results of the patient research work of the last twenty years, which are now being applied, are paying dividends.

*Termites.* Termites still remain unchecked and cause heavy unrecorded losses throughout the Colonial Empire. There is no British authority in the United Kingdom who has specialized in termites and their control, and it does seem high time to provide for a survey of the termite position in

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Colonial territories and for planned research. The establishment of a post at the British Museum (Natural History) for the specialized study of termites has been recommended; but a team for the scientific study of termites and the evolution of satisfactory control measures is warranted. A considerable amount of local knowledge is available in the Colonies about termite damage and the resistance of certain hard-wood timbers to attack. This knowledge requires to be collated and expanded by scientific research, and control measures need to be more generally adopted.

*Pests and Diseases.* Pests and diseases of plants and animals are also factors which have to be kept in mind. In addition to rinderpest, I need only mention certain virus and fungus diseases, such as the 'swollen shoot' of cacao in the Gold Coast, the 'sudden death' of cloves in Zanzibar and Pemba, the 'witches' broom disease of cacao in Trinidad, the Panama and leaf-spot disease of bananas, and then pass on to the pests of cotton.

The need for increased supplies of cotton from within the sterling area is great, especially at the present time. Owing to the research work of the Empire Cotton Growing Corporation and other specialists, many new types of cotton suitable to different areas and resistant to some pests and diseases have been evolved. Crop losses from jassids and other pests and certain virus diseases have been checked by breeding new resistant types. 'Stainers' are troublesome but not limiting; but the red boll worm (*Diparopsis castanea*) is the most limiting, and definitely controls expansion of cotton growing in large areas of Central, East and West Africa where the climatic regime consists of a single rainy season followed by a long severe dry period. Effective agronomic methods have been devised; but the use of insecticides may be necessary before cultivation can be expanded without undue risks in large sections of the continent.

### Importance of Food Supplies

We in Britain are well aware of the shortages of food supplies; and in certain Colonial territories the people have not enough for satisfactory nutrition. Insufficiency of the B-vitamins, hungry periods between the seasons, serious shortages when the rains fail, definite protein starvation—particularly in the southern parts of the West African territories—all exist. Throughout the Colonial Empire there is a great need for wider variety in diet and a much greater consumption of protein foods if extra effort is to be expected in developmental projects. In Africa, it is probable that the growing populations will absorb the bulk of meat supplies available in the near future, and Colonial Governments must give the highest priority to the food needs of their people and to the stimulation of increased local production of crop and animal products.

*Fishing.* The fishery resources in the waters of Colonial territories have been neglected too long, and a wide field is open for development by the application of modern technology. The first stage is to establish a measure of the availability of fish in terms of the yield per unit of human and material effort expended in their capture and distribution, and then determine the level to which exploitation can safely be developed. Practical tests are an urgent need.

At a later stage it will be necessary to build up a body of basic scientific knowledge of the fisheries so

that the level to which exploitation can safely be developed can be determined.

An ambitious programme of research has been planned, including the development of freshwater fisheries and the establishment of fish farming in several areas. There are obviously vast possibilities of increasing fish supplies by fish farming, and a Government training and research centre is to be established in Malaya.

The whaling industry has been developed largely as the result of the whale fishery investigations of the "Discovery" Committee of the Colonial Office. This industry is an example of complete dependence on fundamental oceanography and marine biology. Through this work the vast biological productivity of the southern oceans is made available for human needs, with a reasonable assurance of a maximum sustained production.

### Mechanical Aids to Colonial Agriculture

Colonial agriculture is dependent largely upon peasant producers—many of whom grow their crops on small areas for subsistence purposes. In the main, their husbandry methods and animal industries can be greatly improved, though with the existing tools and the methods in vogue increased productivity is difficult to achieve. The requirements at present are to secure better organisation of farming operations and to test the value of fertilizers and mechanical aids. The effects of the introduction of mechanical implements on the farming economy and the social organisation of the people will require careful study and investigation, as their introduction will necessitate farming units of a larger size, whether cultivated individually or communally. The possibilities of increased soil erosion and dangers from pests and diseases must not be overlooked. Useful lessons will doubtless be learned from the East African Groundnut Scheme.

### The East African Groundnut Scheme

There is no doubt that the world shortage of edible oils made it essential that this project should be undertaken. It will have an important influence on the agriculture of Tanganyika and on Colonial development generally. I have recently had an opportunity of paying a short visit to the Kongwa area, where the speed at which equipment could be assembled for bush clearing, cultivation and harvesting has been much slower than had been anticipated. Much of the equipment had to be reconditioned or modified and some new implements evolved; but many of the technical difficulties on the mechanical side have now been overcome, and those responsible are to be congratulated on their achievements. Unforeseen difficulties had to be expected and allowed for—this is always the case in pioneering ventures—but the groundnuts and other crops this year have been free from any serious attacks from pests in the Kongwa area, except for damage to the sorghums in the experimental area. There has been some loss of certain groundnut varieties from wild pig; but no occurrence of the virus disease, rosette, which is capable of causing serious losses, has, so far, been detected. It is very necessary, however, that the research work undertaken by the scheme should be well in advance of requirements, so that outbreaks of rosette and of other pests and diseases can be met when they arise.

An extensive programme of field trials to investigate crop rotations, fertilizer needs, cultivation

methods and groundnut varieties, as well as a large series of observation plots with a wide range of crops have been put into effect this year, and valuable lessons have already been learnt. This work has been given the highest priority, and steps have recently been taken to increase the scientific staff. It is to be hoped that arrangements will also be made for the testing of a wide range of groundnut varieties for resistance and immunity to rosette disease in an area of the territory where the disease occurs in some abundance, as in my view such work can only be regarded as a necessary insurance.

### Conclusion

A considerable increase of basic knowledge is being built up as the result of Colonial research work; but there are still gaps in our knowledge. The application of the results of research work also leaves much to be desired. The strengthening of the staff of the British Museum (Natural History) appears to be desirable in the interests of Colonial biological research. Termites, in particular, require further study. It is also necessary that early steps be taken to enable Kew to produce a Flora of East Africa. Such a Flora is not at present available, and its production is essential for further ecological work in the East African territories and for the use of biologists working in these territories.

## HIGHER EDUCATION IN THE COLONIES

IT was a graceful gesture by the Sixth Congress of the Universities of the British Commonwealth to devote its concluding session on July 23 at Oxford to a discussion of higher education in the Colonies, and thus to recognize and welcome the youngest members of the academic family.

The discussion, under the chairmanship of the vice-chancellor of the University of London, Prof. Hughes Parry, was opened by Sir Alexander Carr-Saunders with a sketch of the general plans for developing university institutions in the British Colonies and in the Sudan. In addition to the two existing Universities of Malta and Hong Kong, there will soon be, in Malaya, a third university if the proposals of the recent commission are adopted for the fusion of the King Edward VII College of Medicine and Raffles College. Five new university colleges are being established, two on the basis of existing institutions, Gordon Memorial College, Khartoum, and Makerere College, Kampala, serving the East African territories, and three as new foundations, University College, Ibadan in Nigeria, the University College of the Gold Coast, and the University College of the West Indies in Jamaica. These five university colleges are autonomous corporations, governed by councils the composition of which ensures that they are broadly representative of the interests concerned in their territories, including Government, and include an effective proportion of academic staff representatives. Control of all academic matters is vested in academic boards, composed wholly of members of the staff. The students at these colleges will sit for the degree examinations of the University of London, with which the colleges will be "in special relationship". By this arrangement, the University of London, while retaining complete control over the

award and standards of its own degrees, is prepared to devise, in consultation with the colleges, syllabuses appropriate to the needs and opportunities of the territories and to associate the local staffs in the setting of papers and marking of scripts in the examinations. After gaining experience in constructing syllabuses for special degrees, in conducting local examinations and in establishing firm standards, the colleges will in due course seek degree-granting powers and become independent universities.

A sum of six million pounds from central funds administered on the advice of the Colonial University Grants Committee is available as a contribution towards the capital needs of this programme (excluding the developments in the Sudan). Grants for recurrent expenditure will have to come chiefly from the local governments, and arrangements are being made for such assistance to be given as block grants for quinquennial periods to ensure a proper degree of independence for the colleges. Academic assistance, technical advice, library services and co-operation in a variety of ways from the home universities is provided through the Inter-University Council for Higher Education in the Colonies. The critical need in the next phase of carrying through these plans for a new university and five new university colleges is for properly qualified staff. The conditions of service, the salaries, the academic freedom, the research opportunities, the responsibility of the work make service in these university institutions attractive, and every effort is being made by Inter-University Council visits and other means to overcome some of the disadvantages that formerly existed in Colonial work such as the relative isolation. Sir Alexander Carr-Saunders concluded by appealing to the Dominion universities to interest members of their staffs in serving in the Colonial institutions, either in permanent appointments or on temporary secondment.

In the discussion which followed the opening address, Mr. Lewis Wilcher, principal of Gordon Memorial College, and Dr. Kenneth Mellanby, principal of University College, Ibadan, paid tribute to the assistance given to their colleges by the Inter-University Council and by the University of London. Mr. Wilcher reported that Gordon College hoped to obtain independent university status within ten years, and emphasized the value of the services which higher education had to render to the Sudanese in their rapid progress towards self-government. Dr. Mellanby stated that University College, Ibadan, was beginning in temporary buildings near the permanent site of five square miles which the Nigerian Government had presented, in addition to making a contribution of £500,000 towards the recurrent expenditure of the College in the first quinquennium, and an initial grant of £250,000 to an endowment fund. The College would have two hundred students in residence for the session 1948-49, and expected an annual intake of a hundred. Local groups were springing up throughout Nigeria to collect funds to be placed at the disposal of the College for awarding scholarships.

Mr. H. R. Raikes, vice-chancellor of the University of the Witwatersrand, hoped that the Colonial medical schools would ensure that the students' training made full use of the special opportunities provided by the local clinical material and experience, and pleaded that dentistry should be treated as of equal importance and urgency as medicine; he suggested that external examiners going to the Witwatersrand from the