THE BRITISH COMMONWEALTH SCIENTIFIC OFFICE IN WASHINGTON

By DR. ALEXANDER KING

DESPITE many attempts to prove the contrary, the sciences have remained genuinely international in content and development, while their application in all the diverse fields of human endeavour has assumed recognizably similar forms even in the most varied geographical and political environments. An interesting example is the development of weapons and of instruments of war, which has been along broadly similar lines in all those countries possessing sufficient technical resources to enable serious progress to be made. In nearly all directions in which the Allies achieved notable success, Germany had also experimented—and vice versa. This is, of course, because such developments are based on identical scientific principles, already well known internationally before the War.

It was to be expected that the Allies would reach agreement early in the War to exchange information on those categories of technical development which had in the past been restricted from publication, and furthermore agree to collaborate in active programmes of war science. This was an obviously necessary measure if a safe distance were to be maintained ahead of a resourceful enemy, fully mobilized for technical warfare. Co-operation in scientific research between the countries of the British Commonwealth and the United States has in fact been remarkably intimate and harmonious throughout the War; it has proved a potent factor in our ultimate technical victory over the Axis. Much has already been made public of the achievements of the joint Anglo-American effort in particular technical developments, but little has yet been told of the means taken to ensure day-to-day contact between the scientific workers of America and those of the British countries.

Following the success of Sir Henry Tizard's technical mission to the United States in the autumn of 1940, it was decided to establish in London a mission of the American Office of Scientific Research and Development (O.S.R.D.) and in Washington a British Central Scientific Office (B.C.S.O.). Both these missions have continued to work successfully throughout the War, passing across the Atlantic an enormous quantity of scientific and technical information, the bountiful harvest of the research efforts of the two great countries.

Sir Charles Darwin sailed in the early spring of 1941 to take up his position as first director of the British Central Scientific Office, of which Dr. W. L. Webster was secretary. A number of immediate problems awaited them, particularly in connexion with American radar and fire-control developments, but a major part of the time of this first group of scientific men was taken up with making general surveys of technical work important for the War and then just commencing in the arsenals, industrial laboratories and universities of the United States. It was important at this stage that contact should be made between individual workers on general problems on both sides of the Atlantic, and as an immediate result of the preliminary labours of the two scientific missions, a very large number of American specialists visited England to obtain firsthand information of the work of their British col-

leagues, while British men of science flew to the United States for quick consultation with their American opposite numbers. From its inception, therefore, the British Central Scientific Office in Washington had an important function in making arrangements for short visits of British men of science to the United States and ensuring their easy entry to the American laboratories. This service still continues to-day.

As the War progressed and the technical requirements of the three Services became more complicated, it was necessary to attach scientific workers to the Service missions in Washington, but the British Central Scientific Office remained as an inter-Service and inter-departmental centre, the liaison officers of which had to cover an ever-increasing field of scientific research and technical development. The scientific men in the British Central Scientific Office also formed a body of consultants readily available to the missions in Washington of these Service and supply departments.

It is not yet possible to mention many of the topics with which the Office has been concerned, but they range from light alloys for aeroplane construction, through gun erosion, the development of rockets and other special weapons, chemical defence and explosives to medical and agricultural research problems, as well as the protection of Service equipment from the ravages of Nature in the tropics.

The services provided by the Office have extended beyond the transmission of formal research reports and the specific replies of its scientific men in response to questions asked by the Ministries in London. They have included the purchase of scientific stores and materials of all kinds for urgent research purposes in Britain, the maintenance in Washington of a comprehensive library of British and American technical information for the use of British missions and American Government agencies, the sponsoring of British and Dominion scientific workers on short-term visits to enable them to enter American establishments where secret work was in progress, and many other matters which, notwithstanding their routine nature, have been extremely important in the aggregate. The organisation of an office of this type is in itself an interesting evolution, since, owing to the vital urgency of its work, extreme efficiency of operation is demanded, while at the same time the diverse and specialized nature of the scientific inquiries which have to be made necessitates a high degree of flexibility and gives to the scientific officers great individual responsibility and independence of action. Throughout the War, most of these men have been academic men of science on loan from the universities. They have done a magnificent and strenuous job, obtaining information which at times required high scientific attainments and common sense for assessment; they succeeded in establishing close personal relations with their American colleagues who, in the case of the Office of Scientific Research and Development contacts in particular, were mainly university men also.

From the time of the Tizard mission, very close relations had been maintained between the National Research Council of Canada and British scientific workers in the United States. Later, too, Australian and New Zealand Scientific Missions were posted to the Washington Legations of these countries, and the Dominion men of science collaborated closely with their colleagues from the United Kingdom. During the time when Mr. T. W. J. Taylor was director of

the British Central Scientific Office, it became apparent that relations between the scientific men of the various British countries in Washington might with advantage be still closer, so that in the autumn of 1943, the scientific missions of the United Kingdom, Australia and New Zealand moved into common premises adjacent to the liaison office of the United States Office of Scientific Research and Development.

Shortly afterwards, the National Research Council of Canada sent liaison representatives to the British Central Scientific Office, while a number of scientific workers from South Africa joined the British group, and negotiations were begun between the present writer, who had then succeeded Mr. Taylor, and the heads of the Dominion scientific offices, to pool their resources still further. With the consent of the American authorities, the various national sections of the office federated in July 1944 to form the present British Commonwealth Scientific Office. This change of name allowed the designation "B.C.S.O.", which was by that time well known throughout American scientific and government circles, to be retained for the office as a whole, while the mission from Great Britain, still numerically the strongest unit, was renamed the United Kingdom Scientific Mission.

The British Commonwealth Scientific Office in Washington has for its pattern the structure of the Commonwealth itself. Each constituent national unit is completely autonomous and at liberty to take independent action on any subject; in practice, the groups run in the closest collaboration, which is made all the more smooth because so completely lacking in compulsion. The director of the British Central Scientific Office became, under the new scheme, head of the United Kingdom Scientific Mission and director of the services provided in common to the United Kingdom and all the Dominions. These include the provision of clerical staff, arrangements for photography and the copying of reports, purchase of books, specifications and periodicals, travel and hotel reservations and the obtaining of clearances to visit laboratories in the United States.

The advantages of the present system of working are numerous; the disadvantages simply do not exist. It is a matter of convenience to the American authorities to have a single approach for a particular piece of information on behalf of the whole group, rather than five separate applications. Moreover, the increased number of scientific workers which is made available by the amalgamation of the separate missions enables a wider range of subjects to be covered in a more specialized manner.

As an example might be cited collaboration in the development of D.D.T. and insect control measures which have proved so successful in their Service use. The British Commonwealth Scientific Office liaison representatives on this subject consist of an entomologist from Australia and a physical chemist from Great Britain. These men have sat with the American committees on their own particular aspects of the problem, and have reported their results to all the countries represented in the British Commonwealth Scientific Office. In a similar manner, work on the prevention of equipment deterioration in the tropics has been covered by the working together of liaison officers from the United Kingdom and Australia, general medical matters by a South African medical man, food processing and nutrition by a scientific worker from New Zealand. The close proximity afforded by a common office enables hour-by-hour

consultation to be made between the different national units of the British Commonwealth Scientific Office and, what is more important, between scientific workers interested in different aspects of a common problem.

The United Kingdom Scientific Mission is on the vote of the Ministry of Production, policy and staffing being decided by the Scientific Sub-Committee of the North American Supply Committee of the Cabinet. Being centrally placed in the government machine, therefore, the Office can serve all departments equally. The British Commonwealth Scientific Office is also able to represent British groups not possessing members in Washington. For example, much information is sent to India, and frequent inquiries for American technical information are made on behalf of the Colonies, particularly those of the Caribbean area.

The establishment and working of the British Commonwealth Scientific Office has proved that scientific men of the various British countries can work together in the common interest in complete harmony which transcends national differences. Such working together does not endanger the independence of action of any group or subjugate its local needs to the interests of the others. Relations established both within the Office itself and between the British men of science and their many American colleagues will remain long after all these men have returned to their normal peace-time duties, for in no other human activity is intellectual collaboration so natural or so enduring. This unique experiment in collaboration has been born of the necessity of war, but it is at least a pointer to future possibilities.

BIOLOGICAL STIMULATION IN GERMINATION

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Introduction

MANY seeds, spores, and pollen grains will only germinate when they are associated with active independent tissues. Moreover, many of the characteristics of the situation are strikingly similar in the different groups. Some of these similarities have already been emphasized by other writers, others have not. It is the purpose of this article to provide a general review of the subject based on the contention that many of the similarities are sufficiently close to warrant the hypothesis that the same phenomenon is involved throughout the several groups. The subject is one of some significance in two connexions. An examination of the nature of the stimulation contributes to an elucidation of one aspect of the germination process and is therefore relevant to a consideration of the factors involved in dormancy. Secondly, as indicated below, the effect is undoubtedly due to the production by the active tissue of particular chemical activators which promote the development of the dormant unit. It is probable that many of these have not hitherto been isolated and identified, and the topic has therefore important implications for the general subject of growth-promoting substances.

Below, in the interests of brevity and convenience, two terms are used with particular meanings;