Freedom of Research

I have talked a good deal about co-operation and collaboration, but not—you may have noticed—about co-ordination. Science is a free growth, and, as Sir David Chadwick recently wrote in a note to the British Commonwealth Science Committee: "much of the most valuable research must be free . . . To many who rightly prize that characteristic of research, the word 'co-ordination' denotes 'sinning against the Holy Ghost'. . . One must bear in mind that the countries in the British Commonwealth have developed on different lines. These lines may meet in the end, but their starting points have been poles asunder."

This warning must be remembered. Co-ordination is necessary, within limits, to help to guide research into profitable channels and lest waste, overlap or its converse may occur; but in dealing with a group of proud and independent nations, however friendly and co-operative, we and they must all beware of attempting to introduce a degree of direction, authority or control which many will certainly resent. The Imperial Agricultural Bureaux represent an ideal of equal partnership in the co-operative dissemination of information on research. There is no reason why similar collaboration should not be built up about similar bureaux in other scientific subjects, or, for example, around the libraries and information services of the industrial research associations, the Imperial Institute, or other similar bodies in Britain or the Dominions. London need not necessarily be the focus for all. Co-ordination will then come naturally with increase of knowledge, contact and information. Co-operative research is a living, growing organism; it must be carefully tended, not just pushed into a mechanical framework planned from outside.

We hear a good deal about planning, and planning of scientific research we must certainly have. An Africa Research Council, for example, if it were to be set up, would require a deal of planning. Freedom, on the other hand, is the material and moral basis of the British Commonwealth, and requires explicit recognition in all we do or say. In some way planning and freedom must be combined. There is in this, as in most human affairs, an optimum mixture, the right proportions of which we must seek and find. This optimum must be aimed at, here in Britain, in the action and reaction of free science and free initiative with science and initiative provided by the State. It must be aimed at independently, perhaps with a different final mixture appropriate to their conditions, in each of the countries of the Empire; and it must be sought in the freely accepted co-ordination of the scientific activities of the different parts of the whole Commonwealth.

My own faith is that improvement in knowledge, contact, communication, familiarity between the scientific people of the Empire—and of the United States—will allow that co-ordination quietly to be achieved, the planning to be successfully undertaken, without any violation of the freedom on which we all set so great store, about which we are all so sensitive. It comes back again, therefore, to quickness, ease and facility of travel, transport and communication—things which engineers, in one way or another, must provide. For I believe that scientific people—and engineers—are on the whole rather more reasonable and practical—if not very much—than other folk, and that when we get to know each other by working together on a common job, we are

generally ready to appreciate and understand the other fellow's difficulties and virtues and his point of view. The common job exists obviously enough in the scientific development of the Empire, for the improvement, as I repeat, of knowledge and of the life of its people: the important thing therefore is to improve the methods and technique of getting down to it together.

FAMILY ALLOWANCES

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THE subject of family allowances—assistance given in cash rather than in kind, to meet the cost of maintaining children during the period of their dependency—bids fair to become a live political issue. It is now nearly twenty years since Miss Eleanor Rathbone's much-debated book, "The Disinherited Family", was published, wherein she made a powerful and piquant plea for the introduction into Great Britain of some system of communal payment for the important task of rearing children. Other countries had seized the opportunity presented by the War of 1914–18 to slip in the thin edge of the wedge and the breach thus made was afterwards widened, but Great Britain allowed that chance to pass.

It may seem odd that a time of war should be considered appropriate even for the discussion of such a subject. There are several reasons to account for it. When things are upside down, people are more ready to listen to revolutionary proposals. By grafting on to the normal bargaining process for settling wages a scheme of children's allowances, the needs of the family are taken into account as well as the skill and merit of the worker. To accomplish this would clearly be difficult unless prices are rising, and they invariably do rise during wars; and if wages are to keep step with the cost of living, there is much to be said for a sliding scale graduated according to the number of mouths to be fed. The payment of war-time separation allowances encourages, too, a widespread habit of expecting the weekly income to conform to the size of family. Moreover, under war conditions, the unmarried young man, if left to earn good money by making munitions instead of being obliged to serve in the Forces, would be unlikely to wish to attract critical attention by complaining if his pay does not rise in the same proportion as that of the man with a family.

Trades union leaders in Great Britain have in the past been either antagonistic or only lukewarm in their attitude towards family allowances, largely from a fear that they might be used to depress their standard of living. In countries such as France and Belgium there was the same fear, but it did not persist in any marked degree after the introduction of a compulsory State system covering a large proportion of the employed population. Under the type of scheme favoured by these countries, the allowances were financed by equalization funds, to which contributions were made by all the employers engaged in a specified industry or resident in a defined region. The sum put into the pool by each employer was proportional to the number of his workers or to his total wages bill. This simple device overcame the difficulty that some firms might otherwise have been tempted to employ only single men or men with very small families.

Advantages Claimed

Although the British Government may be presumed still to maintain an open mind as to the wisdom of introducing family allowances, a step forward has now been taken by the issue of an official memorandum on the subject (Parliamentary Paper, Cmd. 6354. London: H.M. Stationery Office. 2*d.* net) following a deputation of members of Parliament which the Chancellor of the Exchequer received in June of last year.

Advocates urge the disadvantage under present conditions, when everything possible should be done to avoid inflation, of meeting the rise in the cost of living by a flat increase in wages which puts extra money into the pockets of many people who do not need it. Any additional sum that can be spared towards wages, if distributed in the form of family allowances, would go, they say, some way to prevent malnutrition in households containing several small children. There is also the familiar claim that family allowances may arrest the decline in effective fertility. On this point the evidence derived from the experience of France and Belgium is not very conclusive, according to D. V. Glass, who has made a careful examination of the material. In his "Population Policies and Movements", published early in 1940, he says (p. 202): "it is evident that they have not been influential enough to cause a rise in fertility, or even to stabilise fertility at its already low level of five or ten years ago. On the other hand, it is probably true that the family allowance system in France has helped to reduce infant mortality, and it is likely that this has also been the case in Belgium."

When families are not far from the border-line of poverty, there is no doubt that the advent of babies aggravates their economic condition, which inevitably reacts on the health and nutrition of all the members of the household. Evidence of the appreciably higher incidence of poverty among children than in the general population was obtained in the course of three social surveys, namely London, Merseyside and York. It is evident, therefore, that to subsidize the maintenance of children should be one profitable way of attacking the problem of poverty. But, while agreeing to this, it is still possible to hold the view that it might be wiser to give the subsidy in kind—better provision of infant welfare services, school dinners, improved housing, or some other form of social assistance—rather than in the form of a cash allowance to the parents, who might be tempted not to spend it on the children.

Contributory and Non-Contributory

The main arguments for and against family allowances are summarized in the Government White Paper without discussion. The cost is then estimated on various alternative assumptions. Thus, an allowance might be paid in respect of every child in the family; it might be paid only in respect of the second and subsequent children; or it might be paid only in respect of the third and subsequent children. Again, the scheme might apply to all parents, or it might be limited to parents below an agreed level of income, or to parents who are already subject to compulsory national insurance. The advantages and disadvantages of these various alternatives are briefly examined in the memorandum. Other equally important questions arise for consideration. Should the scheme be paid for by the State, the employers, the parents of the beneficiaries, or by some combination

of these three parties on the principle adopted for national insurance purposes? Finally, if the scheme is to be contributory, should it be also compulsory?

Let us start with a contributory scheme. It is estimated that, in order to provide a flat-rate allowance of 5*s.* a week for each child of parents in insurable employment, the child to be less than fifteen years of age unless still receiving full-time education, the weekly contribution which would be required of every employed person (other than juveniles presumably) would amount to 2*s.* 8*d.* a week. As a matter of practical administration, the scheme would in this case no doubt be fitted on to the existing contributory pensions scheme, and the contribution conditions would be the same for both; in other words, the State, the employer, and the worker would each contribute a share of the total estimated cost. It is further assumed that full contributions would be paid into the pool in respect of members of the armed forces, that equal contributions would be paid in respect of men and women, and that parents would continue these payments even when in receipt of benefit. The last-mentioned assumption means in effect that the nominal weekly allowance of 5*s.* for the parent with one child would be reduced to 2*s.* 4*d.*

No allowance has been made in this estimate for the cost of administration and, in view of the relatively small net benefit available, it would seem that a non-contributory scheme—though more costly to the public in general—might give a better return for the labour and expense incurred. We pass on therefore to consider a scheme where the whole expense would be borne by the Exchequer.

The estimated gross cost of a non-contributory scheme giving allowances at 5*s.* a week in respect of each child as before is £132 million a year. If the first eligible child in each family were excluded from benefit, the gross estimated cost would fall to £58 million a year. These calculations are made on the assumption that the allowances would be available for all classes of the population irrespective of their incomes. Additional estimates have been made, however, on two different assumptions: (a) that the benefits would only be available to parents with incomes of £260 a year or less; and (b) that the benefits would only be available to parents already compulsorily insured for contributory pensions or, if not so insured, whose incomes amount to not more than £420 a year.

Clearly, the administration of the first of these two alternative schemes would involve a means test and for that reason it might not be very popular. The second scheme would be much easier to administer, because the bulk of the families eligible for benefit are already dealt with for national insurance purposes. Confining our attention accordingly to the (b) scheme, it is estimated that the gross cost of providing 5*s.* a week for every eligible child in the family would be £124 million a year. If the first eligible child were excluded from benefit, the gross annual cost would be reduced to £55 million.

These are the gross estimates, but the actual net cost under each head would be rather less, because there would be some saving of expenditure on children's benefits provided by existing social services of one kind or another. These benefits would naturally be revised to avoid duplication with family allowances. For example, where the needs of the family are assessed for the determination of benefits, as in making grants of unemployment assistance, family allowances would have to be taken into account.

It is impossible to estimate all such savings with precision. In so far as an estimate can be made, the total sum saved is put at £7 million a year for a scheme covering all eligible children, and at £3 million for a scheme covering all eligible children except the first in each family. These same figures are used whether the benefits are to be available for all parents or confined to a particular class. It follows that for a universal scheme, covering all parents, the estimated net cost under existing conditions to provide a flat-rate allowance of 5s. for every child less than fifteen years old, or over that age if still receiving full-time education, would be £125 million a year; and to provide allowances for all except the first eligible child in each family the net cost would be £55 million a year. The corresponding figures for a scheme confined in the main to the classes in the population which are already subject to compulsory national insurance would be £117 million and £52 million.

It would be unfortunate if we missed this opportunity of introducing a long-overdue reform. It might be well to start modestly with a scheme covering every eligible child except the first in each family, but to make it universally applicable since, if we can accept the above figures as reasonably accurate, the difference in cost between the universal and the limited scheme is relatively so slight. This would be of help to all except the smallest families. Eugenists would like also to give additional encouragement to families with the best heredity, but to discover the 'best' in this sense and to define it for administrative purposes would be difficult.

RECENT WORK ON GERMINATION

OPENING a discussion on seed germination held at the Linnean Society on May 14, Dr. M. A. H. Tincker, of the Royal Horticultural Society's Gardens, Wisley, read a paper dealing with the physiology of germination and incorporating some hitherto unpublished data of germination studies made at Wisley. The importance of low-temperature storage with low relative humidity tested in the United States was illustrated by common vegetable seeds including onion, carrot, leek and tomato. The response of seeds or achenes to various 'stratification' periods and temperatures so fully worked out at the Boyce Thompson Institute was also brought under review. With a number of lilies the seedling roots may grow but the shoots of certain species frequently do not appear for a year or more; while a higher temperature favours root growth, the dormancy of the epicotyl may be terminated by exposure to lower temperatures for a month or two. The seeds of further species of *Primula* have been shown to be light sensitive. Vernalization studies made at the Imperial College, in which very small embryos may grow into large plants almost as rapidly as normal grain, have an important bearing upon the question of small and large seed. The conditions favourable to the growth of small embryos in *Fraxinus* were mentioned, as was the widely different behaviour of the acorns of different oak species in regard to their after-ripening requirements in contrast to their similarity in respiration during winter. The interesting artificial methods used in Java of division of young, valuable seedlings of rubber at an early stage of germination to give a greater number of plants were described.

Mr. T. Hay referred to the germination of *Emmenanthe* (whispering bells) in soil which has been heated. *Romneya coulteri* also germinated better in heated soil. He stated that *Grevillea robusta* seed when placed in soil edgewise gave a higher germination than when flat. He mentioned the great difficulty experienced in raising many *Cypripediums* and the failure of imported seed. Referring to temperature conditions he cited *Nemesia* as germinating better at low temperatures despite its origin, and in regard to age and maturity preferred two-year-old leek seed and stated that old seed of stocks gave a higher proportion of doubles. He concluded by recounting the interesting story of the re-introduction of *Lathyrus magellanicus* by seed.

NELUMBUM FROM THE SLOANE COLLECTION. Placed in water, after removal of seed-coat, at 5 p.m. on May 12, 1942. Temp. 32° C. At 2 p.m. on May 13, 4 in. long. Kept at room temperature afterwards and photographed on May 17, at 10 a.m.

Mr. G. W. Robinson remarked upon the slow germination of Hellebore seed often after 3-4 years from date of sowing, and commented on the *Primulas*, some of which proved troublesome. High temperatures in bush fires, well known to cause germination in *Acacia* spp., were observed in South America by him to cause *Sisyrinchium striatum* to germinate readily. Seed some eighty years old of *Cytisus*, *Melilotus* and other species had been successfully germinated.

Dr. J. Ramsbottom exhibited seedlings of *Albizia Julibrissin* and *Nelumbium*. The seeds of the *Albizia* were collected during Sir George Staunton's mission to China in 1793 and then stored in the Department of Botany at the British Museum. Following the fire in the Department at South Kensington due to an air raid in September 1940, the seeds became damp and when they were examined in November, were found to have germinated. Three of the seedlings were planted, and grown on at Chelsea Physic Garden; only one, however, survived the air attacks of May 1941. The main interest is that the seeds germinated 'spontaneously' after their 147 years storage.

Three *Nelumbium* seedlings were shown. Two of