Ten days is a shorter period than that hitherto accepted for the *A. minimus* life-cycle (hatching to pupation only has been said to occupy 9–12 days). It seems likely that the causes of the population fluctuations of *A. melas* and *A. funestus* are the same as those of *A. minimus*, and that the life-cycle of these species, too, is shorter than has hitherto been supposed.

C. R. RIBBANDS.

No. 2 Entomological Field Unit,
India Command.
Aug. 3.

[1] Ribbands, C. R., *Bull. Ent. Res.*, **35**, 271 (1944).

Erosion in the Sudan

MR. E. N. CORBYN'S recent article headed "Soil Conservation in the Anglo-Egyptian Sudan"[1] is especially significant at the present moment. The appointment of the Committee to inquire into this question was timely. The vital points which are stressed throughout the Committee's Report (which is discussed in Mr. Corbyn's article) are as follows: (1) The absence of trees, shrubs and vegetation. (2) Erosion caused by excessive population. (3) Feeding of cattle. (4) Cutting of wood for fuel.

Twenty pages are devoted to a repetition of the same trouble in each district from one or all of the above causes. It is imperative to ascertain the proportions of the different causes leading to the erosion of the soil—that is, how far human activities are responsible for either actual damage or neglect and how far the cause is beyond the control of human agency. An eminent writer has remarked that the products of Nature can be divided under two heads: those that cannot be reproduced, such as minerals, coal, etc., and those which we can replenish by scientific research and practice. Certainly our forests come under the second heading, and in the past far too little attention has been given to this subject. For many years time and money have been freely expended in scientific research in the best interests of agriculture and for improvements in food products—both quantity and quality; machinery has been devised and discoveries made which have changed barren into fertile land. In some countries—alas, too few!—both in research and practice the same activity has been shown in regard to re-afforestation, but such vigorous action has been rare.

The Sudan covers an area far larger than France and Germany put together, extending about 1,600 miles from extreme north to south and about 950 miles from east to west, part desert and barren land, with scarcely a shrub or tree to be found, and other sparsely covered.

In America in the course of the last ten years or so tremendous changes have been wrought, especially in the Tennessee Valley, where scientific research and practice have been turned to good account for the well-being of the people. One hundred and fifty million seedling trees have been planted on hundreds of thousands of acres of land which was formerly useless, and more than one million acres have been converted into farms of great productivity, thus improving the amenities of the country to such an extent that it has become unrecognizable.

Again, the thrifty French, having an area of some one and three-quarter million acres of land south of Bordeaux which was useless, planted it up with maritime pine (*Pinus pinaster*) and in successive years produced an annual income of more than £500,000.

The traveller approaching Rangoon by sea will notice that the water is so impregnated with sand that supplies of water to the ship are cut off: the Irrawaddy and Salween Rivers are impregnated in the same manner. For more than nine hundred miles the Irrawaddy continues to wash the soil of Burma out to sea. This process has been going on for thousands of years, the two great mountain ranges disintegrating and the conversion into desert hourly proceeding. The Forest Department in 1920 found themselves with more than 100,000 tons of teak trees stranded through the tributary rivers changing their course. Concrete embankments had been built, but were washed away. Mr. F. A. Leete, chief conservator of forests, assisted by Mr. G. C. Cheyne, made a discovery. They found that by driving bamboo sticks into the sand at intervals of about 9 in. apart the river formed its own barrier[2]. By this method great success was achieved: it might be practised far more extensively and perhaps prove a successful barrier to erosion.

Mesquite (*Prosopis juliflora*), one of the finest root-producing trees, has been planted in the Sudan: how extensive this planting has been, or what success has been achieved, the report does not say. The mesquite tree is remarkable for its spreading roots and the manner in which they check erosion of the soil, and it is on record that the roots penetrate to 50 ft. and even as much as 75 ft. beneath the surface of the ground.

No reference is made in the report to any planting of eucalypts. Possibly these have been tried and found unsuccessful, but although their root production is not as good as the Mesquite they have the extra advantage of providing large quantities of fuel wherever they can be grown.

Acacias, making a selection of the particular sort which has the best character for rooting, should be planted, everywhere in abundance, without a moment's loss of time.

At recurring intervals, different peoples in every part of the world have been driven away from their country through the deadly effects of erosion of the soil. Measures have been recommended and laws have been passed to try to combat this, but have either been abandoned or put into force too late to obviate the unfortunate results.

A. L. HOWARD.

4 Stanhope Street,
Euston Road,
London, N.W.1.
Nov. 20.

[1] *Nature*, **155**, 70 (1945).
[2] Leete, F. A., and Cheyne, C. C., "Regulation of Rivers Without Embankments" (London: Crosby Lockwood and Son).

The British Commonwealth Scientific Office and Non-Governmental Science

THE recent article by Dr. A. King[1] on the British Commonwealth Scientific Office raises the question of the relations of governmental science and non-governmental men of science. As its executive officer between 1941 and 1944, I am well aware of the services which the Office rendered to the scientific departments of the Ministries, to the Department of Scientific and Industrial Research and to the Medical and Agricultural Research Councils, and I know also that it was always willing to stretch a point and give any assistance within its power to outside bodies and individuals. But its 'extra-curricular' activities were severely circumscribed by its inability to spend funds except on behalf of a Government department. Now that the majority of scientific men are, it is hoped, becoming free, should not this agency serve scientific men and institutions outside the official orbit? Indeed, one might ask if Britain can afford a scientific agency in the United States, at a cost to the Treasury probably equal to the running expenses of several of the major scientific societies together, if it is not to serve all the principal groups of scientific workers.

That many men of science now need such assistance in obtaining their urgent needs from the United States is undoubtedly the case. Perhaps I may be permitted to quote one small example from my own experience. In the course of my work, I wished to obtain a protein preparation recently advertised in American journals. I wrote to the makers and asked for a quotation, stating that I would endeavour to place an order through one of the recognized British wholesalers. They replied that at present they were only supplying it directly to the users. I do not know how the modest dollar expenditure required can be arranged.

I understand there are cases in which university institutions are in urgent need of apparatus from the United States. In some instances it is obtainable without any expenditure of British funds, being a free gift or financed by American grants, but it cannot be imported because the import duty and purchase tax chargeable are prohibitive.

Such difficulties would be readily overcome if the official channels and other facilities were available to universities and similar institutions. Purchases of apparatus and materials in the United States would be greatly assisted if an official body such as the University Grants Committee assigned a certain sum, to be allocated among the universities of Britain in accordance with their needs, and to be used by the British Commonwealth Scientific Office to obtain their requirements in the United States. Unless some such arrangements are made, independent men of science will be at a considerable disadvantage, as long as the present dollar restriction continues.

J. A. V. BUTLER.

The University,
Edinburgh.
Jan. 23.

[1] *Nature*, **157**, 63 (1946).

Academic Scientific Men and Consultants

MAY I be permitted, as a consultant of more than twenty-five years experience, to comment on the leading article in *Nature* of January 26?

It would be a mistake to suppose that consultants are less competent to undertake fundamental research than their academic colleagues; what happens is that the consultant in industry increasingly tends to be preoccupied with day-to-day problems and *ad hoc* investigations, so his attention is apt to be diverted from the pursuit of more abstract knowledge. It is very important that this should not happen to the academic man of science; there needs to be a strict limit to the amount of outside work which he should pursue, despite the pull of finance or industry.

As is so well said in the article in *Nature*, one of the primary functions of the university is to provide research workers for industry; it is agreed that this is best done if the university teachers are themselves active in fundamental research. There is need, too, for the production of those men who will be the consultants of the future, for there are quite a number of branches or subjects in which even to-day there is a shortage, or even complete absence, of skilled persons who are able to undertake work for which there is present industrial demand.

Having a long experience of consulting practice, may I say, too, that it is contrary to experience to argue that as industry pays more attention to research there will be less call for the services of the consultant. It is true that more and more firms set up their own laboratories and research departments (though this name is sometimes inappropriately applied). The effect of this is, however, to increase the demands for outside services of the more specialized kind and to increase the calls on the consultant by other firms. It can be said without fear of contradiction that the calls for consultant facilities have increased—and changed perhaps—during the last twenty-five years, and are still increasing. I think they will continue to increase; but it is more than ever necessary for the consultant to be himself up to date and of progressive outlook. The methods, equipment and standards of a generation ago are inadequate to-day, and this may involve capital expenditure and expenses on a higher level than of old.

There can be no doubt that the existence of a competent body of independent consultants is of real value to industry, and that suitable persons should be encouraged to launch out into new fields in which there is a shortage. So it is important that such persons should not be subject to competition from State-supported institutions in their ordinary work for individual firms.

IT appears to me that academic institutions should not undertake work for which private facilities exist, and that their assistance should be, in the main, for the benefit of industries as a whole rather than for private interests. Most consultants welcome co-operation with their academic colleagues and realize how valuable their aid to industry can be.

H. E. COX.

10 Billiter Square,
London, E.C.3.