
Closing Remarks

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Closing remarks

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In attempting to round off this excellent series of reviews and discussions I should first acknowledge and accept with appreciation many of the points made by various contributors to our discussions, especially those of Sir Cyril Clarke, Professor Fogg, Dr Holdgate, Professor Waddington and Professor Clapham; and then confess that I am the first and only person mentioned in the programme with no direct association with the I.B.P.

The international I.B.P. effort was indeed considerable, and not least the U.K. contribution to it. Just what were the original objectives? In brief, the ‘promotion of basic knowledge relevant to the needs of man’. Whether overtly concerned with ecosystems or with human adaptability, the I.B.P. was essentially a programme of ecological investigations, though perhaps an impossible task with the problems faced and the resources available.

In general, the U.K. contribution to the I.B.P., coordinated with the help of so many scientists by the Royal Society (under the chairmanship of Professor Clapham) was devoted to just these same general aims. Programmes of widely varying size were developed, with a very necessary emphasis on comparable if not standardized methodologies, mainly in the U.K. but supplemented by expeditions to, and longer-term work in, greater and smaller regions ranging from the tropics to the antarctic. If anything like world coverage was to be obtained, such diversions, by such a scientifically developed country, were most important for achieving the objectives of the I.B.P., and we have been able to hear something of what has been achieved abroad by the U.K. in a number of these reviews, and also in contributions to the discussions. Thinking of the I.B.P. as a whole, and the U.K. in particular, this form of loosely coordinated international investigation, largely at the academic or non-governmental level, must be among its major achievements, even if there is evidently a long way to go. I suspect also that it was of considerable value to the U.K. scientists themselves.

For, despite the undoubted international nature and traditions of science, it is not easy for the individual investigator to realize just what problems are faced by any decision to collaborate, with an emphasis on interdisciplinary studies, at the international level, and especially on a large scale. I can well appreciate these problems, partly through having been able to see in the International Council for the Exploration of the Sea and in the Fisheries Department of the F.A.O., something of what can be done once the need has been thoroughly appreciated; and partly through seeing, even in those stimulating environments, what real inhibitions could persist, even when the need was urgent and self-evident, and indeed can develop forcibly in some new situations. What kinds of problems were then faced, nationally and internationally, when the coordination of the I.B.P. began, with objectives ranging from marine productivity to tropical forests, human genetics and food supplies?

First, the problem of getting to know and understand (and not just in language terms) people whose names at the best were previously only associated with ‘papers’ in journals; people who in some instances were brought up in a very different national and even scientific

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tradition. And here is another of the considerable achievements of the I.B.P., in stimulating non-governmental scientists to meet and work with other and 'foreign' scientists, who otherwise might never have been more than names to them.

Then after, and often during, that difficult phase there is the need to decide just what to do, and above all how to do it, with all the problems of agreeing on standardization, or at least intercalibration. In this respect another great achievement of the I.B.P., in which the U.K. has played a major part, to judge by the publication list to date, has been the series of the I.B.P. handbooks of which we have heard from time to time.

Yet another problem concerns the widely ranging differences in resources of the various countries concerned, from vast U.S.A. to little Iceland, though fortunately each within the same scientific tradition, and from even vaster India and U.S.S.R. to, for example, Kenya or Zaire, with resources and needs, and points of view, differing so greatly.

Then, of course, when all is agreed, a project has to be begun, developed and hopefully completed, after which there follows the always difficult period of assimilating the results and agreeing on their interpretation; and then publishing them by one means or another. In all this, the U.K. has been, and is being, very successful, although perhaps it is fair to say that, even in such a scientifically advanced country, while basic knowledge has been advanced considerably, not infrequently the advance has in the best sense been mainly in untangling some of the complications and pointing towards what has yet to be done; and I detect in such international reports as I have seen that much the same comments could be made on the results from many other scientifically advanced countries.

Two important points, to my mind, emerge from what we have heard, perhaps not so much simply in respect of the U.K. but also as regards the I.B.P. in general. First, the whole subject of the organism and the environment is a most complex one: in its way, I firmly believe, as complex if not more so than any other. By the I.B.P. as a whole, and indeed by its U.K. component, many important aspects of this relationship have been tackled, and much achieved. But, even in the most successful instances, there is a long way yet to go; and not only in the specific object of providing urgently needed knowledge and understanding, but also in the process of genuine collaboration – actually 'working together' on some problems, between individuals, within and between disciplines, within and between institutes, and within and especially between countries.

If this is true of a group of investigations which, broadly speaking, were inspired within and by the U.K., how much more must it have applied to those countries with much less by way of resources, material and scientific? From one point of view, one may say that this is not the concern of this meeting. But from another, as several have stressed, the problem of communicating and working with scientists of the developing countries is a vital one, and was to some extent implied as a problem for the I.B.P. as a whole. International collaboration there has been, and as I have said, at the best it is never an easy matter. Often, however, and not only in the U.K., it took the easiest form, that of collaboration with scientists from countries similarly well developed in scientific terms. There was regrettably less collaboration with countries at an earlier stage of scientific development, many of them in or near the tropics, where all too few scientists, with too poor resources, are often facing problems of vast magnitude regarding which our ecological understanding is admittedly very inadequate and the need for research all the greater. A glance at the list of international I.B.P. reports suggests that the U.K. position in this was not unusual and may indeed have been better than average.

The I.B.P. provides many lessons for those growing organizations which it may be considered to have stimulated, if not originated. If the study of the world problems of the environment and man's welfare, which were investigated in the I.B.P. and are to be investigated further in S.C.O.P.E., M.A.B. and U.N.E.P., is to be significantly advanced, and the resulting knowledge and understanding effectively applied, then we must bring in the developing countries and their scientists much more fully than we have managed to do so far. There may even be a case for believing that, despite satellites and other modern developments, to some degree world progress in this field will be limited by that of the least developed countries; and this may become the more so as those developing countries with a little knowledge become suspicious (as we have seen in international marine affairs), not only of the understanding but also of the motives of more developed countries. I believe that S.C.O.P.E., M.A.B. and U.N.E.P., and their U.K. components, must do far more than they have done, not only to provide for training others in environmental science but also to induce the maximum of positive 'working together' wherever it can be brought about.

Lastly, and I have already touched on this, how limited is our understanding and even our knowledge. Scarcely a contribution during the last two days has failed to illustrate this; several stress it, and the contributors are to be commended for their modesty in drawing attention to problems remaining as well as to real progress achieved. It is not so long since most ecologists and related scientists must have felt relatively neglected in governmental terms; and now they are being called on for advice more and more, both nationally and internationally. While among the first to confess that they do not yet have all the answers, partly because they have not yet had the necessary means, they really are the people with such understanding as we have, and who (given the resources) alone can get what we still need. Briefly, this is sufficient knowledge and understanding to advise how (in the words of my old friend Geoffrey Kesteven) 'to control and direct the use of resources and interference in resource systems so as to obtain maximum short-term and long-term benefits', while at the same time ensuring that 'every resource-use project should include appropriate restorative or compensating measures'. No one else can do this and, in the face of such great responsibilities, the environmental scientists might easily panic and say that they do not know the answers; or alternatively develop swollen heads and promise 'answers' in a year or so. While recognizing their significance, and therefore endeavouring to ensure that they have the resources to try to meet their responsibilities, the scientists concerned must also recognize, and continue to emphasize, their limitations and, as at present, give such advice as they can both firmly and with great modesty. The solutions demanded of them will come neither easily nor quickly! This too is something that those concerned in furthering the aims and work of S.C.O.P.E., M.A.B. and U.N.E.P. must note, and it is good to see that U.K. scientists are prominent among the organizers and indeed the work of all three.