The biology of high-altitude peoples

THE INTERNATIONAL BIOLOGICAL PROGRAMME

The International Biological Programme was established by the International Council of Scientific Unions in 1964 as a counterpart of the International Geophysical Year. The subject of the IBP was defined as 'The Biological Basis of Productivity and Human Welfare', and the reason for its establishment was recognition that the rapidly increasing human population called for a better understanding of the environment as a basis for the rational management of natural resources. This could be achieved only on the basis of scientific knowledge, which in many fields of biology and in many parts of the world was felt to be inadequate. At the same time it was recognized that human activities were creating rapid and comprehensive changes in the environment. Thus, in terms of human welfare, the reason for the IBP lay in its promotion of basic knowledge relevant to the needs of man.

The IBP provided the first occasion on which biologists throughout the world were challenged to work together for a common cause. It involved an integrated and concerted examination of a wide range of problems. The Programme was co-ordinated through a series of seven sections representing the major subject areas of research. Four of these sections were concerned with the study of biological productivity on land, in freshwater, and in the seas, together with the processes of photosynthesis and nitrogen-fixation. Three sections were concerned with adaptability of human populations, conservation of ecosystems and the use of biological resources.

After a decade of work, the Programme terminated in June 1974 and this series of volumes brings together, in the form of syntheses, the results of national and international activities.

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The biology of high-altitude peoples

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Foreword

The investigations of human populations within the Human Adaptability Section of the IBP (1964–74) were planned on a worldwide scale. One objective was to obtain comparable data on population characteristics over a wide range of ecosystems. Another was to examine and compare different ethnic and economic groups within similar biomes. A major effort was directed at a comprehensive coverage of the high-altitude and circumpolar regions of the world. Yet another aim was to direct international biomedical teams to 'threatened' or disappearing groups – hunter-gatherers and simple agriculturists – to study their often highly distinctive ecological characteristics (and at the same time to provide biomedical help). Yet another objective of interest to many participating countries was the biological condition of populations undergoing migration or living under man-made urbanized conditions.

When in 1974 the IBP was brought to a close, the Human Adaptability Section had largely fulfilled this global programme. Over 50 countries had mounted some 250 projects. Several thousands of scientific papers have already been published along with some 30 detailed monographs dealing with particular national projects. Details of all the contributing countries, their projects, the team personnel and their publications and reports (as known in 1975) are to be found in *Human Adaptability: a history and compendium of research within the IBP* by K. J. Collins & J. S. Weiner (Taylor & Francis, London 1977).

Over and above the purely local interest of a national project – and this is always important – the data obtained from different HA investigations can be utilized in many different ways; the exploitation of the findings will certainly go on for a long time. However, the Special Committee for the IBP decided that an immediate effort should be made to put together a significant proportion of the material in a series of readily accessible 'synthesis' volumes. Within this series of some 30 volumes, six have been planned to cover some of the major approaches mentioned above within the HA Section. The present volume under the editorship of Professor Paul Baker is the third of these to appear.

The first volume (Phyllis Eveleth & J. M. Tanner) deals in a systematic and comprehensive manner with a fundamental characteristic of human beings the world over, namely, development and physique. In this volume, children's growth patterns in particular are examined on a world scale in relation to many factors including climate, disease, nutrition and genetic constitution. The extensive tabulations make this an invaluable survey of base-line growth data for some hundreds of population samples.

Like this volume on growth two further volumes will deal with major response systems of the body. Professor R. J. Shepard has prepared a detailed and intensive survey of physiological work capacity of communities the world over. A synthesis volume on HA investigations into the tolerance to high temperatures and functioning of the respiratory system is also in preparation. In these volumes the significance and causes of variations in these physiological parameters are analysed in detail and a large amount of original data is brought together.

The present volume edited and prepared by Professor Baker and that by Professor Milan, now in press, each comprise a comparative survey of the demographic, genetic and biomedical characteristic of communities living respectively in high-altitude and circumpolar biomes. Each is aimed at understanding how communities differing in their economic base, in population size, and in genetic make-up, come to terms with the particular stresses of life in these environments.

The sixth volume, edited by Professor Ainsworth Harrison, and already published, complements all the other volumes in an interesting way. It comprises a series of case studies each of which provides a vivid illustration of special aspects of population biological structure which enter into the comparative surveys in the other volumes.

The appearance of this synthesis volume affords an opportunity for me as Convener of the HA Section to pay tribute to the vital contribution made by Professor Baker to this major aspect of the HA Programme. Without his enthusiastic leadership in his capacity as Coordinator of the high-altitude population theme and his inspiring field work in the High Andean region carried out year after year within the IBP, this major success of the programme would not have been achieved. His strategic understanding of the problems and opportunities of field work in the high mountain regions of the world is very well displayed in his contributions to this volume. As Theme Coordinator he was in close touch with the teams working in all the other high-altitude regions and he visited many of these locations. The present volume, which gives a worldwide conspectus of high-altitude communities, and the monograph *Man in the Andes: a multidisciplinary study of high-altitude Quechua* co-edited by Michael A. Little (Dowden, Hutchinson & Ross, Stroudsburg, Pennsylvania, 1976) which deals very largely with the work carried out and supervised by Professor Baker, represent major landmarks in our understanding of the mechanisms and limits of adaptation of human beings living and working at high altitudes.

J. S. WEINER

IBP Human Adaptability section publications

J. S. Weiner (1969).
A guide to human adaptability proposals
Blackwell Scientific Publications, Oxford. 88 pp.

J. S.Weiner & J. A. Lourie (1969).
A guide to field methods
Blackwell Scientific Publications, Oxford. 652 pp.

S. Biesneuvel (ed.) (1969).
Methods for the measurements of psychological performance
Blackwell Scientific Publications, Oxford. 110 pp.

P. B. Eveleth & J. M. Tanner (1976).
Worldwide variation in human growth
Cambridge University Press, London 498 pp.

G. A. Harrison (ed.) (1977).
Population structure and human variation
Cambridge University Press, London. 342 pp.

F. Milan (ed.).
The biology of circumpolar peoples
Cambridge University Press, London. (In press.)

P. Baker (ed.) (1978).
The biology of high-altitude peoples
Cambridge University Press, London.

J. S. Weiner & J. E. Coles.
Components of human physiological function: thermal responses and respiratory function
Cambridge University Press, London. (In preparation.)

R. J. Shephard.
Human physiological work capacity
Cambridge University Press, London. (In press.)

A detailed guide to all the IBP projects contributing to the theme of this volume is given in *Human adaptability: a history and compendium of research within the IBP* (1977) by K. J. Collins & J. S. Weiner, published by Taylor & Francis Ltd, 10–14 Macklin Street, London WC2B 5NF. A collection of HA reports, reprints and archival material is held in the Library of the British Museum (Natural History), Cromwell Road, London SW7 5BD.