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## 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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INTERNATIONAL BIOLOGICAL PROGRAMME 11

# Population structure and human variation

EDITED BY

**G. A. HARRISON**

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# Foreword

**J. S. WEINER**

Convenor HA Section, IBP

The investigations of human populations within the Human Adaptability Section of the IBP (1964–74) were planned on a world-wide 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. Yet another 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 HA Section had largely fulfilled this global programme. Over 50 countries had mounted some 250 projects. Several thousands of scientific papers have been published along with some 30 monographs on particular national projects. Particulars of all the contributing countries, their projects, the team personnel and their publications and reports are to be found in *Human Adaptability: A History and Compendium of Research within the I.B.P.*, K. J. Collins & J. S. Weiner (Taylor & Francis, London).

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 material 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, five have been planned to cover some of the major approaches mentioned above within the HA Section.

*The Biology of Circumpolar People*, ed. F. A. Milan

*The Biology of High Altitude Peoples*, ed. P. T. Baker

*Worldwide Variation in Human Growth and Physique*, by J. M. Tanner & P. B. Eveleth

*Components of Human Physiological Function*, ed. J. S. Weiner

*Population Structure and Human Variation*, ed. G. A. Harrison

The present volume is the second of these to appear.

The first and second volumes each comprise a comparative survey of the demographic, genetic and biomedical characteristic of communities living in circumpolar and high altitude biomes. Each is aimed at understanding how

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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. In these two volumes, practically every aspect of population biology comes under scrutiny.

The third 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 the third, the fourth volume is concerned with major response systems of the body. Three physiological characteristics are examined for a wide range of communities living in a wide variety of conditions. These comprise physiological work capacity, respiratory capacity and tolerance to high temperatures. 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 last of the group, the present volume, edited by Professor G. A. Harrison, complements all the other four 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 four volumes. Population structure may be taken as referring to the biological linkages and relationships – genetic, demographic, nutritional, etc. – between individuals and families within a society as well as to the aggregate of individual states of development, health, disease resistance, physiological functional capacity and genetic constitution. These attributes make up the variation and polymorphism characteristic of a population. In the adaptive sense, the survival and homeostasis of a community ultimately depend on two dimensions to which all the attributes contribute – physiological fitness in the short term and reproductive fitness over the long term.

These are the issues treated in the case studies. They focus on particular aspects of structure and functional constitution and on the forces or agencies which have affected the community in the past or are acting on it in the present.

In his introduction to this volume, Professor Harrison, provides a comprehensive guide to the particular topics of each case study and draws attention to their significance for understanding the major issues of evolutionary differentiation, genetic affinity, ecological adaptation, and the effects of migration, isolation and urbanization.

Finally, there is one feature of these contributions which adds enormously to their interest. In nearly every case the contributor provides a picture of the 'cases' as living communities, going about their everyday activities and in settings which range from the tundras of Siberia to the Pacific Islands, from the Amazon to the savannas of Africa, from small and isolated settlements to modern cities.



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## Preface

During the IBP many Human Adaptability (HA) projects from most participating countries had a primary concern with the genetics, demography, or the health of human populations. It would be quite impossible to review with justice all these contributions in a book of reasonable length, especially as analysing components of human adaptability involves the micro-analysis of innumerable very individual situations. Populations differ in endless idiosyncratic ways, and the human characteristics which are relevant for examination are almost infinite. It was, therefore, felt that the spirit and achievements of that part of the HA IBP dealing generally with population structure and function could best be dealt with through a number of case studies. The problem, of course, became 'which studies?' Any selection was bound to be invidious, particularly as in addition to scientific merit a number of other considerations had to be taken into account. Clearly it was necessary to choose projects which represented the whole variety of problems and approaches tackled by HA investigators interested in population biology. Then, as far as possible, an International representation was required, both in terms of the nationality of investigators and of the nations in which the work was done. Note, however, was taken of the fact that structural/functional studies were inevitably being encompassed in other IBP synthesis volumes, particularly *The Biology of High Altitude Peoples* and *The Biology of Circumpolar Peoples*. It was also felt desirable to concentrate on 'in depth' studies, especially those requiring a multi-disciplinary integrated approach. The IBP has provided a very important stimulus to such researches. These anyway were the factors considered in extending the invitations to the authors of this volume. Other equally good selections were possible, but it is felt that the present collection well exemplifies the IBP achievements in the field of human population biology. Contributors were asked to prepare their papers as broad reviews, aimed at the sort of level young research workers of the future would find helpful in understanding population biology, its objectives, methods and achievements, and its difficulties and failures, in the 1960s and early 1970s. For this policy the editor must assume total responsibility.

*April 1976*

G. AINSWORTH HARRISON