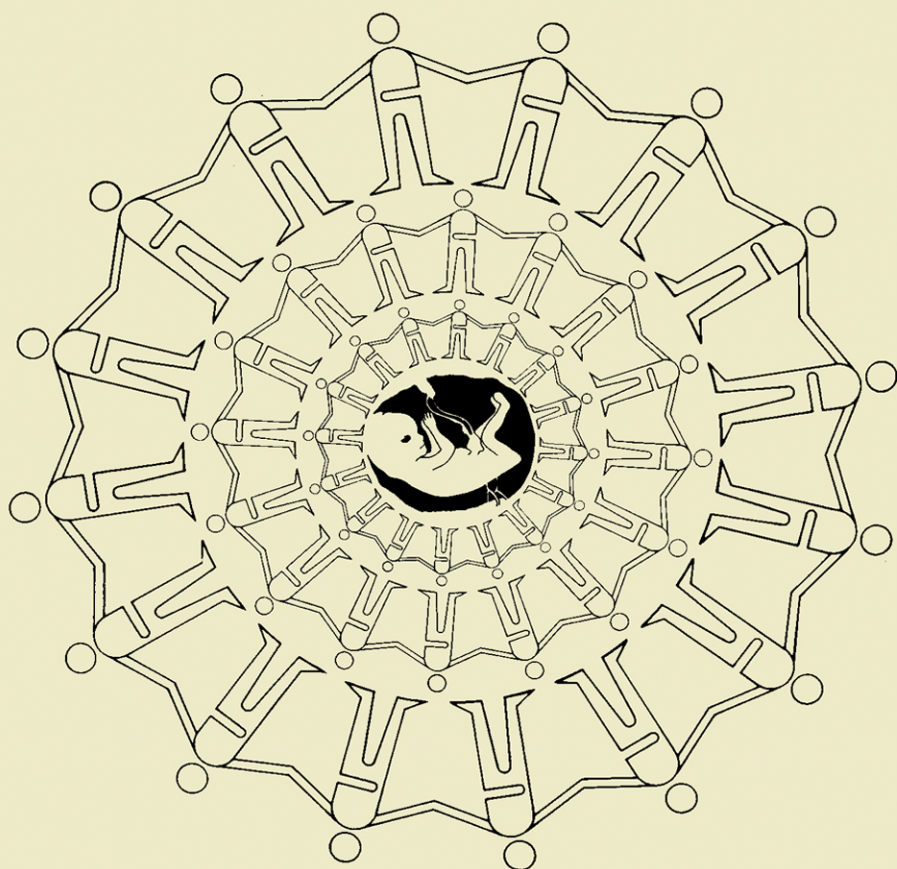




HEREDITY AND SOCIETY

Edited by

IAN H. PORTER • RICHARD G. SKALKO

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HEREDITY AND SOCIETY

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Assistant Editors

SALLY KELLY • DWIGHT T. JANERICH

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New York State Department of Health
Albany, New York*

*Proceedings of a Symposium on Heredity and Society
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FOREWORD

This volume is a record of the second symposium held in Albany, New York on October 26 and 27, 1971, sponsored by the Birth Defects Institute of the New York State Department of Health.

This second symposium was attended by registrants from 16 different states across the country and from several Canadian provinces. Last year's symposium was equally well attended, but to me, the size and the caliber of this scientific group was of special significance. Many had returned for the second time, which seemed an indication that those who took part in the first symposium found it of value, as we certainly did.

Our Department has a long history of dedication to research. We have continued to seek new scientific knowledge and develop new techniques for improving people's health and well being. More than 40 percent of our operating funds go to support research in cancer, heart disease, kidney disease, and other critical areas. To this we have added the Birth Defects Institute, created by legislative action in 1967. The Institute investigates the causes and treatment of birth defects, conducts education and training programs, maintains a chromosome registry to aid physicians across the State in the diagnosis and treatment of birth defects, and provides counseling and referral services for parents with affected children. And, of course, it conducts symposia such as this.

The presentations from last year's program on the environmental causes of birth defects have been published by Academic Press.¹

I think you will find the presentations in this volume thought-provoking and stimulating and that you will benefit greatly from the exchange of ideas in this medical discipline.

The function of these symposia is to focus the attention of health professionals on new knowledge in medical genetics—areas that most of the public knows of vaguely. We have chosen topics to consider and discuss, with which the medical scientists, in general, have not as yet come to grips, but

¹The first volume: Hook, E. B., Janerich, D. T., and Porter, I. H. (Eds.), "Monitoring, Birth Defects and Environment— The Problem of Surveillance," Academic Press, New York and London, 1971, p. 308.

FOREWORD

are about to—such as the genetic implications of population control and abortion—particularly in this State, where we have had over 200,000 abortions in the last year.

These are exciting and important questions and there will be a lot of discussion, now, and in the future—and possibly a few answers will evolve. The central theme, “Heredity and Society” means taking part in the exploration of the science of genetics as it affects and is affected by modern life. Obviously, there is much to be learned of this complex relationship. This symposium is part of that learning process and we sincerely hope that it will prove to be a valuable part.

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The Symposium upon which this volume is based could not have taken place without the expert administrative efforts of Edwin C. Jones and Sylvia Sickles. To them and the rest of the Staff of the Birth Defects Institute, and to Kathleen Decker and Ellen Heenehan for their assistance to the editors in the preparation and typing of the final manuscript, we express our thanks and appreciation.

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SECTION I

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GENETICS AND CIVILIZATION IN HISTORICAL PERSPECTIVE

Hymie Gordon

We are fortunate to be living in a period of great development in the basic science of genetics. In our time we have seen the discovery of the fundamental genetic material itself - not only the primary structure of the nucleic acids but their functionally crucial secondary and tertiary structures as well. Their functional pathology is being elucidated and they can be observed in action directly under the electron microscope. In our time it also has become possible to study the chromosomes of man in health and in disease, and techniques are being developed for examining their fine, submicroscopic structure. Also in our time, Garrod's prediction that differences between individuals are owing to differences in their vital chemistry is being fulfilled as the vast pattern of human biochemical variation is being unfolded. It is becoming feasible to observe the control of vital processes at the cellular, sub-cellular and molecular levels. Disease processes are being studied in the same way and soon we will be understanding many common diseases - infective, metabolic and neoplastic - in molecular rather than in histological terms. The interests of biochemists, cytologists and molecular biologists are overlapping more and more, and soon they will merge into a single comprehensive discipline of

Fundamental Biology.

Whenever major scientific advances are made, ethical problems arise. Historically this has occurred in connection with advances in astronomy, evolutionary biology and nuclear physics. The focus of the new developments in genetics is directed straight at the process of life itself and when their application to human affairs is considered, their potential role in the artificial control of the quality of human life inevitably comes to mind. Hence, it is not surprising that at the present time the new discoveries in genetics have provoked considerable ethical controversy and that the social responsibilities of scientists in general and of geneticists in particular are being debated probably with more vehemence than ever before.

As we join in this symposium on "Heredity and Society", it appears that we are still a long way from resolving the major ethical problems. To some it may seem that the problems are too new and ill-defined for us to be able to understand them adequately. However, when the historical development of some of these problems is considered and when we can examine them in the correct historical perspective, it may be that we will see them more clearly and understand them better. Possibly, experience in the past may help us to develop solutions for the present and for the future. It is my function in this symposium to provide such a historical perspective.

The science of genetics is a relatively new one: it is just over one hundred years old and most of the discoveries relative to its basic processes have been made within the last twenty years. But as an empirical art, the practice of genetics goes back much further because since the very beginning of civilization man has used genetic manipulation to improve the quality of his