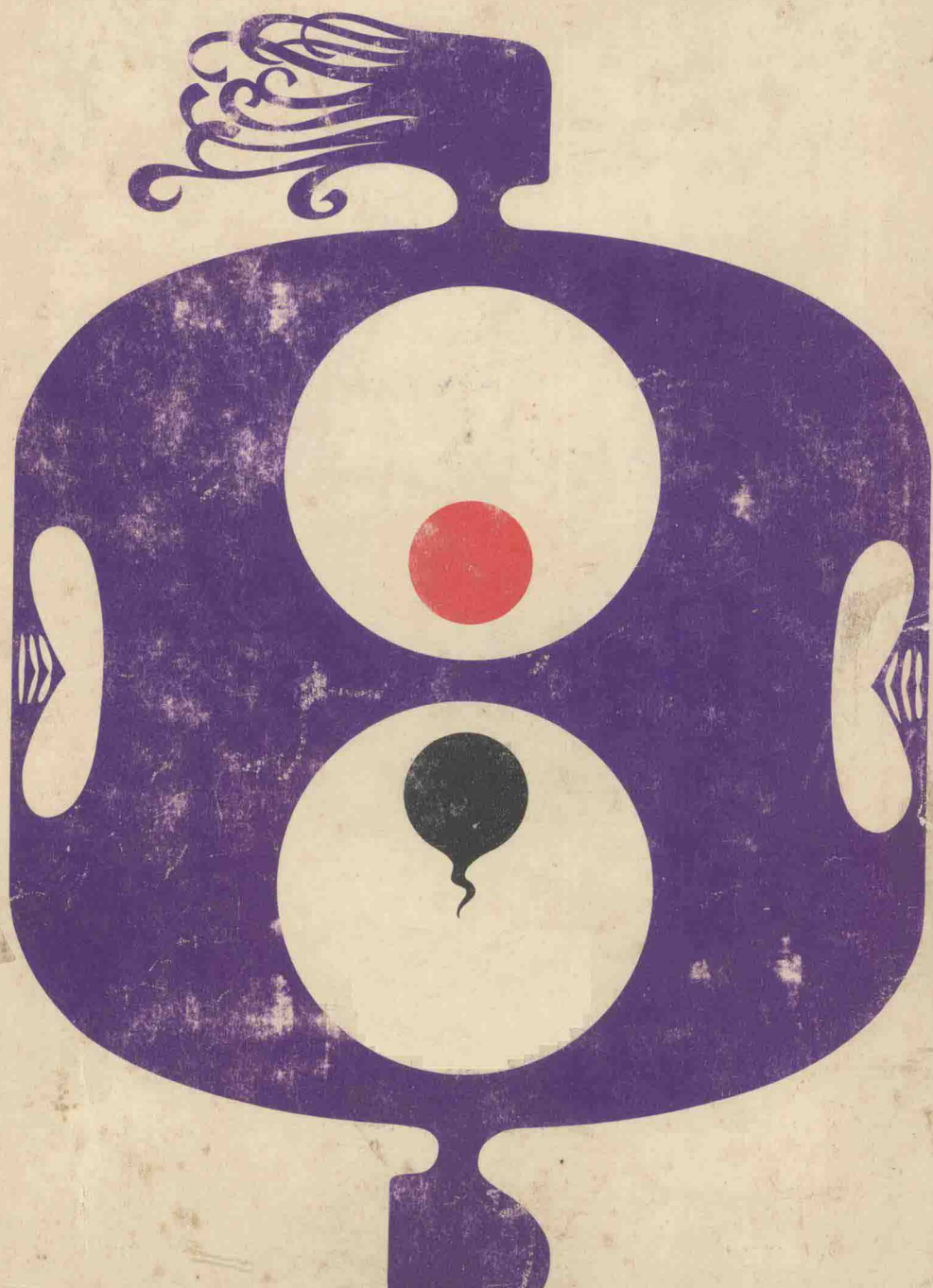


GONADOTROPINS

Edited by BRIJ B. SAXENA,
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Preface

The present volume contains papers presented by eminent scholars during the International Symposium on Gonadotropins held in New York City, June 17-19, 1971, on the occasion of the 200th Anniversary celebration of The Society of The New York Hospital. As the second oldest hospital in the United States, The New York Hospital has earned a reputation for excellent medical care and has a record of meritorious accomplishments in biomedical research.

One of the greatest challenges facing humanity today is the population explosion. The Organizing Committee of the symposium felt a need for a meeting designed to integrate recent studies on the hypothalamic-hypophyseal-gonadal axis and its relation to human reproduction. The present volume is highlighted by the latest information on the subunits of gonadotropins, gonadotropin releasing factors, measurement of human gonadotropins and prolactin, and the clinical use of gonadotropins. It is our fond hope that endocrinologists will find this book a valuable reference for evaluation of current hypotheses and development of new approaches in the control of fertility.

It is with a feeling of honor that the Organizing Committee of the symposium dedicates this volume to the memory of a great endocrinologist, Professor Emil Witschi.

Organizing Committee

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Ralph E. Peterson
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Hortense M. Gandy
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*New York
November 1971*

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The organizing committee is grateful to the contributors and to the many discussants. We are indebted to Om P. Bahl, Solomon A. Berson, Robert M. Blizzard, Piero Donini, Fritz Fuchs, Carl A. Gemzell, Roger Guillemin, Charles W. Lloyd, Bruno Lunenfeld, Luciano Martini, Janet W. McArthur, Samuel McCann, Roland K. Meyer, Francis J. Morgan, Raghuveer N. Moudgal, C. Alvin Paulsen, Leo E. Reichert, Jr., Griff T. Ross, Hilton A. Salhanick, Kenneth Savard, A. Louis Southren, Darrell N. Ward, and Rosalyn S. Yalow for serving as session chairmen. We wish to thank Mina Rano, Mimi Halpern, and Roberta Revell for excellent secretarial assistance.



EMIL WITSCHI

February 2, 1890-June 10, 1971

May I tell you about a man who was a pioneer in the field of reproductive biology during the early part of this century and continued as an active contributor to the field until the time of his death last week.

Emil Witschi was born in an Alpine village near Bern, Switzerland. He developed early a fascination for the variety of animals with which he shared his valley. This interest in nature led him to zoology and to the laboratory of the classical embryologist, Richard Hertwig, with whom Professor Witschi prepared for his doctorate, awarded by the University of Munich in 1913. His indoctrination as a naturalist and his recognition of the importance of comparative biology in the understanding of embryologic and physiologic events led him to range broadly in his investigations of gonadal phenomena and other reproductive problems. Contained in his scientific bibliography of 250 titles are

studies with more than 30 different animal forms, ranging from invertebrates to human beings, including such unusual creatures as the Western banded gecko, African bishop birds, the nine-banded armadillo and the diamond-back terrapin. Few scientists have achievements so diversified as to include the identification of a subspecies of frog, description of ear development for underwater hearing, the analysis of nuptial plumage in weaver finches, and the study of sex behavior of herring gulls. The broad scope of his work, itself, a tribute to his zealous scientific curiosity, pursued with endless vitality and with the highest degree of competence. It is also, of course, the legacy he leaves to all of us and to future generations.

The name of Witschi is identified most intimately with the inductor theory of sex differentiation, formulated and proposed by him in 1914. In those early years his studies on the process of sex differentiation in *Rana temporaria* led him to the realization that all embryos and primordial germ cells are bipotential and that several factors, both genetic and nongenetic, decide the alternative of male or female differentiation. He demonstrated that the embryonic gonadal cortex is an inductor of female differentiation and the medulla an inductor of male differentiation. These concepts, formulated by Witschi more than 50 years ago serve as the basis for the current understanding of human intersexuality.

In 1926 Professor Witschi left Switzerland and his post as lecturer at the University of Basel to visit the United States as a Rockefeller Foundation Fellow. He spent over a year in the Osborn laboratory at Yale, with Carl Moore at Chicago and with Herbert Evans at California. At each laboratory he found a stimulating environment and a great interest in the field of sex differentiation. With the emphasis on this area of research shifting from Europe to the United States, the decision to return to this country and assume American citizenship was a natural one for Professor Witschi, supported by his faithful wife Martha. That he was forgiven his departure from the Swiss scientific community is evidenced by his appointment, 25 years ago, to the Swiss Academy of Sciences and by the conferring of the honorary Doctor of Medicine degree by the University of Basel on the occasion of the 500th anniversary of that distinguished institution. These are but two of the abundant honors he received during his career.

In America, Professor Witschi chose the beautiful setting of the University of Iowa, located on the gently rolling hills overlooking the Iowa river. A department already prominent in endocrine research under the leadership of W. W. Swingle perpetuated this quality by the appointment of Witschi as Professor of Zoology in 1927. Continuously, Professor Witschi and his growing school of Iowa students broadened the attack on the problem of sex differentiation to include the study of fishes, reptiles, birds and mammals. As a result, Witschi's inductor theory found widespread acceptance as a fundamental principle in the development of all vertebrate gonads. Through the years he developed a truly remarkable laboratory for studies in comparative endocrinology and studied

hormonally controlled sexual characteristics in many species. His studies on the comparative aspects of pituitary gonadotropins provide important fundamentals for the current activity in this field. His analysis of hormonal control of feather and bill coloration in birds reveals basic considerations bearing on the evolution of endocrine reaction. His work on temperature effects and overripeness of amphibian eggs has been of considerable importance in the fields of teratogenesis and fetal abnormalities. Among his numerous contributions to the field of genetics is included the discovery of the chromosomal mechanisms for sex inheritance in two different species of amphibia. His place in the history of reproductive science is assured by his monumental study of the migration of the germ cells of human embryos from the yolk sac to the primitive gonadal folds.

Throughout this lifetime of devotion to scientific research, Emil Witschi fulfilled with great conscience his responsibilities as a member of the teaching faculty of a great state university. In 1955 he published his second book, an outstanding textbook, entitled *The Development of Vertebrates*. Replete with original concepts and data, it represents an important contribution to the teaching of embryology. The first book under Witschi's authorship appeared nearly 40 years earlier, it too was prepared for students. At that time, as a teacher in the Science Gymnasium of Basel, he wrote and illustrated a delightful volume entitled, *The Land Animals*, which was to inspire in his young students an interest in biology, and was to serve, also, as an outlet for his artistic inclinations. With this volume, Witschi purged himself of a lingering idea to forsake science in favor of a career in the graphic arts. Those who have observed his classroom lectures, which could serve, as well, for sketching lessons in a school of fine arts, recognize that he succeeded in pursuing both courses.

But perhaps his greatest pride derived from his success in inspiring young scientists. He advised and guided more than forty to the Ph.D. degree. Countless other young men whose research bordered on his interests profited from his consultation, encouragement, and suggestions. This boundless fervor to broaden the horizon of scientific understanding characterizes Emil Witschi. It led him into yet another avenue of scientific achievement as project specialist in reproductive physiology to the Ford Foundation, and more recently, The Population Council. In this capacity Emil Witschi provided guidance to investigators throughout the world. He lived a full life.

Sheldon J. Segal

June 18, 1971

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