
COWLEY'S
Problems of
AGEING

LANSING

THIRD
EDITION

COWDRY'S Problems of AGEING

Biological and Medical Aspects

THIRD EDITION Edited by

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Foreword

The occasion of the publication of another edition of PROBLEMS OF AGEING under the inspiration of a new editor provides an opportunity for the retiring editor to highlight certain important developments in the field of gerontology and to acknowledge the continuing support of the Josiah Macy, Jr. Foundation to these efforts. Earlier contributions have been briefly outlined in the prefaces to the first and second editions republished herewith.

In 1945 interest in ageing on the part of investigators in biological, medical and sociological aspects of the problem, of social workers, nurses, clinical psychologists, and of administrators of welfare agencies, both private and governmental, had demonstrated the need for a multi-professional scientific society in this field and for a journal to publish results of scientific investigations. The Gerontological Society was formed in that year and, aided by a subsidy from the Foundation for the first three years, undertook to publish a journal—GERONTOLOGY—the first issue of which appeared in January 1946. The Society held its first scientific session in January 1949 with an attendance of eighty and a membership of 240, in which the several sciences concerned with problems of ageing were represented. In 1945 the Foundation assisted the Gerontological Society to form a Registry of Gerontology in the Army Institute of Pathology for the collection of tissues of animals and human beings of known age for research purposes.

Today many government grants are being made for research on biological and medical aspects of ageing by the National Heart Institute, following recommendation by the 16-member National Advisory Heart Council under the chairmanship of Dr. Paul White. A significant move was made by Federal Security Administrator Oscar R. Ewing in the appointment of a committee on Geriatrics and Gerontology, Clark Tibbits, chairman, to integrate activities within the various parts of the Federal Government and to complement activities of non-government agencies.

Representatives from fourteen nations meeting in Belgium in July 1950 agreed that a Second International Gerontological Congress would be helpful. This Congress was held in St. Louis September 9–14, 1951 with the cooperation of the U. S. Public Health Service, through the National Advisory Heart Council, and supported by a grant from the Macy Foundation. The Foundation also arranged a meeting of its conference group on ageing immediately before the Congress, at which the directors of the four Congress sections were able to visualize an harmonious and effectively integrated Congress program. This informal exchange of opinion provided

clues to some of the most important and feasible objectives in gerontology to be systematically evaluated and explored during the Congress.

It is now almost ten years since the presentations that made up the second edition of PROBLEMS OF AGEING went to the printer. The third edition, edited by Dr. A. I. Lansing, brings together recent accounts of biological and medical aspects of the problem, integrated with a number of contributions from sociological and economic lines of inquiry. New avenues of investigation have been opened and existing ones have been followed. Only a small part of the information now available, however, has been utilized to enable people to live healthier, more useful and longer lives. What may be regarded as pilot experiments in relatively concise areas of human betterment reveal that if work in this direction is dignified by public approval and support, the following decade will be one of great achievement.

EDMUND V. COWDRY

Preface to the Third Edition

In organizing and finally editing the third edition of *Problems of Ageing* my primary objectives were to render a report on what has transpired in gerontology since 1942, when the second edition was prepared, and to report the opinions of a group of gerontologists as to significant trends and profitable areas for further work on ageing.

This is essentially a progress report. No attempt has been made to influence the writings of the contributors. Indeed, in some instances the editor disagrees, in principle, with the points of view expressed, and it is quite likely that some of the contributors do not see eye to eye with the editor. The point is that an attempt is being made to convey to the reader, for better or for worse, an objective synopsis of new developments, current trends, and the thoughts of a number of the present day workers in gerontology.

In some fields of research on ageing little has transpired of note in the last decade and the contributors have so indicated. In other areas there has been considerable activity. Research on cardiovascular diseases quite properly has received marked emphasis. This class of diseases is the greatest killer in the adult population today. The role of lipids in arteriosclerosis is being followed both intensively and extensively with much yet to be done. The importance of dietary fat and of the physicochemical nature of circulating lipids in conditioning cholesterol deposition in arteries has recently been stressed. This has been set back most sharply by the observation of Siperstein that cholesterol is synthesized in the arterial wall. During the last several years the editor has placed emphasis on the role of ageing of the arterial wall in the production of arteriosclerosis. This point of view is not too well entertained.

On the whole I believe that a spirit of pessimism is present in many of the chapters. Dr. Cobb urges caution in interpretation of many of the almost classical views on ageing of the skeletal system; new data are slow in appearing. Dr. Bickerman summarizes a wide variety of diseases of the respiratory system associated with ageing and finds that the situation is confused. And so it goes.

Research on the biology of ageing is almost at a standstill. There is hardly a handful of workers in this area today. Our population is rapidly becoming an old population. There is a sense of urgency in attacking the so-called degenerative diseases which take such a heavy toll of mature and

elderly adults. It may be that the sources of funds for research are supporting clinical and allied research on ageing to the effective exclusion of biology. This may be an unwarranted suspicion; it is equally possible that were more funds available for gerontology, all areas of research, including biology, would flourish.

Throughout the book there is expressed a need for clarification of the relation between degenerative diseases and ageing. Just what do we mean by ageing and degenerative diseases? It seems that neither is well enough defined to permit a rational distinction between the two. If we accept the view that ageing begins at the time of conception, we rapidly get into difficulties. Gerontology becomes the study of the biology of living. I do not believe that gerontology includes study of the development of the foetus or of the physiologic and psychic throes of adolescence. Ageing, to my mind, is a problem of adulthood, of generally progressive deleterious change in adulthood, correlated with the passage of time. Some of these changes may be classed as diseases and may indeed be curable or reversible. Others may involve profound alterations in the physicochemical makeup of protoplasm, and as such may be irreversible. But regardless of reversibility or specific etiology, all these changes constitute ageing.

In order not to overdo the pessimistic note, it should be observed that much progress has been made in organizing and more widely establishing this relatively new science of gerontology. This point is well made by Dr. Cowdry in his Foreword. Also, the sociologists have effectively come to grips with the problems of ageing and are moving forward briskly. It is refreshing to note that compulsory retirement at arbitrarily fixed ages is being challenged.

The lot of an editor is not entirely a happy one. Credit for effective writing very properly goes to the individual authors. With equal propriety, criticism of errors or inadequacy goes to the editor. If, however, in the reading of this book new research is stimulated, I will have been rewarded.

ALBERT I. LANSING

Preface to the Second Edition

The First Edition was published in January 1939. Soon thereafter demands for more copies were met by a reprinting of the book in which it was not however possible to make either corrections or additions. This favorable reception indicates an increasing consciousness of the inevitability of a further rise in age level of the population and of the necessity of facing it in a constructive way. Our principle of mobilizing and integrating the knowledge and experience of specialists in different fields has been widely followed as is evidenced by the arrangement of symposium after symposium on the subject of ageing. Of these the following is a partial list:

Medical Clinics of North America (Med. Clin. North Am., 1940, 24, 1-164).

American Orthopsychiatric Association (Am. J. Orthopsych., 1940, 10, 27-86).

University of Pennsylvania Centennial Celebration, September, 1940.

Massachusetts Society for Research in Psychiatry—The Symposium dealing with the problems of the aged (Taunton, Mass.), October 11, 1940.

National Institute of Health (Washington), May, 1941.

American Chemical Society (Atlantic City), September, 1941.

Chicago Medical Society, December, 1941.

As the data from the 1940 census have become available we see more clearly the importance of the problem before us from points of view too numerous to mention. One of these is the mobilization of an increasingly large percentage of older people in the war effort, and also for the postwar reconstruction. It is interesting to note that the percentage of those of 65 years and over, calculated in advance for 1940, was surpassed.

Since the publication of the first edition three definite steps have been made to organize research on ageing. Encouraged by the Josiah Macy Jr. Foundation and with the aid of Dr. E. J. Stieglitz, Surgeon General Parran has appointed a National Advisory Committee on Gerontology and authorized a nation-wide survey of investigations on ageing by the U. S. Public Health Service. This fact finding and coordinating function has been supplemented by reorganization of the National Research Council's Committee on Ageing, under the chairmanship of Dr. A. J. Carlson, of the University of Chicago, as a fund raising agency and planning group to further re-

search on ageing. Situated also in Washington, closely affiliated with the National Academy of Sciences and representative of the whole country, the Council is better able to serve in this important capacity than any other organization. A third group concerned with research formulations and action has been established by Dr. V. Korenchevsky who visited the United States for that purpose. It is the American Branch of an International Club for Research on Ageing and operates under the presidency of Dr. Wm. deB. MacNider of the University of North Carolina at Chapel Hill. This club is a small group of investigators each of whom devotes a large part of his time to investigations on the many sided problems of ageing. The idea is that from this very active nucleus the impulse to research will spread widely throughout the United States aided constructively by the U. S. Public Health Service and the National Research Council.

Since these three groups have held frequent meetings, often made possible by the Josiah Macy Jr. Foundation, and because many members of each are also contributors to this volume, ample opportunity has been afforded for the exchange of ideas. An effort has been made to include 9 new chapters without greatly increasing the size of the volume. Consequently in revising and bringing up to date the chapters in the first edition considerable abbreviation has been necessary. The editor is indebted to the authors for their friendly cooperation. He records with deep regret the death of Dr. Ludwig Kast, under whose far-sighted and inspiring leadership this venture was launched, and of Dr. T. Wingate Todd who played a prominent part in the writing of the first edition. He gratefully acknowledges, on behalf of all of the contributors, the continued and very helpful interest of Mr. Lawrence K. Frank and Dr. F. Fremont-Smith, both officers of the Josiah Macy Jr. Foundation.

E. V. COWDRY

*St. Louis,
July 15, 1942*

Preface to the First Edition

This volume is a timely and logical development of the survey of the problem of arteriosclerosis¹ which was published by the Josiah Macy, Jr. Foundation in 1933 to summarize existing knowledge on the degenerative changes and ageing of blood vessels. When the present volume was well under way, the Foundation provided for a conference on ageing, jointly sponsored by the Union of American Biological Societies and the National Research Council, at Woods Hole on June 25 and 26, 1937, which was attended by fifteen of the contributors to this volume as well as by other interested persons. The National Research Council also arranged a conference of its Committee on the Biological Processes of Ageing in Washington, D. C. on February 5, 1938 which included in its attendance seven contributors to this volume. Other smaller meetings of contributors, interested in the ageing of the nervous system and of the endocrines, were arranged by the Foundation. Abstracts and complete manuscripts have been circulated widely among the contributors. Consequently, the opportunity to bring to bear on the problem the experience and points of view of many specialists, working together in a constructive way, has been unrivaled. But each contributor is personally responsible for his chapter. There are, as one would expect, some differences of opinion. These foreshadow progress since they will stimulate further investigation. The style is as simple as possible consistent with scientific accuracy. Each chapter concludes with a summary and a bibliography. The editor feels much indebted to Dr. Ludwig Kast, Mr. Lawrence K. Frank and Dr. F. Fremont-Smith of the Josiah Macy, Jr. Foundation for their continued interest and support. To the contributors of this volume he wishes to express his thanks for their cooperation.

E. V. COWDRY

July 22, 1938

¹ Arteriosclerosis: A Survey of the Problem. Edited by Edmund V. Cowdry. The Macmillan Company, 1933, New York.

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Introduction

It is a privilege to be asked to write the Introduction to the third edition of *Problems of Ageing*, originally published in 1939. This new edition, as in the case of the first and second, must inevitably raise more questions than it can answer. Such, however, is the way of all explorations at the frontiers of knowledge, and should occasion neither surprise nor chagrin.

What do we mean by ageing? Can we define the term, and separate the pathological conditions which accompany old age from the normal processes of senescence?

Even such fundamental issues as these cannot yet be settled with any degree of satisfaction, perhaps because they impinge upon the basic question of the nature of Life itself—growth, development, maturation and ageing representing but subdivisions of the life process.

An aged plant, animal or human being is obviously different from a younger member of the species—but to what extent do, the gnarled bark of a tree, the quality of fur and teeth of a dog or the characteristic appearance and behavior of an elderly man or woman reflect the intrinsic (and hence, perhaps, inevitable) changes which accompany the passage of time; and to what extent are they merely scars of accidental (and hence, perhaps, *preventable*) traumata resulting from an adverse environment?

If we wish to discuss normal senescence, must we not define what we mean by “normal”? Normal with respect to what? Do we mean by “normal” the average, or the optimum—and if the latter, must we not still ask the question, “Optimum with respect to what?”

Beginning in childhood, the “normal” kidney quite regularly shows a few necrotic glomeruli. These increase in number with age. We say that such a kidney is “normal”, but are the necrotic glomeruli “normal”? The question cannot be answered “yes” or “no”. With respect to other living glomeruli, those that are dead or dying are grossly pathological; but it is nevertheless quite “normal” for the kidney of a twenty-year-old man or woman to show a few dead glomeruli. Such dead glomeruli we accept as normal in 1952, but fifty or one hundred years hence will the kidneys of young adults show such necrotic glomeruli, or so many?

During the first two months after birth the human adrenal goes through a process of involution, with a 30 per cent reduction in weight. During each estral cycle both ovarian and uterine arteries participate in a very active process of involution. Could the study of such involutionary changes throw light upon the ageing process?

We are apt to say that for each organism there is a life span which is

not likely to be greatly extended; but do we overlook the continuation of the species through the germ plasm? Does the germ plasm age? Is the process of evolution itself an indication of ageing of the germ plasm? What, indeed, *do* we mean by "ageing"?

One thing seems clear: that the study of a physiological function or anatomical structure may be quite different, depending upon whether the study is focussed upon the "ageing" of the function or structure, or upon some other aspect such as the susceptibility to disease or the response to hormonal stimulation. Research in the field of ageing approaches organs, tissues or functions with a particular frame of reference. It is only in an appropriate frame of reference that facts pertinent to gerontology are likely to be revealed. Research directed at the ageing process, therefore, should not be confined to certain organs or to certain age periods, but rather should be defined by the investigator's particular interest in the ageing process.

Research in ageing is not likely to be rewarding if it is a secondary issue in the course of another research. Research in this field, as in the field of growth, is a special problem requiring its own method of attack, a time-span during which the ageing process is observed, and financial support of sufficient duration to cover the appropriate time-span.

The demand for a third edition of this volume is an indication of the widespread and growing interest of biologists, physicians and social scientists in the latter portion of the life span. This interest springs from theoretical and also from very practical considerations.

As a larger and larger proportion of the population of a country receives the benefits of modern advances in preventive and therapeutic medicine, there is a progressive increase in the average life expectancy and *pari passu* an increasing proportion of the population in the older age ranges.

There are a number of consequences: an increase in the incidence of the diseases and disabilities of later years, a new interest on the part of physicians in the treatment of older persons, and new opportunities and responsibilities for research into the causes, treatment and prevention of such conditions.

The sociologist, the industrialist, the labor leader, as well as the community as a whole and the individual families thereof, are involved in such increase in the average life-span.

There are problems of housing—modern dwellings make no provision for long-lived grandparents—and of retirement. Must retirement be abrupt, as at present, or is a "progressive" or "graded" retirement practical? Here management and labor have an opportunity to make pilot studies before the growing number of employable but unemployed "oldsters" become politically organized.