



INTERNATIONAL LONGEVITY CENTER

A History of Ideas About the Prolongation of Life

Gerald J. Gruman

Classics in Longevity and Aging



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Gerald J. Gruman, MD, PhD, was born in 1926 in Philadelphia and grew up in Lebanon, PA. He attended Lebanon Valley College, Columbia University and Cornell University (B.A., 1946). His medical training was done at the University of Pennsylvania (MD, 1949). Gruman interned at St. Joseph's Hospital (Yonkers, NY) and served two years as a medical officer in the U.S. Public Health Service. He then enrolled as a student in History of Science at Harvard University (PhD, 1960). He taught history at Johns Hopkins University, Lake Erie College, and University of Massachusetts. Aside

from the present book, he edited a number of books in the Arno aging and death series. He contributed to such works as *Encyclopedia of Bioethics*, *Dictionary of the History of Ideas*, *Encyclopedia of Philosophy*, and *Aging and the Elderly*. Gruman also contributed to such journals as *The American Historical Review*, *The Bulletin of the History of Medicine, Science, Geriatrics, History and Theory*, and *Omega*. He has been a recipient of a J.S. Guggenheim Memorial Fellowship and a Special Research Fellowship of the N.I.M.H.

In memory of
HARRIS GRUMAN
1896–1952

. . . tua me, genitor, tua tristis imago saepius occurrens haec
limina tendere adegit.

Aeneid 6: 695

Contents

<i>Preface</i> by Robert N. Butler, MD	<i>ix</i>
<i>Foreword</i> by Harry R. Moody, PhD	<i>xi</i>
<i>Acknowledgments</i>	<i>xiii</i>
I. Introduction	1
II. Apologism	9
III. Prolongevity Legends	29
IV. Taoist Prolongevity in Theory	43
V. Taoist Prolongevity in Practice	60
VI. The Alchemists	82
VII. The Hygienists	116
VIII. The <i>Philosophes</i>	129
IX. Epilogue	157
<i>Endnotes</i>	<i>161</i>
<i>Bibliography</i>	<i>199</i>
<i>Index</i>	<i>213</i>

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Preface

It gives me enormous pleasure to reissue *A History of Ideas About the Prolongation of Life*. It was first published in December 1966 as a monograph in Transactions of the American Philosophical Society, which is the oldest scholarly journal in America. This elegant essay, which integrates aspects of philosophy, religion, science and medicine, is a beautiful example of cultural history at its finest.

Gruman understood the importance of a multicultural perspective, and here he examines attitudes toward longevity—and indirectly, toward death—in Islamic and Chinese societies as well as in Western civilizations.

Perhaps this essay is even more relevant today than it was in 1966, because it places in historical context new scientific findings that relate to the complex biology of aging and longevity, as well as to recent advances in the care of older people (based upon contributions from the fields of geriatrics and longevity medicine).

Gerald J. Gruman provides the reader with a variety of thought-provoking perspectives. His work represents an important contribution to our understanding of the origins of medicine, personal hygiene and public health as well as of the underlying psychological and social determinants of longevity and humanity's longing for its attainment.

The International Longevity Center (ILC) is proud to cooperate in publishing Gerald J. Gruman's classic essay. It is our hope that this contribution will spark renewed interest in reissuing great pioneering works in gerontology and longevity.

Robert N. Butler, MD
International Longevity Center

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FOREWORD

The History of Prolongevity: A Prologue to the Quest for Life Extension in the 21st Century?

Has the quest for life extension, called “prolongevity” by Gruman, gained from the advances of modern science? The answer is sobering. The gap between what gerontologists know and what the public believes has never been wider. Whatever the scientific evidence, prolongevity is an idea that simply will not die. Gruman’s book takes the story of prolongevity up to the year 1800, a point where modern medical science was in its infancy, and where geriatrics had hardly been imagined. In light of progress made in the past two centuries, perhaps it is understandable that *The History of Prolongevity* is not better known among gerontologists. But it should be known because the story Gruman tells is more than of merely antiquarian interest.

What is fascinating about the history narrated by Gruman is the intermingling of science and superstition, medicine and mysticism, repeated over generations in a ceaseless quest for longevity and immortality. This quest was never merely the province of cranks or quacks. On the contrary, one of the greatest religious traditions of humanity, Chinese Taoism, included prolongevity as a fundamental part of its agenda for a millennium or more. In the case of Taoism, we see the combination of rank charlatanry with sublime philosophy, the lure of wish-fulfillment combined with the pursuit of wisdom. This mixture was not confined to the East. Western philosophers, including founders of modern science like Bacon and Descartes, were profoundly convinced of the importance of prolongevity, as Gruman demonstrates.

Prolongevity today is a global phenomenon demanding cross-cultural as well as historical understanding. For example, today herbal remedies and Chinese medicine are high on any list of alternative and complementary therapies, popular not just in Beijing or Hong Kong, but

in Los Angeles and New York. Chinese medicine now has global influence far beyond East Asian cultures. In some instances—such as acupuncture for pain relief—there is little doubt that powerful effects are possible, for reasons that are still unknown. In other cases, alternative remedies have not yet been subjected to critical empirical evaluation. Enthusiasm and anecdotal conviction replace rational assessment.

But lack of proof has not prevented the lay public from using exotic substances with the goal of life extension, in the same way that biochemical agents, including hormones, vitamins, and antioxidants, have become part of anti-aging practices. In the age of the Internet, self-care and self help are driving forces that will shape health care in the 21st century. The history of prolongevity as narrated by Gruman could well become a cautionary tale for medicine in years to come.

History, including the history of medicine, remains open-ended, and here Gruman's work is also relevant. Old questions are constantly reopened. Within recent memory, the scientific enterprise of gerontology has begun to look again at fundamental questions previously regarded as closed. For instance, is aging a "disease?" Is it realistic ever to imagine interventions to raise maximum human life span beyond 120 years? Is it desirable? We have known for at least sixty years that maximum life span in lower organisms is not a fixed constant as would hold true for the speed of light in physics. Caloric reduction has broken that maximum life span barrier in rodents and every other species in which it has been tried, probably even including primates, as recent data begin to suggest. A 30% reduction in caloric intake could raise maximum life span by 30%—comparable to a human life span of 150 years. The mechanism by which caloric reduction works is uncertain. But the empirical fact must give us pause.

The search for life extension ("prolongevity") still retains its vitality. This hope will not quickly die. The mixture of science and superstition that surrounds this whole subject cries out for clarity. For believers in reason, then, we need to understand better the persistence of utopian thinking in human affairs, in medicine as much as in politics. The intertwining of prolongevity ideas with powerful currents of philosophy, religion, and science itself should give us pause. The persistence of this impossible dream is the resonating note that sounds throughout Gruman's narrative. We may be grateful that his master narrative is now more widely available.

Harry R. Moody, PhD
International Longevity Center

Acknowledgments

My aim has been to trace the origin and evolution of the idea of *prolongevity*: the belief that it is possible and desirable to extend significantly the length of life by human action. In this study, primary attention is given to developments before the end of the eighteenth century. There are, however, numerous references to modern times. As Carl Becker and Charles Beard pointed out, there is some present-mindedness in all historical writing, and I must acknowledge that this work is meant to be strongly relevant to the contemporary human situation.

I have tried to integrate, in this investigation, the history of ideas and the history of science, for a concept like *prolongevity* reflects almost equally the influence of philosophy, religion, science, and medicine.

In covering such a vast area of time and space, it was not possible to aspire to definitive treatment. While reliance was placed, as much as possible, on primary source materials, many of them had to be used in translations from the original language. And not a few promising leads had to be abandoned, so that the overall project could be achieved. I should appreciate it if readers and reviewers would let me know of significant omissions or variations in interpretation.

* * * *

In writing this monograph, I owe the deepest gratitude to Professor I. Bernard Cohen and Professor Crane Brinton of Harvard University for important aid and encouragement, over a number of years, in all aspects of the work. Without the generous financial support of the National Institutes of Health, it might have been impossible to complete this research project; in this regard, I want to express my appreciation to Professor Benjamin Spector, Doctor Jeanne L. Brand, and Doctor Frederic D. Zeman. (I want to thank the John Simon Guggenheim Memorial Foundation for a fellowship (1964).) As part of the policy of Lake Erie College in the encouragement of research, President Paul Weaver made available to me a grant to be used in preparing this manuscript for publication. Others whose efforts I should like to cite in connection with this

scholarly venture are Professor George Rosen, Professor Robert Kastbaum and Doctor Robert N. Butler, Professor Arthur Schlesinger, Jr., Professor Henry E. Sigerist, Doctor Edwin D. Harrington, my mother Jeanne (Gruman) Jacobson and my wife Joan, who applied her literary sensibility in reviewing the text.

Gerald J. Gruman

I

INTRODUCTION

Oh that there were a medicine curing age . . .

Regimen of Health of Salerno (eleventh century)¹

THE PROBLEM OF DEATH

The problem of death is a central part of the dilemma of modern man. This concern stems largely from the fact that the modern era has been characterized by a marked decline of faith in supernatural salvation from death, i.e., immortality and resurrection by divine fiat. While these beliefs still are adhered to by many in times of bereavement, their role in everyday life has been weakened greatly, and attention has become centered on the things of this world, especially on the increasing production and distribution of goods and services. Yet, despite the material satisfactions of modern life, the individual feels hollow and powerless when faced by death. One response, and a widespread one, is to attempt to ignore the issue by placing a taboo on it.² Another outlook is that of neo-orthodoxy, which focuses attention on death in order to justify a theological standpoint which is essentially medieval.³ A third approach is that of the secular existentialists, who emphasize death and the "absurdity" of the individual, so as to sharpen man's sense of moral responsibility.⁴

To bring the modern dilemma towards a positive resolution, the best hope would seem to be a reaffirmation of meliorism, which, in regard to the problem of death, would entail a progressive lengthening of the span of life.⁵ Indeed, it may be asserted that meliorism is an indispensable element in modern society, for a community based on industry, technology, and science must continue to advance or it will face disaster.⁶ To cite the most relevant example: during the nineteenth century, the chief medical problem was that of infectious disease. Through the meliorist efforts of reformers in public health and researchers in medical

science, infectious diseases have been brought largely under control, and, as a result, the average length of life has been increased. At the same time, however, a new problem has been created, that of an aging population; society is finding itself burdened with unprecedented numbers of disabled and indigent old people. Consequently, the community, of necessity, is diverting large sums to research into the nature of degenerative diseases and of old age itself. And it can be predicted that these efforts, whatever their motivation, will further increase the length of life. In the light of this experience, it can be seen that meliorism is an inherent component in the structure of a modern society, and, this being the case, it would seem wise to adopt a conscious and systematic policy of this sort rather than resort to it only in a halfhearted and intermittent manner.

In any consistent program of meliorism, the prolongation of life must have a significant place; it is unfortunate, therefore, that the subject sometimes is relegated to a limbo reserved for impractical projects or eccentric whims not quite worthy of serious scientific or philosophic consideration. One reason for this neglect is that there is, in philosophy, science, and religion, a long tradition of apologism, the belief that the prolongation of life is neither possible nor desirable; that tradition will be discussed in the next chapter. Another reason is the fact that there are few subjects which have been more misleading to the uncritical and more profitable to the unscrupulous; the exploitation of this topic by the sensational press and by medical quacks and charlatans is well-known. Furthermore, the past fifty years have seen the failure of at least three highly publicized remedies for aging: at the turn of the century, there was the fermented-milk fad; in the twenties, there were transplants of sex glands; and, in the forties, there was the cytotoxic serum advocated by Bogomoletz.

The purpose of this book is to trace, to the beginning of the nineteenth century (but not without references to more recent events) the evolution of ideas about the prolongation of life, and to demonstrate that the history of this subject is a significant one. It is hoped that we may show that the major hypotheses relating to this subject, by and large, were reasonable deductions from the science and philosophy of the times, and it will be seen that the prolongation of life was an important factor in some of the principal movements in intellectual history—Taoism, alchemy and the Enlightenment, for example. Finally, it will be pointed out that the desire to lengthen life not only initiated alluring speculation but also stimulated research which led to useful discoveries.

THE IDEA OF PROLONGEVITY

In dealing with this subject, I have found it helpful to coin a new term *prolongevity*, which may be defined as the significant extension of the length of life by human action. The prefix "pro-" is used here in the sense of "forth" or "a moving forward," while longevity retains its customary meaning of "length of life." As to the belief that prolongevity is possible and desirable, one may refer to the idea of prolongevity or to prolongevitism.

There is an older word, "macrobiosis," which connotes the prolongation of life, but it is not exactly suitable for our purpose. The term was introduced by Hufeland in 1796 in connection with his famous book on the art of prolonging life, and later editions appeared under the title *Makrobiotik*.⁷ The chief objection to "macrobiosis," and probably the reason why its acceptance has been so limited, is that the prefix "macro-" is much more suggestive of "large size" (as in macrocosm and macrophysics) than of "long duration." Another handicap of "macrobiosis" is that it has become identified with a particular method of prolongevity, that of hygiene, while what was wanted here was a word covering all methods.

The import of the word "prolongevity" (which I first used in 1955) seems to be grasped readily, and it has appeared in the writings of others. It has clear advantages over the alternatives: "prolongation of life" being too clumsy for frequent repetition and "macrobiosis" being too obscure. At times I have employed prolongevity as an adjective (as in "prolongevity hygiene") in addition to its use as a noun.

Advancing to a closer look at the definition of prolongevity, it should be noted that the phrase "length of life" (or the word "longevity") may refer to either of two different phenomena.⁸ The number of years which the average person can expect to live is one meaning of the phrase. For example, in the United States, the average baby born in 1957 could be expected to live about seventy years,⁹ and that figure of seventy years we speak of as "life expectancy."

During the course of history, life expectancy has increased greatly; advances have been particularly striking in the past century.¹⁰ It has been estimated by certain historians that, in ancient Greece and Rome, life expectancy was only about twenty years. During the long period of fourteen centuries from the decline of the Roman Empire till the beginning of the eighteenth century there seems to have been only a very gradual improvement in life expectancy to about thirty years. By 1800, in the more advanced countries, life expectancy had reached thirty-five years, and by 1900, in England, Sweden and the United States, it was

nearly fifty years. In the 1960's life expectancy in the most industrialized nations stands above seventy years.

In contrast to "life expectancy" is the concept of "life span." While life expectancy refers to the length of life of the average person, life span refers to the longevity of the most long-lived persons. Life span is the extreme limit of human longevity, the age beyond which virtually no one, however far he may be above the average, can expect to live. Statisticians estimate the life span at about one hundred ten years. Millions of average people can expect to reach the life expectancy of seventy years, but only a few unique individuals will fulfill the life span of one hundred ten years.

Unlike life expectancy, the span of life does not seem to have increased noticeably during the course of history.¹¹ In every era there seem to have been a few hardy individuals who lived beyond one hundred years. The average man may have died prematurely at twenty or thirty, but, then as now, a tiny quota of long-lived persons somehow managed to survive to the extreme limit of the life span. It is of importance that the two terms be clearly differentiated: there is a widespread and probably erroneous view that the length of life has been increased and will continue to increase almost automatically as a by-product of scientific and social changes. It is the virtue of Louis I. Dublin's definitions that they challenge this vague, complacent optimism by suggesting that there may be a sharp cut-off point, a discontinuity.

While it is necessary to point out this distinction between life expectancy and life span to allow one to cope with vital statistics, there is a danger of overstating Dublin's argument. The distinction between these concepts seems to have been employed in recent times to emphasize the difficulty involved in overcoming senescence; that is, they have been used in a moderately apologist framework. The nature of "old age" remains, however, too nebulous to allow the concept of an absolute life span to pass unchallenged. Suppose, for example, significant progress were made in controlling such degenerative diseases as cancer and arteriosclerosis; Dublin, working from the view of a statistician, feels this would extend life expectancy but not the life span; senescence would continue to operate unhindered and carry off vast numbers of victims in the years between ninety-five and one hundred ten. Others, however, basing themselves on experience at the autopsy table, state that they never have seen a death from pure "old age," and the implication is that the life-span phenomenon might be an artifact of the statisticians and not a never-yielding barrier.¹²

Keeping in mind the concepts of "life expectancy" and "life span," just what constitutes a *significant* extension of the length of life? Reading

through the literature of science and philosophy, we find a great diversity of views among those who accepted the possibility of lengthening human life. One man felt that we might be able to add only a few years, another believed we might live to one hundred fifty or two hundred, and a third writer saw the prospect of immortality. Are all of these views to be classified under the heading of "prolongevity"?

The group which is easiest to classify is the one we may call radical prolongevitism. These thinkers were so optimistic that they foresaw a decisive solution to the problems of death and old age; they aimed at the attainment of virtual immortality and eternal youth. Most Taoists of ancient China belong in this category as do also many of the medieval Latin alchemists. In the modern period, Condorcet supported the radical view and so did the Englishman, William Godwin, and the interesting nineteenth-century American, C. A. Stephens. All shared the belief that human life may be lengthened indefinitely, and there can be no question at all that they were proponents of "prolongevity."¹³

The other group of optimists might be named the moderate prolongevitists. These thinkers proposed the possibility of a limited increase in the length of life. There is much variation in the ideas of the moderates; some thought in terms of centuries, while others foresaw the extension of life by only a few years. Because of the wide range of opinion among the moderates, it is difficult sometimes to judge which of them are to be included in a study of prolongevitism. In deciding where to draw the line, it often is necessary to take into consideration the situation in science and philosophy at the time the person was writing. The Renaissance hygienist Cornaro and his followers represent a moderate form of prolongevitism.¹⁴

To provide perspective for what follows, a few words may be said about the present situation regarding prolongevitism. If someone writes today that life expectancy might be extended by several years, or even by five or ten years, it is hardly worth while to consider his view under the heading of "prolongevity." The average length of life has increased so strikingly during the past century that nearly anyone can foresee the possibility of a certain degree of further extension. All that is needed is something like the discovery of a more powerful drug against tuberculosis or the initiation of more effective measures to prevent automobile accidents or the extension of better medical facilities to black citizens, and one can envision life expectancy inching upwards. Without any radical innovation in science or philosophy, we can look forward to an increase in life expectancy beyond seventy years, gradually approaching but never reaching the life span fixed at about one hundred ten years.

It is around the concept of life span that the question of prolongevity is discussed today. The life-insurance statisticians have established so clearly the limit of one hundred ten years, that anyone foreseeing an