HEALTH ASPECTS OF AGING

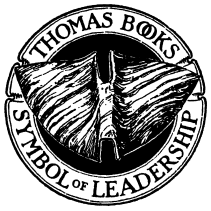
Second Edition

HEALTH ASPECTS OF AGING

The Experience of Growing Old

By

GARI LESNOFF-CARAVAGLIA, PH.D.



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PREFACE

This second edition of *Health Aspects of Aging* serves to broaden the perspectives of societal change due to increases in life expectancy, as well as the effects of age-related changes with respect to the provision of health care for older persons. The growing presence of large numbers of persons aged 65 and older worldwide has caused a reevaluation of the nature of life that is protracted to 100 years and beyond. It has also accommodated a more ordered view of human existence. This recent orientation has also led to a life span perspective, with late life taking on its proper dimension within such ordering, whilst the problem approach to aging has been replaced by a problem-solving approach.

Such a problem-solving approach has incorporated the concept of new social structures and the development of intervention and prevention strategies, along with new technologies. Such new products and health care measures are deliberately aimed to offset debilities due to normal age changes, the onslaught of disease, incongruous environments, and altered social states.

The expectation of living to very advanced old age continues to unfold new human possibilities and to unmask negative stereotypes. The emphasis of science and medicine is less to lengthen life but more to reduce the number of years people spend in states of disease or disability. Increased knowledge and the techniques to allay some of the causes of ill health make clear that healthy aging is clearly possible.

The presence of increasing numbers of older persons in the population can lead to challenges and creative responses. However, such alterations in the composition of the population, if not adequately subsumed and prepared for, can lead to chaos. Aging affects everything from biological systems, clinical medicine, society, and economics, to ethics.

The chapters in this volume address these issues from the perspectives of diverse disciplines and professional standpoints. Since biolog-

ical changes are primary issues, the aging process is largely described from the perspective of biological changes related to age and to particular dysfunctions.

The environmental features and the potential introduction of technological interventions are interspersed within chapters, as well as finding primary focus in particular chapters. The maturity of the technology described in the chapters varies, from devices and systems that are nearly ready to be marketed, to concepts and prototypes that are still in the design and developmental stages in the laboratory. All of the technology discussed covers the essential points of cost, ease of use, reliability, and privacy.

As the proportion of older adults escalates, there will not be sufficient numbers of younger adults to serve as full-time caregivers in the home and health care establishments. Technology will have to substitute as an alternative. The technologies under discussion offer the hope of a better and safer quality of life for many older persons.

Gari Lesnoff-Caravaglia, Ph.D.

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Chapter 1

HEALTH ASPECTS OF AGING: THE FOUNTAIN OF YOUTH REVITALIZED

There are a number of older persons who function very well into advanced old age, and, because of better lifestyle choices, increased income, higher educational levels, and accessibility of new medical technologies, their number will continue to grow. Those who are well endowed with respect to genetic structure and have experienced the advantages of good health throughout the life span will very likely enjoy a healthy old age.

There are inevitable biological changes which occur as an individual becomes older. Such changes, however, are not the result of disease but are more aptly attributed to the aging process known as senescence. This term refers to the bodily changes that occur, and the limitations which such changes may impose. This term is not to be confused with the word "senile," which is often used as a pejorative term to describe older persons who may be suffering from physical or mental dysfunctions.

There are some diseases which are more likely to occur as a person continues to age. This does not mean that persons will necessarily suffer from such diseases. Diseases which may have had their onset in earlier periods of life manifest themselves as persons live to reach advanced old age. Such diseases can be the result of unhealthful lifestyles followed by the individual for a number of years. Cancers and diseases of the circulatory system are among those that often manifest themselves in old age. The use of a number of medications to treat the multiple chronic diseases sometimes suffered by older persons can also lead to additional health problems. Drug dosages and uses in older persons have not been sufficiently studied.

Older persons continue to play significant roles in all areas of life. Many continue to perform in the workplace, at home, and in professional spheres. Many persons, although advanced in age, do not regard themselves as "old." Older persons are also found in the criminal world, as well as in the higher estates of life. For example, a woman aged 80 was recently apprehended at an international airport smuggling vast quantities of cocaine hidden under her girdle. She is the oldest suspected drug smuggler to be arrested by British customs. As the population continues to age, older persons are found to be involved in all aspects of life–both the positive and the negative.

Understanding Aging

Although it is recognized that biological changes are inevitable as part of the aging process, it is not clear why such changes occur. An ancient belief held that there was a magic elixir or potion that could halt aging or retard its progress. The explorer Ponce de Leon was sent to the New World by Queen Isabella of Spain to find the fountain of youth. She was worried that her husband, King Ferdinand, who was reported to be several years her junior, would lose interest in her as she grew older. Ponce de Leon did not find the fountain of youth, but he discovered Florida. Curiously enough, Florida became the haven of the elderly of today.

Theories of Aging

Contemporary theories of aging cannot account for why it is that people age. One theory, the wear and tear theory, maintains that the body simply wears out over time. Other theories deal with the changes within the cells themselves, while still others state that aging is programmed, and that the aging process is regulated by an aging clock located in the hypothalamus. The gene theory maintains that there are certain genes which contribute to bodily dysfunctions, and that these genes appear to become activated as persons grow older. Further, there is the cellular garbage theory that claims that there are certain deposits (such as lipofuscin) that accumulate in cells to create dysfunctions that lead to aging and, ultimately, death.

The autoimmune theory is very likely the theory that should receive greater attention. According to this theory, the immune system gradu-

ally breaks down, and, thus, permits certain diseases to be activated in old age or to cause diseases of long maturation to manifest themselves in old age. This results from the fact that the immune system in older persons appears to function less efficiently.

No theory adequately explains why people age, or how they age. Some hypotheses promulgated to help retard the aging process have included: lowering the caloric intake, sleeping in colder environments, or developing special diets. The ideal is to keep people young for as long as possible, and to avoid old age altogether.

Aging occurs within the body at the cellular level, as well as outwardly. Yet it is the outward signs that are referred to when commonly describing aging, such as the graying of the hair, wrinkling of the skin, loss of hair, stooped posture, or other alterations in appearance. In some older persons, the posture is so bent that the person appears to be facing the ground, and, according to an old saying, the grave is already beckoning them.

Chronological Age

Chronological age refers to the number of years a person has lived or an individual's birthday age. There is also the term physiological age. This is the physical age of the person. An individual may be 90 years old, but have the health status that is equivalent to a 50-year-old. A person at age 60 suffering from a heart ailment may have a heart that can be equated to that of an 80-year-old. Even within one individual, organs age at different rates. A person's kidneys may be one age, the heart another, and the liver still another.

One overarching change that is linked to the aging of an individual is the fact that he or she responds less well to stress. There is also an inherent vulnerability that accompanies the aging process. Persons who appear hale and hearty prior to a stressful event, such as experiencing a fall, may have great difficulty, physically and psychologically, in overcoming resultant trauma or stress.

Increased Longevity

Advances in medical knowledge, combined with better dietary and sanitary measures, have led to an increase in life expectancy. An in-

crease in the number of elderly people is accompanied by a greater incidence of health disorders of the aged.

The aging of the population is a universal change, and has kindled increased interest in the study of population changes or demography. Since the 1880s there has been a gradual increase in life expectancy.

Two approaches are used to examine a population on the basis of age. The cross-sectional approach measures the characteristics of existing groups of people and observes how they compare or contrast according to age. The longitudinal approach selects a group of people of the same age and follows changes in their attributes as time passes. The cross-sectional approach has the limitation that each age-based subgroup has had a different biomedical history that may have uniquely influenced the characteristics measured. Following a group throughout its life span (longitudinal) is expensive, and, at each successive stage of study, the survivors are unique.

A conspicuous feature of an aged population is the range, or variability, of function seen in any given age group. An individual, age 70, who is near death and has many systems failing to maintain homeostasis, provides a notable contrast with those of the same age and in good health who may expect to live another 10 to 30 years. This variability is not trivial to the understanding of age changes. It is not surprising, for example, that older persons have nutritional needs and metabolic characteristics that are different and more limiting than those of their youth. If there is no particular value to the species in these functions lasting in optimal form beyond the reproductive period of life, then some may deteriorate as aging occurs, while others randomly persist. Gerontologists, who study all aspects of aging, and geriatricians, the biomedical group interested in the health of the aged, must look at the aged as a population in which some of the physiological characteristics of the young continue, but in which other characteristics become altered in an irregular way and need new understanding.

The study of aging must be multidisciplinary, drawing substantially from fields of study such as sociology, psychology, biology, genetics, and biochemistry. Physiology remains central in considering the mechanisms of the body and the processes by which they are carried out.