The Escape from Hunger and Premature Death, 1700–2100

Nobel laureate Robert Fogel's compelling new study examines health, nutrition, and technology over the past three centuries and beyond. Throughout most of human history, chronic malnutrition has been the norm. During the past three centuries, however, a synergy between improvements in productive technology and human physiology has enabled humans to more than double their average longevity and to increase their average body size by more than 50 percent. Larger, healthier humans have contributed to the acceleration of economic growth and technological change, resulting in reduced economic inequality, declining hours of work, and a corresponding increase in leisure time. Increased longevity has also brought increased demand for health care. Professor Fogel argues that health care should be viewed as the growth industry of the twenty-first century and that systems of financing it should be reformed. His book will be essential reading for all those interested in economics, demography, history, and health care policy.

Robert William Fogel won the Nobel Prize for Economics in 1993. He is the Charles R. Walgreen Distinguished Service Professor of American Institutions at the Graduate School of Business and Director of the Center for Population Economics at the University of Chicago. His numerous publications include *Time on the Cross: The Economics of American Negro Slavery* (with Stanley L. Engerman) and *The Fourth Great Awakening and the Future of Egalitarianism*. 
Recent work in social, economic, and demographic history has revealed much that was previously obscure about societal stability and change in the past. It has also suggested that crossing the conventional boundaries between these branches of history can be very rewarding.

This series exemplifies the value of interdisciplinary work of this kind and includes books on topics such as family, kinship, and neighborhood; welfare provision and social control; work and leisure; migration; urban growth; and legal structures and procedures, as well as more familiar matters. It demonstrates that, for example, anthropology and economics have become as close intellectual neighbors to history as have political philosophy or biography.

For a full list of titles in the series, please see the end of book.
The Escape from Hunger and Premature Death, 1700–2100

EUROPE, AMERICA, AND THE THIRD WORLD

Robert William Fogel
The University of Chicago and
National Bureau of Economic Research
To

Sir Tony Wrigley

and to the memory of D. Gale Johnson and Peter Laslett,

whose works have greatly influenced my approach to

many of the issues discussed in this volume.
This three-dimensional diagram, called a “Waaler surface,” illustrates how height and weight are related to the risk of both poor health and mortality. Its nature and uses are explained in nontechnical language in Chapter 2. Waaler surfaces were first proposed by Hans Waaler (National Institute of Public Health, Oslo) in 1984 and realized by John Kim (Center for Population Economics, University of Chicago) in various articles written or published in the late 1980s and early 1990s. Constructed by Grigoriy Abramov (Center for Population Economics, University of Chicago).
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The frontispiece to this volume is a mathematical representation of the relationship between human physiology and longevity. It is emblematic of the enormous advances in the health and wealth of people over the past 300 years. It is also emblematic of the vast increase in humankind’s control over the environment and of the scientific, industrial, biomedical, and cultural revolutions that are the foundations for that control.

These advances are aptly described by the term “technophysio evolution,” which was coined to describe the unique nature of human progress since 1700. During these three centuries there has been a fifty-fold increase in the average incomes of the peoples of the United States and Japan and comparable increases in the leading countries of Western Europe. The peoples of these countries have greatly improved their health and more than doubled their longevity.

Technophysio evolution and its implications are the central themes of this volume. The term describes the complex interaction between advances in the technology of production and improvements in human physiology. The interaction is synergistic, which
means that the total effect is greater than the sum of its parts. This interaction between technological and physiological improvements has produced a form of evolution that is not only unique to humankind but unique among the 7,000 or so generations of human beings who have inhabited the earth. Although the process has been experienced only by the last ten generations of humankind, it is still ongoing. Technophysio evolution is likely not only to accelerate during the twenty-first century, but also to have a much more far-reaching impact on the poor countries of the world than it has had to date.

This book is based on the McArthur Lectures that I delivered at Cambridge University in November 1996. In those lectures I sought to summarize my own research into the synergy between improvements in productive technology and in human physiology during the past three centuries. I also sought to place that work in the context of the revolution in biodemography, including historical demography, that began shortly after World War II and has continued down to the present day.

This volume differs from the McArthur Lectures in two respects. First, I have omitted one highly technical lecture that focused on problems of measuring the contribution of various factors to improvements in nutrition, health, and longevity. Some of these issues are discussed in Chapters 2 and 3 in a manner that makes them accessible to general readers. Second, I have added two chapters.

Chapter 4 deals with the crises in financing health care and retirement brought about by increases in longevity and the rapid growth in the demand for health care services in both rich and poor nations. In this connection, I evaluate the debate over whether advances in biotechnology will save the current national health care systems, many of which are teetering on the brink of insolvency.

Chapter 5 surveys the evidence and debates bearing on the equity of health care, both within nations and internationally. Immediately after World War II, many nations sought to establish national services that would provide complete health care to everyone. More recently, public authorities have shifted their emphasis to guaranteeing “essential” health care. The distinction between
universal and essential health care is evaluated, as are debates over the optimal mix of private and government components of health services. Problems of preserving equity created by an increasing reliance on the private sector are considered.

The share of health care in national incomes has been rising in both rich and poor nations. This development has created alarm among public officials and some academic analysts. The alarm is unwarranted because the rising consumption of health care is driven by popular demand. In the pages that follow, I argue that health care is the growth industry of the twenty-first century. It will promote economic growth through its demand for high-tech products, skilled personnel, and new technologies, just as electrification spurred economic growth during the first half of the twentieth century. To achieve that potential it will, however, be necessary to reform some aspects of the system of the financing of health care that are not well suited to current needs.
I am indebted to Sir Tony Wrigley, who invited me to present the McArthur Lectures and who has influenced my research since the 1960s.

It was my good fortune to have had Simon Kuznets as my principal teacher in graduate school. He introduced me to the many exciting issues on the interrelationship between population growth and economic growth.

Much of what I have reported in this volume stems from the findings of the collaborators in the program project “Early Indicators of Later Work Levels, Disease, and Death,” including Dora L. Costa, Matthew E. Kahn, Chulhee Lee, Louis L. Nguyen, Clayne L. Pope, Irwin H. Rosenberg, Nevin S. Scrimshaw, Chen Song, Werner Troesken, Sven E. Wilson, Peter D. Blanck, Christine K. Cassel, Johanna T. Dwyer, Jacob J. Feldman, Joseph P. Ferrie, Roderick Floud, Kwang-sun Lee, Robert Mittendorf, Aviva S. Must, Ira M. Rutkow, James M. Tanner, James Trussell, and Larry T. Wimmer.

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