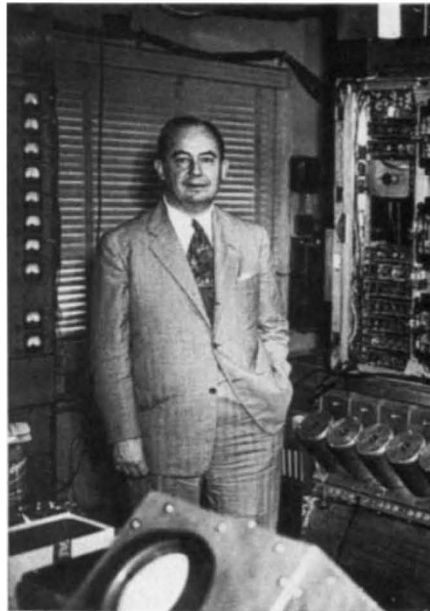


talents. Half of the book is therefore devoted to a detailed treatment of von Neumann's work in this sphere.

Von Neumann was one of the first to realize that new mathematical methods would be needed to use the computer effectively and he helped set out the research agenda for computer-orientated numerical analysis. At Princeton, he also established a meteorology project, which helped prepare the first computer methods for weather forecasting and led to the production of daily numerical forecasts. Naturally, he applied the computer to various scientific problems as the opportunity arose and this allowed him to make contributions in fields as diverse as atomic physics, fluid dynamics and traffic simulation. More importantly, von Neumann was fascinated by the analogy between the digital computer and the human brain. Almost singlehandedly he blazed a trail into the theoretical field of information processing systems, or automata, and introduced such themes as learning, reliability of systems with unreliable components, self-replication, and the problems of memory and storage capacity in biological nervous systems. This work, which was tragically and prematurely ended when von Neumann died of cancer in 1957, remains central to modern concerns with parallel processing and artificial intelligence.

Because von Neumann was "violently anti-Communist . . . and more militaristic than most" (his own words), not all of his energies were directed towards constructive ends. It was in America's growing military-industrial complex that he found his true spiritual home and much of his later work involved the development of bombs and delivery systems. Yet, in contrast to Andrew Hodges' recent biography, *Alan Turing: The Enigma of Intelligence*: Burnett Books/Hutchinson, London, 1983 and Steve Heims' study, *John von Neumann and Norbert Weiner: From Mathematics to the Technologies of Life and Death*: MIT Press, Cambridge, 1980, the political, military and economic

dimension are only lightly sketched here. Only a brief final chapter looks at von Neumann as scientific consultant and statesman and there is no discussion of von Neumann's deeper motivations. On the other hand, this book is far better documented than Heims' — Aspray has clearly researched far more archives than any other writer — and it is not intended as a full-scale biography. Within its narrower focus it succeeds admirably and is a



Von Neumann — brilliant and precocious.

major addition to the MIT Press's excellent series on the history of computing. The author's extensive knowledge of the subject enables him to bring new and interesting insights into every aspect of von Neumann's work. He allows us to see the true scale of von Neumann's achievements in computing for the first time and firmly establishes his reputation as the most influential computer pioneer of all time. □

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## Beating disease

Roy Porter

**Disease, Mortality and Population in Transition: Epidemiological-Demographic Change in England since the Eighteenth Century as Part of a Global Phenomenon.**

By Alex Mercer. *Leicester University Press/Columbia University Press: 1990. Pp. 262. £45, \$69.*

How do we explain the great modern rise in population, the taming over the last few hundred years of once terrifying diseases such as typhus and typhoid, and the leap in life expectancy? Traditionally, all these

are put down to the triumphs of scientific medicine. Then, in a series of influential works, Professor Thomas McKeown of the University of Birmingham threw a gigantic spanner in the works. Mortality from conditions such as tuberculosis, he insisted, was on the decline long before effective medical treatments were developed. Indeed, in earlier centuries, medicine itself had all too often been counter-productive — thus hospitals were 'gateways to death'. So what had defeated the empire of disease? The explanation, according to McKeown, lay in rising standards of living, and above all, improved nutrition.

Alex Mercer is one of numerous epidemiological demographers convinced

that the McKeown thesis does not hold water. For one thing, Mercer argues, medicine deserves more credit than McKeown allowed. The development by the medical community first of inoculation and then of vaccination helped conquer smallpox, after the plague's disappearance the most fearsome epidemic disease in Britain. And then the adoption of what we may, in the broader sense, call preventive measures — improved personal hygiene, urban clean-ups, purer drinking water, better waste-disposal, the isolation of sufferers from contagious diseases — initiated that long retreat of the major water- and air-borne infections visible from mid-Victorian times, probably independently of any demonstrable enhancements in diet. And this story of general health and environment improvement, Mercer notes, may hold some lessons for action nowadays in the Third World. Although hi-tech medicine may not be appropriate or affordable, improvements in health need not wait upon general economic progress: elementary public health and personal hygiene initiatives can achieve in Africa today what they accomplished in Manchester and London last century.

Of course, all was not pure gain. The age of communicable diseases was succeeded not by radiant health but by rising incidence of chronic and degenerative conditions, above all cancers and circulatory diseases; and Mercer offers interesting speculations upon possible epidemiological linkages between acute disorders and noncommunicable diseases with multifactorial aetiologies — for instance, cancer as, in some sense, the 'successor' of tuberculosis. Nevertheless, Mercer's analysis provides a credible corrective to McKeown's excessively negative reading of the role of medicine.

The problem is that Mercer adds little new information to a now familiar anti-McKeown line that has emerged during the last decade. Indeed, he fails to integrate any substantial contributions to the case, for instance Linda Bryder's and F.B. Smith's books on tuberculosis, both of which appeared nearly three years ago. Nor, in some cases, does he fully get to grips with the real ambiguities of the evidence. Recent research, above all that of Roderick Floud, has demonstrated that the English grew taller during most decades of the nineteenth century. This suggests better diet and, by inference, better resistance: maybe there is life in McKeown's nutrition theory after all. Mercer offers a workmanlike, if not especially readable, survey of a key debate. We have not yet heard the last word. □

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