Some individuals age more successfully than others. In a field dominated by youngsters, mathematician Donald Coxeter produced his last important paper at age 96 years; George Bernard Shaw, his last play at 93 years; and Grandma Moses, her last painting at 101 years. The record holder for human longevity, Madame Calment, died at age 122 years with no clinical symptoms of dementia. So what permits some to age with their cognitive abilities largely intact, while more than half of individuals older than 80 years develop mild to severe dementias? As longevity increases, the medical and social importance of this question becomes ever more pressing, and a book such as Brain Aging is particularly welcome. However, as well written and enlightening as the book is, I find aspects of it disturbing.

The book is divided into 4 broad sections describing methods and models for assessing cognitive aging, quantifying brain changes with age, assessing functional changes in the nervous system, and summarizing specific mechanisms regulating brain aging. The introductory chapter by Elizabeth Glisky is particularly commendable. Glisky makes it clear that age-related changes in human cognitive functions differ in extent and detail from individual to individual, a fact that many other writers bury within averages and trends. Glisky also ably summarizes the various kinds of basic cognitive functions susceptible to study—attention, working memory, long-term memory, and perception—as well as higher-level cognitive functions such as language, decision-making, and executive control. While all of the essays are clearly written, well-organized, informative, and accompanied by extensive and useful bibliographies, that by Glisky provides a range and structure worth emulating.

One problem with studying brain aging in humans is that it is difficult or impossible to perform invasive experiments that might link changes in cognitive function to underlying anatomical, cellular, and metabolic changes. Thus, most of the essays focus on studies related to monkeys and rodents. The methods described range from magnetic resonance imaging, genetic profiling of cellular metabolism using RNA, and conduction velocity techniques to receptor and second-messenger studies and design-based stereology for reconstructing 3-dimensional images of histological specimens.

The range of changes in animals that can be studied with these methods is much greater than that in humans and includes signal transduction, receptor modification, stress and hormonal effects, neural plasticity, changes in blood flow, reactive oxygen species, and neuronal activation. Moreover, the direct effects of diet, exercise, and drugs are susceptible to better control and study in animals than in humans. But because cognition in rodents is relatively rudimentary compared with that in humans and monkeys, the range of functions studied by most investigators is limited to spatial learning, memory, and fear conditioning. The discrepancy between measurable rodent and human cognitive functions creates substantial issues that the book never addresses. This problem is exacerbated by the fact that the rodent studies focus on changes in the hippocampus, while the human and monkey studies focus on the forebrain. The reader is left uncertain as to which regions of the brain are the most significant for understanding functional aging.

Unfortunately, the structure of the book does not assist the reader in making sense of the diverse contributions. There is no concluding chapter synthesizing the current state of the field, discussing areas of controversy, highlighting anomalous results, or pointing to new opportunities.

As a broadly trained physiologist, I was also puzzled that the brain studies described in the book were performed almost without reference to the aging of the rest of the animal. Surely cardiovascular and pulmonary function and disease must affect brain function, as must the aging of the immune system, the increased incidence of metabolic disease, and the fact that aging patients are increasingly medicated with an ever-broader range of pharmaceutical agents, the combined cognitive effects of which are largely, if not completely, unknown. Is the absence of discussions concerning the aging brain within the context of the aging body a result of overspecialization in training, the need to focus (too narrowly!) to obtain grants, or perhaps a deeper philosophical adherence to what many now consider the outmoded Cartesian separation of mind and body? These issues should be discussed explicitly.

Finally, I cannot help but get on my hobby-horse about the need for all working scientists, particularly those writing for each other, to describe and discuss the limitations of knowledge. Investigators conduct research because of what they do

**Financial Disclosures:** None reported.
not know, not because of the knowledge that they have already accumulated. What drives breakthroughs is the explicit recognition of ignorance. Every editor, whether their topic is the aging brain or any other medical topic, should have someone write a chapter about the limitations of techniques and methodologies and how these may be trapping investigators into particular types of experiments that limit their hypotheses. Conversely, investigators need to know how their theories affect and limit data collection. None of this is evident from Brain Aging, yet only when it becomes apparent will the next generation of work in this field be catalyzed.

Robert Root-Bernstein, PhD
Department of Physiology
Michigan State University
East Lansing
rootbern@msu.edu

Financial Disclosures: None reported.

Disease Surveillance:
A PUBLIC HEALTH INFORMATICS APPROACH
Edited by Joseph S. Lombardo and David L. Buckeridge.
485 pp, $105.95.

A FUNDAMENTAL FUNCTION OF PUBLIC HEALTH IS SURVEILLANCE—the early identification of an epidemic, disease, or health problem within a population. The events of the past decade, from anthrax infections to sudden acute respiratory syndrome to avian flu, highlight the need for effective surveillance. Quick informed action can save lives, protect the public, and reduce the impact of disease. But the concurrent decline in public health infrastructure and the tightening of public health budgets makes surveillance more difficult. This, coupled with a wave of retirements of experienced surveillance professionals, suggests that the need for training in surveillance may be at a high point. Fortunately, the rise of public health informatics—the application of data, technology, and computer science to surveillance—provides an opportunity to begin to better understand, identify, and predict disease outbreaks.

Disease Surveillance: A Public Health Informatics Approach, edited by Joseph Lombard and David Buckeridge, is a textbook aimed at those enrolled in a full-scale graduate-level course or those taking a specific class to learn an important set of new skills. The book contains 12 chapters, each with useful study questions and an ample set of references. The editors tie the book chapters together with a well-written introduction.

One of the strong points of the book is its attention to new technologies that promise to make it possible to scan a large population and spot an outbreak almost as soon as symptoms begin appearing. Another particular strength of the book is the training it provides on the use of new technologies, with sections on automated surveillance systems, database development and software, and development of surveillance systems in the context of the Health Information Portability and Accountability Act of 1996. The book could serve as a reference manual for those who occasionally have a need to work with or develop surveillance methods or for those managing such systems.

The book does an excellent job of describing complex technologies for persons whose expertise lies elsewhere, an important asset because many public health practitioners have little computer expertise beyond standard word-processing and statistical programs. For example, there is a chapter on using algorithms for surveillance that is particularly informative, laying out the issues and describing techniques in clear, jargon-free language.

The shortcomings of the book are related to the shortcomings of medical surveillance in general. The issues lie not at the center of the discipline but at its edges: What should be done once a disease outbreak is detected? Can anything be done by that point? How can effective surveillance be carried out in the most vulnerable and most at-risk communities, such as the population of undocumented workers and the uninsured? And is surveillance, beyond restaurant-related outbreaks and a few other fairly common diseases, cost-effective for every health department? Should surveillance resources be spent on other health issues?

The book, as good as it is, does not answer these questions. Perhaps these issues would be best addressed in a set of discussions beyond the perimeter of the book. Again, the book does make an excellent reference manual or a basic textbook for a course on surveillance. That investigators have yet to fully develop a surveillance system that can simultaneously protect the privacy of individual citizens, reach those whom the health care system is currently not assisting, and provide a reasonable degree of safety to the public is not the fault of the authors. It is the fault of society.

Russ Lopez, ScD, MCRP
Department of Environmental Health
Boston University
School of Public Health
Boston, Massachusetts
rptlopez@bu.edu

Financial Disclosures: None reported.

Rethinking Informed Consent in Bioethics
By Neil C. Manson and Onora O’Neill.
226 pp, $32.99.

INFORMED CONSENT HAS THE POWER TO DISTINGUISH MEDICAL practice and research from battery and exploitation. Beneficent intentions and medical expertise alone cannot do this. Perhaps no other ethical obligation is so universally embraced in medical practice and research as the obligation to