A comprehensive medical history

The Western Medical Tradition: 1800 to 2000
by W. F. Bynum, Anne Hardy, Stephen Jacyna, Christopher Lawrence & E. M. (Tilli) Tansey
Cambridge University Press: 2006. 614 pp. $90, £50 (hbk); £19.99, $29.99 (pbk). Available as a two-volume set with *The Western Medical Tradition: 800 BC to AD 1800*. $70, £40

Andreas-Holger Maehle

"The social history of medicine has come of age," stated historian Andrew Wear nearly 15 years ago in the introduction to *Medicine in Society* (Cambridge University Press, 1992), a collection of historical essays that became popular as a textbook. After reading *The Western Medical Tradition: 1800 to 2000*, by Bill Bynum and colleagues at the Wellcome Trust Centre for the History of Medicine at University College London, my diagnosis is that the subject has now fully matured.

Conceptualized as a companion volume to *The Western Medical Tradition: 800 BC to AD 1800* by authors from the same centre, the new book provides in four large chapters a comprehensive synthesis of the development of medicine in the context of nineteenth- and twentieth-century Western society. Two general themes emerge: one is the increasing effect of the natural sciences in shaping medicine against the background of industrialization and modernization; the other is the gradual acceptance, by governments and the public alike, of Western orthodox medicine as the arbiter in matters of individual and collective health. The history of 'alternative' medicine, although not ignored, does not receive particular treatment in this otherwise wide-ranging historical survey. There is, for example, no sustained discussion of the history of homeopathy.

Inevitably, perhaps, the broad overview in this book reflects certain trends and focal points in the historiography of medicine over the past 20 years or so. Accordingly, the history of public health and social welfare, of epidemics, of medicine in wartime, and the rise of modern hospital medicine take up a lot of space. Scientists central to the history of medicine, such as Rudolf Virchow, Louis Pasteur and Robert Koch, are treated in due detail. The book also raises awareness of historiographic methods. Stephen Jacyna, for example, in his chapter on the first half of the nineteenth century, discusses the approaches of Marxism and Michel Foucault to the history of medicine.

The book has a strong international perspective, covering developments in Germany and France, as well as Britain and the United States. It was not written strictly as a comparative history, but still provides valuable insight into different national styles of medicine. For instance, the strong drive towards medical specialization in Germany, the United States and France is contrasted with a resistance to this trend by British doctors that lasted until after the First World War. Medicine in Nazi Germany is treated in a separate section, but the presence of eugenic ideas and practices in Western countries during the 1920s and '30s is emphasized in other parts of the book. Given this international approach, it is regrettable that the otherwise useful bibliographies for each chapter cite only English-language publications. This may be appropriate for a volume that is bound to become a key textbook for UK and US courses on the history of medicine, but the book's reach could have been made even wider by including, say, some French- and German-language scholarship in the field.

Another merit of this volume is that it contains one of the very few summaries of the history of Western medicine after 1945. The authors of this chapter, Anne Hardy and Tilli Tansey, focus on Anglo-American developments, but regularly contextualize them with data from various European countries. They also address the apparent paradox that despite undeniable progress in diagnostics, therapy and disease prevention, public perception of medicine and biomedical research has become increasingly critical since the 1970s. The story of progress in medicine is also qualified by public criticism of the inequality in health-care provision between developing and developed countries, especially in the face of the HIV pandemic, the resurgence of tuberculosis and continuing problems with malaria control.

As this book shows, traditions in medicine and science can have a powerful influence on how health care is shaped for the future. I therefore recommend the book to anyone with a serious interest in understanding the interactions between the social and scientific events that have formed modern medicine. ■

Andreas-Holger Maehle is head of the Department of Philosophy, Durham University, Durham DH1 3HN, UK.

The background buzz

Noise
by Bart Kosko
Viking: 2006. 272 pp. $24.95

P. V. E. McClintock

Every macroscopic system is subject to noise, from the random fluctuations of its environment as well as its own internal fluctuations. If, like Bart Kosko, you consider things such as e-mail spam and extraneous signals and objects to be noise, then your immersion seems even more overwhelming. Noise is not a trivial detail, and in general it cannot just be ignored on the grounds that it will somehow average out. In the case of nonlinear systems, far from averaging out, it gives rise to a diverse range of important phenomena, such as stochastic resonance.

In *Noise*, Kosko takes the topic of noise, using the widest possible definition, and tries to make it accessible and interesting to the general reader. He opens with his central thesis that noise is "an unwanted signal" and develops ideas from information theory of noise in digital signals. The next two chapters cover noise in the everyday sense of unwanted acoustic disturbances. There is anecdotal material about unneighbourly behaviour, litigation, crematoria, noise from aircraft, the law on trespass, damage to hearing, noise-induced stress, and undersea noise involving the US Navy, dolphins and whales.

Much of the hard science, and its exposition in simple terms, is consigned to the (long) fourth chapter. Kosko covers a remarkably wide range of topics, from cosmology and photosynthesis to white and coloured noise, and the central-limit theorem. This is followed by a chapter including Fourier techniques and spread-spectrum encryption. The book ends with a discussion of stochastic resonance, an interesting phenomenon in which noise plays a creative role, rather than its usual destructive one. Here the addition of noise to a nonlinear

HANNA HGAL/SPL

In one ear: there's more to noise than unwanted sound, and it's not all bad.

system can cause amplification and enhance the signal-to-noise ratio of a signal passing through the system.

Each chapter is prefaced with ten or so intriguing and provocative quotations that occupy several pages. There are also more than 60 pages of notes at the end of the book, arranged by chapter, expanding on the material in the main text. Many of them are useful and interesting, but in the end I got tired of continually turning pages to find them; they would have been far more convenient as footnotes.

Has Kosko succeeded in his aims? I believe he has, to a large extent, although in one or two places he illustrates the G. K. Chesterton dictum that "He who simplifies simply lies" by conveying a misleading impression. For example, few readers will appreciate that stochastic resonance can do nothing to enhance the signal-to-noise ratio of a given signal. It can certainly ameliorate the information loss that otherwise occurs when a signal passes through a nonlinear system, but I very much doubt whether readers will understand this fact from Kosko's discussion. I suspect, though, that schoolboy howlers such as "The brain consumes about 20 watts of power each day" are not from the author's pen.

I am surprised that Kosko omits all mention of optimal fluctuational paths, given their conceptual simplicity and the nice way they link together many of the other ideas he presents. Most of the interesting and important events in noisy systems involve such optimal paths, including chemical reactions, mutations in genes, and failures of lasers and electronic devices. In all these cases, the system fluctuates near an attractor of some kind for a long time, and then travels along an optimal path to a different attractor. Remarkably, despite the noisy driving force, these paths are deterministic in character.

While accepting the author's broad view of what constitutes noise, I also feel that some of his writing introduces its own noise, through the unnecessary introduction of a multiplicity of distracting ideas that are tangential (or irrelevant) to the point being discussed. What is certain, however, is that every reader of this book will end up learning something new and interesting. ■

P. V. E. McClintock is in the Department of Physics, Lancaster University, Lancaster LA1 4YB, UK.

SCIENCE IN CULTURE

A modern megalith

Mariko Mori's glass sculpture responds to the death of stars.

Martin Kemp

Prehistoric standing stones and rings, many erected more than 5,000 years ago, are awesome achievements. Not surprisingly, the greatest of them, such as Stonehenge, have served over the centuries as magnets for legends and mystical mumbo-jumbo.

The reality being revealed by modern archaeoastronomy provokes almost as much wonder as the legends. Perhaps most astonishing are the astronomical alignments that have been demonstrated in megaliths. It is clear that our 'primitive' forebears not only observed celestial phenomena with remarkable precision, but also built their great stone monuments as a means of relating their earthly existence to cosmological events far beyond their reach.

Such astronomical megaliths serve as the inspiration for an installation by that most high-tech of artists, Mariko Mori. A student of fashion in her native Japan, she worked briefly as a model before studying art in London and now lives in New York. She began by exploiting multimedia to fashion herself into a futuristic 'cyber-chick', transformed into a synthetic fantasy of kitsch sexuality, far removed from the ragged desires of our organic reality.

Superficially — and it is easy to see such work as superficial — she seemed to belong to a late species of pop art, delighting ironically in the sheen of slick popular imagery. However, she has insisted on a more serious purpose, adducing her immersion in Buddhist philosophy to stress the interconnectedness of all things, via art, science and technology.

With her earlier work it was difficult not to see these high claims as somewhat forced. However, her recent creations have laid this problem to rest. She has been collaborating with scientists to produce experiences that are startling in their technical sophistication, yet evoke both the inner world of our minds and the outer worlds of the cosmos.

***Tom Na H-iu*: the output of a neutrino detector becomes a meditation on the soul.**

SHIRAISHI CONTEMPORARY ART, TOKYO

At the 2005 Venice Biennale she exhibited *Wave UFO*, a futuristic pod in which the brainwave data from electrodes attached to three participants were projected on the ceiling as mutating coloured shapes. Three kinds of waves — alpha (blue), beta (pink) and theta (yellow) — were used to render visible endlessly variable arrays of mental processes. Now, at the 2006 Singapore Biennale, she is showing *Tom Na H-iu*, a 3-metre-high radiant glass monolith that is plugged into cosmic radiation.

The translucent megalith is suffused by light from an internal LED, controlled by a computer, which is, in turn, linked to the Super-Kamiokande detector used in the Kamioka Observatory in Japan to detect neutrinos from outer space. Among the neutrinos that govern the megalith's light emissions are some that emanate from exploding, dying stars — supernovae. Programmed to respond to the detection of different neutrinos in real time, the sculpture glows with colour-coded traces of ancient violence from remote regions of the cosmos.

In Celtic mythology, say the work's promoters, Tom Na H-iu is a place where the souls of the dead linger before being reborn, and the Celtic standing stones that inspired the artwork were believed to play a role in this spiritual transmigration. Mori is tapping into the puzzles of birth and death across enormous distances and deep time. The microscopic is a mirror of the cosmic. The lives of our minds and bodies are integral to the processes that govern the Universe.

Just as our Neolithic ancestors reached out to the stars, tuning into the apparently eternal patterns that ruled their seasonal lives, so Mori's sculpture resonates to the beat of celestial time. However, that beat is no longer that of the traditional music of the orderly spheres, but drums out the death march of great stars.

A larger version of *Tom Na H-iu* is on show with other work by Mori at the London gallery Albion until 22 December.

Martin Kemp is professor of the history of art at the University of Oxford, Oxford OX1 1PT, UK. His new book, *Seen | Unseen*, is published by Oxford University Press.