of deep-sea exploration. The next two chapters examine the evolution of sounding and dredging methodology, with attention to the preoccupations of its developers, including the fundamental questions of how deep the ocean actually is and if any life exists in its dark and pressured fathoms. Finally, in Chapters 5 and 6 Rozwadowski discusses national interests in the commissioning of expeditions, as well as aspects of life at sea, including social hierarchy and spatial and gastronomic constraints.

The field of deep-sea exploration comes thus to be seen as the culmination of questions, practices and ocean investigations of many different sectors and kinds. Ocean exploration by seafaring nations such as the United States and Britain helped to define the ocean as an unclaimed territory. Thanks to observations, dredging, mapping and naming by both amateurs and prospective scientists, that territory was transformed into a frontier that was ripe for scientific exploitation. Rozwadowski develops the important point that relatively unknown expeditions made important contributions to the establishment of oceanography as a field. Her case studies include the North Pacific Exploring Expedition in 1853, which solicited no official narratives, and the 1872–6 Challenger Expedition, which amassed a record-breaking collection and published its findings in over fifty volumes. It is easily forgotten that lasting impressions of scientific work are not just channelled through public accounts, but are also adumbrated in the personal communications of scientists, as well as in their engagement and practices with people in other fields. For instance, Rozwadowski writes about the fascinating change deep-sea scientists made within the political culture of ships. Not only were scientists often 'considered as unlucky a shipmate as a cat or a corpse' (p. 191), but, once onboard, they entered a highly stratified culture with a rigid pecking order and practical knowledge systems of experienced seamen that often ridiculed the 'strange' behaviour and requests of scientists.

Rozwadowski shows that behind the transformation she tracks in perceptions of the ocean lies a complex fusion of the working knowledge of seamen and whalers, the popular writings of ocean explorers, the leisure activities of the upper classes in Europe, commercial interests in laying telegraph cable, and national ambitions in exploring the last frontier on the globe. Her book amounts to a persuasive case for the claim she makes, here and in her article in *The Machine in Neptune's Garden* (on schemes for ocean dwelling in the 1960s), that historical research about the ocean and about ocean researchers is of vital importance for those seeking to comprehend the current environmental crisis, as historical understanding provides us with a necessary reflexive perspective and understanding of theories, methods, technology and the ocean environment. Both volumes are therefore significant steps in raising awareness of the importance of historicizing environmental research, including ocean research, and deserve a wide readership.

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David E. Nye, **Technology Matters: Questions to Live With.** Cambridge, MA and London: Massachusetts Institute of Technology Press, 2006. Pp. xiv + 282. ISBN: 0-262-14093-4. £18.95 (hardback).
doi:10.1017/S0007087407000696

'No innovation without representation!' is the battle-cry at the heart of this important book; nor is there representation without comprehension. Although specialists may not find Nye's apologia for their subject particularly novel, they will rarely encounter one as cogent, clear or provocative. For the general reader it is hard to imagine a more approachable and yet sophisticated account of how and why 'technology matters'. Neither talking down to his audience nor pulling his punches, Nye guides us expertly through major debates, referring to a wealth of engaging examples (current, historical and fictional), and setting out the choices we presently face as individuals and as a species.

'Technology matters because it is inseparable from being human' (p. ix). With this straightforward opening statement, Nye briskly propounds the universality of technology in our lives and the provisional nature of our understanding. He delays only to announce the ten principal questions to be addressed, one per chapter, starting with 'What is technology?' and ending with issues of risk and human dependence on, and independence of, technology. The first five chapters provide a lucid introduction to the standard Big Questions about technology: what it is; its relations with culture (including, specifically, gender) and science; the refutations of determinism via cultural choices and unintended consequences; the differences between externalist, internalist and contextualist approaches; the unpredictability of technological change; and the role of consumers in finding unexpected meanings and uses. By Chapter 4 Nye is categorical: 'Technologies are social constructions' (p. 49). He endorses Thomas Hughes's concept of 'technological momentum' as especially valuable in understanding large-scale systems, such as the electric grid or transport, where the interdependence of technical components and the complex of vested interests make any fundamental reconfiguration both onerous and expensive. Although apparently deterministic, such embedded systems, Nye insists, were initially the product of human choices. Yet it is vital not to underestimate their intractability – witnessed, for example, by the tribulations of reversing the exponential rise in car journeys in societies where the urban sprawl they have promoted is not economically served by public transport or safely navigated on foot or bicycle. In an alarmingly short time, successful new technologies are 'woven into the fabric of daily life', coming to seem 'natural' and 'inevitable', to be something we 'cannot do without' (p. 65). One generation's awe-inducing novelties are taken for granted by the next.

In the remaining chapters, Nye casts off academic impartiality to craft a reasoned but hard-hitting polemic against the truisms of economic and technological liberalism. First, he disputes the sustainability of the ever-rising material standards that a Western minority enjoys at the expense not only of most other inhabitants of the planet, both human and nonhuman, but also of their own peace of mind. 'According to some polls … Americans of the 1990s were no happier than they had been in 1957. Their work hours had increased, while time spent with friends and family had declined' (p. 100). From Thomas More and Thoreau to E. F. Schumacher and World Watch, simplicity of life has been proffered as the key to individual contentment; it is now prescribed as a collective necessity if we are to avoid the worst consequences of exceeding Earth's 'carrying capacity'. The outcome rests with human choices: for what will we use our limited resources of water and land – swimming pools and green lawns or drinking water and crops?

Few predictions have been as consistently incorrect over the long term as the spectre of technological unemployment. The nature of work has altered enormously during the past two centuries but the Janus-faced prospect of enforced leisure – for the vast majority – remains as remote as ever. In Nye's view, the predominant trends remain ones of increasing intensity of work and its trespass on home and privacy. For some, stuck in poverty and lacking trade union representation, there is no choice, but for consumer junkies obsessed by 'getting and spending' and for status-seeking 'workaholic' professionals there is. One of Nye's most striking remarks is that the 'factory system undermined the musical aspects of traditional work' (p. 111). Industrialization demanded new skills and created novel opportunities at the same time as it destroyed old ones, computerization likewise. Both developments, however, draw us further away from the seasonal, social and bodily rhythms that modulated pre-industrial life. The losses are more subtle – and soul-destroying – than forecast.

And so, what about representation? Neither markets nor media provide the spheres for reasoned deliberation they once did and the US Congress in 1995 overturned its predecessors' enlightened establishment of the Office of Technology Assessment. Nye's sympathies lie, by default, with the protestors who took non-violent direct action against the World Trade Organization and against corporations that ride roughshod over people and planet, but his goal is

to reintegrate their activism into the mainstream political process. He commends Dutch and Danish citizen forums on technological policy, 'deliberative polling' (through which in the 1990s Texans demonstrated their preference for renewable energy sources) and 'the sorts of controls used to evaluate new drugs' that would allow society to monitor and, if necessary, recall new technologies, since many of their consequences are unintended and their risks unforeseen. These are valuable proposals, though I fear for their efficacy in societies where pork-barrel politics keep the twin fires of consumerism and militarism well stoked, or where public inquiries may be curtailed in the name of efficiency and a new generation of nuclear power stations commissioned by prime-ministerial fiat.

Few books matter as much as this one. MIT Press is to be congratulated on producing an attractive hardback for the price of a paperback. Nye leaves us in no doubt that humanity – especially those of us living in the most technically advanced countries – neglects the use and abuse of technology at its peril. Yet his underlying tone is upbeat and empowering: technology presents us with serious challenges but nothing is determined. We have choices and the most important choice is not to put our heads in the sand.

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Carsten Timmerman and Julie Anderson (eds.), **Devices and Designs: Medical Technologies in Historical Perspective.** Basingstoke and New York: Palgrave Macmillan, 2006. Pp. xiv + 284. ISBN 1-4039-86444-4. £55.00 (hardback).
doi:10.1017/S0007087407000702

The experience of sickness, its diagnosis and treatment has been dramatically transformed over the last century. Many, if not all, of these changes involve technological developments that have enabled the body of the sick to be evaluated in new and different ways and that have permitted the caregiver to intervene in the illness experience in an unprecedented manner, with not always predictable outcomes. In their thoughtful introduction to this excellent new collection of essays on the history of medicine and its technologies, editors Carsten Timmerman and Julie Anderson concede that the significant role of technology in medical care has not exactly been neglected by historians of medicine, science and technology. Nonetheless, the field, as evidenced by the contributors to this book, has expanded and developed; it has become more international and more methodologically diverse.

Devices and Designs includes essays that focus on a broad spectrum of medical technologies and associated topics, including orthopaedic techniques, the X-ray, the laboratory analysis of body fluids, the artificial eye and the prosthetic hip, the medical linear accelerator, the cardiac pacemaker, the social organization of medical research (especially the clinical trial), and the pharmaceutical industry and its impact on germs, patients and providers in the treatment of infection and the control of hypertension. In addition, several authors concentrate on the conceptual features of the careers of certain medical technologies: evaluations of efficacy, assessments of risk and benefit and the understanding and deployment of evidence in making recommendations about the use of such controversial technologies as hormone replacement therapy, breast cancer screening and cochlear implants.

In an especially illuminating essay, Neil Handley, the curator of the British Optical Association Museum and College of Optometrists in London, analyses what he calls the 'artificialization' of the human face by the use of 'false eyes'. These eyes, unlike false teeth, did not initially serve a physical function; they were used to conceal a defect and to normalize the appearance of someone who had lost an eye through disease or injury. Given their cosmetic function, it is perhaps unsurprising that physicians and surgeons left the provision and sale of these devices to