

does not explore. For example, the invention of sound ranging artillery techniques to improve counter-battery fire during the first world war — the ‘acoustics war’, as one populariser put it — helped generate widespread interest in both seismic and electrical methods of measuring movements in the earth. Although the Schlumbergers began their work in 1911, it is tempting to ask whether wartime experience of these techniques either advanced their testing, or had a bearing on their reception.

Equally, whilst Bowker attributes the competing (and eventually, more widely accepted) seismic method to Germany, he might reflect on the work of British military geologists (and their geophysicist cousins) who believed they had taught the Germans something; and who in the 1920s, applied their techniques to oil exploration in the vast new realms of the reconstructed Middle East, to make their reserves safe for the Royal Navy. It is instructive that several of the most helpful and clear diagrams Bowker uses to describe oil exploration techniques are drawn from a well-known English textbook of 1938. Whilst the author rightly stresses the huge development of the American oil industry, the needs of Western Europeans and Japanese would also repay attention. Finally, in his skilful analysis of rhetoric and description, the author might have engaged with the effects of the effervescent ‘scientism’ that coursed through Europe and America in the early postwar period, and which only went flat with the coming of the Depression. An enthusiasm for the peaceful applications of science and a commitment to ‘scientific method’ seized the imaginations of socialists and capitalists alike, undoubtedly contributed a sympathetic *Zeitgeist* to Schlumberger’s strategies, and lent the authority of science to their particular form of corporate internationalism.

For such collateral stories, we must look elsewhere. However, their absence does not mar this subtle account of negotiation between a private company and its public history. While at times Bowker’s interpretative tendency leads into dense thickets of sociological theory — a direction not all his readers will find easy — his achievement is to show how a form of laboratory activity developed, outside conventional institutional walls, and defined its ‘science’ in such a way that it became recognised as such. In this, he has added to our understanding of an innovation that is as much social as scientific, and has demonstrated the value of applying methods drawn from the social studies of science to the circumstances of applied research. He has shown us how, in practice, narrative can become knowledge, and has cautioned us that forgetting or blurring origins, and disregarding failures and alternatives, is a common feature of the history of science. We are reminded, by Schlumberger’s singular success story, that outcomes which may appear obvious, are neither necessary nor inevitable — even when, in the real world, they actually work.

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Rethinking Technologies edited by Verena Anermatt Conley (University of Minnesota Press, Minneapolis, 1993), pp xv+248, ISBN 0-8166-2215-9.

Rarely has a book done as much of what its title promises as does this book. Not only were the authors “re-thinking technologies” but I found myself being challenged to think in ways in which I had not considered before. As such this book offers a unique and stimulating, if

at times difficult to understand, re-think regarding technology, especially for western thinkers.

The essays in this book critically examine the subject "technology" re-thinking its place and analysis via the use of the socio-political spaces of philosophy, psychoanalysis and the arts. In the same way that various writers in what is variously called the History and Philosophy of Science (HPS) and/or Science or Technology Studies(STS) have examined the link between the humanities, science and technologies, this collection looks at many contemporary issues ranging from pollution through to war, consumption, massification, the media, drugs and offers a particularly interesting coverage of cyberspace.

These contemporary topics are examined via essays divided into four conceptual parts, which are respectively "questioning technologies", "technology and the environment", "technology and the arts", and finally "technology and cyberspace". Unlike many edited collections, the various essays show an inter-connectedness of thought and a dialogue, as contemporary discourse and knowledge systems are analysed in a trans-disciplinary way. Such a trans-disciplinary perspective is accounted for by the writers being either members of the Miami Theory Collective, based at the Department of French and Italian at Miami University in Oxford, Ohio in the USA, or are co-opted for the purpose of writing this book.

Clearly influenced by continental philosophical thought, and especially the work of Heidegger, the essays succeed in looking at various different forms and conceptions of technology. Hence technology is revealed to be not only altering human subjectivities, but de-centering people's position in the world. Likewise it is a mode of thinking, a special kind of technique which can become self fulfilling, and offers particular ways of controlling the world.

Most of the work can be seen to reach back to Heidegger article "The Question Concerning Technology" published in 1953, although they reflect critically on Heidegger's work, especially in terms of more recent literature. Yet, the insight offered by Heidegger in terms of "the essence of technology is nothing technological" is seen by them to be a crucial starting point.

As someone with a postgraduate background in science and technology studies, at times I found myself wanting them to draw more explicitly upon the literature which is to be found within STS/HPS. Yet, at times they do, utilising concepts which are right up to date within the critical literature regarding technology, but only insofar as is necessary for their endeavours. In this way, technology is re-thought in a much more liberated way, rather than adhering to the conventions within any one academic endeavour.

Perhaps the most innovative focus of the book is to be found in the second half, in dealing with art and cyberspace. Yet I must also say that these were essays to which I needed to return several times in order to gain full benefit. The section regarding art, especially the essay by Scott Durham on "The Technology of Death and its Limits" prompts critical reflection on limited dominant notions in Western thought with regard to what counts as "technology" and "knowledge".

Likewise, the reflections on cyberspace also suggested to me that not only is the collection well researched, but grounded in real life. For example, in discussing "The Seductions of Cyberspace", N Katherine Hayles points at the way in which cyberspace is not just an affliction of the postmodern age in terms of providing too much information, it can also be used to cope with that affliction. I was also challenged markedly to think by her statement that approximately 10 per cent of the US population are also cyborgs in a technical sense, if one includes people with electronic pacemakers, hearing aids, drug implants, artificial joints, and prosthetic limbs. As she notes, virtual reality would substantially increase this percent-

age. Yet she also suggests that in terms of impact on the psychic/sensory organisation, virtual reality users, or cybernauts, are more thoroughly cyborgs than are people with pace-makers.

In discussing issues to do with sexuality and body form, we are also exposed to the question of the masculine domination of constructions of hyperspace. As Hayles observes, virtual worlds are programmed in machine language, following linear decision paths and operating according to binary logic gates:

Layered over this deep structure is the matrix of possibilities of which the player is aware. What body form do you choose? How do you want the world to look? How do you want to interact with other players? In its collaborative aspects, virtual reality emphasizes connectivity, sensitivity to others' choices, open-ended creativity, free-wheeling exploration. It can, of course, be co-opted into masculine ethics of competition and aggression. Even when this is not the case, the von Neumann architecture of the machine provides an underlying context of rule-governed choices that constitutes a masculinist sub-text for the virtual world. (p. 184)

As she observes, it is hardly surprising that writers who have extrapolated fictional worlds from virtual technology see them governed by masculinist ethics: "Control is the dominant cord, subversion a minor but crucial intervention." (p. 184)

Yet, perhaps the most challenging essay is to be found in Patrick Clancy's essay "Telefigures and Cyberspace", which is an innovative transcription of a performance in word and pictures. The pictures are also offered in a black and white format, providing a stark quality that complements the written text. Within this last essay a technological creature can be seen to travel through the world through time and space, and in the process provides openings towards new spaces, and analyses of the spaces and connectivities. Quite clearly this creature is shown to be the human machine/cyborg, a re-incarnation of Boris Karloff.

It is hard to do this collection justice, in part because each reader will discern something important in it from his/her background which speaks to them. In part this is because of differing intellectual and personal backgrounds. Yet, it is true to say that all those who think that we have a good grounding in technology could well particularly benefit from being challenged to re-think technology via the intellectual endeavour contained within this book. Humbled and frustrated, I am nevertheless the richer for having entered into the world provided by this book.

My biggest criticisms are that at times the philosophical message could be conveyed in simpler terms, since this book is not easily accessible. More importantly, in re-examining technologies, the provision of insight from indigenous peoples and so-called developing countries could have enriched this critical enterprise.

This book is well worth the read by all interested in critical reflection upon technology, and especially technology with regard to vital social questions and every day life. In essence it is more appropriate for postgraduate than undergraduate readers, although definitely a must for those engaged in the critical study of technology and society from philosophical, psychological, literary and discourse analysis perspectives.

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