to determination of the cost-sharing split between Commonwealth and State Governments. The role of case payments in a larger model which includes needs-based funding of defined populations is not clearly defined. The separate funding of medical costs might make sense, but not necessarily for the reasons presented.

In summary, this book is a valuable contribution to the debate. Some issues are unresolved, and others are not fully argued. This is, however, a consequence of the complexity of the problems rather than the way in which they have been addressed.

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Vitamin C and Cancer: Medicine or Politics? *by Evelleen Richards*
(Macmillan, Basingstoke, 1991), pp. xiv + 269, £ 35.00, ISBN 0-333-44419-1.

"It's a good read", said my friend, "I'm getting a copy for my Department". I was impressed, because the friend who said it is a professor of cancer epidemiology, and it is not common for scientific specialists to pay that sort of compliment to works on sociology of science. Like many good books, this one can be read at more than one level. At one level it is simply a readable and generally accessible account of the controversy regarding the effectiveness of vitamin C in controlling cancer. Some will doubtless read it just for that — to get an answer to the question, does it work? They will be disappointed, because the book doesn't answer that question.

What it does set out to show is that the orthodox medical establishment has *rejected* the claims made for vitamin C but it has not *disproved* them. The 'vitamin C believers' are headed by a pair I cannot help thinking of as 'The Odd Couple' of cancer research: one of America's most distinguished scientists, the double Nobel Prize winner Linus Pauling, together with Ewan Cameron, self-described as "an obscure Scottish surgeon" fired by "one blazing idea and a life-long desire to do something useful about the cancer problem". The controversy became acrimonious. When the negative results of the second Mayo Clinic trial were presented and accepted as "methodologically sound and therefore definitive", Pauling railed about "fraud and deliberate misrepresentation". How could such a sharp disagreement arise? As boiled down by Richards' skilful analysis, the answer is that neither side was necessarily wrong or dishonest, it was just that they were answering subtly different questions.

The sociological and epistemological agenda does not come to the fore until the third of the three parts of the book. Basically, it is the by now familiar thesis about objectivity, that "there ain't no such thing", strictly speaking — not even in randomised controlled double blind clinical trials. The case study material is deployed to devastating effect in support of this thesis. Especially impressive is the analysis of the social shaping of the controversy (ch. 7): views on efficacy were socially negotiated, and so was publication; the media played an important role in the social construction of the facts, and rhetoric was as influential as reason; both sides changed their ethical positions according to the exigencies of the moment. The comparison of vitamin C with two alternative chemotherapeutic agents, 5-fluorouracil and interferon (ch. 8) is icing on the already rich intellectual cake.

And yet — even when faced with this dazzling exemplar of constructivist interpretation, a niggling doubt remains in my mind. Richards claims (p. 174) that "the idea of neutral appraisal is a myth. Judgements about experimental findings are inextricably, *necessarily,* bound up with . . . professional and wider social values." Inextricably and necessarily? What about the criticisms which Pauling and Cameron made of the second Mayo Clinic trial, as lucidly set out on pages 145-7? Richards is fully convincing as to why Pauling and Cameron would have put the questions and executed the trial differently. Carrying different conceptual baggage, they would have paid more attention to the vitamin C intake of the control group and they would not have discontinued medication immediately tumour progression became apparent. But Richards gives me no reason to suspect that, in trials done along those lines, the conclusions would be in any important way bound up with the wider social values of the investigators.

Richards' study is deep and rich, full of details about the negotiations that went on behind the scenes. She ends her book by inviting readers to carry out their own analyses of further results that appear. Unfortunately, the invitation is hollow. We the readers do not have access to the backstage activity, the letters from and between the participants, the negotiations with publishers and learned bodies, and so on. We should be all the more grateful for the rare privilege of this one short backstage tour under such expert guidance.

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Artificial Intelligence at MIT: Expanding Frontiers *edited by Patrick Henry Wilson with Sarah Alexandra Shellard*
(The MIT Press, Cambridge, Massachusetts, 1990), two volumes, pp. 656 + 634, $70.00, ISBN 0-262-23150-6 and 0-262-23151-4.

This book is a high quality collection of recent reprinted papers by staff and students of the MIT Artificial Intelligence Laboratory. Volume One includes papers such as Abstraction in Numerical Methods, Repairing Learned Knowledge using Experience and Guarded Horn Clause Languages: Are they Deductive and Logical? Volume Two is devoted to the control of mechanical robots, and the design of computer systems which recognise images.

All very good stuff, no doubt, but I suspect that there are very few people, even within the originating laboratory, who could understand every chapter. To overcome this problem each chapter is prefaced by a half page non-technical summary of what the author(s) are doing.

But having read the book, three important questions spring to mind. What exactly is Artificial Intelligence? Who is the book aimed at? And what implications does this have for the future?

The Series Forword defines Artificial Intelligence as "the study of intelligence using the ideas and methods of computation", adding "Unfortunately a definition of intelligence seems impossible at the moment". Despite this uncertainty, the editors arrogantly assume that intelligence must be computational in nature, and that subjects such as psychology and philosophy