respond to the treatment), *unsafe* (because the complications outweigh the probable benefits), *unkind* (because the quality of life after rescue is not good enough to have justified the intervention), and *unwise* (because it diverts resources from activities that would yield greater benefits)."

The last part of the work deals with policies and actions taken about technology. The Office of Technology Assessment studies are reviewed, as well as the NIH Consensus Development Meetings, and the different kinds of audits and evaluation studies.

The book has no real conclusion, except that technology assessment is a question of information: "Any programme of management for technology as a whole must assume a pragmatic approach, avoiding the influence of purists and academics who are unwilling to take or to recommend action until or unless all the data they want is available."

I regard this book as a most refreshing one, because it is written by a clinician, and not by a technology assessment expert. But it needs to be read, among others, by clinicians, and I wonder how that objective can be achieved, outside of English-speaking countries. Cochrane's book on epidemiology, ten years ago, was translated into French, with a great deal of interest. But it was at a time when political controversy, rather than today's conservatism, was favored. I hope these circumstances do not delay such translation and that the book will have the success it deserves, within and outside of the British Isles.

After Barney Clark. Reflections on the Utah Artificial Heart Program, *by Margery W. Shaw, Ed. Austin, University of Texas Press, 1984, 211 pp.*

Reviewer: Torkel Aberg, M.D., Uppsala University Hospital, Sweden.

As many will remember, Barney Clark was the first human to receive an artificial heart. He lived for 112 days after the operation. The cause of death was multiple organ failure. One year after the operation, a conference was held to "explore our human struggles as we discuss and evaluate the artificial heart implant program," the results of which appear in this book.

The work is divided into four parts: ethical perspectives; governmental, sociological, and legal issues; relations with the media and the Institutional Review Board; and economic, historical, and scientific issues. Some of the participants in the conference were members of the team participating in the operation and treatment of the patient; others were outside experts and university faculty uninvolved in the experiment.

One very attractive feature of American culture is the readiness and candidness with which conferences such as these are held and published!

The book makes fascinating reading, not only because it describes an extremely unusual and important clinical experiment but also from a general standpoint. It further gives those outside of the United States a view of the thinking there.

Several chapters are devoted to the selection of patients, the process of informed consent, and patient autonomy. As one often finds in dissertations on

ethics, the text is verbose and not always easily understood. There is also a tendency in the United States, to become sentimental, even bombastic, when talking about ethics. In some chapters, the language becomes ethereal, with large passages devoted to some minor point. I do not deprecate the presence of medical ethicists in a debate of this kind; on the contrary they contribute much, but they have to step down from their ethereal heights and make themselves better understood!

The ethical analysis given in this book furthermore, does not take into account the difficult problem of resource limitation—the consciousness that in treating one patient you say no to another. This problem, most acutely experienced in underdeveloped countries, but is being felt also in Western Europe. It seems that only the affluent community of the United States can afford to ignore this issue. Hence these chapters, interesting as they are, cannot serve to guide ethical positions in other parts of the world. Rather, they provide extremely good insight into the American culture.

Another cultural insight is provided by a chapter discussing sociological perspectives on the artificial heart. The author maintains there are unusual traits in the relationship between doctors and staff on the one hand, and the patient and his family on the other, which can be traced to the culture of the Mormon religion. Surprisingly, this issue had been avoided by the participants of the medical team.

Lawrence Altman, the medical correspondent for *The New York Times*, covered the artificial heart implantation during its entire course. At the conference, he gave a very candid opinion about how the media had been handled during the 112 days. His address gives a most revealing view into the thinking of a journalist. This chapter is one of the most useful of the book, disclosing the astute and sometimes exaggerated suspiciousness of journalistic professionals, and the awkward attempts of medical-administrative professionals to keep them at bay. The lesson of this chapter is the value of simple truth in dealing with the media.

David Blumenthal, who teaches health policy and management, gives an extremely interesting overview of the economical issues involved in advanced research. As an economist, he is conscious of resource limitation and deals with it very convincingly. He also touches upon the ethical consequences of resource limitations—contrary to the medical ethicists. He does not take a stand as to the continuation of the program on the artificial heart, but points out that there is a point of no return when development cannot be stopped.

Stanley Reiser, professor of humanities and technology in health care, writes a lucid chapter on the machine as means and ends. He maintains that machines have powerful symbolic meanings for us, since we build into them our own aspirations. This is particularly the case of one that can replace the heart, center of emotions. His chapter thus gives a thought-provoking insight into a significant aspect of our modern culture. One of his concluding sentences is worthy of citing:

> It is a difficult circumstance to tolerate, that we can create more beneficial medical technology than we have social skills or fiscal capability of providing it to those who are in need of it. Our capacity to produce medical technology will grow and present us with continuing dilemmas, particularly those involving monetary costs, which cannot be met simply by policies directed at creating a more efficient use of health resources. The cost saving of a policy of efficiency implies a basically static system. What we have, however, is an exceedingly dynamic system, producing technologic goods

> that are beneficial at an ever increasing rate. Their allocation will require a far-reaching examination of social and individual values underlying the production and use of medical technology as well as new calculations about the proportion of our nation's wealth we choose to expend on health care.

It is a pity that the conference did not include any description of what science gained by the implantation of the first artificial heart—beyond the mere knowledge that it worked for 112 days. Although the case history has been published elsewhere, at least an abbreviated version should have been included. It would have enabled the reader to judge for himself the medical value of the experiment.

One interesting point that was only mentioned in passing during the conference is the quality of life of artificial heart recipients. The power source of the heart that Barney Clark received was extracorporeal, that is, he was tied to a "black box" by lines passing percutaneously to the heart. To be tied to a power source may seem a very severe limitation of the patient's quality of life. However, patients with quadriplegia, after an adaption period of some years, may state that they have an excellent quality of life, even though they cannot move, are tied to their beds, and are dependent on other people. Quality of life is a very subjective thing. Although the freedom to move around is a great good, people may be willing to give it up when confronted with death. The solution of an implantable power source, from this point of view, may not be necessary.

Many issues are inadequately dealt with in the conference and the book. The most important are the broad applications of the principle of the artificial heart. That we will in the near future have an artificial heart that can maintain life for prolonged periods is almost assured. It is noteworthy that economists are most ready to take up this difficult question. That it will be an expensive treatment modality is also probable. The Office of Technological Assessment has made a cost-benefit calculation of the artificial heart, and calculates that each year between 16,000 and 66,000 people in the United States could use this device. However, their assumptions are conservative, especially as regards the age of the potential recipients, for whom they draw a line at 65 years of age. I cannot foresee the mechanism by which society can deny people above 65 an effective treatment once it has been accepted for those who are 64. The spread of the technology depends on its medical efficiency, whether older people tolerate it as well as younger. If it is well tolerated by older persons—and surgical history speaks definitely in favor of this view—the number of potential beneficiaries becomes much higher, with increasing costs for the program. If end-stage myocardial failure were a rare disease, the artificial heart would not have the financial implication that it bears. It must be realized, however, that heart disease is a most common cause of death in all Western countries, and that the application of the artificial heart in routine treatment will include a large number of individuals. In this context, the application of an expensive treatment in a large proportion of the population staggers the mind. The question is whether current society will be able to afford it, or if we have to wait for another, more affluent period with a new kind of prosperity to use it. The problem, then, leaves the realm of medicine and enters into the much more unpredictable arena of the general future of our societies.