Why is this book thus flawed? Arthur Burks knew Mauchly. He worked with him on ENIAC. The only hint of their relationship, though, is indirect. Burks was cited by Honeywell as a co-inventor of parts of the ENIAC which Eckert and Mauchly claimed for themselves. Though the judge's finding on this issue was in favour of Sperry (Mauchly), his comments are presented to suggest that this was merely a legal ruling and not entirely just. Does Burks bear Mauchly's memory a forty year old grudge? He also consulted for Honeywell against Sperry and, therefore, Mauchly. Was this purely a matter of his expertise, or was there some ulterior motive? Is the possibility of litigation casting a shadow over the revelation of far more personal conflicts? What, if anything, are the authors holding back?

There is further reason to see more in this than just a heated academic debate. Subsequent to an earlier paper in which the authors made an Atanasoff-ENIAC connection, Mauchly's widow published an article in the journal, *Annals of the History of Computing,* trying to rehabilitate her husband's position. In an appendix, Burks and Burks take this article apart. They show it to include contradiction of Mauchly's own courtroom testimony, selective editing, and apparently deliberate rewriting of the trial transcript. Burks and Burks *v* Mauchly and Mauchly (deceased) begins to look a real grudge match.

This book is an important corrective to a shortcoming in the history of computing. Read it by all means. But, for a more complete explanation of the events covered, we must await a more neutral, sociologically and psychologically satisfying account.

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Your Word is My Command: Towards an Australian Capability in Human-Computer Interface Design *by the Australian Science and Technology Council* (Australian Government Publishing Service: Canberra, 1990) pp.vi. + 109, ISBN 0-644-12571-3.

This important report is the result of an ASTEC research project of approximately one year's duration and follows the discussion paper *Controlling the Genie* (ASTEC, 1989). The report is in three parts. Following an introduction, Section Two identifies the trends in human-computer interface design and in the design process and raises issues of interest and concern. Section Three examines the state of play in Australia, provides an overview of current activities and analyses the strengths and weaknesses thereof in order to reveal the opportunities that the field of human-computer interaction research and development work might open. The final section outlines measures that should be taken in order to foster and develop a Human-Computer Interaction design capability in Australia.

The importance of Human-Computer Interaction design is revealed in terms of a dual focus or impact. First, the contribution of Human-Computer Interface design enabling better/best use of computer based technologies. Second, the role of Human-Computer Interface design in enhancing the marketability of high-technology products. Human-Computer Interaction is seen as both an

embedded and a generic technology, which is important for the development of a competitive edge in many areas of Australian industry.

Examining the costs and benefits associated with Human-Computer Interface design the report suggests that the productivity benefits of the massive investments in information technology over the last two decades have not really emerged, and that putting a super-computer on every one's desk makes no sense unless the users can harness and exploit the power of the machine (p.6). Such are the costs of non-use or sub-optimal use. There are more obvious and famous examples of catastrophic costs. Aviation accidents and the near disaster of Three Mile Island are cited among the examples of the dangers and costs of poor Human-Computer Interaction design. Less clear and calculable are the costs of worker stress, RSI, alienation, etc. By citing a broad range of costs associated with poor design the report makes the benefits of good Human-Computer Interface design clear.

The report suggests that at base is the question of where and how computers and humans meet, and this includes issues relating to hardware, software, human skills, organisation and environment. One might add to the questions where and how, by asking what for and on whose terms. These questions would raise the issue of organisational and human purpose, and would broaden the focus from that of interface, albeit contextualised, to that of interaction.

While the report identifies some promising recent moves toward a broader, more interdisciplinary approach to Human-Computer Interaction, it suggests that there has been a tendency for the focus to be on technical questions about the interface. As the report rightly suggests, Australia needs a broadening of perception and a more trans-disciplinary approach than has hitherto been the case.

The timing of concern over Human-Computer Interaction is not accidental. Indeed one could say that there is a window of opportunity. Twenty years ago computers were so expensive that the people who used them were forced into a subservient role. With technological development, and the concomitant changes in relative costs between computers and humans, the balance has shifted. Computers are now powerful enough to run the more complex (for computers) graphics, optical recognition, speech recognition, etc. software that is basic to improved interfaces. Moreover, they are cheap enough to be set into a different, subservient role to the humans that work with them. These changes in cost differential have been, and continue to be an important factor in changing orientations and values.

Your Word is My Command identifies the flexibility of the interface as a key area for focus. It is suggested that there is a great need to develop interfaces that are adaptable to the users, especially in terms of user skills level, and flexible enough both to support the many skills levels of users and to grow the users' skills at various rates. Another key area for focus that the report identifies is that of allowing for group interaction rather than the stereotype individual user.

One might add that, looking at the question of interaction rather than interface, some attention should also be given to human-computer-human interaction. That is human interaction mediated by computers. Indeed, this opens to view the second of the two major bodies of work that could inform the Human-Computer Interaction program. The first is the enormous amount of work that has been done on the interaction of humans and machines. The second is work on mediated interaction in the fields of communication and organisational analysis.

The report highlights the importance of developing skills in Human-Computer Interaction research and development, and in interface design skills in particular. It is suggested that computer related training has traditionally been of two types: either that based on electrical engineering or on the discipline of computer science, which has tended to be maths/science based, and oriented toward technical concerns and problem solving. The need to extend this backgrounding is identified, and it is suggested that design oriented training be used as a model. In this regard the report suggests that software engineers be trained in the same way that architects are taught architecture (a design discipline) rather than through the current problem oriented computer science courses. A far greater appreciation of design, and of technology assessment issues should also be developed in courses that are primarily aimed at engineers and managers. Indeed a much greater element of technology assessment skills development is needed in a broad range of professional and vocational tertiary training.

The third part of the report has been somewhat overtaken by circumstances. The proposal and outline for a national centre for Human-Computer Interaction research has come to fruition. A co-operative Research Centre for Human-Computer Interaction (CHCI) is currently being established in Canberra. It is to provide a national multi-disciplinary capability in the design and management of human-computer interaction and of the environment in which that interaction takes place. While complementing the work that was being undertaken during the review in 1989-90 the report suggests that it was fragmented, unco-ordinated and transitory. The new national centre is to provide the focus necessary to make Human-Computer Interaction research, development and implementation in Australia integrated, co-ordinated and enduring.

In summary *Your Word is My Command* is an important report. It gives a very good overview of the main issues relating to Human-Computer Interaction; it gives some taste of the activities in the field overseas; it correctly identifies a window of opportunity and it analyses the current state of play and the opportunities for Australia in a realistic way. The importance of broadening the focus of Human-Computer Interaction beyond purely technical matters to include social and design concerns is well developed in the report. In addition, of course, it provides the background to, and an outline of the newly formed Centre for Human-Computer Interaction.

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Technological Change in the Information Economy *by Peter Monk*
(Pinter Publishers, London 1989), pp. 199, £25.00, ISBN 0-8617-713-6.

Much discussion has taken place about the effects of information technology (IT) and its impact on all aspects of the economy. Economists refer to the advent of 'knowledge industries' in an 'information economy' in the move from an industrial era to a post-industrial future. Sociologists express concerns about 'information rich' and 'information poor' in a society where being computer literate can change whole employment patterns.