Connections. New Ways of Working in the Networked Organization *by Lee Sproull and Sara Kiesler* (MIT Press, Cambridge, Mass., 1991), pp. xiii + 212, $US19.95, ISBN: 0-262-19306-X.

TAS6Y@ANDREW, DAS@FAS.RI and HAS@A.GP.CS are electronic mail addresses for three employees with the surname of Simon at Carnegie-Mellon University. One is the Nobel Prize winner; the others are a staff engineer and a secretary. According to Sproull and Kiesler, not knowing which is which (though the last seems by far the best bet for Herbert Simon) means that one can as easily communicate through e-mail with the great man as with the *hoi polloi*. This is a dominant theme of *Connections*: organisations become much more integrated, much more human, when anyone feels free to talk with anyone else. Whether anyone has anything worth saying is a less dominant concern. The liberation of those who cannot bring themselves to pick up a telephone or scrawl a name and address on an envelope does not necessarily make for a better informed organisation, though it may well help certain individuals feel better. Whether these include senior managers — or Herbert Simon for that matter — is not discussed.

According to the blurb on the dust jacket of *Connections*, the book is all about how "computer networking is changing the way people work and the way organizations function". It is actually about neither, being quite obsessed with how people in organisations use computer networks to chat with each other. This is less surprising than that these individuals seem to have little else to do, and the organisations which employ them no other purpose than the facilitation of this electronic gossip.

Connections reeks of sociology and psychology and may satisfy those whose perspectives are bounded by these persuasions. The book itself supports its own argument that communication within interest groups has certain advantages over the broadcasting to a wider audience that publication implies. And just as the book does not concern itself with the persuasive power of information, neither does it manage to persuade itself. While there is much interest in the nature of organisations and of the people who work within them, there is almost none at all in the nature of information. The strange characteristics of that particular good are subsumed entirely within the characteristics of information technology. The authors conclude — without acknowledgement — that "the means by which a message is conveyed affects the meaning of the message" (p.54). Perhaps their own message would be altogether more convincing conveyed electronically rather than in a form which encourages contemplation.

The destinction of such a book as this is that it presents a perspective uncluttered and unconfused by reality. Within its covers, just as within some of the electronic networks it describes, is a world of common interests, a world of people straining to have purpose and meaning in their lives, a world fit for sociologists — or at least for sociologists to study. In this paradise, firms do not actually make anything. They and other organisations are social units composed of people who apparently have no function other than to send and receive messages. And they can do so by means of a technology that apparently has no wires, no technical dimension at all. If economics and engineering have no place in this world, neither has management. This book is concerned almost entirely with those who are managed rather than with those who manage.

Electronic communications gives the managed more control over information and consequently challenges existing systems of organisational control. This is emancipation, a good and worthy thing, not to be trivialised by consideration of what becomes of an organisation — and its employees — when it is out of control.

To do them as much justice as possible, Sproull and Kiesler are much concerned with what they call 'second level' effects. The impact of electronic communication is neither pre-ordained nor predictable. For example, it seems that the anonymity of electronic mail encourages the sending of intemperate messages, a practice known as 'flaming'. This is mildly interesting, as are the problems encountered when individuals try to apply filters to their electronic mail or to schedule their activities by means of electronic calendars. There are lessons to be learnt here, but always there is an uneasy feeling that the authors are more interested in proclaiming their message than in whether their readers learn from it, a characteristic they may well share with those who use electronic mail. Is there really meaning in such words as 'extremetization' and 'deindividuation'? Similarly, is there some point to the following explanation that escapes this reviewer? Risky behaviour is apparently encouraged by electronic communication.

> ... suppose you have a choice between a safe investment and one that is riskier but more attractive. Suppose the first will return $20,000 over two years, whereas the other investment has a 50 per cent chance of returning $40,000 and a 50 per cent chance of returning nothing. Which would you choose? Most people avoid risk when one alternative is a sure gain; they choose the $20,000 (Kahneman and Tversky 1979). By contrast, when the choice is between a sure loss and a chance of losing nothing, people tend to take risks. For instance, when the choice is between surely losing $20,000 and an investment that has a 50 per cent chance of losing nothing and a 50 per cent chance of losing $40,000, most people will pick the second investment. (p.67)

Given the latter choice, only the risk addicted or the completely brainless would invest at all. Silliness in authors is not normally to be excused, but there are grounds for making an exception in this case. These are that a great many electronic messages, which are the concern of this book, are likely to be equally silly. Certainly the authors' readers cannot be expected to overlook the fact that nearly all of the many examples of electronic messages they present are barely literate. The authors themselves seem oblivious of this barrier to communication. If individuals are able to express only the vaguest of meaning, it is unreasonable to expect the medium to supply the precision that is lacking in the message.

Quite rightly, the authors do not portray electronic mail as a substitute for more conventional correspondence. Quite wrongly, they do see as an equivalent to letters and memos what is little more than electronic graffiti. While graffiti, just like electronic mail, has a sociological and psychological importance well worthy of exploration, it is fundamentally no more than scribbling on a lavatory wall. Sproull and Kiesler take their subject far too seriously to concede that electronic mail might be anything less than deeply significant and fundamentally meaningful.

Apparently, it takes five seconds to read the average electronic mail message and six minutes to reply (p.34). The calculation is provided to show how little

time is wasted even by those who deal daily with dozens of the things. It also suggests something else: that thoughts which take six minutes to compose and five seconds to absorb may be less than fully considered. The authors have the electronic mail address of Herbert Simon. They can make electronic contact to be sure, but they may find intellectual contact just a little more difficult.

Stuart Macdonald
Warwick Business School

The Economics of Hope, *by Christopher Freeman* (Pinter Publishers, London and New York, 1992) pp.xiv + 249, £37.50, ISBN 1-85567-083-6.

Very few academics and practitioners working in the field of technical change will be unaware of the major contributions that Chris Freeman has made over the years both to the development of the subject and to the raising of the profile of the issues and the analysis with which the subject is concerned. There will also be very few who have not read at least some of Chris' work and benefited from that reading. As with much academic discourse, however, especially in a field that is often very applied and always has a major policy interest, research results and papers frequently appear as conference papers, papers for international bodies (such as the OECD) or in some of the less highline journals. This has definitely been the case with some of Chris' work. In this volume, some of his more inaccessible papers are reproduced (with a sprinkling of new material) and are made much more available.

The chapters in the book have been written at various times over the previous 25 years. The opening chapter, which appears not to have been previously published, is a review of J.D. Bernal, *The Social Function of Science*, in which Chris spells out his intellectual debt to Bernal as both a stimulus to his own work and as a forerunner to the steady progress made over the last 25 years in the quantification of, and collection of statistics relating to, the technical change process. In fact, one of the themes running throughout this volume is the progress that has been made in measurement and the need for further progress in the future.

The next two chapters (the first being a paper prepared for the OECD in 1967, the second being the text of a lecture given at the Design Council in 1983) follow the measurement theme and give examples of where progress in measurement has facilitated understanding. The first is built largely around a discussion of the Jewkes, Sawyers and Stillerman work on the sources of innovation, the second is mainly concerned with design and how design fits into the R&D taxonomy. I was particularly taken by how Chris, in the second chapter and also in the discussion of Bernal, makes clear his personal views on defence R&D.

Part 2 of the book (chapters 4-6) is headed *The Theory of Innovation and Evolutionary Economics*. Chapter 4 first appeared as an OECD paper in 1989, chapter 5 as a workshop paper in Montreal in 1990, and chapter 6 was published in the *Revue Economique* in 1991. In the authors own words, the chapters make clear that an evolutionary theory of economic growth must pay special attention to the origin, development and diffusion of dominant technology systems. These three chapters ought to be essential reading for any student of technological change wishing to discover the essence of the evolutionary approach.