

**TECHNOLOGY, CONSUMPTION AND THE FUTURE: THE EXPERIENCE OF
HOME COMPUTING**

A Thesis submitted for the degree of Doctor of Philosophy

by

David Skinner

Department of Human Sciences, Brunel University

July 1992

Brunel University, Uxbridge

Department of Human Sciences

David Ian Skinner

Technology, Consumption and the Future: The Experience of Home Computing

1992

Abstract

This study of the home computer boom is of relevance to wider discussions of consumption, innovation and popular attitudes towards science and technology. Based primarily on empirical work with computer users, it also explores the various media, commercial, academic and political discourses which contributed to the boom.

The home computer boom was an event which amounted to more than the sum of individual decisions to purchase and use micros. It is testimony to the influence of visions of a world shaped by technology in the public imagination. Contact with the home computer was mediated by powerful beliefs about the future significance of information technology both inside and, most importantly, outside the home.

Many buyers had only vague notions of the nature and capabilities of their micro and how it would fit into their lives - these were issues to be resolved after purchase. Obtaining a machine was just the first stage in 'computer careers' which were often marked by shifting commitments to computing. *Any simple ends-orientated view of micro use is inadequate.* Much computing, even with advanced and, supposedly, practical hardware and software, has a strong exploratory element.

The example of home computing shows how, rather than being an absolute which determines demand, the usefulness of goods is constructed and negotiated in specific social contexts. An issue which preoccupied many was 'finding a use' for the computer. They can be seen investigating and debating the value of various applications. This is not simply resolved at a individual or household level. It is part of a process of innovation - yet to be fully resolved - which takes place across the spheres of production and consumption.

Contents

Preface	iii
Acknowledgements	vii

Part One: Issues and Frameworks

1 Technology and the Future	2
I: Technology, millenia and modernity	2
II: Innovation and culture	21
2 The Millennialism of the Information Technology Revolution	32
3 An Agenda for the Sociology of Consumption	70

Part Two: The Experience of Home Computing

4 Making Sense of Home Computing	113
I: Empirical approaches and issues	113
II: An account of empirical work	137
5 Elements of the British Home Computer Boom	164
6 Responding to Prophecy: Buying into the Home Computer Boom	204
7 Finding a Use for the Home Computer	241
8 Models and Domains of Computing	285
I: The development of models of computing across the spheres of production and consumption	286
II: Computing, involvement and identity	305

Part Three: Themes and Implications

9 Themes and Implications	332
----------------------------------	------------

References

Footnotes	350
Bibliography	423

Appendices

1 Letters used to contact interviewees	442
2 Data on households interviewed and their computer ownership	446
3 Examples of early interview schedules	450
4 List of interviews	453

Preface

At the start of the 1980s very few people knew what a home computer was, let alone aspired to own one. During the next few years, however, millions of microcomputers were purchased in Britain by ordinary people, many of whom had little knowledge or experience of information technology. This explosion of interest in a new product was the focus of considerable attention in media, policy and academic circles.

My own preoccupation with home computing began in the mid 1980s. Before studying sociology I had worked in the computer industry. Having used micros in a business environment, I was particularly intrigued as to the appeal and purpose of computing in the home. I planned an investigation of home computer owners based around two deceptively simple questions: why did people want home computers and what did they use them for? As the project progressed, however, it developed into a study not only of individuals or households and their micros but of the home computer boom as a public event. This required consideration of the various media, commercial, academic and political discourses which contributed to the boom.

Early on in research design I concluded that many commentators were too willing to make assumptions about the demand for, use of and, indeed, future of the home computing. There was a need to 'make strange' the micro as a product and computing as an activity. To do this, I became embroiled in two wider sets of literatures and debates concerning, on the one hand, cultural dimensions to technological change and, on the other, consumption. Bringing together material and perspectives from these normally distinct fields offered new insights, not only into home computing but into the process of innovation.

The organization of the thesis reflects my determination to relate discussions of home computing to a range of broader theoretical and substantive issues. It is in

three parts. The first part introduces issues and frameworks which will be developed throughout the thesis. Chapter one begins by identifying a history of intellectual and popular interest in technology which has at its heart beliefs about technology's ability to transform the (social) world. It then goes on to argue that innovation should be seen as a cultural process. Case studies of earlier developments such as broadcasting, telephone and electricity show that discourses about new technologies are not merely reactive but are an integral part of their 'invention' and adoption. Chapter two illustrates some of the arguments of the previous chapter by examining the nature and influence of prophecies of an Information Technology Revolution. It considers the, often unarticulated, consensus about the significance of computers in the future and the widespread agreement that they will bring about a qualitatively different kind of society. This consensus can not be explained by examining existing social changes or simply by reference to the inherent qualities of the technology.

Having established technology as culture as a theme of ^{the} thesis, chapter three introduces discussions of the sociology of consumption. It argues for an approach which sees goods as cultural resources - means of participating in and making sense of social life. The chapter raises a series of issues to be addressed through empirical work, including the role of goods in the construction and maintenance of individual and collective identities, the relationship between the spheres of production and consumption and the development of notions of 'need' and 'usefulness'. Finally, the chapter suggests a number of reasons why technologies make particularly evocative consumer goods. D.5

The second part of the thesis focuses squarely on home computing. Chapter four reviews existing work in this field and makes the case for qualitative research which places individual and household experiences of the micro in a wider socio-cultural setting. The second part of the chapter provides an account of my own fieldwork, focusing particularly on the interviews I conducted in 1987 and 1988 with micro owners. A key theme of the thesis is the relationship between

personal histories and wider cultural trends. Because of this, chapter five starts discussion of empirical material with an account of the development of home computing in the public domain. In order to understand this, it does not simply focus on the shifting conceptions of the home computer among producers and marketers of micros and associated products. The evolution of home computing is seen in the context of a wider event involving the promotion of information technology through education, the media and government initiatives.

The next three chapters utilize interview data to make sense of home computing. Chapter six concentrates on owners' accounts of the motivations and processes involved in obtaining a micro. It argues that their purchases were a way of participating in the boom - both at the level of social networks and as a way of dealing with public culture. In doing so, it confirms the argument of the last chapter that ideas about the future significance of information technology, both inside and outside the home, played a crucial role in determining the intensity and nature of popular interest in computing.

Many buyers of micros knew comparatively little about the the nature or capabilities of their machine. Just as significantly they were unclear as to how it would fit into their lives. These were issues to be resolved after purchase. Chapter seven considers what happened to home computers once they entered everyday life. Rather than a simple regular pattern, it argues, computer use is best understood as a trajectory or 'career'. Careers are often marked by shifting commitments to computing. By examining the activities classified by interviewees under various categories of use, the chapter argues that any simple ends-orientated view of computing is inadequate. Much micro use, even with advanced and, supposedly, practical hardware and software, has a strong exploratory element.

An issue which preoccupied many was 'finding a use' for the computer. They can be seen investigating and debating the value of various applications. Chapter eight

argues that, by doing this/s, they took part in the development of cultural D5
conceptions of computing. The chapter is in two parts, each of which considers
the increasing differentiation of computing products and activities. The first
focuses on the emergence of distinct models of computing - ways of understanding
and evaluating products and activities. The second part looks at computing as a
social activity and considers how it is mediated by age, class and gender. In
doing so it argues that practices and evaluations of computing are context
specific - embedded in different social domains.

The final part of the thesis draws out some of its major themes and sets out its
implications for the further analysis of consumption, innovation and computing.

Acknowledgements

Firstly, I would like to thank my partner, Sharon and my parents, Ian and Yvonne, for all the support they have given me while I struggled with this thesis.

Two people have made a major intellectual contribution to this project. To describe Roger Silverstone as a patient and tolerant supervisor is a gross understatement. During the early stages of research he encouraged me to approach my topic in an original way. Later, when I finally began to generate chapters, he was a supportive and perceptive reader. Leslie Haddon has also been an enormous help. He was a conscientious reader of numerous drafts and has always been willing to share ideas and resources. Just as importantly, Leslie took my work seriously (and quoted it) when nobody else did.

I would also like to thank those people who, over the years, have discussed my ideas with me. In particular, Maureen Humbrook, Marek Kohn and Adam Kuper deserve a mention. Conversations with colleagues and students at Anglia Polytechnic were also useful. Many others gave me practical help with the conduct of research and production of the final thesis - these include Brook Street Computers, Becky Hurst, Chris Walter, and Sharon, again.

Finally, I would like to thank all those people who participated in the research.

Initial funding for this project came from an ESRC research studentship.

I: ISSUES AND FRAMEWORKS

Chapter One

Technology and the Future

This chapter establishes the cultural life of technology as a theme of the thesis. It focuses on beliefs about technology's ability to shape the future. That the thesis begins in this way demonstrates the distinctiveness of its approach. In later chapters concern with the Information Technology Revolution and the evolution of home computing will be addressed as cultural phenomena. This chapter, therefore, provides necessary background for discussions that follow and points to the relevance of the case study of home computing to a wider set of debates. The tone reflects its introductory nature. It does not profess to be a comprehensive discussion of culture and technology. Rather, the aim is to draw out particular themes, issues and metaphors which will be developed later.

The first part of the chapter highlights the special place that technology has in the modern imagination. The second examines some cultural dimensions of technological innovation. Although each part is distinct, they are united by the suggestion that beliefs about the social significance of technology are not simply of abstract interest but actually affect the course of innovation.

Part I: Technology, Millenia and Modernity

Two dilemmas faced by social theory highlight the uniquely powerful position technology has in our understanding of the future. The first relates to technological determinism - the view that innovation has its own internal impetus and that technological change in general, or certain key developments in particular, act as an independent force for social change. This is an anathema to most social scientists who ritually debunk it. They are keen to demonstrate 'the social shaping

of technology' - pointing to economic, political and cultural factors which influence its development and dissemination.[1] While many academics reject a history written by machines, technological determinism continues to have widespread appeal as a way of making sense of change.[2] It is not uncommon for talk of the future to degenerate into long lists of possible technical developments and their 'impacts'. In addition, many of the approaches which emphasise the social construction of technology actually engender little faith in the possibility of intervention in the process of technical development.[3] This brings us to a second dilemma which relates to the control of technology. Modern society is often characterized by a model of increasingly rational decision-making about social and technological change. But there is, at the same time, a feeling that the forces of industrialization have a momentum all of their own. The idea that science and technology are 'out of control' is a potent one.[4]

The discussion above shows that social theory often appears uncomfortable when considering technological change. It asserts the primacy of the social but remains in awe of the apparently technological. That technological change appears to be close to the heart of modernity is, in fact, tacitly recognised by social science through its own growing concern with technology. It is also reflected in the way the term technology has altered "from something relatively precise, limited and unimportant to something vague, expansive and highly significant." [5] Social science's interest is part of a broader history of intellectual and popular fascination with science and technology which shares many of the same preoccupations and contradictions. Understanding this tradition may actually suggest new directions for the analysis of technological and social change. One way to strive beyond debates about 'technological determinism' may be a more reflexive approach which explores the idea of technology. This involves addressing a paradox which runs through our culture:

" Technological systems and patterns of change are experienced as a frame of inevitability within which we paint our life picture. Yet the frame is a product of human action."[6]

This part of the chapter considers one aspect of the paradox, exploring the characteristics and appeal of visions of a future shaped by technology.

Technology and the experience of industrialization

The scale of the continuing upheavals of modernity have helped to make the modern consciousness historical, acutely aware of the past and the future. Technology has a special place in this consciousness. To understand this further we need to consider the rich and varied cultural response to modernization.

For Humphrey Jennings the experience of industrialization is summed up by the word 'Pandaemonium'. By constructing "the imaginative history of the Industrial Revolution" via a collage of hundreds of descriptions and documents written between 1660 and 1886 he evokes the physical, geographical, social, political, economic and intellectual turmoil of this period. As well as the violence and squalor Jennings shows us the glory of the beginnings of industry - the creativity, the growth of new ways of understanding the world and the confidence of the industrial bourgeoisie.[7]

The excitement of the Industrial Revolution which Jennings captures so well were probably confined to a fairly small section of the population. For those who were moved off the land, filled the cities, staffed the factories and entered total institutions the thrill was not so great. Their overriding feeling may well have been of powerlessness rather than of power. Among the writings in 'Pandaemonium' there are many illustrations of how awesome a process was underway. There is a sense of the elemental, violent forces of industrialization - descriptions of steam engines as monsters and the smoke of a million fires. In 1824, for example, Thomas

Carlyle described London as an "enormous Babel of a place" writing that "it is like the heart of all the universe; the flood of human effort rolls out of it and into it with a violence that almost appals one's very sense." Similar sentiments about the power and unnaturalness of new industrial structures and technologies are expressed many times.[8] The vision of the industrial revolution as apocalypse is a powerful one. Consider this description of the Black Country in 1830:

"The earth seems to have been turned inside out.... The coal...is blazing on the surface.... By day and by night the country is flowing with fire, and the smoke of the ironworks hangs over it. There is a rumbling and clanking of iron forges and rolling mills. Workmen covered in smut, and with fierce white eyes, are seen moving about amongst the glowing iron and dull thud of forge-hammers." [9]

The Industrial Revolution was about much more than technological innovation. Nevertheless, technology captured the imagination of those who lived through this period. For them it was the age of the factory, of steam and of smoke. Technology began to be perceived as the great destroyer and the great creator, as both the dehumaniser and as the realization of human dreams.[10]

All that is solid melts into air?

The turmoil of the Industrial Revolution was not simply a moment of transformation - far from stabilizing, its flux of creation and destruction became normality.

Marshall Berman believes that the experience of modernity is encapsulated in Marx's phrase 'All That is Solid Melts into Air'.

"To be modern is to find ourselves in an environment that promises us adventure, power, joy, growth transformation of ourselves and the world - and, at the same time, that threatens to destroy everything we have, everything we know, everything we are." [11]

Berman provides us with two very powerful ideas. In an analysis of Faust, he offers an archetype for the quasi-religious mission of the developer - a way of comprehending the unreason of technical rationality. In graphic accounts of the turmoil of modernity he gives us a way of understanding the uniqueness of the modern age. He is not alone in this, as David Harvey writes:

"... there is abundant evidence to suggest that most 'modern' writers have recognized that the only secure thing about modernity is its insecurity, its penchant, even, for 'totalizing chaos'." [12]

According to Berman technological development is one very visible dimension of a wider process:

"If scientific and technological cadres have accumulated vast powers in modern society, it is only because their visions and values have echoed, amplified and realized our own. They have only created means to fulfil needs embraced by the modern public: open-ended development of self and society, incessant transformation of the whole inner and outer." [13]

This raises questions about the extent to which a preoccupation with technology necessarily imply enthusiasm for the constant remaking of our physical and social world. This fascination is actually more complex and ambivalent than Berman is prepared to allow.

The search for permanence

Berman sees modern culture as a celebration of the flux and contradictions of modernity. Others review writings of the nineteenth and twentieth centuries and come to very different conclusions. There is scant evidence of, for example, a British modernism of the kind Berman describes. [14] In 'Culture and Society' Raymond

Williams identifies a very different response to modernization. The wide variety of positions he considers are united in their ambivalence towards industrialization. They either reject modernity wholesale in favour of nostalgia for an earlier age or else seek to temper its excesses in the name of values very different from those of perpetual development. The maelstrom of modernity is experienced as a fall from grace and we are exiles in it. Far from Berman's modernist involvement:

"Recognition of evil was balanced by fear of getting involved. Sympathy was transformed, not into action, but into withdrawal." [15]

This kind of response to development was not confined to Britain. [16] An important theme of modern European cultural life - highlighted by David Meakin - is nostalgia for organic communities based on unalienated craft work. Meakin is interested in the power of the idea that work, and therefore life, has become alienated by mechanization and the factory system. In much the same way as Williams, Meakin understands the literature of modernity not simply as a tradition that is aware of the dark side of industrialization but one that seeks to escape it altogether. [17] For much of the writing that Meakin considers there is not a dialectic but a contradiction between the development of mechanical and human potentials. The technology of production came to symbolize impersonal and dehumanizing relations in the work place. As the process industrialization continued it brought with it the vision of humanity crushed by the machinery of Fordism. [18]

Meakin identifies "a nostalgia for permanence in the face of a fast-changing environment." The attack on industrialization (and by implication technology) is based on the ideal of a stable authentic 'organic' way of life. The desire to escape the 'dehumanizing' mechanization and modernity and 'return' to a simplified stable rooted work existence is evident in both politically radical and conservative perspectives. [19] Nostalgia for an 'organic' society of the past is not unique to the modern era but it took on a new significance in the nineteenth and twentieth

centuries when rapid transformations of space and time threatened notions of identity and historical continuity.[20] Patrick Wright describes the influence on contemporary culture of a memory of another time or place - "... a world, in Adorno's phrase, where 'existence itself appears endowed with meaning'."[21] This sense of loss cannot be seen as a simple reflection of historical experience.

Raymond Williams in 'The Country and The City' describes how the quest for 'natural' or 'organic' community is expressed idealization of rural life. He shows, however, that a belief in an earlier stable rural community which has just been lost runs through writing on the countryside for at least four hundred years. The organic society of Old England is always hidden behind the last hill:

"When we moved back in time, consistently directed to an earlier and happier rural England, we could find no place, no period, in which we could seriously rest." [22]

To sum up, a strong tradition exists within modern thought which seeks to escape modernity, to resolve its contradictions rather than live by them. Up to this point discussion has been of nostalgic visions of a pre-industrial past which are by definition anti-technology. One of the characteristics of modernity, however, is that such aspirations have increasingly been projected into a highly technological future as well as a rural past. Mechanization came to be seen not only as the destroyer of a simpler, more authentic past but also the harbinger of a stable organic society of the future.

Nostalgia for an age yet to come

By the 1880s a very powerful current of intellectual and popular enthusiasm for science and technology was present in modern culture. This enthusiasm, however, was not necessarily for the flux of development. The appeal of science and technology sprang from its apparent power to order and control the natural and social world.[23] Science and technology seemed above the worldly concerns of politics or

of capitalism - scientists and inventors actively cultivated this impression.

Technologists presented themselves as social visionaries attempting to change the world whose only allegiance was to science and the rational improvement of society.

Carolyn Marvin describes the public face of nineteenth century electrical 'experts':

" Electricians disciplined by science, it was claimed, could not be misled by personal or political motives. On the contrary, the lofty standards of the profession endowed them with general moral authority in human affairs." [24]

The inventors of the late nineteenth century and the system builders of the twentieth century saw themselves as engaged in "the second creation of the world."

Technical engineering was also social engineering. This mission transcended divisions between capitalism and socialism. [25] The stable, ordered society technologists strove to create had much in common with the nostalgic visions of 'organic' community.

For Marshall Berman true modernists are those who understand both the promise and threat of modernity. He argues that the intellectual response to industrialization has faltered so that in this century:

"Modernity is either embraced with a blind and uncritical enthusiasm, or else condemned with a neo-Olympian remoteness and contempt; in either case, it is conceived as a closed monolith, incapable of being shaped or changed by modern men."

Part of this decline in the modernist visions is "a familiar refrain, shared by those who love the modern world and those who hate it" that "modernity is constituted by its machines." [26] The irony of Berman's claim is that it is only in this century that the West could be said to be industrialized rather than industrializing. The growing excitement and concern with technology in the

twentieth century reflects the reality of the increased role of scientific and technological advance in capitalist development.

Berman portrays twentieth century thought as divided between two camps of technological enthusiasts and Jeremiahs. He contrasts the unequivocal faith in technological development of, for example, the Italian Futurists, Bauhaus, Le Corbusier, Buckminster Fuller and Marshall McLuhan with the detachment of aristocratic and Frankfurt School critiques of the technical culture of industrial society. A parallel that he does not draw, however, is that members of each camp seek to transcend the turmoil and flux of modernity. Both express the desire to escape the complexities, contradictions and power relations of the present. For many 'modernists' the rationality of the machine was incorporated into a myth "to redeem us from the formless universe of contingency." [27] Far from being enthusiasts for things as they are, Le Corbusier, McLuhan and the rest see the development of new productive forces, of new technologies as a way of solving the problems of modernity. Indeed it would not be too flippant to view many descriptions of a highly scientific and technological future as nostalgic. Le Corbusier, for example, did not simply wish to construct new buildings but to design a new ordered way of life. [28] Similarly, Marshall McLuhan's enthusiasm for new technologies of communication was rooted in a belief that they promised an escape from the rationalism of industrialization and a return to an enchanted oral community. [29]

This section has identified powerful cultural responses to modernity in which technology has assumed special significance. Technology plays a major part in both positive and negative visions of social transformation which run through modern thought. For some the machine symbolizes the dehumanizing character of industrialization. Others were inspired by dreams of a future shaped by technology. These dreams, however, are not always an expression of faith in modernity but rather an attempt to resolve its contradictions, to make it stable. Just as the idyll of

Old England is always just beyond our reach lost in the past, this technical future never arrives but is always a few years hence.

The power of prophecy

New insight into the nature and appeal of predictions of a future shaped by technology can be gained by considering a series of parallels between contemporary thinking on technology and earlier beliefs about the possibility of personal and social transformation.[30]

The doctrine of progress is often portrayed as the dominant modern perspective on social change. As the discussion has already hinted, however, other pessimistic strands run through modern thought. Although closely wedded to Reason, the relationships between faith and myth, science and rationality and the idea of progress are more complex than sometimes portrayed. Looking back from the dog-end of the twentieth century the doctrine of progress appears a contingent and unstable response to a crisis of meaning - a search for the authority of God without His arbitrariness.[31] It was most robust and important when allied with the development of forces of production; with power rather than reason.[32]

The doctrine of progress was itself a marriage of two other approaches to the future - millennialism and utopianism.[33] Their influence has persisted and has proved at least as meaningful as belief in progress. The doctrine of progress holds that history will develop towards the perfectibility of humanity and society.[34] Millennial and utopian accounts share a belief in the possibility or threat of an end to history - of transcending the flux and contingency of the present. The self-conscious utopia of modern times has a lineage which can be traced back to religious notions of paradise. The idea of a man-made utopia developed in the fifteenth and early sixteenth centuries, inspired by faith in a mixture of

Christianity and science.[35] Like later utopian writing, this vision of the future was ahistorical in the sense that it was perfect and unchanging. While utopianism reflects a search for a 'natural' pattern of life, in religious millennialism the only stability is the will of God expressed through history - a single coherent story with significance for all humanity which is fuelled by conflict and develops to a climatic finish.

Prophecy is central to millennialism. A defining characteristic of millennial predictions is their binary quality. They deal with hell as well as heaven. Ideas of disaster and millennium are inseparable. The psychological roots of the paradise myth and of millenarian hope, can never to be divorced from the apocalypse - with its twin prophesies of terror and salvation [36]. A similar duality can be seen in the relationship between utopian writing and dystopias or as Krishan Kumar prefers to call them 'anti-utopias'. [37]

While utopias remain recorded in books, time and again millennial ideas have caused people to change their lives. In particular historical and social circumstances, millennial beliefs have inspired active movements - sects responding to prophecies of imminent, collective and this-worldly salvation. They are fired by the conviction that life on earth will be totally transformed - not a mere improvement on the present but perfection itself.[38] The Late Middle Ages, for example, saw the rise of movements dedicated to the prediction and immediate establishment of heaven on earth. Such movements are marked by emotional intensity and a complete rejection of the existing social order.

"It is characteristic of this kind of movement that its aims are boundless. A social struggle is seen not as a struggle for specific, limited objectives, but as an event of unique importance, different in kind from all other struggles known in history, a cataclysm from which the world is going to emerge totally transformed and redeemed." [39]

Millennial movements are found around the world. Perhaps the most famous example are the Melanesian Cargo Cults:

"In these movements, a prophet announces the imminence of the end of the world in a cataclysm which will destroy everything. Then the ancestors will return, or God, or some other liberating power, will appear, bringing all the goods the people desire, and ushering in a reign of eternal bliss." [40]

The history of active sects helps us to understand the more general appeal of millennial ideas. Both negative and positive millenniums reflect deep dissatisfaction with the present and appear to have particular appeal at times of social upheaval. [41] The millennial propensity is easiest to identify at the point where tradition and modernity confront each other. Cargo Cults and the millennial movements of the late Middle Ages were products of social dislocation and uncertainty. Their greatest appeal was to those who longed for deliverance for an impossible situation - the displaced victims of this turmoil. [42] Peter Worsley, for example, sees the Cargo Cults as a response to the disruption to a traditional society caused by colonization. The violence of the colonists and the dramatic shifts in their fortunes helped to create a situation where important aspects of European society such as price fluctuations and the production of tools and goods were "beyond rational explanation to the Melanesian." [43] Thus, the most famous feature of these millennial movements - the expectation of the arrival of the Cargo - arose from the quite reasonable doubt that goods were made by Whites or that the Whites did any menial work at all.

Millennialism is as much a response to the disruption of values and of social relationships as much as a product of material loss, economic hardship or physical oppression. It has most resonance in a situation when destruction and regeneration seems to be the only alternative to societal death. This level of emotional

investment helps to explain another feature of millennialism - the resilience of its prophecies in the face of the disconfirmation.[44]

For some writers millennial ideas are only of significance at a particular stage of social development. By associating millennialism solely with the religious idiom, however, they miss the opportunity of detecting the persistence of the millennialism in more "advanced" social forms. Millennial ideas always had a wider cultural presence outside of the active religious sects. They remain an influence on mainstream religious, intellectual and popular culture.[45] Norman Cohn and others emphasise the persistence of millennial ideas - secularized but still prophetic in tone - in Europe long after the end of the period of active sects. The idea of a final apocalyptic crisis heralding the complete transformation of society followed by an era of complete peace and fulfilment lies behind some of the most significant political philosophies and social movements of the nineteenth and twentieth centuries.[46]

Cohn and others see the persistence of millennial ideas in modernity as a continuation of a cultural tradition. The validity of this argument is not of particular importance in the context of this thesis. What is significant is that, for whatever reason, millennial ideas continue to inspire. Just as parallels can be drawn between millennialism and modern political discourses so similar analogies can be made when looking at contemporary approaches to technology and social change.

Technological utopias and dystopias

Technology has been incorporated into the modern eschatology. The Melanesian Cargo Cults were fascinated with technology. In Western society it has also become part of religious millennialism; in the flying saucer cults and in predictions of a nuclear holocaust by groups such as James Jones' People's Temple.[47] In the films of Steven Spielberg technology is frequently portrayed as being enchanted or

associated with quasi-religious themes of rescue and redemption. The potency of the idea of technology in the modern imagination springs from belief in its power to transform the material and social world. In an age when technology is seen as the ultimate expression of impersonal power and we ourselves feel powerless, technology becomes the source of deliverance or damnation. This extends far beyond the realm of the religious. It is possible to identify utopian and millennial elements in a wide range of contemporary visions of a future shaped by technology. Obviously, most technological enthusiasts and Jeremiahs are not members of religious millennial sects. The comparison is valid, however, because of the structure of their beliefs, the emphasis on prophecy and their ability to inspire popular hopes and fears.

Technology often features in overtly utopian visions of a society sometime in the future. This is not a new development. Howard Segal looks at twenty-five technological utopias all conceived in the U.S.A. between 1880 and 1930. As with millennialism, these reflect both faith in a future shaped by technology and also discontent with the present. Segal points to the great similarities in their vision.

"The dirt, noise and chaos that invariably accompanied industrialization in the real world were to give way in the future to perfect cleanliness, efficiency, quiet and harmony. Technology, like fire, would be domesticated." [48]

The taming of nature as well as technology means that the supposed tension between the machine and agrarian order is resolved - organic society returns. Efficient transport and communication systems would enable people to live and work where they chose. Housework would be eased by gadgetry. Paid work would become a less important aspect of our lives. These utopias are very ordered societies of self-control and conformity governed by benevolent technocrats - even the climate is controlled.

The technological utopias, particularly Edward Bellamy's 'Looking Backwards', exerted a powerful intellectual and popular influence. They mark the beginning of a tradition of utopian and anti-utopian writing about a future shaped by science and technology.[49] Both came out of the flux of the late nineteenth century and wrestled with "the overriding paradox of the age: the co-existence of technological progress and social chaos." [50]

Segal shows that technological utopianism was part of a wider cultural trend. Similar beliefs about technology and the future inspired a diverse range of social movements associated with ideas about conservation, scientific management, technocracy and industrial design. A return to the countryside and organic communities is a recurring theme in writing on technology and the future.[51] In addition, Segal suggests that similarities exist between the utopians and more recent strands of futuristic writing on social policy.[52]

Comparable themes concerning technology and social change are present in less obviously utopian writings. The vision of a society of science - a new form of ordered community - has a lineage going back to Bacon, Comte and Saint-Simon. It lives on in the ideas of the theorists of Industrial society like Kerr and of the post-industrial society like Bell. In their view, technological change allows or requires society to escape previous economic and political constraints. The new industrial or post-industrial state is above the old concerns of politics and capitalism.[53] Significantly the same future vision of a society of technology and technical experts provides the raw material for dystopias such as condemnations of the 'technocracy'. As Winner writes:

" Here is another reflection of the modern ambivalence about technology. A technitized regime deliberately built according to an ideal plan is the penultimate dream of all science fiction and science fantasy. But technocracy which arrives through no settled plan but as the result of the enervation of politics and the rise

of a technical elite is one of the primary vexations of modern political thought." [54]

The most powerful critiques of post-industrialism have dismissed the notion that the development of technology and the activities of technologists could escape the influence of existing social, economic and political constraints. [55] Yet it is precisely on the premise that technological change will bring about a qualitatively different kind of social life that the power of this idea rests.

Technology, social change and everyday life

So far, the chapter has attempted to say something about cultural conceptions of technology by examining texts. One of the themes of this thesis is, however, the way similar ideas about technology and the future permeate everyday life. Once again parallels with millennialism provide clues to the power and appeal of technological prophecies.

Making sense of technology is part of wider problem of contemporary living of understanding change and complexity. Flux and change are endemic to modernity. Everyday life is full of problems of meaning and action that arise from that quality - placing strain on our ability to make sense. Technological change is one of the most easily grasped and obvious manifestations of this.

The practice of everyday life is informed by a powerful but unarticulated common sense about the past and the future which is at once "incoherent but incontestable." [56] Most attention has been paid to the ways our understanding of the past and the ways this is more about living in the present than abstractly defined truth. [57] Similar things can be said of notions of the future as of folk philosophies of history. Like our ideas about the past, visions of the future have

far more to do with authenticity than objectivity. Notions of the future are ways of getting by in and making sense of the world - elements of what Michel de Certeau describes as 'perambulatory rhetorics'. These have a mythical structure:

" ... a story jerry-built out of elements taken from common sayings, an allusive and fragmentary story whose gaps mesh with the social practices it symbolizes." [58]

These popular practices take place within 'historically situated conditions'. [59] It would be a mistake, however, to see them as being somehow fixed or determined - they are transitory and contingent bids to get by. Sometimes they utilize 'utopian' and 'fantastic' spaces - worlds outside the reality of the present. [60]

De Certeau's practices of everyday life are the tactics of the relatively powerless - the activities of the modernized rather than the modernizers. This is important to bear in mind when considering popular responses to technical change. Most of us have a relationship with technology which is closer to that of Charlie Chaplin in 'Modern Times' than it is to Berman's Faust. [61] Our perception of technical change is, in part, influenced by our place in the social and organizational pecking-orders. [62] Aside from important differences in class and power, ideas about technology and the future reflect the fact that most people take little part in any decision-making about the social and technological changes that affect them.

"Each individual lives with procedures, rules, processes, institutions, and material devices that are not of his making but powerfully shape what he does. It is scarcely even imaginable what it would mean for each of us to make decisions about the vast array of sociotechnical circumstances that enter our experience." [63]

We are, for the most part, powerless in the face of technological development. [64] The character of contemporary society is such that people often understand changes in their lives in terms of changes in technology. While the development and

adoption of technology is determined by social forces, technological systems embody political decisions which are often imposed on users.[65]

Our sense of powerlessness is reflected in the way technology has become incorporated into our sense of disaster. Experiences of calamity are mediated and in some cases predicted by technology.[66] In the period when the destructive potential of technology has been demonstrated in two world wars and now offers the possibility of a man-made apocalypse or ecological nemesis, when it plays such a central role in the work place it is easy to understand how it has become associated with blind impersonal power. Our response to it is at once wonder and horror.

We understand, accommodate and make decisions about change without the time or the information to act in a perfectly rational manner. At the same time the complexity of the technology which is part of our everyday life makes huge demands on our ability to make sense of it. Lack of knowledge and time to understand technology makes it easy to ascribe it magical qualities. This is reinforced by our very limited ability as individuals to affect the shape of change.[67] Technological development may seem to us - as it did to followers of Cargo Cults - immaculate, costless and beyond human agency. Another misconception which springs from lack of time, expertise and control is to understand technology solely in terms of **things** - as magical epoch-making artifacts.[68]

Changing attitudes?

So far the discussion has only tacitly recognised that the cultural response to technology changes in the face of shifts in the nature and social role of science and technology. This has altered dramatically during the twentieth century. Science and technology have become increasingly interrelated institutionally and as forms of knowledge. Their development now commands massive resources, playing a key role in production. Technologies have grown in pervasiveness, complexity, scale,

power and interconnectedness.[69] This has led some social theorists to assign them a new ideological power.[70] It would be surprising if these changes were not accompanied by shifts in perceptions of technology and social change.

A number of cultural historians detect a sea-change in perceptions of technology. According to Thomas Hughes "technological enthusiasm" reached its peak in the USA between 1900-1941 and is "now passing into history." The first wave of enthusiasm centred on the high-profile independent inventors. Later the laboratories of academic and industrial science came to be seen as a "source of better things for better living." After world war two it is possible to identify a growing current of opinion expressing distrust of technology.[71] While technological development may not universally wear the mantle of progress, a deep-seated belief that it is uncontrollable is, however, just as powerful.[72]

Shifting attitudes towards technology may be part of a wider cultural change in understanding the future. Intellectually the idea of social progress through science has been under attack in recent years. This is, for example, a major plank of postmodernism's rejection of the Enlightenment project. One of the ironies of this argument is, however, that while faith in the meta-narratives of scientific progress is dismissed, postmodernists like Lyotard often locate their theories in accounts of technological change.[73] In the modern era the compression of time and space made establishing and maintaining a sense of the past and future a central cultural problem.[74] It appears, therefore, that whatever shifts may be taking place in the evaluation of technology its role as a symbol of the future is secure. Social and intellectual flux may mean its cultural status is enhanced. It could also be that at a time of social dislocation and disruption, when our sense of historical time is being eroded and when faith in progress has been reduced to an acceptance of the inevitability of change, that discussions of the future will, if anything, take on an increasingly millennial tone.

Part II: Innovation and Culture

The place of technology in the culture of modernity has been considered many times before. Such discussions, however, have usually been kept separate from the study of innovation. The second part of the chapter argues that this is an omission since the issues addressed in the last section can contribute to our understanding of technological development. 'Millennial' hopes and fears about the future impact of technology can be seen at play when we examine the processes of innovation.

This part of the chapter is in three sections. It begins by establishing that technological innovation is a cultural process involving much more than the technical activities of technologists. This argument is developed further in the next section using examples of earlier new technologies. Finally, the role of utopian and dystopian visions of the social impact of technologies in the process of innovation is highlighted.

Technological development as a cultural process

Technology is about more than physical artefacts. It encompasses systems of human organization and knowledge and only makes sense as part of human activity.

Technical innovation is, therefore, culturally embedded - a process involving not just objects but practices and meanings. New technological artefacts are themselves "imbued with cultural meanings" and hence "encompass far more than the products referred to in economics and technology literatures." [75] The development of new technologies involves a wide range of interests engaged in shaping its identity.

This goes far beyond what are normally considered the boundaries of the sphere of production. Even more significantly, it encompasses a wide range of debates and actions often inadequately organized under the term 'adoption'.

Once a technology has established a role in the everyday, the course of its development appears, with hindsight, to be predestined:

" This predestination, however, when closely examined, proves no more than a set of particular social decisions, in particular circumstances, which were then so widely and imperfectly ratified that it is now difficult to see them as decisions rather than (retrospectively) inevitable results." [76]

Raymond Williams' 'Television, Technology and Cultural Form' shows how the development of television as a *technology* was inseparable from its *establishment* as a social institution and set of cultural practices. Williams is one of a whole range of writers who show how the creation and exploitation of technology is subject to political, military and commercial decision-making. The eventual user of the technology is largely absent from accounts of this process. In fact this is one of the themes of such approaches. Ruth Schwartz Cowan maintains, for example, that we have electric refrigerators rather than gas ones (which supposedly have many advantages to the consumer) because the electric version had the backing of large utility companies and corporations to finance its development and promotion.[77]

A danger with this kind of approach springs from the assertion that technology can only be understood in terms of the *intentions* of those who develop and control it. Technological choices are human choices but we should not pretend that all their consequences are foreseen. Williams himself rightly points out that technology is never totally determined. Its design and implementation may be affected by a whole range of different, perhaps contradictory, motivations.[78] An important element of this complexity is the role played by consumers and users in shaping the course of innovation.[79]

By arguing that the social construction of technology involves consumption as well as production I am not proposing a simple model of consumer sovereignty. Rather, in

common with all products, technologies have a 'double life' - one reflecting the power and intentions of those who manufacture it and another in which users remake it.[80] Technologies vary in their 'openness' - the possibilities for autonomy and creativity they offer the user. This is, however, likely to be greatest when a technology is new. Early buyers and users are doing far more than 'adopting' technology. As Roger Silverstone and David Morley write:

" ... there is a profound indeterminacy in the innovation process around consumption and use, an indeterminacy which has been identified but barely studied." [81]

It would be wrong to infer from this argument that such issues are simply resolved by individual users. Rather, early users are participating in a cultural process of forming and evaluating the technology. The history of earlier 'new technologies' illustrates this well.

Earlier new technologies

At this stage I wish to draw out particular aspects of the innovation process using examples drawn from a period when now firmly established technologies were new technologies. Contemporary examples will be considered at length in later chapters but an historical approach, thanks to hindsight, throws the issues central to this chapter into sharper relief. The pages that follow will use examples relating largely to the new communications technologies which emerged in the late nineteenth and early twentieth century. There are two main reasons for selecting this constellation of innovations. Firstly and pragmatically, an appropriate literature exists covering this area. Secondly, these were among the first **mass** technologies which had to find a place not only in administrative and capitalist structures but in people's everyday lives.

The evolution of the telephone, electricity and broadcasting illustrate how innovation involves a series of institutional and cultural debates. Crucially for my own argument, they also show how discourses about new technology are not merely reactive but are an integral part of the development and adoption of the technology. The way the telephone was understood and promoted, for example, varied from country to country. These perceptions played a part in determining the very different rates of take up of the new technology and the institutional structures that grew with it. The debates which lead to the development of the institutions of broadcasting also show a great deal of national variation.[82] Such debates were influenced by existing social relations and cultural conceptions of technology.[83]

Technologies do not emerge fully made into the world. Much remains to be resolved in a process of debate involving interests, institutions and publics.[84] There is still much 'inventing' to be done. Carolyn Marvin offers a sophisticated historical account of this in relation to the development of electric media:

" ... the early history of electric media is less the evolution of technical efficiencies in communication than a series of arenas for negotiating issues crucial to the conduct of social life; among them, who is inside and outside, who may speak, who may not, and who has authority and may be believed." [85]

A key aspect of this process is the definition of what the technology is and what it is for. The exploration and development of a demand for the technology cannot be understood as matching technical solutions to pre-existing fixed needs. An important part of the debate concerns the 'usefulness' of the technology. This is resolved not in relation to abstract criteria of utility but rather to the satisfaction of certain key groups. Similarly, it must be decided who the users of the technology are to be. Also bids must be made for expertise - the right to be authoritative about its working and use. Shaun Moores' discussion of the early years of radio shows that these decisions are not simply resolved at a macro level.

Broadcasting had to capture social spaces and social time within households. Radio's journey into the routines of everyday life was neither inevitable or immediate.[87]

These processes can be seen at work when we consider the history of other communications technologies. Bell's experiments with the electric transmission of sound received much attention especially in the USA. They were greeted with a mixture of wonder and disbelief. Despite this, it was not initially obvious how his new device could be used especially since telegraphy was a firmly established and increasingly sophisticated form of one-to-one communication. Much institutional and financial support was necessary to foster the development of telephony. Bell and others had to persuade investors and administrators that telephony was a useful technology. Many were unconvinced and dismissed it as a 'toy'. The future of telephony was uncertain and debated. It was, for example, by no means clear that it would be used for interactive person to person communication rather than one-way broadcasting.[88] Similarly not everyone was convinced of the value of wireless technology. Initially, it was seen primarily as a one to one communication technology and could have developed as an interactive medium, rather than an instrument of broadcasting. Once it was conceived as a transmission medium a wide range of forces prompted questions as to the content of broadcasting, its finance and the development of institutions to control it. These debates were renewed in relation to television.[89]

Debates about the shape of a new technology and its appropriateness take place among elites of technologists, administrators and investors but they cannot be confined to these groups. Publics and, in particular, early users are involved in this process. Promoters of new technology have to communicate its benefits and make claims for the status of expert to wider audiences. This is a neglected part of the work of innovators, highlighted by Marvin:

" Focused on the point of mass production, artifactual communications history has failed to recognize that electricians were as deeply involved in the field of cultural production as in the field of technical production."[90]

Technologists may be talking to more than one audience. In her history of electric media, Marvin describes the role of a number of distinct 'textural communities', of professionals, enthusiasts and the middle class based around professional and popular publications, in promoting technologies and 'inventing the expert'.

Wider publics played an active role in histories of other communications technologies. People had to be convinced of the need for a telephone. They developed ways of using the telephone - even the telephone conversation had to be invented.[91] Similarly the development of the audience and of ways of listening and watching was a crucial part of the invention of broadcasting. Lyn Spigel in tracing the history of television as seen through the pages of women's magazines in 1950s USA shows people had to learn to want TV, how to operate it and ways of watching it. Magazines had an important role in presenting 'the idea of television' and a vision of its place in the home to a key audience - women.[92]

Histories of earlier new technologies show how conscious attempts were made to mobilize public opinion about technological change. Such attempts reinforced and fed off a popular fascination with new technology. Innovations were the subject of cultural events in which the wider public debated and enthused about their possibilities.[93] These events were serviced by a popular press which was itself dependent on public interest in new technology. As Corn writes:

" ... until quite recently, to be popular at all when writing about science and technology almost required that one be upbeat and prophetic."[94]

While technologists and commercial interests sought to channel this interest they

were never fully in control of it.[95] Popular enthusiasm for new technologies was expressed in the establishment of clubs of users and the popularity of predictive and fictional literature about a technological future.

Popular attitudes to new technology played an important role in determining the pace of diffusion and character of use of the new communication technologies. On occasions, popular interest in a technology has manifestly shaped the direction of its development. Susan Douglas discussing the early days of wireless in the U.S. shows how the popular enthusiasm for the technology (in part stimulated by the press) was far greater than that shown by the large corporations or the military. While administrations failed to see the promise of the wireless, visions of a future shaped by radio enthused the public. The army of amateur wireless users influenced by such ideas played a significant part in the development of the technology both by contributing to its technical advance and by showing its possibilities.[96] The pioneering audience for radio broadcasting were also 'hobbyists' inspired by its technical potential. The enthusiasm of these pioneers was more for radio's technical capacities than the content of broadcasting. They built and experimented with home-made crystal sets. Radio was a 'miraculous toy' designed for and used by lone male enthusiasts. This incarnation of the radio allowed its spread as a technology but threatened its long-term future within the household.[97]

Innovation, utopia and dystopia

Once we understand innovation as a cultural process, the discussion of conceptions of technology and social change conducted in the first part of the chapter takes on a new significance. Technological enthusiasm, for example, is not separate from technological innovation. It is part of the drive to invent, develop and adopt technology.[98] Public debate about innovation shows that new technology often becomes the focus for intense hopes and fears. Discussions of the social consequences of technologies are frequently couched in utopian and millennial terms.

Debate about innovations frequently have a prophetic tone. As Marvin writes in relation to electric media:

" It is impossible to separate public discussion of innovations in communication in the late nineteenth century from public fascination with the fruits of electrical possibility generally." [99]

This fascination is not only with the utopian promise of the technology. Debates about new technology have negative as well as positive elements - dystopian inversions of utopias. [100] Electricity, for example, prompted fears of social catastrophe among experts and the wider public.

" Discomfort with the menace of electrical technology was elsewhere manifested in apocalyptic theories of disaster." [101]

A recurring theme in discussions of the future impact of new communication technologies is their consequences for social relationships and home life in particular. For some, telephone, wireless and television were all seen as both potentially disrupting to the family. Conversely saw them as restoring traditional family relationships. [102] Promoters of innovation had to manage and defuse concerns just as they exploited public utopianism. [103] Moores' discussion of early radio use shows, for example, that there was considerable disagreement even **within** households about the merits of the technology and its use.

" Far from being a focus of family unity, the radio's point of entry was marked by a disturbance of everyday lives and family relationships." [104]

It is not only discussion of communications technologies which have taken on a prophetic tone. Joseph Corn's collection of historical studies of American visions of the future prompted by a whole range of new technologies highlights how

"erroneous, exaggerated and wildly utopian" many predictions have been. It was believed, for example, that X-Rays might even be able to reverse death. Some technologies such as nuclear power are thought to be revolutionary in the sense that they will change every aspect of life.[105] Corn makes the point that not all technologies have inspired the same level of utopian and dystopian prophecies. He explores what it is about certain technologies that makes them more likely to become the subject of such claims. This cannot be explained by reference to the eventual significance of the innovation. One source of imaginary power is our ignorance of complex technology.

"When a technology [such as flight, light or x-rays] makes it possible to do something previously impossible, particularly if a supernatural aura has surrounded the activity, the new invention becomes a prime candidate for being viewed as a technological fix." [106]

"It was the promotion of plastic as a product of modern chemistry, as a result of reactions incomprehensible to the average person, that helped make it seem like an agent of utopian promise." [107]

Historical circumstances can make a technology particularly attractive as a panacea. Corn argues that the hopes attached to nuclear power, for example, can only be understood in the context of memories of the depression and the frustrations of the post-war period.

'Millennial' hopes and fears about the social impact of a new technology has an important bearing on its adoption. A dimension of this which is sometime ignored is that promoters of innovation - technologists, administrators and marketers - are not averse to disseminating and exploiting such ideas.[108] Marvin shows, for example, in relation to electric media, how experts actively used utopian visions of a future shaped by electricity to promote themselves and their technology. Inspired by a

belief in their ability to be 'creators of social miracles' experts consciously excluded others from access to knowledge about the technology:

" Although an express mission of science was to kill magic and myth, electrical experts were deeply implicated in the production of both Claiming that their work benefited the world in ways the world could neither imagine nor truly understand, they resisted every outside suggestion that they explain themselves to the masses." [109]

The promotion of a new technology involves an important element of showmanship. New technologies often have a life as a 'wonder' or spectacle. Displays of electricity, for example, were common in its early days. While experts were quick to condemn 'charlatans' who used electricity as part of theatrical stunts they were not adverse to trading on 'electrical magic' in performances, expositions, tricks and events. The telephone was also displayed as a wonder of science at exhibitions, on lecture tours and in department stores. [110] This period in the development of a new technology presents a number of problems for its promoters. They must exhibit and sensationalize it as a 'wonder' while ensuring it escapes being labelled as a toy.

Not only are promoters of technology actively engaged in mythologizing their products but also in contributing to the mystique of their producers. Historians such as Thomas Hughes have described the conscious attempts by inventors to create personal mythologies and similar collective attempts by scientific professions. [111] Technologists are, therefore, actively engaged not only in the production of a technological present but also technological futures. This should not always be seen as a cynical process. Producers of technology are themselves inspired by such visions. [112] This further reinforces the argument that the cultural response to a new technology is actually an important dimension of the process of innovation.

Utopian and dystopian visions of a future society transformed by technology are an integral part of debates about the identity and value of novel technological artefacts.

Conclusion

This chapter has highlighted the special role new technologies play in our common sense of the future - inspiring hopes and fears that are 'millennial' in structure and appeal. This observation takes on a new significance once innovation is understood as a cultural process. Prophecies about the social impact of technologies influence their production and consumption.

Rather than offer a definitive analysis, the intention of this chapter has been to open up popular conceptions of science and technology, especially of new technologies as an area worthy of empirical study. It also provides a framework for making sense of a range of issues addressed later in the thesis. The millennial metaphor will be developed in the next chapter which explores the nature and influence of prophecies of the Information Technology Revolution. The role of such ideas in innovation and consumption is discussed in detail later in the thesis. Visions of a future shaped by technology played an important part in the home computer boom.

Chapter Two

The Millennialism of the Information Technology Revolution

" ... even within the great tradition of optimistic technophilia, current dreams of a "computer age" stand out as exaggerated and unrealistic. Because they have such broad appeal and because they overshadow other ways of looking at the matter, these notions deserve closer inspection." (Langdon Winner 1984)[1]

This chapter provides a necessary backdrop for any discussion of enthusiasm for computers. It is concerned with the predictive literature on the social impact of computers. The last chapter identified a tradition of popular excitement and concern about new technologies and highlighted such technologies' ability to inspire 'millennial' hopes and fears. Debates about computers and the future fit neatly into this history. It has already been noted that some technologies have had more imaginative potency than others. The computer has been extraordinary in this respect.

In the late 1970s and early 1980s much was written about the social consequences of developments in computing and telecommunications that were grouped under the term 'Information Technology' (IT). This genre focused on the key role IT was to play in shaping the future. While there was much disagreement about the nature of the impact of the new technologies, a robust consensus was created as to their significance. There was a strong strand of 'millennialism' running through this discourse. The tone was prophetic and the predictions were not simply of change but of the transformation of existing social conditions. This chapter looks at the literature on the so-called Information Technology Revolution and seeks to explain its existence and its major characteristics. While the main focus is on a body of predictive works by academic and popular authors, this writing reflected and reinforced a wider interest in a future shaped by IT. The hopes and concerns

expressed were also voiced in policy-making, media and corporate arenas. In this, they were perhaps more influential than many of the earlier technological predictions discussed in the last chapter.

In examining the nature, appeal and influence of the idea of the Information Technology Revolution relatively little attempt will be made to assess the extent to which it is grounded in actual social and technical changes. This is not to deny that IT is implicated in many important social processes and practices. Rather it is a useful device to leave such issues aside in order to highlight certain characteristics of the IT Revolution discourse. In doing this there is a continuity of approach with the last chapter. Electricity, radio and television are all significant technologies but the discourses that surrounded them when they were 'new technologies' are worthy of consideration in their own right.

Focusing on discussions of the Information Technology Revolution as a cultural phenomenon is a justifiable antidote to a dominant discourse which sees the social significance of IT as self-evident - springing directly and unproblematically from present and predicted technological changes. This form of argument has proved largely impervious to critique despite what, to most sociologists, would appear erroneous theoretical and empirical assumptions about social change. Critics have attacked the technological determinism which underpins much of it. Information Technology is portrayed as something which develops independently of society with its own impetus and then effects social change.[2] This is in marked contrast to the growing tendency in other areas to emphasise the 'social shaping of technology' and the complex and often unintended consequences of technological development. Discussion of inequalities and power relations is absent from many accounts of the Information Technology Revolution.[3] Proponents of the IT Revolution also run the risk of over-estimating the uniqueness of IT given that technological dynamism is a fundamental characteristic of contemporary society. In the context of this thesis, however, the validity of visions of a future shaped by IT is not the central issue.

Far more important is the influence of these visions and the way institutions and publics responded to prophecy. In this sense, the example of the Information Technology Revolution backs up the old phenomenological axiom that if people believe something to be true then it is real in its consequences.[4]

Although its influence persists, during the 1980s the notion of the Information Technology Revolution lost much of its millennial potency. Ironically, many aspects of the literature seem quaint or outlandish now that, just as predicted, computers have become more everyday. Prophecies of an IT future have become rather old fashioned.[5] Never-the-less they deserve scrutiny. The prophets of social transformation helped form a more general orthodoxy about the social and economic importance of computers. This, in turn, shaped the agenda for academic and public discussion of the 'social impact' of information technology. Thus, this chapter is an important building-block in the thesis. The ideas and era it evokes form crucial parts of the background to the home computer boom. As I shall show later, ideas about the future significance of IT influenced the production and consumption of goods marketed as home computers. This applies both to beliefs about the general future social significance of IT and specifically to visions of a computerized home. These ideas mediated the experience of home computing and helped shape the way it was to be later studied and interpreted.

The chapter starts by discussing three attempts to describe a future shaped by information technology which highlight features shared by less obviously utopian literature. It then goes on to examine some of the characteristics of the Information Technology Revolution as portrayed in a whole range of predictive texts. The next part of the chapter tentatively attempts to explain the attention given to IT. Finally the chapter offers a critical examination of the idea of the Information Technology Revolution as it relates to the home.

Three Futures

The evocative power of IT is illustrated by the key role it plays in the arguments of a range of books describing a future transformed by technology. The genre of which they are part has much in common with the technological utopianism of earlier eras.[6] It has a strong millennial undercurrent, describing a society made stable by technology in which the problems of industrial society are resolved. While it draws on ideas of technological and scientific advance, the fundamental impulse behind this writing is not unequivocal belief in progress. Like many previous visions of a technological future, its power comes from a sense of present malaise, uncertainty and crisis. Three examples have been selected which illustrate the range of writing in this area. They are inspired by different political perspectives and views of the future yet they are united in a conviction that IT will play a central role in social transformation.[7]

Writing in 1984, deputy editor of 'The Economist', Norman Macrae looks back from the year 2024 to the present in much the same way as Edward Bellamy did in his classic technological utopia 'Looking Backwards'. [8]. Macrae sees a world in chaos and slipping into war - full of starvation, despotism and nervous disorder. But his future is a very bright one. After going through what he considers to be a 'period of antithesis' between 1965 and 2010 the world takes on a saner and more stable character. A new world emerges from a period of purgatory in which threats of war are needed to win a permanent peace and a world government is needed to supervise the disappearance of all government. Macrae's solutions to the problem of famine, drugs, health and shortage of natural resources are, in part or totally, technological. New technologies, especially information technology, mean that many of the problems of contemporary life melt away. Computers and telecommunications allow the creation of a new kind of society whose organization is determined by a world-wide 'computerized town meeting' which up to a billion people take part in. Suggestions are assessed by a computer model of the world economy and are rejected

'as being likely to increase the unhappiness of mankind.' On a smaller scale, this kind of conferencing becomes a key method of group opinion sounding, decision-making and innovation.

For Macrae, new technology necessitates the withering away of government and the development of a decentralized way of life world-wide. Computers allow us to self-manage our health and education. They herald a completely new way of organizing work and the economy. For example, children may start working as young as nine years old, especially as computer programmers. New technology means custom-built, small-scale production. Capital is no longer the vital economic resource. Now entrepreneurial use of readily available knowledge has become crucial.[9] Up to 90% of the US work force could telecommute from home or elsewhere:

"They could live on the beach in Tahiti if they wanted to, and telecommute daily to computers and other colleagues in the New York or London or Hamburg or Timbuctoo-tax-havan office through which they worked." [10]

While his technological utopia is rather different, Zbigniew Brezezinski (writing in the 1970s) also offers us a vision of contemporary malaise contrasted with a future of stability, order and common sense.[11] It is, according to Brezezinski, our tragedy to be caught between "Two Ages", between two ways of life. Once again, the coming years are crucial ones in the history of the world. We are about to experience the greatest changes ever seen in history - far more profound than any of the great political revolutions. These changes will affect the very essence of our existence. Once again, technology, especially information technology, plays a central role in shaping this new society which Brezezinski terms 'technetronic' - an amalgam of the words technology and electronic. This revolution is "a process lacking ideology, lacking leaders and political parties." [12] It transcends the concerns and the conditions of the present.

In Brezezinski's future industrial production is no longer the key determining factor in social change. It is replaced as the motor of development by new technologies and sciences, notably new means of communication and microcomputers. Technology will not only alter production. By extending our rational faculties it will change what it is to be human. Science and technology, including genetics and biochemistry, will shape every aspect of life. Services and automation will change the concept of labour. 'Technological unemployment' will be a major social problem. The 'heavy industry' of information will have the crucial function of organizing the masses. Information and culture will become a major instrument of power. Society will be divided into an elite who will control flows of information and the mass of people whose chief problem will be free time.

Perhaps the most influential and certainly the most widely read of the three technological utopias is that of Alvin Toffler. Like Macrae and Brezezinski he heralds the birth of a new civilization in 'The Third Wave' (1980). Another unifying feature is that his work is a response to what he sees as a profound crisis of industrial society which became apparent in the 1960's:

"Strikes, blackouts, breakdowns, crime and psychological distress spread throughout the Second Wave world. Magazines did cover pieces on 'why nothing works any more'. Energy and family systems shook. Value systems and urban structures crumbled. Pollution, corruption, inflation, alienation, loneliness, racism, bureaucratism, divorce, mindless consumerism, all came under savage attack. Economists warned of the possibility of a total collapse of the financial system." [13]

Every conflict, contradiction and disaster is taken as a sign of the immanent arrival of a new kind of society. Toffler believes that "...beneath the clatter and jangle of seemingly senseless events there lies a startling and potentially hopeful pattern." After the agricultural First Wave and the industrial Second Wave humanity is about to experience the Third Wave. Again the present and the immediate future

will witness the crucial turning point of world history. The next few decades will see " ... the deepest social upheaval and creative restructuring of all time." [14]

We get close to the core of Toffler's vision of the future when he describes it as "highly technological and anti-industrial" at the same time and "the first truly humane civilization in recorded history." [15] Once again in common with earlier visions of a future shaped by technology this seeks to transcend the conditions of the present. According to Toffler:

"Second Wave systems are in crisis. Thus we find crisis in the welfare systems. Crisis in the postal systems. Crisis in the school systems. Crisis in the health-delivery systems. Crisis in the urban systems. Crisis in the international financial system. The nation state itself is in crisis. The Second Wave value system is in crisis....Even the role system that held industrialization together is in crisis....The collapse of Second Wave Civilization has created an epidemic of personality crisis." [16]

The arrival of the Third Wave resolves all these crises as well as ending the 'standardization', 'specialization', 'synchronization', 'concentration', 'maximization' and 'centralization' of industrial society.

Toffler is anxious to eschew technological determinism in his explanation of the arrival of the Third Wave but technology plays a very important part in the new civilization. New forms of communication technology enable a 'de-massification' of the media to take place. Computers and robots make possible customized 'wholistic' production. They allow the two halves of human life - production and consumption - to be reunited. Toffler chronicles the rise of the 'prosumer' - a shift from production for others to production for self. Networks of computers create an 'intelligent environment'. New technology makes possible the establishment of a 'telecommunity' and of 'semi-direct democracy'. [17] Thus the vision of a

technological future is combined with a return to an idealized version of 'organic' preindustrial social relations.

The, quite different, three visions of the future discussed above are 'millennial' in that they share the conviction that we are living through a crucial watershed in human history. A completely new kind of society is taking shape around us - emerging out of the chaos of the present. Technology, especially information technology, provides the basis for this new society which transcends the concerns, cultures and power structures of the present. From the stand-point of the 1990s it might be easy to dismiss these visions of the future but there are a number of reasons why they are worth considering. Firstly, they struck a chord in the popular consciousness. Toffler, in particular, has sold millions of copies of his books. Secondly these writers were not without influence. Brezezinski was President Carter's national security adviser and is a key member of the Trilateral Commission. Toffler helped shape AT and T's corporate plan and his ideas have been given credence across the political spectrum.[18] Thirdly and most importantly, they have much in common with other less obviously utopian literature that focuses directly on the social impact of information technology. It is to this body of work that I now turn.

Anatomy of the Information Technology Revolution

While the promise or the threat of the 'Computer Revolution' or of Automation has had earlier vogues, the current debate, in Europe at least, dates from around 1978. That year was marked by a sudden concern in media, political and academic circles with recent developments in microelectronics.[19] A spate of books began to appear in the late 1970's, both aimed at influencing policy-making and at climbing best-seller lists, which attempted to predict the contours of a future 'information society' or 'leisure society' or 'computerized society'. While developments in microelectronics provided the catalyst for this, usually talk was of 'information

technology' encompassing developments in telecommunications as well as computing. It was not until the 1980s that the microcomputer itself came to be universally seen as the embodiment of IT.[20]

The character of the information technology debate varied from country to country but many of its preoccupations were international.[21] The focus was not on the present social consequences of IT but on its future impact. Much of the writing shared both a similar tone and similar themes with the technological utopians discussed in the last section. In fact the utopians fed off an already powerful discourse about computers and the future. I am not the only one to point to messianic elements in this discourse.[22] Implicit or explicit in much that was written about the social impact of IT in this period is the notion that computers will bring about rapid and dramatic change. Some were prepared to consider the computer "the single most important invention in recorded history." [23] A qualitatively different kind of society would result from its adoption. The assertion that information technology in general or microelectronics in particular would produce 'revolutionary' social change was made again and again. Technological developments were to be at the heart of the 'Second Industrial Revolution' or the harbinger of a new information based society.

Many of the works on the Information Technology Revolution assumed a celebratory tone, only tempered by warnings about missing the opportunities offered by computers. Their authors, as Winner writes, saw themselves as prophets:

" Like political revolutionists, advocates of computerization believe that a glorious transformation is sweeping the world and that they are in its vanguard." [24]

Christopher Evans' 'The Mighty Micro' - both a best-selling book and a television series - was one of the most popular early British works on the social implications

of the microchip. In it Evans talks of "a future which is being moulded by a single startling development in technology." We are entering a 'Computer Revolution' whose significance is impossible to overestimate:

"As with the Industrial Revolution it will have an overwhelming and comprehensive impact, affecting every human being on earth in every aspect of his or her life. Again, parallelling its predecessor, it will run at a gallop, though its time course will be shorter and its force may well be spent not in 150 years, but in twenty-five. Thirdly - again note the parallel - once the revolution is underway it will be unstoppable..." [25]

In the 'Mighty Micro' and similar works, predictions about the development of new products and services are used to suggest the arrival of a profoundly different kind of society. There is a strong element of what Joseph Corn calls the 'technological fix' in these predictions as to how I T will change society. Technological change would bring an end to the many of problems which have dogged industrial society.[26] Amongst its prophets, IT is seen as a solution to a whole range of fundamental social problems such as crime, war, poverty, pollution and the underdevelopment of the Third World.[27] What were previously seen as political debates are closed by technological developments. By the end of the 1980's, according to Evans, "even the most ardent Marxist will probably have to bow to the overwhelming testimony of the microprocessor" and concede "that the world has changed, and for the better, and without the long-awaited revolution of the proletariat." [28]

Sometimes this enthusiasm for the future reveals a profound discontent with industrial society. Some prophets, for example, view new technology as the only solution to what appear themselves to be 'technological' problems. This is the thrust of James Martin's vision of a 'Wired Society':

"It is possible now to build a world without pollution, without massive destruction

of nature's beauty, without human drudgery, in which destructive consumption patterns are avoided, and in which the human mind can be nourished as never before in history and can soar to new forms of greatness." [29]

Yoneji Masuda while aware of the dangers of the 'Automated State' enthuses about the promise of IT:

" We are moving towards the 21st century with the great goal of building Computopia on earth, the historical monument of which will be only several chips one inch square in a small box. But that box will store many historical records, including the record of how four billion world citizens overcame the energy crisis and the population explosion; achieved the abolition of nuclear weapons and complete disarmament; conquered illiteracy; and created a rich symbiosis of god and man without the compulsion of power or law, but by the voluntary cooperation of the citizens to put into practice their common global aims." [30]

This kind of utopian vision was not echoed by all writers on the future social impact of IT but it did play a crucial role in shaping the agenda for discussion of computers. Much other work on the subject has been a dialogue with the utopians. The notion of the IT Revolution has lain behind a broader strand of predictive writing.

Retrospective surveys and critiques tend to concentrate only on one aspect of the discourses of the IT Revolution - enthusiasts promoting a vision of a future shaped by IT. [31] Although perhaps less high profile and certainly less popular, there was, from the start, another contrasting strand of writing on IT. The late 1970s and early 1980s saw a critical response to the utopian accounts of the IT Revolution notably from Marxist and humanist perspectives. It articulated a whole range of concerns about the future impact of IT. Sceptics expended much energy debunking the utopianism of the IT prophets but they found it difficult to develop their critique

without accepting the basic premise that the arrival of this new technology was of profound importance. To counter the enthusiasts they offered an equally all-embracing and apocalyptic dystopian vision of a computerized future. Neither Marxists or humanists could escape the belief that the arrival of information technology marked a watershed in modernization.[32]

Far from finding unanimity, reviews of the available literature on the social consequences of IT in the early 1980s would remark on the wide range of predictions and interpretations on offer. Often approaches are crudely divided into two camps of 'optimists' and 'pessimists'. [33] Accounts frequently took the form of debates with actual or apocryphal opponents, be they 'Luddites' or 'Utopians'. But while it is right to characterize this era as one of debate about the social impact of IT, what unifies writings is a belief in the future significance of the technology whether it be for good or ill. Influential collections of writing on IT such as those edited by Forester presented a wide range of views but by their tone and format promoted a powerful sense that IT was something very significant and warranting *urgent social debate*. [34] Often predictions of the computerized future contained many of the same features with the optimists and pessimists merely arguing about how these features should be interpreted.

The pages that follow highlight some of the common features of the computerized future debated by utopians and dystopians. They offer an anatomy of the Information Technology Revolution. A number of different but overlapping discourses about IT and the future go to make up this composite picture. There are a whole range of areas of social life where IT was said to have a 'revolutionary' impact. These partial or less ambitious accounts, however, themselves implicitly or explicitly rest on the concept of the IT Revolution.

An end to work?

The transformation of paid work is an important feature of many accounts of the IT Revolution. A frequent assertion among both optimists and pessimists is that information technology will increase productivity to such an extent that it will call into question the central role of waged work as an organizing principle of the lives of individuals or of society as a whole. IT will not simply be implicated in the restructuring of work and the economy but will transform them.

Many of those who make such drastic predictions realise that they are not the first people to 'cry wolf' on this issue. In the 1950's and 1960's there had been a widespread belief that automation would create massive amounts of leisure or unemployment.[35] Information technology is, however, considered different from all the other innovations that have characterized industrialization for two reasons - its supposed 'exponential' development and its all-pervasiveness. Nothing about the world of work will remain unchanged by IT, according to Clive Jenkins and Barrie Sherman:

"Apart from a few personal services, some illegal, it is difficult to think of areas where microelectronic technology will not be used." [36]

While few economists are prepared to predict long term unemployment trends, against the background of rising unemployment in the late 1970s and early 1980s, 'multi-disciplinary' writers painted a picture of a future workless society.[37] The influential 1978 BBC documentary 'Now The Chips Are Down' asked:

"What will happen to the men in today's jobs? Can we all live on the wealth of automatic factories and the earnings of an elite band of 60,000 software engineers?" [38]

Professor Tom Stonier maintained in 1983 that:

"In 25 years it will take no more than 10% of the labour force to provide us with all our material needs."

Despite the agreement about the dramatic impact IT would have on production and work relationships, utopian and dystopian accounts of the social consequences of this exist side by side. While some talk of a 'leisure society' of 'affluent redundancy' others describe a process of automation that will create a polarized society of massive unemployment and segmented labour markets. Similarly, the computer will either abolish drudgery and mundane work or else bring deskilling and control in the work place to a new level of sophistication.[39]

Ironically, given the way that technology is portrayed as an inevitable force for social change much of the literature presents us with a moment of decision. The technological determinism that underpins the argument is abandoned in favour of rhetoric of choice.[40] Once again, the alternatives are utopian and dystopian - political choices will determine whether we will live in a heaven where people's time is their own or a hell of mass unemployment, social division and poverty. Jenkins and Sherman, for example, offer us a choice between "repression and a better life." They talk of two futures of IT-induced unemployment. One is "the waste of human and other resources and out of this can only come violence, poverty, misery and growing inequalities." In the other, people are liberated from work.[41]

The writings of Andre Gorz offers a striking example of the use of this argument and the power of IT in political discourses. Gorz is a Marxist who in his earlier works condemned every aspect of the technocracy and of the industrial division of labour.[42] But microelectronics is different - " a technological transformation affecting the very bases of the social order established over the last 150 years."

"Unlike the mega-technologies of the industrial era, which were an obstacle to decentralized, community-based development automation is socially ambivalent." [43]

Gorz argues that the microchip's ability to automate so cheaply that investment destroys jobs means that the wage contract as the basis of social organization is destroyed. This offers us a 'pathway to paradise' - the means to transcend industrial capitalism. 'Paradise's' alternative is an awful and equally final and all-encompassing one - "capitalism itself will 'spontaneously' turn towards a new order form of industrialization which will ... mark the final triumph of the reign of commodities." [44]

Although Gorz's optimism is not shared by most other Marxists it is worth noting that many of them qualify their IT dystopias by acknowledging a liberatory potential of computers which is wasted under capitalism.[45]

The information society

Another theme common to many discussions of IT is the idea that it will provide the infrastructure for a new 'information society'; a society in which the production and distribution of knowledge or information outstrips the making of material goods in importance. This is an argument with influence around the world. Talk is of a 'wired society' where information is crucial and in which telecommunications are the 'new highways'. [46]

Once again utopian and dystopian accounts of this development exist side by side. Enthusiasts talk of the unfettered communication, the inevitability of the decentralization of power and the development of an infinitely democratic and knowledgeable society. Universal access to computers will facilitate openness and debate. Many commentators look forward to an era of direct participation in democratic decision-making facilitated by computers.[47] Others attach equal

importance to this new electronic environment confident that it will herald greater centralization of power, proving the ultimate tool for manipulation and control. David Burnham, for example, talks of 'The Rise of The Computer State'. His vision is based on the belief that the "overwhelming influence of computers is hard to exaggerate." In a future society access to a computer will determine class. The computer offers new opportunities for surveillance and storage of information on people. It can be used to manipulate opinion and to undermine individuals. He cites examples to support the contention "that the industrial nations of the world have become enmeshed in a complicated political and technical process that is transforming them into increasingly powerful but relatively benign police states." Burnham is not alone in seeing IT as a tool of authoritarian power and a threat to democracy.[48]

A new stage of human and social development

An indication of the importance attached to the Information Technology Revolution is that discussion of its impact frequently went beyond issues of jobs and power to consider how computerization might alter our very sense of self and relationships with others. A number of predictive works portray the computer as the symbol or the medium of a new stage in human development. James Martin's tone is not untypical:

"Humankind is poised midway between the beasts and godlike power of communication." [49]

Christopher Evans believes that:

"During the 1990's computers will increasingly serve as intellectual and emotional partners." [50]

Similarly apocalyptic dystopian visions of the impact of the computer on the personality and relationships also exist. An increasingly intimate relationship between humans and technology is portrayed as undermining relationships between humans.[51] Geoff Simons, for example, sees the computer as the archetypal dehumanizing machine. It makes us machine-like, deskills us, threatens our self-image, distorts human personality and acts as an instrument of political domination. It is the destroyer of ethics and human interaction. Simons writes of "the gradual destruction of human-to-human contact" due to the spread of information technology.[52]

One important aspect of this debate relates to changing modes of thought. Alvin Toffler talks enthusiastically about the creation of an 'intelligent environment':

"In altering the info-sphere so profoundly, we are destined to transform our own minds as well - the way we think about our problems, the way we synthesize information, the way we anticipate the consequences of our own actions. We are likely to change the role of literacy in our lives. We may even alter our own brain chemistry." [53]

Toffler is not alone in arguing that computers offer us a new stage of creativity and inventiveness - a fundamental change in the way people think about themselves and the world around them.[54] Others, famously Joseph Weizenbaum, view the same process as one of the dehumanization. People become slaves to models given to them by machines or become lost in a welter of meaningless information.[55]

The computer as partner and god

Further evidence of the gravity ascribed to the Information Technology Revolution is that the computer is often portrayed as the decision-maker and problem-solver of the future. Christopher Evans, for example, believed that the period between 1979 and

1982 would see a growing reliance of state and corporate bureaucracies on computer modelling.[56] This could give computers a god-like status.

"The realization of our desperate plight in a world hopelessly over-complicated and overloaded with information, will become glaringly apparent in the turbulent 1980's when the full impact of the Computer Revolution will be upon us. In such circumstances the temptation to turn to the computer for assistance will be overwhelming. Once we have yielded, however, things will never be the same again. Man, for so long the sole and undisputed master of the planet, will no longer have to face the universe alone. Other intelligences, initially comparable, later vastly superior, will stand by his side." [57]

Again, the main debate is not about the future significance of IT but whether this development is positive. While Evans argues that the computers might end the risk of war since computer modelling will show us the futility of thinking we can win, Geoff Simons talks of the computer as war-maker, promoting dehumanizing war games and heightening the possibility of a nuclear accident.[58]

Such arguments rest on speculation about future developments in artificial intelligence (AI). While there is a much disagreement as to how well advanced or feasible the project of AI is, this does not stop utopians and dystopians speculating about the social consequences of 'thinking machines.' [59] On the one hand, it heralds a great new adventure for humanity and the opportunity for the world's problems to be solved by machines wiser than ourselves. On the other, it is the final triumph of instrumental reason over rationality and a threat to the continued existence of the planet. Michael Shallis may set out to warn us of the dangers of worshipping 'The Silicon Idol' but, as with Joseph Weizenbaum, the computer is viewed as a new stage in the dehumanisation of man by technology and technical rationality.[60] Instead of god, the computer become devil. Geoff Simons points to 'the menace of the computer invasion':

"Today computers are learning to think about the information that they hold, how to draw conclusions from their knowledge in ways that are starting to outstrip human intellectual competence."

The computers are, according to Simons, taking over - developing free will and survival strategies and will serve their own purposes. They will make decisions which we will not be able to comprehend the reasoning behind.[61] Michael Shallis is equally convinced of the threat computers pose.

"Because of their versatile application potential there is virtually no area which can remain immune to computer encroachment, and this circumstance inevitably affects how human purpose is framed in society." [62]

Why a Revolution?

The last section showed that a large canon of predictive literature took extremely seriously the notion that IT would not only change but **transform** fundamental areas of society. While a stark division exists between utopians and dystopians, the literature shares a belief in the profound significance of information technology whether it be for good or evil. Much of the writing from this era is 'millennial' in tone and structure. We have seen the amount of agreement there is that the arrival of information technology marks a crucial watershed in the process of industrialization or even, for some, in the evolution of humanity. The present is a key moment of decision. Both optimistic and pessimistic accounts posit that the next few years will see a break in social development. When it finally comes the Information Technology Revolution will not be a muddled trend to which new technology is implicated - it will change every aspect of our lives. IT will be central to the new world; a high-tech heaven or a high-tech hell. Although it is born out of turmoil this new society will have a stable and ordered character.[63]

It is now time to examine the basis of this discourse on the Information Technology Revolution and the agenda it helped to form. Prophecies of the Information Technology Revolution have a structure and influence which cannot be explained simply by reference to existing technological developments or social trends.[64] Yet so influential has the notion of the 'revolutionary' impact of IT been that many of its proponents do not feel the need to do more to justify their claims than to cite the level of interest and agreement on the subject. 'Millennial' writing fed into and off a wider excitement and concern about the impact of IT among policy-makers, corporations, unions and the public. It helped shape a powerful consensus about the 'revolutionary' potential of computers in a whole range of different areas of society including work, politics, relationships and home life. What was agreed was that computers were to be taken seriously. Similarly discussion of computers was always about the future. A few trends are identified but the real Information Technology Revolution is always a few years hence. This is something, once again, shared with faith in the millenium and is one of the reasons why this discourse is so resilient. If the promised transformation does not come then belief in its ultimate arrival remains undented. In 1985, for example, Forester felt it necessary to defend predictions made five years before:

" Some skeptics might still look around and conclude that information technology has not yet changed things very dramatically. It is rather like those who saw the first automobiles, telephones and TVs and concluded they'd never catch on." [65]

The implication being that existing developments are merely early signs of what is to come. Technological dynamism gives this kind of argument added power. Hopes and fears can be projected a few years into the future, perhaps onto a new development such as advances in telecommunication or the 'Fifth Generation' of computers and software.

Fourteen years on from the explosion of interest in IT, many of the prophecies of the IT Revolution have not come to pass. Perhaps more tellingly, interest in the social impact of IT has declined. Some recent assessments of the the early prophecies of the IT Revolution have been made which put a series of ticks and crosses against a list of predicted innovations.[66] This misses the point since the new technological developments, gadgets and services were to the IT prophets merely indicators of a more profound change. Although the revolutionary metaphor has been used to describe technical developments, the Information Technology Revolution was about something more. New technology implied inevitable social transformation. This points us towards what is at once the most powerful and the most erroneous part of this discourse - IT promises or threatens to transcend current social conditions and concerns. This is one of the characteristics it shares with earlier discourses about new technology. IT optimists and pessimists touch on two recurring themes in modern thought: a dystopia of 'the iron cage of rationality' and an utopian escape or return to an 'organic', rural society.[67]

Association with IT gives old ideas a new authority. The Information Society and the Wired Society are close relations of the post-industrial society. Some of the prophets of this new era, openly acknowledge their debt to Daniel Bell.[68] Talk of a new electronic environment and changes in relationships and identity echo McLuhanism. The credibility the idea of IT gives to such previously highly questioned social predictions illustrates its power as a closer of arguments. It reflects the influence and appeal that the idea of the Information Technology Revolution has. Langdon Winner writes of:

" ... the almost religious conviction that a widespread adoption of computers and communication systems and broad access to electronic information will automatically produce a better world for humanity. It is a peculiar form of enthusiasm that characterizes social fashions of the late twentieth century. Many people who have

grown cynical or discouraged about other aspects of social life are enthralled by the supposed redemptive qualities of computers and telecommunications." [69]

What is striking is the willingness of IT prophets to believe and use the wildest forecasts about the development of IT and its future social impact. The pace and power of technological developments are overestimated. There is near-unanimity as to the efficiency of computers; every confidence in their ability to enslave or liberate. [70] Skeptics are put in the faintly ridiculous and ultimately fruitless position of having to prove that the Revolution, as these writers envisage it, will not take place in the future.

A number of attempts have been made to 'show up' the Information Technology Revolution as a piece of ideology supporting the interests of certain social, political and technological groups. [71] There are undoubtedly 'ideological' elements to high-tech futures. One has only to return to the utopias considered at the start of the chapter to see this. Brezezinski, the cold war warrior, is arguing for a strong 'healthy' West to counter the threat of communism. Macrae's future is anti-the ecology movement, socialism and regulation of all kinds and pro-free-market capitalism. While this kind of analysis of texts of the IT revolution is valid, perhaps a more significant issue is why people choose to couch their arguments in the form of technological utopias.

So influential is the idea of the Information Technology Revolution that it cannot be considered the province of one particular political position. Rather, it is fought over by competing groups and ideologies. If we turn to its role in political life in the early 1980s we see that different political protagonists battle to claim it as their own. In Britain, a striking consensus was created about the national importance of IT. [72] During this period politicians via speeches, articles and books sought to integrate computers into their own particular vision of the future. Technological determinism mingled with pleas for political intervention.

Information technology provided the tools and infrastructure for Margaret Thatcher's self-reliant yeoman economy. The Conservatives argued that we must recapture the virtues of the first industrial revolution in order to triumph in the second.[73] For Francis Pym and Shirley Williams IT brings a revolution that neither socialism or laissez faire capitalism can handle. It necessitates a new centrist politics.[74] Soon after his election as leader of the Labour Party Neil Kinnock turned to IT to provide his own version of the Wilsonian 'White Heat'. Computers also found a special place in the rhetoric and policies of more radical political groups. Belief in the significance of the Information Technology Revolution was an important facet of the Communist Party's attempts to come to terms with 'New Times.' Other Leftists began to argue that it offered a final crisis of capitalism.[75] Many Greens cite it as an opportunity to decentralize power and production. It had a strong appeal to proponents of 'New Age' and 'alternative' ideologies.[76] Thus, while information technology may be incorporated into different attempts to gain or keep political hegemony, its appeal is wider and has deeper roots.[77]

Why Information Technology?

To understand the potency of this argument we must put it in the context of the more general cultural tendencies of millennial prophecy and technological determinism discussed in the last chapter. A key point, made in the previous chapter and developed in this one, is that discussions of new technologies are not simply determined by the inherent qualities of the technology. Discourses about new technology, indeed the whole idea of new technology, should be understood as cultural phenomena. If we accept this then we need to develop a more sophisticated explanation of why IT, in particular, should promote so many hopes and fears and why these should be taken so seriously. Leaving aside any existing social changes IT may have been part of, a number of other factors can be seen to have contributed to its power as the focus of prophecy.

The qualities and cultural history of the computer

The last chapter cited speculation by Corn and others as to the factors which make technologies likely to be the subject of utopian and dystopian claims.[78] Put crudely, this rested on people's ignorance of the workings of novel technology - if it did something which was incomprehensible or previously thought impossible or supernatural it gained a particular imaginative potency. Using this criteria it is not hard to explain why the computer achieved its status. It is the ultimate 'black box' whose workings are masked and beyond comprehension to the uninitiated. Data enters the computer and comes out transformed as if by magic.

The computer, the robot and the thinking machine have a long imaginative prehistory and continue to inspire authors of fiction today. This is part of a tradition of belief in the creation of a thinking, feeling machine and of likening humans to machines. A world-wide history of real and imaginary automata, for example, stretches back into legend.[79] Throughout this century robots crop up in films, art, comics, as toys and as side-shows. This long image of fake robots and people pretending to be robots continues:

"The world of automata and robots contains an area of illusion and fraud which presents many traps for the innocent." [80]

In addition, two of the great projects of science and technology lie at the heart of the conception and design of the computer. It is supposedly a 'universal machine' which can perform any task. Also, the creation of an 'electronic brain' is the culmination of a long history of attempts to construct representations and imitations of humans. The idea of building a 'machine that thinks' lay behind much of the early work on computers.[81]

Many of those involved in the initial development of the computer harboured doubts as to its usefulness outside a few highly specialized areas.[82] The computer has never *th* *l* *ss* always had a high profile in the media and features in numerous stories, films and folk tales. Writings on computers and society frequently remark on how attractive the computer has proved to people as a metaphor for understanding themselves and the world around them.[83] This fascination was given a new twist in the 1970s. Bringing computing and telecommunications together was given new potency by quasi-religious ideas about universal communication, the sharing of knowledge and linking up the world. The computer became *part of something more nebulous but all-encompassing* - Information Technology. Progress in microelectronics gave the impression of technical change that was so rapid anything was possible. Christopher Evans, for example, believed in 1979 that:

"...computer technology is embarking on a period of exponential growth, and social and economic change will probably occur in its wake, for a period at any rate, at the same conceptually unmanageable pace." [84]

Perhaps most significantly in the context of this thesis, what gave discussions of IT a new twist was the prospect of its spread into all aspects of life.

Microelectronics presented, for example, the opportunity for everyone to have access to computers. This became a powerful component of prophecies. Bolter's argument is a common one:

" When computers ... are counted in their millions, rather than in terms of thousands, they will manifest their full impact on society." [85]

The IT Revolution in social and historical context

A great deal has been written about the computer's ability to absorb, fascinate or repulse. There is a large technical and general literature on 'computerphobia', 'robotphobia' and 'cyberphobia' on the one hand and computer 'addiction' on the other. I am not the first to notice that, surprisingly, this fascination with computers and their power as a 'metaphor of our age' is taken as being perfectly natural.[86] In order to understand it further we should not only consider the material qualities and cultural history of the computer already touched on but also to place discussions about *IT in social and historical context*.

The Information Technology Revolution debate is part of a wider resurgence of interest in understanding current social change and futurology.[87] Attempts to make sense of the shifting political, economic and cultural map of late twentieth century capitalism offered by, for example, David Harvey provide not only a more plausible account of social change than that offered by the IT prophets but they also, at the same time, help explain why these prophecies have such appeal.

The world-wide debate about the Information Technology Revolution, its nature and the significance attached to it, was as much a product of historical circumstance as of technological change. One has only to think back to the utopias of Brezinski, Toffler and Macrae to see that the appeal of the vision of a future transformed by new technology lies in a profound discontent with the present. The 1970's marked the start of a period of economic, political and cultural crisis and the end of the stability and concerted growth that had characterized the post war economy. A period of restructuring in the labour market began which also saw an undermining of a broad national and international political consensus at the heart of the post 1945 expansion. During this same period a phase of cultural crisis and reappraisal was initiated.[88] All this contributed to what might be called a crisis in confidence in industrialization and the social institutions of industrial society. Important

aspects of this were loss of faith, for many, in political futures such as that offered by socialism and, ironically, in scientific progress.[89]

Discussion of ^{the} Information Technology Revolution took place against this backdrop of recession and crisis. As more than one critic has noted, most graphically in Britain, the optimism of future predictions was in stark contrast to the present economic and social conditions of the late 1970s and early 1980s.[90] The appeal of the idea of the I T Revolution comes in part from this sense from malaise. It is not difficult to understand why in such uncertain times the industrialized world would be so receptive to the language of catastrophe, transformation and rebirth in which much of the discussion of information technology is couched.

Information Technology in The Home

Having considered some general characteristics of the debates about the Information Technology Revolution I now wish to examine the idea in more detail as it relates to the home. One of the major features of the idea of the IT Revolution, presented in many different forms, is that it offers a resolution to the problems of industrialization or as an end to industrialization itself. This is well illustrated by what had been written about the supposed impact of information technology in the home. It is worth remembering that this discourse predates the marketing of goods as 'home computers'.

The computerized future is an important facet of many visions of a future shaped by IT. A major theme in writing on IT and the home is the elimination of mundane domestic work. This fits into a long history of predictions of a 'push-button' 'home of the future'. Horrigan writes of the US experience:

" The 'home of tomorrow' appears to be a fixture of American capitalist society, but it seems destined to be always just over the horizon." [91]

Sometimes IT prophecies return to old themes of domestic robotics but also talk was now of an 'intelligent home.' [92] Such visions, based around the assumption of near-universal ownership of IT, have the added dimension of an emphasis on access to information. The home becomes a centre for data processing. Initially at least such predictions were not focused on the ownership of home computers. Instead talk was of the use of microelectronics in a wide range of domestic appliances and of communication using technologies such as videotext and cable.

Discussions of the future impact of IT on home life predicted much more than technical change easing housework. New technology would fundamentally alter life within the home and the relationship between it and the outside world. In the words of Ursula Huws, the idea of a computerized home became "emotionally charged." [93] Following a pattern set by debates about earlier new technologies, the notion of domestic IT prompted both utopian and dystopian visions about changing home life. Optimists and pessimists argued chiefly not about the significance of IT for the household but rather about how to interpret agreed changes. [94]

The problems of modernity are often associated with the separation of work from home and community. There are a number of elements to this idea. As the last chapter noted, a strong strain of anti-urbanism runs through modern culture. The factory production line and the large office are seen as the archetypal form of 'dehumanizing' or unsatisfying work. Much of the literature on deskilling or human relations at work harks back to an idealised past of small workshop craft production or the rural agricultural community. The separation of paid work from the home is seen as one of a number of major factors which mean that industrialization is 'bad for the family'. IT is presented by some as an opportunity to resolve such problems.

It is a common theme of discussions of information technology that a large increase in the number of people working in or near their homes will be a potential or inevitable consequence of its arrival. The bulk of this new work is thought to centre around I T and much of it will take the form of 'telecommuting' so that people miles apart will be able to communicate as if they are in the same work place. This was not a novel idea but its association with IT gave it a new power.[95] While there is no universal agreement that this process is a good thing, much of the literature maintains that it will have certain *benefits*. The blurring of the dividing line between work and home is thought to produce a more satisfying 'whole' life and is perceived as being 'good for the family'. [96] It will eliminate the hassle and pollution of commuting. People will have far more choice as to where they live, hence there could be a move out of built-up areas to small stable communities in the country. A strong strand of utopianism runs through accounts of the impact on home life. Shirley Williams:

" Human beings can be made whole again, working and living in the same communities. Microelectronics offer the opportunity of reuniting the family, and making commuting an obsolete and unnecessary activity." [97]

Alvin Toffler sees the 'electronic cottage' as an important aspect of Third Wave society.

"The rise of the prosumer, the spread of the electronic cottage, the invention of new organisation structures in business, the automation and de-massification of production, all point to the home's re-emergence as the central unit in the society of tomorrow - a unit with enhanced rather than diminished economic, medical, educational and social functions." [98]

New production and communication technologies mean that most work will take place within the home - putting the splintered parts of people's lives back together again. This home-based society could produce greater community stability.

"The electronic cottage could help restore a sense of community belonging, and touch off a renaissance among voluntary organisations like churches, women's groups, lodges, clubs, athletic and youth organisations. The electronic cottage could mean more of what sociologists, with their love of German jargon, call *gemeinschaft*."

[99]

It will also ease problems of pollution and energy use. Like Macrae, Toffler predicts new economic structures based around a society of electronic yeoman. According to him:

"The leap to a new production system in manufacturing and the white-collar sector, and the possible breakthrough to the electronic cottage, promise to change all the existing terms of debate, making obsolete most of the issues over which men and women today argue, struggle and sometimes die." [100]

The term "electronic cottage" sums up many of the explicit and implicit themes of much that has been written about telecommuting and a "wired" information society. The household takes on a new significance not only as a centre of work but also of learning and of "communication". The electronic cottage is situated both in a small semi-rural community and in the global village.

The theme of the 'electronic cottage' was taken up by many prophets of the IT revolution. Aldrich, for example, ^{argues that} the transformation of television into an interactive medium by videotext technology will make the home a locus of information and work.[101] Christopher Evans maintains that the Computer Revolution will mean that the home "will become the main centre of work and a fountain-head of leisure

25

activity". Three factors will contribute to this; firstly, interactive computer games that "will offer intellectual stimulation of a kind not found in the external world"; secondly, the growth of home tuition; thirdly, "periods of social turbulence, discouraging aimless travel and making the home an even more attractive environment." [102] James Martin's 'Wired Society' is also a home-based one. Industry will be run by machines. Leisure will be a major growth industry. We will receive "superlative education" via computers and television. We will work, shop and bank from home. Our medical needs will be taken care of by computerised diagnostics and videophone consultations. We can take part in political decision making from our home. More people and organisations will move out of urban areas a "new village culture" will emerge. [103]

A common theme of IT utopianism is that computers will allow a 'return' to an idealised preindustrial rural family life. As two IT prophets put it:

" Surprisingly as it may seem, the home of the future may be more like the home of the past." [104]

In Norman Macrae's society of 2024 technology has had a major effect on life within the home. The Computer Revolution of the late 1980's was lead by teenage programmers. While the past forty years has seen a flourishing of a plurality of community and families begin to pick lifestyles by watching videos of those on offer, the nuclear family remains. In fact after a period of antithesis "modern developments have brought the family back together again". [105] These developments are all computer-related. Both spouses often work at home. They undertake computerized life-style counselling before and during marriage. Children's computer monitored education will be run by their parents and they start work at an early age thus avoiding problems of adolescence.

For the utopians the arrival of IT in the home will prompt a transformation of our relationships and of our sense of self. Alvin Toffler believes that computers will turn the home into an "intelligent environment":

"As we grow more familiar with the intelligent environment, and learn to converse from the time we leave the cradle, we will begin to use computers with a grace and naturalness that is hard for us to imagine today. And they will help all of us - not just a few "super-technocrats" - to think more deeply about ourselves and the world." [106]

In summary, a strong strand of utopian writing described a future in which IT is implicated in the transformation of home life and the relationship between households and the outside world. This vision helped shape discussion of information technology and the home. It influenced a number of more limited debates about such things as education in the home via IT. [107] A wide range of policy initiatives, debates and international studies were prompted by a belief in the future significance of 'telework.' [108] The idea that IT could bring a return to a 'family life' shattered by modernity has also had an influence on policy-makers. At the launch of the 1983 white paper on Cable both Prime Minister Margaret Thatcher and Minister for Information Technology Kenneth Baker said that it 'would be good for the family'. Ursula Huws quotes an invitation to a Housing Associations Charitable Trust organised seminar on designing homes for homeworkers, which broaches the hypothesis "of the social benefits of family unity and the re-emergence of the 'headship factor'..." [109]

Like other aspects of the IT future, the idea of the 'electronic cottage' has been a resilient one. After ten years of researching and evaluating the idea of 'teleworking' this is what Huws finds most striking:

" ... the 'electronic homemaker' has become a highly charged symbol, embodying for many their hopes and fears about the future of work." [110]

It is testimony to the power of the idea of the 'electronic cottage' that critics of the concept are more likely to talk of the problems of isolation, of the breakdown of work place solidarity, of the detrimental effect on women's position and so on than to question the basic assumptions that in the near future a large percentage of the work force will be or could be telecommuters. Huws, for example, in her earlier discussions of teleworking speculated about "terminal isolation" and "the atomisation of work and leisure in the wired society". Although her position has now changed, in the mid 1980s she linked predictions about the huge potential for electronic homeworking to fears about an atomisation of the working class, the return of women to the home and a strengthening of centralised ideological control.

"Whatever the exact timescale of the developments, and the global breakdown of the division of office labour which results, it seems clear that the trend is overwhelming in the direction of casualisation and the reconstitution of the home as a workzone." [111]

Huws' research is grounded by a determination to empirically assess the significance of IT in the home. Others have launched a dystopian critique of the 'electronic cottage' without feeling the need to do this. A range of writers, for example, predict that IT will undermine relationships within families and between families and the outside world. Geoff Simons perceives the computer as a threat to all human relationships; firstly by enforcing on us impoverished systems of communication and conceptions of humanness; secondly, by becoming an "alternative love-object". Simons outlines a possible future of robot lovers and "machines replacing people in human affections." [112]

The home micro and the computerized future

The home computers which became popular in Britain were very different from those envisaged in visions of an IT home of the future. Such was the significance attached to the introduction of IT into the home, however, that developments which in the light of our recent experience of computing do not appear earth-shattering, were ascribed, for good or ill, great importance.

Belief in the potential of IT to 'transform the household' was based around scenarios of computerized shopping lists and menus.[113] In 1979 Christopher Evans, for example, wrote about:

" ... the use of smaller computers to file all kinds of information from cooking recipes and telephone numbers to shopping lists and family correspondence, and to cope with important but boring details of household accounts."

Widespread use of computer games was also predicted and thought to be very significant.

"Large industries will grow along with them, but the real significance lies with the fact that their intellect - grabbing capabilities - they are very real - will one day be harnessed in the service of the colossally powerful teaching computers which will appear on the scene in the mid-to-late 1980's." [114]

Others, such as Weizenbaum, just as vehemently condemned computer games as a threat to the healthy development of children.[115]

Conclusion

The analysis of the IT Revolution debate in this chapter can be seen as an extended example of the kind of 'millennial' discourse about technological and social change considered in the previous chapter. According to the prophets of the IT Revolution, computers necessitated the abandonment of the old and promised or threatened the transformation of existing social conditions. In both its utopian and dystopian forms, this belief helped shape a powerful agenda for understanding computing. This had two key components: firstly discussion of computers was always discussion of the future; secondly computers were *something of great social significance*.

The predictive writing on IT set the tone for a very public debate about the future social impact of computers. This debate involved the media, political and business interests. As David Lyon writes:

" The roots of the information society idea are intertwined in a fairly complex manner. It is hard to disentangle the diverse strands of attempted social prediction, government policy, futurist speculation and empirical social analysis." [116]

Excitement and concern about the Information Technology Revolution inspired policy and research initiatives world-wide many of which considered far more than the role of IT in economic restructuring. In many countries IT was put on the "national agenda" and deemed worthy of special attention and resources. [117] More than this, it inspired self-conscious attempts to make a computerized future a reality. Wired City projects, national IT plans and the huge resources committed to Fifth Generation and other research projects were all influenced by the consensus about the future importance of IT and visions of a future society shaped by these technologies. [118]

Predictions of the Information Technology Revolution provided powerful raw material for the promoters of computers be they technologists, marketers, managers or policy-makers. Rob Kling and Suzanne Iacono highlight the way such ideas inspired 'Computer Based Social Movements' engaged in the promotion of IT in a variety of spheres of social life. These were characterized by a belief in the inherent merit and limitless applications of computerization.[119]

1978 was, in words of the then Prime Minister, "the year Britain woke up to microelectronics." [120] The need to develop a national strategy on I T became a recurring theme. In the late seventies many commentators thought that the government had failed to appreciate the significance of microelectronics both as the vital factor in future economic good health and in terms of developing policies to cope with the inevitable unemployment. [121] 'The Chips Are Down', a television programme deemed so important that a special screening was conducted for cabinet ministers and senior civil servants, concluded:

"The questions shout. The government seems totally unaware of the effects that this technology is going to create. The silence is terrifying." [122]

The silence was about to end. A range of policy and research initiatives were launched and motions on IT were discussed at the national conferences of all three main political parties and the Trade Union Congress. [123]

As illustrated earlier, the predictions of the Information Technology Revolution influenced policy-makers of both left and right. While the tone was not necessarily utopian, it was prophetic and evangelical. The belief that computers were going to shape the future was a powerful one.

" From the assumption that IT will surge through society in the manner of a tidal wave comes the lesson that we must make haste to prepare for its unavoidable consequences by changing industrial practices, introducing computers into the school curriculum and rapidly becoming 'IT literate' so we may sail into the 'information age'." [124]

The emphasis was on the adoption of and adaption to inevitable technological changes. Policy and research initiatives wrestled with an agenda written by the IT prophets. Predictions of the transformation of the world of work, for example, prompted numerous attempts to evaluate the future impact of IT on employment. [125] Efforts were made to assess the future impact of IT on a whole range of other areas such as democracy, education, ethics, privacy and civil liberties. [126]

In Britain one particular element of the Information Technology Revolution had a particular resonance. IT was to come to be seen as a source of economic deliverance or damnation. The arrival of information technology was often presented as a crucial watershed in economic development - a one-off test of a nations economic, intellectual and perhaps even moral strength. Passing the test would ensure steadily increasing prosperity. Failure could only mean inevitable decline. As a later chapter will argue, this idea and the policy initiatives it inspired were to influence the character of the British home computer boom. [127]

Although the hey-day of the Information Technology Revolution was in the late 1970 and early 1980s it has a significant bearing on the subject-matter of this thesis. There are a number of dimensions to this. An important one is that it influenced the discussion of computers even when the emphasis shifted from assessment of predictions to evaluating and responding to actual developments. It was, for example, to have a profound influence on social research in this area - a theme I will return to in chapter four.

Although many of the products of the home computer boom were very different from the machines envisaged by prophets of the IT revolution, the chapters that follow will show that belief in the future significance of computers has influenced the production, consumption and study of the home micro. Indeed, it was an important facet of the cultural processes of innovation and adoption of home computers. In common with earlier new technologies, 'millennial' hopes and fears engendered by the computer were part of the appeal of the home computer.[128] Also in common with earlier technological goods, such ideas were actively used to promote home computers by technologists, commercial interests and policy-makers. Thus, in their different ways, the researchers, producers and buyers of home computers were all responding to prophecy.

Chapter Three

An Agenda for the Sociology of Consumption

In prophecies of the Information Technology Revolution the shape of home computers, their uses and the demand for them is taken for granted. The processes of technological development and adoption are largely ignored. This is an omission which this thesis seeks to rectify. In order to do this another dimension must be added to the research. The last two chapters established the cultural dimensions of technological change as a theme. My investigation into home computing can also be seen as a case study in the sociology of consumption. Bringing together the literatures on technology and culture on the one hand and consumption on the other provides important insights.

This chapter examines material on consumption in order to establish a theoretical approach and set up a series of issues to be addressed during the rest of the thesis. It is in four sections, beginning with an historical sketch of the development of the modern institutions and practices of consumption. This argues that consumption is an important but neglected aspect of life in modern societies. The second section considers attempts by social theorists to make sense of the modern experience of consumption. This literature review raises a number of important issues which are best approached via empirically informed work rather than further abstract theorizing. The third section sets up an agenda of issues which will be addressed through just such empirical work. Finally, links are made between the discussion of consumption and issues raised in earlier chapters. The special status of technological goods is discussed and the peculiarities of the 'object domain' of home computing established.

Consumption - The Neglected Side of Modernity

Consumption is an area of relative neglect in sociology which, until recently, has been more interested in the process of production of goods than why the goods were produced and what they are used for. The classical sociological vision of modernity was a 'productivist' one. This can be seen from the key descriptive terms the discipline has used to describe modernity - industrialization, capitalism and rationality. According to this dominant view it is the relations and experience of work which shape social life.[1] Although consumption has received more attention as a social phenomenon since the 1950s, theorists of 'consumer society' have had to struggle with the concepts and assumptions of productivist social thought. They have usually dealt with this by ascribing a growing significance to consumption in contemporary society. This may be a valid claim but what are often viewed as recent developments (such as the rise of 'consumerism') were actually part-and-parcel of modernity from its beginnings. The Great Transformation involved a consumer revolution as well as an industrial revolution.[2] No comprehensive consumption-based account of the rise and nature of modernity yet exists to counter production-based accounts. It is possible, however, to give a re-reading of the sociological 'grand narrative' of modernization which assigns consumption its rightful place in the story.

The development of institutions and practices of consumption

The origins of modern consumer culture may be traced as far back as the growth in trade and cultural diversity which began in the fifteenth century. Certainly by the nineteenth century many of the foundations of modern consumption practices had been established.[3] The development of mass consumption was integral to the rise of industrial capitalism, emerging hand-in-hand with mass production and wage labour. The expansion of the market economy meant that many aspects of life were drawn into the cash nexus. Previously consumption was confined to a relatively small sections

of the population. Now the mass of people were surrounded by an ever-increasing number of commodities to purchase.

During the period 1880-1920 the key features of modern consumption became apparent.[4] It is no coincidence that this was also the time when industrial capitalism can be said to have reached maturity. From its origins, industry had produced consumer goods (for example textiles and china) but by the end of the nineteenth century this kind of mass manufacture and distribution had taken on a new significance.[5] The quantity and range of goods available grew rapidly.

Manufacturers quite consciously began to increase the number and subtlety of distinctions between products.[6] New forms of marketing and design had been evolved even before modern industrial production but they came into their own around the turn of the century, hand-in-hand with the development of large-scale capitalism and new systems of communication.

The emergence of a consumer culture involved the creation of new places, and institutions devoted to the display and sale of goods. This in turn helped alter the experience of consumption.[7] The marketing and distribution of mass consumer goods became increasingly sophisticated, often taking place nationally or even internationally. The development of the institutional structures of mass marketing encompassed such things as the growth of advertising and the establishment of trademarks and brand names. Consumption became more controlled and rationalized. Advertising, design and marketing were professionalized. Laws about the licensing of products and outlets were established. Corporations sought to control the way that their products were marketed and sold.[8] Mass retailing at fixed prices also dates from this era. The shop came to replace the marketplace. The arrival of the department store in many late nineteenth century cities set new standards in cheapness, efficiency, scale and the array of goods available. Just as significantly great efforts were put into new methods of displaying goods.[9] In the USA mail-order merchandising helped to create large scale markets for consumer goods

in rural areas. In addition, a whole range of other institutions, events and practices such as billboards, electric lights, mass fashion magazines and public expositions, served and promoted consumption:

" Americans beheld the promise and prestige of new goods in advertisements, catalogues, magazine illustrations and stories, novels, theaters, train stations, restaurants, hotels, expositions and fairs. More than a new way for providing for one's sustenance, consumer behaviour spawned new professions, institutions, desires and outlooks." [10]

The development of a new consumer culture was part of the growth of what is sometimes referred to as 'mass society'. It is closely tied to two other central features of modernity - urbanization and the development of mass communications. The city was the first site for the social and commercial display of mass consumer goods, notably fashion. The development and design of urban spaces became closely tied to the needs of consumption-based social life. A plethora of goods and images which were part of a new visual landscape. Shop displays, billboards and advertisements surrounded the city-dweller. New forms of education, transport and communication were as crucial to the development of consumption as they were to new systems of production and power. Newspapers, magazines, books, theatre and cinema were both the objects of consumption and its promoters. Newspapers, for example, spread the word of consumerism through both advertising and editorial. The media came to act increasingly as 'social authorities' about consumption. Influential consumer texts provided information and advice on consumption. [11]

A new way of life

Care must be taken not to simply extrapolate from changes in productive and institutional spheres when considering the consequences of such developments for the conduct of everyday life. What is clear, however, is that modern consumption

required not only structural changes but also major shifts in values and attitudes. Its growing significance to the conduct of social life was often discussed at the time - bemoaned as well as lauded. Much energy was expended in the evaluation, accumulation and display of an ever-increasing and changing range of goods and experiences. The activity of consumption itself becomes an integral part of everyday life. Writing about the department store, David Chaney suggests that it highlights the development of an important feature of consumer culture:

" What is distinctive about consumerism is that the form of life accumulated through commodities is displayed as much through the means whereby the commodities become accessible and are acquired, as through what are held to be desirable features of particular commodities." [12]

Considering the period around the turn of the century, Stuart and Elizabeth Ewen talk of "a historical redefinition of the nature of daily life." They support their argument with impressionistic accounts of the experience of European immigrants to cities of the USA in the early part of this century. For the new arrivals becoming American involved not only learning the disciplines of industrial wage labour but also how to be a consumer:

" The promise of the 'melting pot' was inextricably tied to the consumption of American goods. It equated the utilization of consumer products not only with citizenship, but with a demonstrable and necessary transformation of the self. To be 'reborn' meant a profound metamorphosis in the culture of daily life: a change in the habits and understandings demanded by the new, unfolding agencies of consumption." [13]

Ewen and Ewen identify similar processes at work as rural Americans were drawn into the mainstream of modern life. The implication is clear - the processes which were writ large in the case of people moving spatially from culture to culture applied to

all. To act as a consumer meant adopting a new way of life which, although natural to us, had to be learnt. Producers actively set out to create audiences and markets for their products. Many of the early leaders of retailing saw the "education" of consumers as an explicit aim. They wished to foster particular forms of knowledge, competence and attitudes among potential customers. Just at the time when values of craftsmanship in production were on the decline, craft and technique were promoted in the sphere of 'consumership'. This era saw the growth of popularity of sources of advice on consumption such as books on home decoration and etiquette.[14]

Consumption required not only new skills and knowledge but also the development of new aesthetics, new criteria for judging artifacts and experiences. For example, the idea of clothing habits being subject to fashion - an ingrained part of modern life - involved the transformation of perceptions and attitudes. Consumers developed a greater propensity to reject existing practices in favour of new ones. This highlights one of the key defining characteristics of modern consumer culture - the appeal of novelty.[15] We live in an economic, social and cultural system which constantly produces new goods and imagery. Demand does not diminish in the face of this ever-expanding universe of goods.

This brief sketch shows that consumption behaviour must be understood as an historical phenomenon. Despite continuities and parallels between modern and pre-modern practices, the nature and significance of consumption in industrial societies is unique. By the turn of the twentieth century a whole range of new consumption institutions and practices had developed. Consumers operated in a material and symbolic environment of unprecedented dynamism and complexity. The tendencies evident at this time were heightened as the structures^{of} industrial capitalism evolved. 'Fordism' involved more than the perfection of the production line and other technologies of production. Just as important was the development of 'scientific' techniques of mass marketing. A more recent shift towards 'flexible accumulation' reflects Capital's continued drive to shorten the half-life of

products and increase their number and turnover.[16]

The historical account shows what an important facet of modern life consumption is. Given this, why has its sociological investigation of consumption, until recently, been so limited? Once again, consideration of the period each side of 1900 is enlightening. At that time the development of modern consumption was accompanied by considerable debate and comment - much of it critical or pessimistic - about its impact on society. This marks the beginning of a tradition of ambivalence towards consumption which now seems integral to the culture of consumption itself.[17] It is much in evidence when one considers the way that consumption has been approached by social theory. This ambivalence contributed to the trivializing of consumption as an aspect of social life and the subordination of consumption to production in social analysis. It also helps to explain the appeal of theories condemning wholesale the role of consumption in modern culture.

Four Approaches to Consumption

Within the social sciences a number of very different ways to understand the role of consumption in contemporary society can be identified. I wish to discuss four strands of social thought. These all have the merit of attempting to go beyond banality of economic theory to understand the centrality of goods in everyday life. What follows is not a chronology of the development of a sociology of consumption. Perhaps because of the productivist bias in sociology, discussion of consumption has been fragmented. The four approaches outlined below have, until recently, developed largely in isolation from each other.

Critical Theory

Those looking for evidence of the rich vein of ambivalence towards consumption which runs through modern culture should examine the content and influence of Critical

Theory. This is part of a wider tradition, spanning the political spectrum, of criticism of 'mass culture' or 'consumerism'. [18] Contemporary society, according to this view, is dominated and distorted by the activity of consumption. The 'culture of consumption' is a debased one and consumers are the victims of manipulation and exploitation.

Critical Theory looks to consumption as part of an attempt to understand the way that culture sustains and reproduces advanced capitalism. The Frankfurt School, typified by Marcuse, Horkheimer and Adorno, applied Marx's theories about commodities, reification and fetishism to cultural phenomena. For them, leisure has become indistinguishable from work - disciplined, instrumental and experienced in terms of necessity. Individuals' needs have become bound up with the needs of a mass consumption economy. By creating false needs and debasing real ones - consumption acts as a form of social control. [19]

Critical Theory understands the development of the institutions and practices of consumption as the extension of commodification outside of the work place and into other spheres of life. Advertising, marketing, media and other forms of mass culture (the so called 'consciousness industries') are ascribed great power to shape and, indeed, create people's desires, channelling them in the interest of an all-powerful monopoly capitalism.

" By the dawn of the twentieth century, capitalism had come to mean an integrated, increasingly monopolistic interpenetration of market, scientific know-how, industrial and finance capital and communication networks. Channels of popular sensibility and desire were themselves subject to the encroachments of a marketable vernacular. "[20]

Rather than talking of popular or even mass culture, the members of the Frankfurt School preferred to talk of the 'culture industry' in order to challenge the view of

"a culture that arises spontaneously from the masses themselves." [21] The culture industry is inherently ideological since its primary aim is its own reproduction. It sometimes engages in direct manipulation of its subjects but has a more significant influence by the continual reinforcement of the ground rules of satisfaction via consumption, expression through consumer choice and escapism. This constitutes an attack on true individual identity, involving the manipulation and transformation of the personality. Modern society is "a society organized around the purchase" in which shopping becomes the only legitimate sphere of expression of both personality and demands for a better life. [22]

The weaknesses of the Frankfurt School approach to popular culture have been pointed out (and caricatured) many times. It is easy to condemn Marcuse or Adorno for their profound pessimism, elitism and contempt for the interests and concerns of ordinary people. This is a problem recognised even by sympathisers with the project of Critical Theory. Douglas Kellner, for example, criticises the Frankfurt School's approach because they "picture the development of capitalist society as a completely successful attempt on the part of corporate capitalism to dominate its helpless and passive victims and to constitute contemporary society in its own image and interests." Kellner argues that this is part of a tendency which "extends its rational and justified critique of aspects of the consumer society and fetishised consumerism to consumption per se in a global, totalizing critique." [23]

Kellner's work is an example of recent attempts that have been made to amend the Critical approach while keeping its thrust. Rather than a direct result of 'false consciousness', consumption is characterized as a realm of expression but this is seen as a symptom, or in some cases an instrument, of domination. [24] A number of serious problems remain, however, with Critical Theory and associated strands of cultural criticism. It is over-deterministic and makes dubious claims about the intentions, effectiveness and, most importantly, the coherence of the strategies of the 'consciousness industries'. As a friendly critic points out:

" ... while consumer industries may well seek to create passive, disciplined consumers, the question of the use individuals actually make of commodities is too readily assumed to be identical to that designated by advertisers." [25]

Critical theory seeks to understand consumption almost exclusively by examining the sphere of production. A whole range of theoretical and empirical work has, however, shown consumers not as passive receptacles but as active and creative.

The most fundamental objection that can be raised to Critical Theory is that it often appears blind to the uses goods are put to - the important role they play in the conduct of everyday life. Daniel Miller makes a telling point when he argues that this kind of cultural critique rests on the questionable assumption that goods somehow get in the way of social relations:

" Most critics of mass culture tend to assume that that the relation of persons to things is in some way vicarious, fetishistic or wrong; that primarily concern should be with direct social relations and 'real' people." [26]

Things are the raw material of culture. Although produced by large capitalist enterprises, they become the stuff of everyday life. Miller argues that approaches in the critical tradition are often guilty of romantic nostalgia for a past of true community and/or of future utopianism in their assumptions about the possibility or desirability of social life not mediated by goods.

Critical Theory's approach is, therefore, fundamentally flawed not least because, along with much other theorizing, it invites blanket condemnations of contemporary culture rather than empirical study of consumption in action. It would be a mistake, however, to ignore some of the issues it highlights. [27] In particular, the role of the so-called 'consciousness industries' must not be neglected and should be a matter of empirical investigation. Large and sophisticated institutions exist in

contemporary society whose express purpose is to influence consumer behaviour. In addition, mass media are the most important of a whole range of 'cultural mediators' between producers and consumers.[28]

Goods as material resources

A powerful antidote to all-encompassing critiques of 'consumer society' is offered by the 'household resources' approach.[29] For J Gershuny, Ray Pahl and Sandra Wallman, goods are material resources which facilitate social life both inside and outside the home. They are keen to show the links between consumption and other areas of economic life. J Gershuny, for example, highlights the economic importance of the household as a site of both production and consumption. He explains the historical specificity of modern consumer behaviour by relating it to structural economic changes. Goods are implicated in changes in life within the home and the relationships between the household and the wider economy. Gershuny argues that the post-war increase in consumption of household goods is part of growing prosperity but also marks a shift towards a 'self-service' economy. Goods are substituted for services and the home increasingly becomes the site of the final stage of production.[30]

In this model, the sphere of production simply generates better goods for consumers to select from. Demand for goods is neither an indulgence or the result of false consciousness. Goods are an important resource in the running of the household. Consumers are very different from the dupes/victims of Critical Theory. They are active and rational, making reasoned decisions about the management of the household - for example, assessing the relative merits of goods versus services. According to Gershuny, households make a " choice between alternative technical means of provision for particular functions" based on such things as prices and the unpaid work time necessary to use the goods.[31] Consumption behaviour is, however, constrained and determined, shifting in response to structural economic changes.

By showing the important role that goods play in everyday life and, particularly, in the running of the household, the resources perspective points the way for empirical study. It recognises that consumers understand the search for new goods as a response to real needs. In this sense, the resources model is closest to the way that people discuss and explain their own behaviour.[32] Nevertheless it has limitations as a way of making sense of consumption. In particular, it offers a simplistic view of the motivations and processes involved in consumption.

Gershuny's analysis is based around a highly economic 'institutional model' of the home. The implication is that a household manages material resources via consumption along similar lines to, for example, a firm. Similarly, Gershuny assumes certain fixed needs and functions which goods, services or unpaid labour must fulfil.[33] 'Social innovation' involves shifts in the ways such needs are met. From this perspective, the value of goods springs from their potential as material resources. New products provide clear-cut practical benefits, for example, 'freeing time' within the household by increasing productivity. This is seen as an inadequate explanation of the pattern of consumer spending even by those in broad sympathy with materialism.[34]

Sandra Wallman's study of 'Eight London Households' adds a social dimension to Gershuny's economic theory.[35] It highlights the differences as well as the similarities between households in the way they manage resources and rightly emphasises the complexity of this process. This leads to a more sophisticated approach towards needs which are defined, to a large extent, by households themselves. Wallman looks at the household in terms of **livelihood**. She extends the idea of resource management beyond what is normally considered economic. Goods are resources necessary to livelihood as are housing, services, money, time, information and identity.

Wallman's work and that of Ray Pahl's 'Divisions of Labour' are full of insights into the ways that households actively use goods to construct livelihood. Their

approach, however, remains limited by what is, at heart, an economistic model of the household. The purchase of a good is a rational choice made by the managers of the household to maximise utility. Starting from the insight that it is hard to separate economic activity from other forms of domestic life they end up reducing cultural practices to economic rationality. By understanding activity outside of paid employment in terms of its contribution to economic life and applying concepts developed in relation to production to consumption, they reflect and reinforce the productivist bias within the social sciences.

Both Pahl and Wallman are aware of the complexity of the 'needs' of households and that " ... what is 'necessary' household work is highly problematic and, to a large degree, culturally determined." [36] The cultural is, however, still treated as a complication to rational economic behaviour. Utilities are largely material springing from the in-built qualities and capabilities of goods. Instead of rethinking the economic in the light of her discussion of the role of factors such as identity, time and knowledge, Wallman considers these 'resources' in an economistic way. For example, the purchase of a sports car is used to show the complexity of the process of resource management at work in a single consumption decision. The car is an asset which is worth money, it saves time in transporting the owner, and it conveys identity. [37] All this may be true but how much can we understand about sports car owners by considering the car as a financial investment or as a time saver?

Goods as cultural resources

The root problem with the household resources approach is that it focuses on utility of goods in a very narrow sense. Goods are understood as tools for the servicing of everyday life - their functions and benefits are material (and self-evident). A more powerful approach conceptualizes consumption as a cultural process. The case for this perspective is put forcibly by Grant McCracken:

" The system of design and production that creates consumer goods is an entirely cultural exercise. The consumer goods on which the consumer lavishes time, attention and income are charged with cultural meaning. Consumers use the meaning to entirely cultural purposes. They use the meaning of consumer goods to express cultural categories and principle, cultivate ideals, create and sustain lifestyles, construct notions of self, and create (and survive) social change." [38]

Once goods are seen as cultural resources then emphasis shifts from their material qualities to their ability to act as symbols which mediate social relationships. A tradition of studying consumption's role in establishing and maintaining social standing can be traced back to Thorsten Veblen. He understood the demand for goods, particularly novel goods, in terms of status competition. Veblen argued that this takes on a new importance thanks to the social upheavals of industrialization. Simmel also developed this theme - understanding fashion as a response to the problems of impression management presented by the new urban way of life. Modern life brings with it pressures towards both conformity and individuality; fashion responds to this by both uniting and dividing us into status hierarchies. Attempts by those lower in the hierarchy to emulate their betters force the upper class to constantly reevaluate their tastes to maintain distance and difference from other social groups. Critics have rightly argued that to see the upper classes as the sole source of cultural innovation, to explain most consumption in terms of 'emulation' and, indeed, to talk solely in terms of status competition, grossly over-simplifies the complex processes and meanings of consumption. [39] Despite these limitations, Simmel and Veblen opened up the cultural life of goods as an area of study.

Veblen was influenced by early anthropological writing. Anthropology has always sought to understand the social role of artefacts in other cultures. Where this perspective differs from Veblen's is that, by showing the importance of material objects in all cultures, it undermines the view of consumption simply as the

blandishments of a particular social class or group. The most systematic attempt to apply the insights of anthropology to contemporary consumption practices is provided by Mary Douglas and Baron Isherwood. They offer a critique of both the perspective which sees goods as simply means to satisfy material needs and also approaches which understand consumption simply in terms of display and envy. Instead, goods are ascribed a fundamental role in social life as communicators of meaning. Consumption is "a rational process whose primary function is to make sense of the inchoate flux of events." Goods are "making visible and stable the categories of culture" and "make and maintain social relationships." The world of goods is a system of information, *performing an essential role in culture by providing 'markers' which pattern behaviour.*[40] It is "the very arena in which culture is fought over and licked into shape." Douglas and Isherwood highlight the role of goods in 'metaphorical understanding':

" ... the essential function of consumption is its capacity to make sense. Forget the idea of consumer irrationality. Forget that commodities are good for eating, clothing and shelter; forget their usefulness and try instead the idea that commodities are good for thinking; treat them as a nonverbal medium for the human creative faculty."[41]

Once we accept this 'relational' view of consumption, then it follows that the value of a good comes not from its inherent material qualities but from its role in social relations and is negotiated between consumers.[42] This process is itself one of the satisfactions of consumption:

" The stream of consumable goods leaves a sediment that builds up the structure of culture like coral islands. The sediment is the learned set of names and names of sets, operations to be performed on names, a means of thinking.

" Enjoyment of physical consumption is only part of the service yielded by goods; the other part is the enjoyment of sharing names." [43]

This view of consumption as a social activity is developed by others working within the anthropological tradition. Appadurai, for example, writes that consumption is "eminently social, relational and active rather than private, atomic or passive."

Marshall Sahlins argues that "goods stand as an objective code for the signification and valuation of persons and occasions, functions and situations." So, for example, clothing acts as a complex system of classification, the material embodiment of differences between ages, genders and classes, between times of the day, week and year and between spaces and occasions. [44]

Proponents of the symbolic approach point to the many ways in which class, gender and subcultural divisions are worked out in the world of goods. Systems of taste in goods, are used to establish and maintain social boundaries and identities. In their analysis, Douglas and Isherwood touch on the relationship between social stratification, power and consumption. They identify a 'drive to exclusivity' in consumption practices pointing out that while income rises in an unbroken curve, it is possible to identify distinct classes of consumers. [45] This differentiation does not correspond directly to occupational classifications of class. Different consumer groups exist and friends 'synchronize' their consumption. This implies differences between groups in the way that they read and communicate with goods. Power comes into the discussion when Douglas and Isherwood suggest that, while everyone attempts to control the flow of meaning and information from goods, it is the wealthy and powerful who are in the position to do this best.

The issue of what Douglas and Isherwood call 'consumption classes' is the central concern of Pierre Bourdieu's 'Distinction'. He highlights the way that goods, and systems of taste in goods, both reflect and establish distinctions between social groups. In particular, consumption and the evaluation of commodities is central to

cultural identity, both reflecting and reproducing social stratification. Unlike Veblen, Bourdieu does not believe that this activity is generated solely by the upper classes. He documents a far more complex process of cultural reproduction in which taste emerges out of 'habitus' (objective conditions of class existence) and lifestyle. Consumption is embedded in personal, household and class histories.[46]

The scope of Bourdieu's work illustrates the subtlety and complexity of the interplay of consumption and social relations. The consumption practices of different social strata cannot be reduced to manifestations of social rivalries - they may, for example, express the ideals or morality of the group.[47] It would be wrong to over-estimate the coherence and consistency of the consumption practices of social groups.[48] Nor should taste in goods be understood simply as representations of underlying social relationships - patterns of consumption may themselves be the source of identity.

'Distinction' is part of a literature which highlights the role of goods as communicators in contemporary society, actively used by consumers to construct identities and embody ideas. Hebdige, for example, points to the role of goods in subcultures, arguing that commodities are part of 'signifying practice' - used in the establishment of group identities and boundaries.[49] The sphere of production is not a neutral party in this process of differentiation. Producers have sought to increase the number of goods and aim them at distinct social groups. This tendency has been heightened recently with the advent of shorter production runs and 'niche-marketing.'[50]

The symbolic approach is a powerful tool for understanding the social role of goods but potential pitfalls exist in its application. Earlier the material resources approach was criticised for a one dimensional and utilitarian view of consumption - seeing it primarily in terms of material benefits. The symbolic approach can be accused of a different kind of reductionism by understanding goods simply as

resources used to establish and maintain social relations. By understanding goods as ciphers of social relationships we are in danger of mounting an 'attack on culture'. Material artefacts are fundamental to all culture and it would be wrong to adopt a view which assumes that "the cultural scheme is the sign of other 'realities'".[51]

A second potential limitation of the symbolic perspective springs from its anthropological origins. Cross-cultural insights should not blind us to what is unique about modern consumption. The developments outlined in the first part of this chapter point to a fundamental change in how goods were experienced and used. This was particularly evident in the area which the symbolic approach focuses on - the use of goods to construct personal and social identities. As we have already seen, Simmel and Veblen both pointed to a new emphasis on goods as expressions of identity and status during the era which saw the birth of modern consumer culture. Other cultural historians argue along similar lines.[52]

Changes in the experience of consumption are closely linked to the development of modern social structure. Industrial capitalism has brought with it a radically different kind of environment in which the symbolic use of objects takes place. The enormous complexity and diversity of material culture is matched by a great variety of consumer interests and strategies. All this occurs in a relatively unstable social context:

" The bricolage of the streets is no longer aided by the structured conventions of a mythology; as amongst the classic peoples' of social anthropology, its foundations are comparatively weak in this respect. Even images of stability, such as nostalgia, are continually restructured and reinvented according to individual domestic situations and expectations."[53]

As the first section of this chapter made clear, in modern society the capitalist

economy has taken over the symbolic production performed by other social institutions at other times and in other cultures. Both the medium and the dynamism of symbolic production are important.[54] The growing complexity of the social environment has been matched by an increasingly complex symbolic environment. This presents problems for us when we try to use goods to communicate, establish identity or make sense. Knowledge is significant and problematic in effective consumption; not simply knowledge about goods themselves but about what goods should represent. There are now a whole range of persons and institutions - epitomized by the media and advertising - who play a 'mediating role' in consumption and help to generate the meaning of goods.[55]

Modern consumers, dealing with an ever-expanding universe of goods, must fight a constant battle to establish and maintain control over this system of meanings. Inequalities in the distribution of what Douglas and Isherwood call the 'technology of consumption' mean that the poor lose the ability to control and participate fully in flows of information.[56] It may well be that the dynamism of the sphere of production - both of goods and images - and the sheer range of products available may threaten the usefulness of goods as cultural resources.

" The bombardment of stimuli, simply on the commodity front, creates problems of sensory overload that makes Simmel's dissection of the problems of modernist urban living at the turn of the century seem to pale into insignificance in comparison." [57]

Some suggest that the problem of maintaining the meaning and value of goods which, as Douglas and Isherwood point out, has always been integral to consumption, may have been exacerbated to such an extent that goods lose their role as communicators. Featherstone remarks:

" It should be apparent that the problems of inflation produced by an over-supply

and rapid circulation of symbolic goods and consumer commodities have the danger of threatening the readability of goods used as signs of social status." [58]

The concept of 'inflation' within the symbolic economy is an illuminating one. Consumers have to cope with 'cultural disorder' which makes it very difficult to read symbols. This has led some theorists of postmodernism to talk of 'a crisis of representation' which makes the sort of rational communication with goods problematic. [59] Communication may be either hampered by the hubbub of complex and contradictory messages or distorted as people lose the ability to distinguish between goods and their messages. The emergence of this perspective can be seen in the development of Jean Baudrillard's thinking on consumption. In his earlier work consumer objects were understood as part of a network of signifiers playing an increasingly crucial role in capitalist social relations. Later, however, as part of an analysis of 'cultural implosion', Baudrillard argues that objects have come to signify nothing outside of themselves. In mass society a symbolic culture is no longer possible. [60]

Although it raises important questions, the work of Baudrillard and others marks an unwelcome return to global cultural critiques. Large assumptions are made about how consumption is experienced and little attention is paid to the ways that consumption interacts with a diversity of social practices. [61] Empirically informed work continues to suggest that, whatever the complications, people are still able to construct meaning and identity using goods.

Consumption and fantasy

Some recent writing on consumption emphasises its role not in social relations but in the imaginative life of individuals. Colin Campbell, criticises the view of consumption as being essentially 'other-directed', arguing that 'relational' approaches are flawed both empirically and methodologically. He damns Veblen,

Simmel and Bourdieu for adopting a perspective in which "the purposes and intentions of individuals are deduced from the observed consequences of their actions rather than being established directly from the actors themselves." [62] Campbell prefers to see consumption as an attempt to achieve individual satisfaction. While he acknowledges that some social groups may use cultural novelty as part of an attack on tradition, he argues that most consumption is 'inner-directed' rather than about social relations.

According to Campbell, the appeal of goods, particularly of novel goods, lies in 'self-illusory hedonism'. New goods or the desire for new goods are the raw material for day dreams which provide us with an escape from everyday life. This process is actively exploited by advertising. In contrast to the imaginative promise of a new good, the reality of consumption is inevitably disillusioning leading to more day dreaming about other goods. Campbell talks of " a cycle of day dreaming, longing, desire for the new, consumption, disillusionment and renewed desire." This is a process which is "entirely inner-directed and does not depend on processes of imitation and emulation." [63]

Campbell's work highlights the role of fantasy in consumption and the way that goods are implicated in the imaginative life of individuals but his approach is not satisfactory as it stands. In his concern to show that goods cannot be understood merely as ciphers for social relationships, Campbell makes the mistake of viewing day dreaming and social life as totally unconnected. Fantasies may themselves be social - people have dreams in common and share them with others. Dreams are used and exploited in social relations and in displays of status and identity. Most importantly, our fantasies are about social life - not how it is but how it might be.

Rather than being a counter to the symbolic perspective the fantastic elements in consumption described by Campbell are best seen as an aspect of the cultural life of

goods. Mike Featherstone's recent work shows that it is possible to address the same issues without rejecting the social character of consumption. He locates modern consumption within a 'carnavalesque' tradition of popular culture. In premodern times this was epitomized by carnivals, fairs and festivals during which established norms and relationships were often transgressed:

" These were **liminal** spaces, in which the everyday world was turned upside down and in which the tabooed and fantastic were possible, in which impossible dreams could be expressed." [64]

While this may sit uneasily with the rationalization of consumption in the modern era, it remains an important facet of consumer behaviour. Accounts of the early history of consumer culture detect its presence:

" From the 1830s on, many consumer goods (such as clothing, cosmetics, jewellery, patent medicines) were surrounded by an aura of sensuous mystery, even magical self-transformation."

This supernatural element was controlled, domesticated and exploited by the institutions of modern consumption. [65]

Thus day-dreaming and fantasy are important aspects of consumption. Goods are implicated in dreams of transformation, of transcending the present conditions of everyday life. They can act as bridges to an idealized past or future. [66] This remains, however, a social process even if it is about actual or imagined transgression or inversion of the social rather than with the establishment of norms and relationships. As Miller remarks:

" Fantastic does not ... mean vicarious, nor does the construction of myth imply mere illusion. The projection of images of possible worlds and cosmologies has

always been central to the development of social relations." [67]

Issues for Empirical Study

Although making the case for a symbolic approach to consumption, the above discussion is left deliberately open. All the perspectives considered are more effective at raising questions than closing debate. The development of a sociology of consumption is at an early stage and much existing theorizing is guilty of over-abstraction. In recent years there has been a turn towards case studies of consumption. Rather than aiming for generalizations the time has come to study particular examples of consumption. Following on from the discussion of theory, such studies should be based on three principles:

- 1) Viewing consumption as embedded in culture as it is lived and acknowledging the active role people play in constructing the uses and meanings of goods.
- 2) Consumption practices must be understood as being informed or constrained by wider forces. It is clear that a satisfactory approach must relate cultural practices to economic and social structures.
- 3) Specificity is also important. The possibility needs to be considered that there are different kinds of consumption, different kinds of good and different kinds of consumers. The very centrality of consumption to contemporary social life makes any blanket statement about the social role of goods simplistic. We should be aware of the variety of different ways that consumption can be implicated in social life

The theoretical discussion so far suggests an agenda for empirical research. Four sets of questions will be addressed during the rest of this thesis. These are the relationship between the spheres of production and consumption; the processes entailed in consumption; the role of goods in establishing identity and

participating in society; and, finally, the need for and use values of goods.

The relationship between the spheres of production and consumption

It has already been noted that the various approaches discussed in the last section placed different emphasis on the spheres of production and consumption in their analyses. While Critical Theory sees consumption as largely shaped in the sphere of production, those who understand goods as cultural or material resources emphasise the ways consumers actively select and construct their goods and practices. In theoretical debates we are often asked to choose between two unsatisfactory absolutes: on the one hand a view of individuality subverted by the consumer culture of advanced capitalism while on the other, romantic assertions about the sphere of consumption as an arena of expression. It is more useful to reformulate this debate as an empirical question - to what extent are the uses, meanings and values of goods set before they ever reach the consumer?

Any simplistic notion of producers shaping demand must be rejected. What is needed is an approach able to consider the limits of producers and products to determine the experience of consumers but which, at the same time, recognises that such factors must impact on the use of goods in everyday life. Consumption is an active and creative process. There are, however, dangers of romanticising the freedoms that consumers have.[68] If we belittle the role of producers in shaping the experience of consumption we actually echo one of the most potent forms of contemporary marketing rhetoric. The notion of consumption as an arena of self-expression and of consumers constructing 'lifestyles' rather than following fashion is a powerful one and its influence and significance should itself be studied.[69] Whatever creativity is at work in the processes of consumption, the relationship between producers (of both goods and images) and consumer is still an unequal one. Production provides 'conditions of meaning' which frame consumption practices.

Daniel Miller tackles consumer-producer relations by emphasising the way that the material qualities of goods may shape the way that they are experienced. Because objects "can never possess that entirely arbitrary and abstract capability" they can be even more powerful than language at "naturalizing cultural differences." Objects can be particularly effective cultural resources precisely because they appear innocent and natural. Miller is not arguing that the material qualities of goods act as a final constraint on the ways that they are understood and used.[70] There are other important sources of meaning.

Hebdige's work can be read as an example of the space which people make for themselves using goods. It is an account of the way that 'spectacular subcultures' appropriate the goods and symbols of the dominant culture and give them different oppositional meanings. But there are contradictions and limits on this process of subversion. The relationship between the subcultures and commercial interests is an ambiguous one. Subcultural practices also become incorporated - they are soon grist for the mill of mass marketing.[71]

The complex interplay of consumer and product identity described by Hebdige suggests that we should not understand the relationship between the spheres of production and consumption in terms of a one-way flow. Chapter one described how innovation was a cultural process in which consumers and users play an active role. This idea can be applied across the range of goods not just technologies.[72] Understanding the complex processes whereby the meanings of goods change over time involves both the spheres of consumption and production. This encompasses the shifting 'biography' of single objects and also cultural shifts in their role and identity.[73] The processes whereby goods are constructed and reconstructed take place in both public and private domains. We must consider in detail the interrelationship between the two domains. This is only just starting to be done. Miller takes examples of case studies of such diverse object domains as children's sweets and motor scooters to

argue that production and consumption must be viewed as "constantly interactive." [74]

Consumers are, therefore, part of a 'circuit of cultural production'. This is not to say that consumers preferences simply 'feedback' to producers and shape the course of product development. While some cases exist of consumers directly articulating the direction in which they wish products to develop (for example, consumer lobbies) this is the exception rather than the rule. The reality is far messier. It is better to talk of the ways producers attempt to conceptualize demand and make sense of consumption behaviour. Producers' methods of understanding markets are imprecise and imperfect especially for a new product. They look for clues about demand from a variety of sources such as market research. Most significantly, they construct their own conceptions of actual or potential consumers of their products. [75]

When understanding the relationship between producers and consumers of goods a more sophisticated model than one that counterposes products on the one hand and isolated consumers on the other is required. The sphere of production must be understood in the broadest possible sense. It involves more than processes of design, manufacture, distribution and marketing of particular goods. Advertising obviously plays an important role in the transmission of beliefs, values and meanings. These processes are inseparable from media and other discourses about consumption. The media has an important defining role - introducing products and practices. [76]

Similarly, the relationship between producer and consumer is mediated by the social in the form of wider cultural trends and social networks. Consumers' readings of goods are influenced by social relations of age, gender and class. It follows that we should not assume that all consumers stand in the same relationship with producers or all share the same level of influence over the sphere of production.

Finally, we should acknowledge that different kinds of objects may lend themselves more or less to appropriation by consumers. It may, therefore, be too simplistic to postulate a single relationship between the spheres of production and consumption.[77] Chapter one already touched on one special case - the nascent product. Consumers role in the development of novel goods will be considered in detail later in the thesis.

The processes of consumption

The discussion above showed consumption to be an active process. One of the differences between the theoretical approaches discussed in the last section is how they define this activity. The day-dreaming perspective understands consumption as a cycle of fantasizing about, wanting and acquiring goods. Similarly, Critical Theory concentrates on the mechanisms of demand and purchase of goods.[78] In very different ways, both the household and symbolic approaches focus on the use of goods as material and symbolic resources after acquisition. The different elements identified in each perspective can be seen as moments in a process of consumption.

An important part of the process of consumption is the decision-making involved in the acquisition of a new good. It is part of an on-going process involving choice, use and evaluation of goods. Particular goods must be understood as part of a series of interrelated acquisitions. The selection and purchase of goods can involve considerable work, builds on existing collections of goods and experiences and requires particular knowledge and competencies. Neither the vision of 'economic man' making rational choices on the basis of product and market information or the 'cultural dupe' view of Critical Theory do justice to the problems people face in making consumption decisions or the sophistication with which they confront those problems.

The process of evaluating and selecting goods is not simply an inconvenient

practicality to be undergone on the way to ownership and use. Shopping and more generally the discussion and evaluation of goods is an important social activity in its own right. The activities of consumption are not always consummated by purchase. They involve window shopping and trying things out. People visit sites of consumption in order not only to make purchases but also to experience the possibilities and fantasies of consumption.

Once a good enters our lives - through purchase or some other means - more work is required to turn it into a personal or domestic object. We must utilize or gain skill and knowledge in order to use the good. By this I do not simply mean 'use' in the narrow sense of the practicalities of operating or maintaining the good. Competence and time are required in order to integrate the new acquisition into existing constellations of goods and to deploy them as cultural resources.

At a common sense level, when we think about goods and social display we might follow Veblen in considering the conspicuous display of material wealth. This is not a satisfactory ideal-type to understand how goods are used as cultural resources. The disdain of accumulation and display that runs through Veblen's own analysis of the 'leisure class' of turn of the century America is more typical than the naked competition by purchase that he describes. Even the nouveau riche of the USA soon responded to what one historian describes as a "national tradition" of "ambivalence about luxury" by developing subtler forms of status competition via consumption. Ideas of 'good taste' began to mediate and control accumulation.[79] Typically, the successful use of ideas of 'taste' to distinguish groups and construct identity involves not the naked display of spending power but rather subtler shows of skill and knowledge. The effective social use of goods often requires inconspicuous consumption. Even shows of wealth are often described with the language of authenticity and utility. Thus, the successful use of goods in social display requires considerable work which is best viewed as a process rather than a simple act of acquisition.

Consumers deal with the dilemma of using mass produced and marketed products to construct and project identity. In wrestling with this, they must rework the good into their own personal project. Daniel Miller uses the idea of 'reappropriation' to understand this process. This involves "creative strategies of consumption to appropriate that which they have not created." [80] After being acquired from the commercial world the status of a good gradually alters:

" This is the start of a long and complex process by which the consumer works upon the object purchased and recontextualizes it, until it is no longer recognizable as having any relation to the world of the abstract and becomes its very negation, something which could be neither bought or given." [81]

Tentative attempts have begun to understand and describe this process. McCracken, for example, describes various 'instruments of meaning transfer' which include rituals of exchange, possession, grooming and disinvestment. [82]

Silverstone, Hirsch and Morley develop the idea of personal absorption of goods in relation to their empirical work on household consumption. They rightly see consumption is as a dynamic process by which commodities are transformed or 'domesticated' into personal/household objects and are used to construct meanings and boundaries. They describe the way goods cross between the public and the private by identifying four stages in an on-going process by which households 'appropriate' objects and their meanings:

- 1) **Appropriation** - the route whereby a commodity becomes owned or possessed
- 2) Through arrangement and display goods are added into the system of household objects - this is referred to as **objectification**.

3) The **incorporation** of goods into the routines of everyday life and into the politics of the household. When this is accomplished they become invisible as commodities.

4) Successful incorporation of a good into 'the moral economy of the household' leads the way to **conversion** which involves the use of the domesticated good in the maintenance of the relationship of the household to the outside world.[83]

This four stage model illustrates and operationalizes the notion of consumption as process. It is, however, a model developed specifically for the analysis of data from an ethnography of households. To get leverage on the importance of the household as a unit of consumption it has to make assumptions which could themselves be the subject of empirical investigation. The notion of a moral economy of the household is not the only way in which public/private divisions and the work of turning goods into cultural resources can be understood. We might ask to what extent goods are appropriated, objectified, incorporated and converted by households and to what extent this takes place on an personal basis or in other social grouping. Clearly there are other spheres of consumption which need to be considered apart from the household.[84]

Silverstone and his colleagues acknowledge the complexity of the processes they attempt to model. They point out that it would be wrong to see each stage as entirely distinct or to see the domestication of goods in terms of a simplistic and inevitable absorption of goods. It is legitimate to go further than this and ask whether the problems and failings of absorption are as interesting and significant as its successes. As Silverstone et al themselves point out, many goods are obtained which arguably are never fully incorporated into the routines of people's everyday lives.[85] Such goods may not only fail to act as cultural resources but become a liability in social dealings. As McCracken writes:

" There are certain goods that the consumer never successfully lays claim to because the consumer never successfully lays claim to their symbolic properties. The good becomes a paradox: the consumer owns it without possessing it." [86]

A serious complication relates to the difficulties placed in the way of successful absorption and use of goods due to the complexity and dynamism of the symbolic environment. In the face of an ever-expanding and changing world of goods, consumers must constantly reevaluate - in a sense reabsorb - their personal objects. The meaning of goods is, in McCracken's phrase, "constantly in transit." This applies to both the biography of individual objects and their social history as a set of products. [87] Silverstone et al themselves hint at this by conceptualizing the household as engaged in a on-going battle for 'ontological security' in the face of a mass of images and products which surround them. [88]

Goods, identity and participation in social life

Talk of the shifting meaning of goods leads us to consider the ways that goods are used as cultural resources. What emerged from the evaluation of theoretical approaches was that, given the centrality of goods in social life, it would be a mistake to reduce their role to a single organizing principle such as the pursuit of status. A recognition that goods are embedded in a "plethora of projects" is required. [89] We should be aware of the dangers of 'thinning the meaning' of a good by concentrating on one particular aspect of its cultural life. Detailed studies of consumption and life within households, for example, highlight the complexity and variety of different ways that households get by with goods. [90] The richness of data produced by such studies should caution us against assuming that the meaning and role of goods remain the same in different settings. It should also be recognised that a single good can be part of a whole range of practices or relationships at once. [91]

We must start to draw distinctions between consumption practices. They vary in their coherence and intention. Not all consumption is displayed with the same care or pride - some, for example, is kept secret. Consumption practices vary in the self-consciousness of the processes of identity construction involved.[92] It would also be dangerous to exaggerate the coherence and consistency of the consumption of particular social groups. There will be considerable inconsistencies and even contradictions in their patterns of taste and consumption. This itself reflects the diversity of projects that goods are involved in and the difficulties of using them effectively. There are also dangers with a unitary view of consumers. We must be sensitive to the differences in perspective and behaviour of different types of consumers. An important illustration of this would be in relation to consumers' attitudes towards novel goods. Some, for example, have a particularly innovative approach towards consumption, serving as 'cultural mediators' actively championing the novel.[93]

Two concepts are useful as ways of making sense of the complex and diverse ways in which consumption is implicated in social life. The first of these is **identity**. It encapsulates a variety of practices which have already been discussed. Identity involves both individuals' sense of self and also the process of inclusion and exclusion of people from social groupings. We both distinguish ourselves from and identify with others via consumption. Of course, these processes are interrelated and a successful approach needs to take into account the interplay of individual, household and subcultural identities. Group or individual identities are often fragile and contradictory. Rather than seeing their attainment as a one-off goal, like consumption this is best understood as a process. It takes place in a constantly shifting symbolic environment. In addition, there are in-built tensions in the use of goods to establish identity. We must deal with two contradictions: firstly the dilemma of at once seeking to express individuality and membership of groups; secondly of promoting our own tastes while at the same time seeking exclusivity.

A second important and related concept for making sense of consumption is **participation**. A variety of practices referred to in the culture as resources approach - communication, social demarcation, making sense of the world - actually refer to the way goods enable us to participate in social life at the levels of household, family, social networks and subculture. Consumption plays an important mediating role between private and public worlds. Goods are ways of making sense of and participating in a wider public culture. Their consumption constitutes a bid for membership not only of particular groupings but of society itself.[94]

The link between consumption and participation in public life has been developed in studies of poverty. There has been a growing dissatisfaction with definitions of poverty based on notions of fixed, often physiological, needs for nutrition, shelter and so on. A shift away from 'absolute' definitions of poverty was prompted by a recognition that it can only be measured by reference to the way of life of a particular society at a particular point in time. People are poor if they cannot participate in the accepted way of life of the society in which they live and are excluded from normal living patterns, customs and activities. Lack of income means that people's ability to be sociable in the most profound sense is restricted. Interestingly, this has recently been linked directly to the issue of citizenship - a recognition that lack of control over material resources restricts our membership of society.[95]

The broader implication of this discussion is that consumption should be studied as a bid to participate in social worlds. This theme will be developed later in the thesis.

Needs and use values

One of the most basic but fundamental questions about consumption is why do people want goods? In answering this we explore the characteristic which make modern consumption unique - an apparently insatiable appetite for more goods. What is most distinctive is the desire for new goods - not only replacements or improvements to existing artifacts or practices but the novel and unfamiliar.[96] Thus, the nature of demand for goods and the basis on which the selection and evaluation of goods takes place are important and far from straight-forward issues. An understanding of this demand and the very notion of 'needs' inevitably requires analysis of the ways in which goods are useful and have value for people.

The issue of needs and use values came up on a number of occasions during the discussion of theories of consumption. This is an area where some of the most significant contrasts exist between perspectives. They offer, for example, very different ways to understand the development of demand for novel goods. An enlightening way to explore the issue of needs and uses is to examine the differences and similarities between the, apparently diametrically opposed, approaches of Critical Theory and the Household Resources perspective.

In the Household Resources approach demand for goods is an aspect of household management. The need for goods and the uses they are put to are conceptualized in material terms such as time-saving, sustenance and the effective running of the home. This approach assumes certain fixed needs and functions of households which goods, services or unpaid labour must fulfil. Changes in consumption behaviour are a response to alterations in the economic and technical environment.[97]

On the face of it, the approach of Critical Theory to needs and use values could not be more different. Critical theorists argue that the creation of new 'needs' by the consciousness industries is a central dynamic of modern consumer capitalism. Implicit in such critiques is a notion of true and false needs. Marcuse in 'One

Dimensional Man', for example, draws a clear distinction between true needs essential for survival and well-being and false needs "superimposed upon the individual by particular societal interests in his repression: the needs which perpetuate toil, aggressiveness, misery and injustice." [98] More recently, critical theorists have developed a more sophisticated approach, aware that blanket condemnations of consumer wants and interests are of little use as the basis for empirical study or a progressive political projects. Attention has turned to what is seen as the exploitation of true needs by commercial interests. This shift, however, makes distinctions between true and false needs even more crucial. Critical theorists are involved in a desperate struggle to avoid relativism - insisting on the possibility of objective criteria by which to judge needs. [99]

Critical Theory's attempts to evaluate needs and uses is based on a very limited conception of what the basis of what 'real' needs and uses could be. While it differs from the Household Resources approach in seeing consumers as the victims of manipulation, it makes similar assumptions about (real) needs and uses being fixed and materially based. In the case of both critical theories and the Household Resources approach an inadequate view of needs springs from inadequate view of 'real' uses. This reflects the predominance of a utilitarian perspective on consumption that assumes that consumption is (or should be) the rational pursuit of gratification which springs from the intrinsic qualities of goods. [100]

Needs and use values have become mystified through their association with biology and production. [101] The irony is that it has been anthropologists, studying societies with limited productive capacities, who have found it easier to argue that physical needs are an inadequate explanation of culture than have academics addressing the enormous complexity of modern life. They rightly argue that needs and uses must be understood as culturally rather than materially based Practical reason is an indeterminate explanation of cultural form. Nor can one work with a simple division between a notion of material needs and material use values on the

one hand and symbolic needs and symbolic use values on the other. The demand for 'necessities' such as food and clothing for example, is organized by "symbolic logic".[102] This is not to discount the 'real' or 'practical' benefits provided by goods but rather to see these satisfactions as culturally mediated.

Once we see that consumption is implicated in a whole range of cultural practices this leads to a far broader view of how goods come to be 'useful'. Douglas and Isherwood argue that it is only when one understands consumption in terms of making sense and communicating that we can see why demand is insatiable. If goods are understood as cultural resources then we have to view the demand for the good and its usefulness not as fixed and absolute - somehow embodied in the good - but as something which emerges from exchange. Appadurai argues that exchange sets the parameters for utility:

" Demand ... emerges as a function of a variety of social practices and classifications, rather than a mysterious emanation of human needs, a mechanical response to social manipulation ... or the narrowing down of a universal and voracious desire for objects to whatever happens to be available." [103]

Sahlins maintains:

" Use-value is not less symbolic or less arbitrary than commodity-value." [104]

The important implication of this is that the value and meaning of goods is socially negotiated. The construction of value and utility is itself a crucial aspect of the processes of consumption. We can no longer see the activities of consumption as simply the route to the achievement of a mysterious use value. Satisfactions come from and uses are made of the good along the way.

The process of utility construction does not simply take place at the level of

household or social networks. The view of needs and use-values as socially negotiated should not blind us to the role of wider forces. Consumers' needs and use values are developed in the context of the activities of producers, advertisers, the media etc. Nor should we see this as a static, once only process. The shifting ever-expanding symbolic universe makes the construction of needs and use values particularly problematic. We struggle to hold on to utilities in a 'high intensity market setting'. [105]

Rather than an absolute which determines demand for goods, utility is, therefore, itself shifting and constantly reconstructed. Notions of need and utility and rational decision-making then become not the basis for evaluating or classifying consumption practices but rather the subject matter of consumption studies. [106] In doing this researchers have to deal with an interesting contradiction - the importance of notions of necessity and material utility in the discourses of both producers and consumers. [107]

The rhetoric of utility and efficiency is to be found through-out advertising and product design. Miller discusses a dominant modernist form of design in which aesthetic is supposedly subordinated to function:

" This embodiment of utility and technological rationality in the object as modernist form may be a powerful example of the much more general tendency toward the legitimizing role played by technological rationality in the modern world." [108]

In domestic consumption this reflects a cultural shift in the twentieth century whereby the household has come to be seen as a source of physical rather than moral welfare and domestic goods have been marketed in terms of 'labour saving' and efficiency. [109]

It may be simplistic to argue that we are entirely blind to the symbolic

significance of production and consumption. Notions of practicality and rationality are, however, a powerful part of the rhetoric of consumption - even if they sometimes appear as post-hoc rationalizations. Issues of practicality and need can be troubling ones for consumers. This will be examined further in later chapters.

Technology and Consumption

Having established an approach and agenda for research into consumption. This section makes links between consumption and the themes of the two preceding chapters. It introduces the 'object domain' of home computing as a case study in the sociology of consumption.

Different kinds of good

The thrust of the previous discussion is that consumption theory has suffered from over-generalization. No one study can hope to encapsulate every aspect of consumption practices. No good is the typical or quintessential good. Studies of the relationships between people and goods should acknowledge the complexity and diversity of forms that this can take by studying specific 'object domains'. [110] Such studies must also focus on 'conjuncture and specificity' acknowledging how the role and meaning of goods may change over time. [111]

Goods vary in their status or role within consumption practices. While common sense notions of luxuries versus necessities and 'symbolic' goods versus 'practical' goods should be the object of study rather than the basis of it, the existence and power of such distinctions shows us that all goods are not the same. A whole range of important distinctions between goods could be explored. Two issues are of special relevance to this thesis.

It should be recognised that not all goods have the same potency as symbols. Some

goods are clearly ascribed more significance than others both as 'positional goods' and particularly evocative objects. Studies of consumption should consider how these distinctions function and change over time.

The status of new goods is another important issue. Given the dynamic nature of consumer culture, new goods - particularly novel goods - have a special character. The discussion and evaluation of new goods has a particular place in the activity of consumption. Novel goods are, for example, an extremely potent raw material for 'day-dreaming' and identity construction.[112] A successful venture into the world of the new demonstrates competence in the activity of consumption but it is a high-risk business. This brings us to another reason why new goods are so interesting. New goods, especially novel ones, present problems of absorption for consumers.[113] A place must be found for them in their everyday lives. This can be a difficult process and because of this there is a particular self-consciousness in the way that novel goods are handled. Debates about the 'usefulness' of novel goods are particularly fluid and intense.

Technological goods

Technological products are goods with special symbolic power. To understand this further it is necessary to return to some of the themes of chapter one.

One of the contradictions within the modernist discourse is that technology is portrayed as a force somehow above or outside of capitalist relations while at the same time it is marketed and sold. Technological development is ascribed too much gravity to be subject to the whims of consumer fashion. Since the nineteenth century, however, the histories of growing technological sophistication on the one hand and of the development of the culture and institutions of consumption on the other, have become intertwined. It is no coincidence that many of the examples of technological development cited in chapter one were drawn from the same period

between 1880 and 1920 when modern consumption practices took shape. At this time technology became increasingly involved in consumption as well as production.

Technologies began to facilitate and mediate consumption. They were, for example, implicated in new ways of displaying and purchasing goods. The new information and communication technologies themselves carried messages of faith in progress through technology and consumption.[114]

Rhetorics of newness, of being 'up to date', of obsolescence and of improvement are powerful ones in the culture of consumption. They take on a new significance when associated with technology. This helps to explain why technologies are particularly attractive to marketers as products with a short 'half-life.' The powerful discourses about technology and the future discussed in chapter one to make technologies evocative consumer goods. They give technological goods a special significance - not least as symbols of modernity itself. The place of technology in contemporary culture makes it, in the words of Silverstone, Morley and Hirsch, "the commodity par excellence in the modern world." [115]

An interesting parallel between the historical examples used in this chapter and in chapter one is that both new technologies and the rise of institutions and culture of consumption are discussed in utopian terms. Many technological utopias are also utopias of consumption.[116] This suggests that technology and consumption are a powerful mix. Both offer a utopian promise and the magical possibility of self and social transformation.[117] Equally, critics discuss both 'technological society' and 'consumer society' as dystopias.

The utopian promise of technology helps to explain the production, marketing and appeal of technological goods. Ownership of technological objects is a way to grasp technological change. Advertising sustains the relationship between magic and technology.[118] Visions of a future transformed by technology are actively used to sell products. Adrian Forty describes how, for example, in the inter-war years

accounts of a future "electric age" were promoted via exhibitions, show house and advertisements in a battle against gas suppliers and appliances. The utopian promise of electricity was used to distract from the present inadequacies of electrical goods.[119] Forty also shows how this promise was actually physically represented in the design of goods. Thus the most popular designs for the wireless in its golden age was an embodiment of its status as a symbol of the future, suggesting it belonged to "a future and better world." [120] The appeal of millennial ideas about technology and the future explain why :

" The use of imagery to make products appear 'ahead of their time' has been a recurrent and at times thoroughly monotonous feature of twentieth-century design." [121]

Home computing as an object domain

Although its exploration provides insights into consumption in general, what makes the object domain of home computing so interesting is not its typicality but rather its specialness. Home computers had a high symbolic value. *A number of factors* contributed to this. The home computer is a novel good. It is also a technological good. Associations with the prophecies of the Information Technology Revolution helps explain the character and intensity of demand for the home computer.

Analysis of the object domain of home computing sheds light on the four sets of issues outlined in the last section. The story of the home micro has been of the changing meaning of a consumer good. In studying this process the complexity of the relationship between domains of production and consumption is revealed. Examining consumers' 'computer careers' provides an insight into the (often problematic) processes by which goods are selected, evaluated and absorbed into everyday life. Study of home computing also offers an illustration of some of the many ways that goods are used to participate in social life. This embraces the role of the

computer in the construction and maintenance of individual and group identities. In addition, consumers took part in the 'public event' of the home computer boom. It has already been argued that novel goods present particular problems for consumers as they attempt to incorporate them into the practices of everyday life. The case of the home computer highlights this. Consumers can be seen self-consciously grappling with issues of utility and usefulness.

II: THE EXPERIENCE OF HOME COMPUTING

Chapter Four

Making Sense of Home Computing

The first three chapters have outlined a series of issues and frameworks which will inform the rest of the thesis. It is now time to turn directly to home computing. This chapter introduces the research data which follows.

I have already established home computing's credentials as a case study in the sociology of consumption. The thesis also seeks to make a contribution to debates about domestic IT. The first part of this chapter reviews attempts to make sense of home computing. In doing so it maps out an analytical approach and raises questions to be addressed empirically. Following on from this, Part Two of the chapter outlines the development and conduct of my own research.

Although it aims to highlight issues which shaped the design and conduct of my empirical work, the chapter is also informed by the experience of research and publications which appeared during or after fieldwork.

Part One: Empirical Approaches and Issues

Discussion of available empirical material on home computing is divided into three sections. The first highlights the need for further investigation of this area. The second puts the case for a qualitative approach. The final section argues that home computing should be understood as a cultural phenomenon.

The Need for Further Research into the Demand for and Use of Home Computers

The history of home computing is one of competing conceptions of what the home micro is, what it is for, who uses it and what its future is. Academic study of home computing is not immune from this. For various research traditions and projects "the home computer" becomes something very different. Despite this diversity, however, early research in this field shared one characteristic - it responded to a powerful agenda about the future social impact of computers.

Social research into home computing must be seen as part of two interrelated events both of which are described in detail in other parts of the thesis - the growing political, media and academic interest in the 'Information Technology Revolution' and the home computer boom itself. An important theme of chapter two was the extent to which ideas about a future shaped by information technology permeate any discussion of computers. Overtly prophetic literature on the IT Revolution has already been discussed. Such ideas have exerted a powerful influence on the extent and character of empirically informed research into the social context and consequences of IT use. Research into home computing was easily justified because of the powerful consensus about the future social significance of IT. As soon as home micros began to be sold in any numbers they were considered important and worthy of study. They were widely perceived as a step towards the computerized society of future predictions.

Academic work on home computing has both fed into and off a wider public concern about the social impact of computers. Discussion of the home micro reflected the burden of prophecy it carried. In particular, a series of very public debates about the social consequences of home computing helped shape the strength and direction of academic endeavour. The home computer became the material focus of a series of concerns about the social impact of IT.[1] Following the familiar pattern of discussions of information technology and society, these impacts were frequently

discussed in utopian and dystopian terms. Researchers did not simply accept predictions about the Information Technology Revolution - many were sceptical - but so powerful were such forecasts that they were usually the starting point for empirical investigation.[2]

The research agenda on the impacts of home computing contained a number of different elements springing from some of the interrelated but distinct sub-discourses about computers and the future discussed in chapter two. Four strands of prediction had a particular influence. The first involved forecasts of changing patterns of work and leisure such as those about the growth of 'telecommuting'. A second strand foresaw a home of the future in which IT played an important role in the running and administration of the household. The third focused on the implications of the spread of the micro for education and the need for universal 'computer literacy' in a future 'information society'. Finally, some researchers set out to test assertions that intimate mass contact with computers would bring about cultural or psychological change. A number of examples of responses to this agenda can be cited. Strands of work began looking at, for example, teleworking, computer addiction and the impact of IT on households.[3]

In the mid 1980s, when this project was germinated, academic discussion of home computing started from the premise that the micro was to have significant social consequences. Attempts to assess and refine predictions were the norm. The emphasis was on the 'impacts' of the adoption of the micro. This was not confined to the 'impact' of the home computer on life within the household and patterns of work and leisure in and around the home. In contrast to many other domestic technologies, the home computer was seen as being of relevance to issues beyond the boundaries of the household. It was considered worth examining, for example, the importance of widespread ownership of home computers for future individual and national economic well-being.[4]

Despite the powerful consensus about the social significance of the spread of home micros, a number of researchers rightly pointed to a paucity of empirical evidence about home computing. There was an awareness of the dangers of making assumptions about the use of home computers based on actual or projected sales figures.[5] It was acknowledged that talk of 'impacts' may be premature given the lack of basic knowledge about the activity of computing. Informed discussion of a whole range of issues awaited further empirical study. As a key attempt to review the area stated in 1985:

" Identifying the ways in which the technology is likely to be used, the extent to which usage will be integrated into family life, and the factors that influence usage, may explain the social, psychological, and other implications of this technological change."

Thus, the investigation of deceptively simple questions about who owns home computers, how much micros are used and what for were essential first steps to understanding home computing.[6]

Understanding the development and demand for home computers

The nature and extent of demand for goods marketed as home micros was an area of relative neglect in early research. Much work was informed by the assumption - which got its power in part from predictions of a computerized future - that interest in the micro was unproblematic and would continue to grow. This was a particularly potent idea in the early to mid 1980s when forecasts of near-universal computer ownership were frequently aired by government, industry and media sources.[7] A number of studies dating from this period explicitly used a 'diffusion of innovations' model to make sense of home computing. The premise was that adoption of home micros would increase at rates and to levels comparable with those of other domestic Information and Communication Technologies (ICTs) such as

television or the telephone. The diffusion of innovations perspective can be located as part of a tradition of writing on innovation and on characteristics of 'early adopters'. Current home micro users were seen as the pioneers of a process of leading to near-universal computer ownership. The possibility that they were part of a small niche market or a short-lived craze was not taken seriously. Interesting research questions were considered to be what makes these 'early adopters' 'social innovators' and what obstacles existed to the wider diffusion of the home computer.[8]

Assumptions made explicit in the diffusion of innovations approach about rates and levels of adoption of home micros are actually implicitly shared by a far broader range of writing.[9] Many commentators appeared willing to assume the future spread of home computers from existing ownership figures. For many, the study of home computing as it is now provided indicators about a future in which ownership is far wider and applications and hardware more developed. A recent review of literature on home computing highlights one dimension of this:

" There is a strong assumption that not only will home based IT continue to grow steadily in social importance but that coming developments in home control, remote working, shopping, banking and education will converge around the products which we now recognise as home computers." [10]

This has increasingly been questioned even by promoters of domestic IT. Enthusiasts for an 'intelligent home' have, for example, in recent years, sought to distance it from the home computer.[11]

The projections of the spread of home computing made by many commentators rest on largely untested assumptions about the nature and extent of demand for home micros. Even some of those in broad sympathy with the diffusion of innovations approach were prepared to acknowledge difficulties in applying it to home computing. In

particular, a series of papers published in 1985 and 1987 by W Dutton and various collaborators pointed to the inadequacy of current research in the area and the need to generate more empirical data on which to rest models of diffusion.[12] As my own research continued an even more radical critique suggested itself. This related both to the development the home computer itself as a product and to the demand for that product.

The diffusion of innovations approach treats the home computer as a largely fixed and unproblematic product category. The history of the development of the home micro, however, suggests this is a dubious assumption. Murdock, Hartman and Grey rightly argue that the diffusion of innovations approach is fundamentally flawed because of its premise that the home computer is "a simple easily recognisable commodity" and that there is a single unified market for home computers.[13] Their analysis relies heavily on the empirical work of Leslie Haddon which traces the complex early history of the home computer as a product category. Regular meetings and later collaboration with Haddon were to influence the direction of my own research. Haddon's work can be read as an attempt to 'denaturalize' the development of the home computer as a technological and marketing concept. Far from being linear and preordained, the history of the micro was very messy. Haddon shows how the emergence of the home computer as a product was the result of a range of, sometimes conflicting, conceptions, interests and unintended consequences. Rather than being fixed and stable, the identity of the home computer changed over time. Also, rather than a single home computer it might be better to talk about the development of a number of distinct products and markets.[14]

Often, research into home computing has not recognised the implications of the complex history of the micro as a product category. Two, neglected, sets of issues were to become themes of my empirical work:

The motivations and processes of consumption One of the characteristics of the development of the micro highlighted by Haddon was the considerable uncertainty among its makers and promoters concerning its viability as a consumer good. Producers were far from certain about the extent and nature of demand for a home computer. In marked contrast to the smooth projections of diffusion and the growth of applications offered by some researchers, he highlights considerable doubts about the long-term future of the micro among producers.[15] This suggests that, when considering consumption, we need to examine the motivations behind purchase in some detail. They are not as self-evident or unproblematic as many commentators assumed.

As the last chapter argued, the demand for novel goods is particularly problematic as is their absorption into everyday life. These issues are writ large in relation to the home micro. In common with other novel goods, home computers place special burdens on consumers and also offer particular opportunities. There was a need for further study and recognition of the complexity of the processes of consumption - decision-making, purchase and appropriation as well as the social significance of the activity of consumption itself. Exploration of these issues is essential to understand not only consumption but the development of home computing itself.

Consumption and the development of the home computer The methodology and writing up of the thesis recognizes that an understanding of the history of the production and promotion of the home micro is vital to contextualize home computer ownership and use. This does more, however, than provide background to the study of consumption. As chapter one argued, innovation is a cultural process. The starting point of Haddon's work is that both producers and consumers of the home computer were participants in a 'cycle of cultural production'. The complex relationship between the spheres of production and consumption discussed in the last chapter takes on particular significance in a new object domain.[16] To explore this further detailed work was required looking at the consumption of micros and the evolution of the product from the stand-point of users.

Understanding home computer use

Models of the diffusion and impacts of home micros rest ultimately on assumptions about home computer use. In early work researchers were too willing to speculate on 'impacts' simply from ownership figures.[17] In many discussions of the diffusion of micros, for example, it is assumed that the amount and extent of computer use would evolve towards more applications and heavier use. Concerns about impact on family life often rested on the idea of the micro having found a place in the routines of the household. But as Dutton et al write the integration of the micro into the life of the home remains an unresolved issue:

" Still there is uncertainty over the extent and manner that personal computing has and will become integrated into everyday life in the home." [18]

As the last chapter suggested, purchase is only the first stage of a complex process of consumption. This process is not always successful and is particularly problematic in relation to novel goods.[19] Dutton et al argue that data on the extent and nature of micro use after purchase is scarce.

" Adoption, of course, does not necessarily lead to the successful adaptation and incorporation of the technology in the home setting."

" Before anticipating or forecasting the impacts of purchasing a personal computer, it is useful to focus first on the more immediate issue of how people use this new and evolving technology." [20]

The priority therefore is detailed empirical investigation of home computer use. In addition, analysis of existing material reveals the need for a more sophisticated analytical approach to understanding home computing. Some existing research rests on a simplistic view of uses and 'usefulness' - working with an essentially

economistic model in which micros are primarily material resources which satisfy pre-existing needs. An example of this approach is the work of Venkatesh and Vitalari. It is worth considering in some detail because it makes explicit tendencies which can be found in a broader range of both predictive and empirical literature. Venkatesh and Vitalari draw parallels between the adoption of computers in organizations and in households. They are interested in how home computers change patterns of life within the home notably in patterns of time allocation given to different tasks.

" As a rational system, the household accepts or rejects new technologies based on measurable benefits that the technologies can confer on the household - for example, time and cost savings and improvement in material conditions." [21]

The household according to Venkatesh and Vitalari has defensive and adaptive mechanisms towards new technologies which evaluate the usefulness of the technology at fulfilling needs be they 'instrumental' or 'expressive'.

Venkatesh and Vitalari over-simplify not only the motivations but also the processes involved in consumption. At this point it is worth thinking back to the critique of the 'household resources' approach to consumption offered in the last chapter which argued that it rested on a very limited view of why goods are useful to people.[22] Venkatesh and Vitalari's view of technology as "a tool designed to meet a specific need of the user" and of the household as "a functioning social and economic system and recipient of technology" falls into this trap.[23] Goods are seen as resources with clear-cut practical benefits springing from their inherent material qualities. Such an approach ignores the complexity and fluidity of 'needs'. Instead, as the last chapter argued, goods should be understood as cultural resources. Hence their value or usefulness is a far more complex issue - negotiated in particular social contexts.

Viewing home computers as material resources gained plausibility from the association of the micro with predictions about a computerized future in which home computers are productive tools aiding the running of households and telework. Such assertions, however, were made in the face of considerable debate about the usefulness of existing home computers.[24] These began to be expressed in academic work even among those in broad sympathy with a materialist view of the household. Feminists, for example, offered a critique of the approach in relation to IT in the home claiming that the computer has little bearing on domestic labour.[25] More generally, discussion of the usefulness of the micro took a new turn in 1985 in the face of press reports about the collapse of the home computer market. In reports on their research Murdock et al, for example, stressed the disappointment some interviewees felt about the worth of their micro and quoted longitudinal data showing that many machines fell into disuse. Although evidence is mixed, others have also explored the issue of disappointment with and non-use of micros. In common with some other commentators, Murdock et al also argue that many of the applications promised by promoters of computing in the home have failed to take off - not least because of the technical limitations of the most popular machines.[26]

Doubts about the usefulness of the micro suggest we should think more critically about the nature and appeal of involvement with computing. At this point let us return briefly to Venkatesh and Vitalari's work. They point to a contradiction in their approach:

" Since their inception , computers have generally been viewed as time saving devices. In reality, however computers are also very effective time consuming devices which force users to reallocate their limited time and change the way they perform tasks." [27]

Venkatesh and Vitalari's sample was drawn from members of California computer clubs in the early to mid 1980s. They had to go to considerable lengths to impose a

resources model of computer use onto this group of enthusiasts. A very different line of approach was opened up in research by both Leslie Haddon and Margaret Shotton who began to study these type of people not as 'early adopters' but as members of a world of 'hobbyists'.

" For its participants it was the computer as such which was interesting; any practical applications were secondary." [28]

Thus, home computing brings the issues of needs and use values highlighted in the last chapter into sharp relief. Despite the continued popularity of a material resources model in some quarters, a more sophisticated approach to the uses and usefulness of the micro and to the satisfactions gained from home computing is required. As Jane Wheelock, herself a proponent of a household resources approach, notes:

" According to Jonathan Gershuny's definition of a socio-technical innovation, this occurs when the means by which a need is satisfied changes. What is perhaps unique about home computers is the fluidity of the need that is being met by them." [29]

While the uniqueness of the micro is open to question, the gist of Wheelock's argument is valid and raises important issues for empirical study.

Quantitative and Qualitative Approaches

Having pointed to the need for further empirical work and highlighted deficiencies in some of the analytical frameworks utilized to understand home computing, this section assesses various attempts to conduct research into home computing. In doing so it begins to map out my own approach.

Market research and other quantitative data

During project development some quantitative data was available on the extent and nature of home computer ownership and use. North American surveys of micro use were mostly small-scale location-based studies.[30] In Britain three kinds of source existed. The General Household Survey offered a large sample national measure of computer ownership. Commercial research, responding to producer concern about the shape of markets, was primarily interested in actual and potential purchase of home computers. This included market surveys based on computer industry estimates and quantitative research on ownership and use. By far the most significant piece of academic work was by Murdock et al who generated data on home computing as part of a longitudinal study of ICT use in the East Midlands.[31]

Quantitative data provided a valuable context for research. The data gathered in the early years of the home computer boom shed further doubt on the assumptions underpinning much speculation about the present and future impact of home computing. Industry material suggested a volatile market and identity for the home computer. Predictions about IT in the home focused on its role as a technology of communications involved in 'telework' and the servicing of the household. Attempts to quantify the types of use which computers were put to, however, portrayed games as the most popular while 'practical' applications such as work and home finances were comparatively rare.[32] Figures on sales of commercially produced software market show ^{that} games became the most significant market. Data also pointed to relatively light ownership of peripherals and the predominance of relatively low-cost, low-capacity machines.[33]

Although far from worthless, quantitative data had a number of limitations and left important questions unanswered. One problem related to the rapidly changing home computer market which ensured that ownership figures soon became out of date. In addition, since the mid 1980s the amount of market research carried out has declined

leading to a lack of more recent data.[34] A further draw-back of commercially-orientated research is the narrow range of issues it addresses. Far more needed to be done, for example, to understand the motivations behind purchase. Similarly, attempts to understand micro use were specifically aimed at comprehending markets rather than obtaining a detailed picture of the significance of home computing.

The status and interpretation of macro data on home computing has been comprehensively discussed elsewhere.[35] Statistics can be subjected to both a positivist and a phenomenological critique. Problems of classification and data collection mean that even figures on home computer sales and ownership are subject to considerable variation. Even when there is agreement between estimates, it is as likely to reflect 'consensus formation' among analysts as accuracy. Despite these limitations, ownership figures do at least give us some insight into the distribution of micros. The value of other types of information relating to patterns of computer use is more questionable. In a review of statistical sources, Leslie Haddon raises three significant issues concerning data collection. He argues that because of the thin distribution of micros even apparently large-scale studies produce relatively small samples of active users. Doubt is cast on the ability of survey informants to describe the use patterns of other family members. Haddon also suggests that the questions and categories selected by quantitative researchers can dramatically alter the picture of use they produce. They lead, for example, to quite different pictures of the levels of female computer use.[36] This brings us on to the most significant kind of critique that can be levelled at quantitative data which relates to its meaningfulness.

At the time my field work was conducted too little was known of the experience of home computing to draw many meaningful conclusions from quantitative data. The dangers of prematurely imposing statistical order on a relatively new and fast changing phenomenon seemed acute, particularly when our understanding of home

computing is weighed down with assumptions from the predictive literature. Both market and academic research, for example, operated by classifying use into different categories such as work, games, education, word processing, home finances or learning about computing. These seemed to rest on unwarranted assumptions about home computer use and in particular the meaning and motivation behind that use. The limitations of this approach became increasingly apparent during fieldwork and is one of the major themes of the analysis of empirical material.

The short-comings of quantitative methodologies was recognised even by some of those involved in constructing statistical data on home computing.[37] Such sensitivity to the problems of interpreting use statistics is not confined to the study of home computing. There has been a trend in mass communications research towards qualitative methods prompted by similar concerns. Researchers into television, for example, now argue for the need for detailed qualitative work in order to make sense of viewing statistics. This shift in the study of domestic technologies reflected an awareness of the need to go beyond speculation about impacts on the household to detailed empirical understanding of the social context of ICT use.[38] It can also be related back to the theoretical discussion in the last chapter on the requirement for further understanding of the 'active consumer' and of consumption as embedded in practices of the everyday.

This discussion points to the need for a detailed understanding of the meaning of home computing and its place in people's lives. General characteristics of qualitative methodologies - openness and flexibility, the emphasis on meanings held by subjects, the importance of context and process - make them particularly attractive in these circumstances.[39]

The meaningful machine

An alternative approach to the statistical certainties of quantitative studies is offered by two American books published in the mid 1980s which made detailed attempts to understand the experience of computing. These qualitative studies focused on the nature of the relationship between individual and computer.

David Sudnow attempts to understand the experience of computing, describing himself as a 'Pilgrim in the Microworld'. He spends an entire book describing his attempts to master the video game 'Breakout'. Although his gaming takes place on a video console Sudnow considers his experience applicable to the understanding many other forms of computer use.[40] His account involves minutely detailed descriptions of his interaction with the machine. The format and content of Sudnow's book suggests a different agenda for research into computing. It provides an antidote to the utilitarianism of much other writing on home computing - the micro is not understood as a tool but something to be explored and enjoyed. Sudnow's account also shows we should treat with caution attempts to assume impacts and meanings from particular types of 'uses.'[41]

Sudnow raises as a central issue the appeal of computing. In doing this, however, his analysis is limited because of his own enthusiasm for games playing. He talks, for example, about his "obsession" with the game and describes it as a drug. For Sudnow, however, the source of the ability of software to absorb and fascinate - which he describes in detail - is self-evident. The route to greater understanding of the significance and the phenomena of video games is by close examination of the technology itself. Playing 'Breakout' gives him an insight into a new form of experience which will become increasingly ubiquitous in the future.

" How could we not play these "games"? How could we not stand in awe of the computer, the ultimate rational tool, that device that the most influential brands of reason for a hundred years could announce as their perfect piece of auxiliary equipment?"[42]

Thus while Sudnow raises important questions - not least about the appeal of playing games on 'the ultimate rational tool' - he remains convinced that the answer to such questions lies in the inherent qualities of computer hardware and software. We are left with only tantalizing glimpses of social life around the machine which Sudnow sees as largely incidental to his account.[43]

Sherry Turkle provides a more significant attempt to understand the experience of computing. Rather than relying her own experience, Turkle concentrates on those of over four hundred interviewees. She includes home micro owners as part of a wider constituency of computer users. Turkle's group of subjects is actually larger than many of the samples considered by statistical studies but she is not interested in generating quantitative data. Instead the emphasis is again on the meaningfulness of the micro. Turkle can be located in a broader strand of writing seeking to understand the emergence of a new computer culture.[44] She focuses on the role of the micro in processes of personal development and the construction of identity.[45]

" I look at the computer in a different light, not in terms of its nature as an 'analytical engine,' but in terms of its 'second nature' as an evocative object, an object that fascinates, disturbs equanimity, and precipitates thought."

" A relationship with a computer can influence people's conceptions of themselves, their jobs, their relationships with other people, and with their ways of thinking about social process. It can be the basis for new aesthetic values, new rituals, new philosophy, new cultural forms."[46]

Turkle's book opens up a whole range of issues. Not least, it suggests ways of studying and understanding computing. Turkle characterizes herself as an ethnographer of computer users:

" Like the anthropologist who lives in an isolated village in a far off place to get to know its inhabitants, their ways of seeing and doing things, their myths and rituals, their economy and artifacts." [47]

Along with Sudnow, Turkle points to the need for a deep understanding of 'doing computing' and the value of observing computing in action. Most importantly she shows the care required to understand the meaning of computing activities. For example, she challenges outside perceptions of video games as "mindless" and points to the variety of ways people use games and the different sources of their appeal. [48] Unlike Sudnow, Turkle does not seek to explain things simply by reference to material qualities of the computer.

" ... the elusiveness of computational process and of simple descriptions of the computer's essential nature undermines any such consensus and makes the computer an exemplary 'constructed object' - a cultural object which different people and groups of people can apprehend with very different descriptions and invest with very different attributes. Ideas about computers become easily charged with personal and cultural meanings." [49]

Turkle emphasises the diversity of relationships that individuals have with computers. This is a crucial step since it shifts discussion away from the impact of computers on people and instead asks what people make of computers. [50] Also by highlighting a 'non-instrumental' dimension to computer use she points to a tension in the notion of the 'useful' computer which deserves to be explored further.

A number of critics have highlighted what they see as important limitations in Turkle's approach. The first of these springs from the significance Turkle ascribes to the phenomena she is studying. She believes that contact with the computer is implicated in transformations in our sense of self. The experiences she chronicles "prefigure changes in our culture as a whole." [51] Although she denies technological determinism, fascination with computers is portrayed as a natural response to a uniquely evocative machine.

" Computers call up strong feelings, even from those who are not in direct contact with them. People sense the presence of something new and exciting. But they fear the machine as powerful and threatening." [52]

Turkle chooses to explore this by concentrating almost exclusively on the interaction between individuals and machines rather than social interaction around computing. [53]

Turkle pays little attention to the ways our relationships with computers are culturally mediated. This is illustrated by the way she attempts to explain why the computer is particularly evocative or absorbing. Her explanation rests largely on the qualities of human-computer interaction and is grounded in a faith in the future social significance of the micro. As with Sudnow, that people should wish to own and use computers is largely taken for granted. For Pam Linn this is a fatal flaw:

" Turkle claims to be rendering the computer world strange, yet suspends her critique before getting to the computer. In short, she affirms claims to the uniqueness of computing. Thus Turkle reproduces the sense of magical possibility around computers and programming by dismissing the social constituents of computer use; by refusing to recognize the many labours of computer production; by ignoring the cultural definitions of particular user groups (...); and by failing to critique the exaggeration of computer power in popular representation." [54]

While this attack is perhaps unnecessarily hostile, it does suggest a whole range of areas where computing can only be fully explained by adding a social and cultural context to the detailed analysis of individual experience. Thus while Turkle is interested in the ways computers are embedded in the biographies and lifestyles of individuals her view is largely asocial. This is reinforced by the emphasis she places on the 'escapism' of computing. My own approach, in contrast, has been to highlight the ways in which home computing is a cultural phenomenon.

Towards Understanding Home Computing as a Cultural Phenomenon

The discussion so far suggests the need for a qualitative approach able to embrace the variety and complexity of people's experience of the micro. In Britain at the time I started my research there was no equivalent to the Turkle's detailed work with computer users. In addition, there was a need to concentrate on the areas neglected by Turkle - to study home computing as a cultural phenomenon. This argument springs from the perspective outlined in the last chapter which views goods as cultural resources implicated in a multiplicity of personal and social projects.

There are a number of dimensions to any adequate socio-cultural understanding of home computing. Many of these have been identified but not fully explored in other work.

Computing and social divisions

A criticism levelled at Turkle's qualitative work is that, because of its emphasis on individual-machine interaction, it tends to play down the role of important social relationships of gender and class in shaping computer use.[55] Although she does touch on the issue of gender differences in computer use, for example, Turkle emphasises other psychological distinctions in her arguments.

The reluctance of Turkle to discuss sharp gender divisions in the experience of computing is in marked contrast to the consensus that exists in other empirical studies about large differences in the numbers of men and women involved in home computing. Use data from quantitative studies is supported by the findings of more detailed studies^{which} all point towards gender differences, even if there is disagreement about the extent of this. This should be seen in the context of a wider concern with gender differences in a education and the workplace. A common suggestion was that the study of home computing would provide insights into the sources and significance of these inequalities.[56]

A variety of researchers argued for further research into gender differences in computing. Leslie Haddon - who considered this issue in some detail - argued that this was made more urgent by the willingness of people to jump to conclusions about its origins and implications. Assumptions were made about the consequences for women's job prospects and domestic role based largely from extrapolations from the past and notions about the role of home computing in the labour market.[57]

Explanations focused on the 'masculine' qualities of hardware, software and associated products. The emphasis was on the 'exclusion' of women from computing.[58] Thus speculation about this area rested on assumptions about the appeal, nature and significance of home computing which needed to be explored more fully by empirical work.

Similar points can be made about the role of social class in shaping home computing. A number of early studies recognised this as an area worthy of further attention. Quantitative data from both sides of the Atlantic showed differences in levels of micro ownership and use by social class.[59] Having said that, in Britain at least, the gap in ownership figures seemed to narrow during the mid 1980s so that while large disparities existed between professional and semi- or non-skilled manual households in levels of micro ownership, the largest volumes of computer sales were to Intermediate (C1, C2) households.[60] A number of sources voiced concern about

class disparities in access to home computing. This kind of discussion may be premature. As with gender we must understand home computing as an activity before the mechanisms and significance of inequalities in access to home computing can be discussed meaningfully. In doing this we must go beyond analysis of the distribution of home computer ownership since, as Murdock et al have rightly suggested, class related factors may affect access to micros but also the nature of use after purchase.

Socio-cultural setting

Placing computing within its social context requires more than looking at the play of class, age and gender. The more immediate environment of computer users - what Dutton et al refer to as the 'socio-cultural setting'-should also be considered.[61] Two dimensions of this deserve further attention.

Computing as a shared activity

Dutton et al are not alone in pointing to the important role of social networks of computer users in the activity of computing.[62] Murdock et al developed this idea:

" Several analysts (eg Dutton et al 1985) have argued that the choice of pursuit of particular user identities largely depends on access to other users who can offer support, advice and encouragement and socialise the novice into a particular user subculture. Conversely, users who are isolated from or marginal to such networks may experience considerable difficulty in acquiring the competences required by certain uses and in sustaining their interest and motivation over time."

Analysis of their research data points to the high proportion of users who exchanged ideas and software with other users.[63] Murdock et al's use of terms like 'subculture' highlights a social dimension to computing. This is further developed

by Haddon who studied computing as an activity shared by adults and teenagers outside of the home. We should therefore think very critically about any notion of 'isolated' or 'privatized' computer use.[64] This issue is also touched on by Turkle. The organization of her book is based around distinctions between 'new computer cultures' such as games players, artificial intelligence workers, personal computer owners, and hacker programmers. While Turkle acknowledges they are united to a greater or lesser extent by shared values and experience these cultures are seen as the natural product of individual-machine interaction and their members are treated almost exclusively as "psychological entities." [65]

The issue of networks has been sign ~~sted~~ in other works but not fully explored. In particular, the significance of such social contexts and variations between them merit further study. There has been a tendency to study networks largely in terms of how they facilitate or limit computer use within the household - as part of an explanation as to whether people 'succeed' or 'fail' at home computing. This downplay the extent to which the sharing of interest in computers could be an end in itself. Researchers should be aware that the context of home computing is not necessarily the same thing as its physical location.[66]

The interplay between networks and another dimension of the socio-cultural setting - the household - is a stimulating area for study. This relates back to the issue highlighted in the last chapter - the role of consumption in linking public and private worlds.

The household

A whole range of research views home computing as a household issue - taking the household as a unit of analysis of micro ownership and use.[67] There is, however, a tension in the literature concerning the appropriateness of this. Other studies such as Turkle's or Sudnow's, for example, focus on the computer user as an

individual while Haddon studies home computing outside of the home context altogether. Market researchers are divided about whether the micro is best understood as an individual or household object.[68] These ambiguities spring from the disparities of use of different household members. Typically, not all family members use a home computer in the way that they all, with variations, might be expected to watch television. The idea of the 'family computer' in this sense has increasingly been questioned. Quantitative data suggests use is unevenly spread through the household along lines of age and gender.[69] This is supported by household-based studies which suggest that often only a single family member is actively involved in computing. So skewed can use be within the household that in some cases adults, for example, may not be able to report accurately on the computing of their children.[70]

The discussion above suggests that, to an extent, the validity of the household as a unit of analysis is a matter for further empirical investigation. A model which can embrace both the role of household and outside factors is required. There is also, however, a need to recognise that the household environment may be significant even if only one member uses the micro. Other household members may affect or be effected by computing without direct involvement. Researchers into other media have, for example, conceptualized the home as a site where gender differences in use are played out and reproduced.[71] One line of enquiry relates to parents and children. Ownership data shows that micros were most heavily concentrated in households with children. Many of these machines appeared to have been gifts from parents to children.[72] Murdock et al raise important questions about clashes of expectations between parents and children about computing.

" Beneath the bald figures for the dominance of games playing, however, the in-depth interviews often revealed a story of disappointed parental hopes and generational conflicts about how the computer should be used." [73]

Another set of issues are opened up by Shotton in her study of 'computer dependency'. She was concerned with the response of other family members to an individuals' computing - as the sources of marital difficulties, for example.[74] It should also be noted that, as Shotton sees it, computing was not simply implicated in changing patterns of behaviour and relationships - it was fitted into existing ones.

A wider view of culture

This section has already developed a far broader understanding of the 'socio-cultural setting' of computing than that put forward by Dutton et al. Another dimension must now be added to understand home computing fully. The experience of individuals, households and networks should be seen as part of a wider public event. Chapter one has already highlighted the way the spread of new technologies is a cultural process. Home computing offers a graphic illustration of this.

A number of writers pointed to the powerful discourses which mediated the British experience of the home computer even if they were sometimes dismissed glibly as 'media hype'.

" The high sales have now crumbled, but the moment of microcomputer popularity remains a curious cultural phenomenon." [75]

Linn's obituary for the micro was premature but her argument is sound. Once again it is worth thinking back to the arguments of previous chapters. They have highlighted the influence of ideas about the future on the consumption of technological goods. Information technology carries some particularly potent cultural baggage in this respect. A range of writers in Britain and abroad have mentioned the symbolic power of the micro and suggested that beliefs about the

Information Technology Revolution have influenced their acquisition.[76] Murdock et al, for example, argue that home computers are "complex commodities embodying particular mixes of exchange value, use values and sign values." [77] While Murdock and others have rightly pointed to the role of the media and advertising in mediating the experience of computing, their view of promotional discourses and their impact is monolithic and deterministic.

It is not enough merely to remark on the life of the micro as a cultural artefact. This thesis goes beyond passing references, asides and footnotes and instead makes the symbolism of the home computer a central concern. In doing so it seeks to develop a more sophisticated approach to understanding its nature and implications. The development of such an approach and its application is outlined in the second part of the chapter.

Part Two: An Account of Empirical Work

The second part of the chapter shifts discussion of others' research to that of my own. It describes the development of the thesis and, in particular, of the empirical research which forms its core. The account has a strong narrative element reflecting the evolutionary nature of research design. It is in three parts, beginning with an outline of the genesis of the study and its progress prior to fieldwork. The central section is an account of the fieldwork. The status of the material generated by empirical work and its writing up is the subject of the final section.

Project Development

In 1985 - the year of the inception of this project - two powerful but contradictory pressures on research design were evident. The influence of the concept of the Information Technology Revolution and predictions about the social impact of

computers on research has already been described. 1985, however, marked a watershed in perceptions of the home computer. That year saw a dramatic decline in confidence in the home computer among producers and commentators.[78] It became common to discuss home computing in terms of a craze or hype. The talk was of dashed expectations - far from being the harbinger of the future, the home computer now had no future. These two seemingly opposite readings were present in my own early efforts to formulate a research project. Put crudely, the stimulus for research was the need for a detailed empirically-based understanding of the reality of domestic computer demand and use. It was worth asking three deceptively simple questions - who was interested in home computers, why did they buy them and what did they use them for? These were to remain the basis of the project throughout fieldwork.

My own background of work experience in the computer industry had a significant influence on the choice of topic and the conduct of research. Correctly, I believed that my knowledge of and confidence with computer products and applications would aid empirical work. Although not fully aware of it at the time, I also brought an agenda to the study of home computing from the work place. In particular, as someone who saw himself as an 'instrumental' user of computers, I was intrigued as to what practical uses the millions of home micros sold in Britain between 1980 and 1985 were being put to. While I was later to reject this analytical framework, it sparked an interest in the 'usefulness' of home computers which was to be increasingly significant as the project evolved.

Reading during the early stages of the project, some of which forms the basis of chapters one and two, had a major influence on the direction of research. Exposure to material on technological and social change led to an interest in popular conceptions of science and technology and a growing awareness of the cultural dimensions of processes of technological development. The large amount of material available on information technology and society proved more useful as a topic than

as a resource. I became interested in the popular appeal and influence of predictions of the IT Revolution and speculated that the home computer boom could be understood as a response to it.

My academic interest in home computing dates back to 1983.[79] During the preparatory stages of research this was developed further through informal contacts with owners of home micros, visits to computer exhibitions and reading computer magazines. Immersion in 'historical' material on the home computer boom was initially seen as simply providing a background to field work. It led, however, to an interest in the boom itself as a cultural phenomenon. Consequently, collection of secondary data on the boom became a far more ambitious exercise which continued during and after fieldwork and eventually provided the basis for one the empirical chapters. While it was still intended to explore the present utilities and pleasures derived from computers, a number of new dimensions were added to fieldwork plans. In particular, two new concerns emerged. The first of these was the influence of wider discourses about computers and the future in mediating the purchase and use of micros. The second area of interest was the clash between purchasers' expectations and experience of computing - how were people's perceptions of information technology reflected in and possibly changed by their use of home computers?

From its inception the research project was envisaged as being largely qualitative. The case for this approach to the study of home computing has already been made in the first part of the chapter. Although the choice between quantitative and qualitative methodologies is often portrayed as a trade-off between 'reliability and validity', given the gaps in knowledge about computer use outlined in Part I, an exclusively quantitative study was open to accusations of unreliability as well as

invalidity.[80] Although there are elements of an interactionist perspective in my approach - notably its open-endedness and emphasis on understanding the point of view of social actors - this was not informed by a theoretical objection to structural approaches. On the contrary, the thesis rests on the assertion that meaningful social behaviour can ultimately be located in the structures and processes of wider society.[81] Also, in contrast to many interactionist studies, considerable work was done elaborating a research problem before fieldwork.[82]

Research eventually involved a variety of methodologies including surveys of secondary sources and a small element of participant observation.[83] The intention from early in the planning stage was, however, that semi-structured interviews open-ended enough to allow people to recount their own experience of the computer would be the core of empirical work. Given my interest in attitudes and particularly in past events (both personal and national) interviews seemed a more productive route than ethnographic methods. Another early decision was that the study should be predominantly household-based. Contact with households seemed to offer a chance to meet 'ordinary' computer owners and to examine computing in context.

Fieldwork

Fieldwork took place in 1987 and early 1988. This was a period of transition in home computing. The intensity of the home computer boom had passed but was close enough for its participants to be readily interviewed. The late 1980s saw a number of developments in home computing products and markets which were to be influential into the 1990s - most notably the marketing of specialist games machines and the growing popularity of higher specification computers.[84] It was also marked by a 'mini boom' of interest in PCs and home/office applications fuelled particularly by the aggressive marketing of Amstrad.[85]

Location

Fieldwork was almost exclusively based in a relatively small geographical area.[86] Aside from practical considerations, there were a number of reasons for a location-specific approach. It opened opportunities to study social networks and activities of computer users. Also, although the project was not a study of location per se, it allowed consideration of the ways that locality might impact on home computing. Influences outside of the home such as schools, labour markets, computer clubs, shops and the availability of ICT services are all subject to local variation.

Hillingdon offered a number of benefits as a research location. Transport, organizational and time considerations meant fieldwork had to be based relatively close to London where I lived. The proximity of Brunel University helped gain the cooperation of respondents who had a familiarity with and interest in this local institution. The Borough also has a wide social spread and a high proportion of households with children.[87] It was hoped to utilize the quite dramatic differences in social composition between wards to achieve a group of respondents from a range of socio-economic backgrounds.

I do not wish to claim that somehow Hillingdon is a 'typical' microcosm of Britain as a whole. It has its own particular social and economic make-up which may have influenced the direction and content of research. Its location in the South East of England, for example, may be significant given growing economic and labour market inequalities between the regions.[88] At the time of fieldwork Hillingdon was an area of relative prosperity and low unemployment.[89] Although it has a higher proportion of service class workers than Britain as a whole, in comparison with the

rest of Outer London it has a low proportion of Professional and Managerial, and Other Non-Manual workers but is high in Skilled, Semi-Skilled and Un-Skilled Manual workers.[90]

The concentration of IT industries and IT related work in the South East has been highlighted by a range of commentators.[91] Home computers have been associated with inequalities between information-rich and information-poor regions. The nature and significance of such 'information-gaps' is, however, ill-defined.[92] Regional imbalances in computer ownership, for example, do not appear that significant.[93] A factor worth considering in the context of this thesis is that because of geographic variations in the labour market Hillingdon residents are more likely to have used computers at work and have the potential to use home computers for work related tasks than the population as a whole. The Borough contains a large number of IT related industries. Lying between London on the one hand and the 'M4 corridor' on the other, commuting residents also had access to IT related work.[94]

Finally it is worth noting that my research in Outer London is contextualized both by national statistics and access to detailed studies conducted in other regions.[95]

First steps

During the first phase of empirical work contact was made with a number of organizations of computer users. This had three objectives. Firstly, those running the organizations were potential key informants about the development of home computing. Secondly the organizations were seen a possible way of contacting 'ordinary' computer users. Thirdly the organizations were an interesting phenomenon in their own right.[96]

During these early stages three long taped interviews were conducted with people

primarily considered key informants about the development of home computing. Two of these were with men who had been amongst some of the earliest computer hobbyists in Britain. Both of them were actively involved in running computer clubs and other user organizations. Another useful meeting was with a group of teenage boys who ran a computer fanzine.

Attempting to make contact with computer clubs was an interesting exercise in itself. Although information about the organizations was readily available, many of those contacted appeared to be defunct. A number of stimulating conversations were held with former members and organizers of the clubs. Most fruitful of all were discussions with two people involved in a now defunct group in the Hillingdon area (Club A). They also provided a mass of material including minutes of the club meetings, copies of the club magazine and other written and photographic records of group activities.

I was able to contact two very different but thriving groups of computer users. The first of these was a national organization which promotes the use of computer communications (Club B). I attended meetings and a series of lectures and workshops organized by the group. The second set of micro users met at a club held in a local computer shop (Club C). Its informality made it possible to chat with members and offered the opportunity of watching the predominantly male teenage membership actually using computers. In both cases participation in meetings and discussions with group members provided the raw material for extensive fieldnotes.

Interviews with club members

Computing organizations were used to generate pilot interviews with computer owners. Individual taped interviews were conducted with five teenagers and one adult who had attended the Clubs A and C. All but one of these interviews took place at the subjects' home.

With hindsight, involvement with the computing organizations and the interviews with members provided rich data. In particular they offered an insight into the worlds of adult hobbyists and male teenage computer users. As a piloting exercise the interviews offered important lessons. They increased confidence in the basic soundness of my approach. The informal structure worked well leading to illuminating and often lengthy discussions.[97] Interviews were able to generate material, particularly of an historical nature, which participant observation could not. The complexity of accounts of computer use also confirmed the necessity for a qualitative approach. In the light of piloting, the interview schedule was refined to give greater prominence to three issues: the ways in which computer use changes over time; the role of computing in activities outside of the home; and, finally, the life of the micro as a consumer good.

At this point in the research the contacts generated via clubs seemed to have important limitations. Membership was almost exclusively male and, in the case of Clubs A and C, predominantly teenage.[98] It proved very difficult to develop discussions with teenage club goers into interviews with other members of their families.[99] This was due in no small part to the boys' reluctance to involve other household members in the research. In retrospect, this appears as much a finding as a fault of this approach.[100] At the time, however, it was experienced only as a frustration and led to the ending of involvement with the clubs and club members. I was also concerned that club membership itself marked interviewees as atypical computer users. Subsequently this appeared a less important consideration since, as the household interviews confirmed, clubs appealed to a wider constituency than simply highly committed enthusiasts.[101]

Contacting households

I had decided that the bulk of fieldwork would be interviews with households. The criteria for selection was to be that at some point they had owned a micro. This is not such a clear-cut decision as it first appears since work in the clubs (and later fieldwork was to confirm this) showed that an interest in computing did not necessarily imply ownership of a micro. Also, as the discussion of statistics indicated, the definition of a 'home computer' is not a simple issue. I concluded the only valid definition was to allow respondents to decide for themselves what constituted a home computer.[102]

Involvement with the clubs showed that the means of contact might have an important effect on the kind of interviews I could conduct. Three considerations shaped strategy: the need to generate contacts quickly but in a controlled manner; the need to gain access to households and not simply individual users; and the ability to generate a broad range of different kinds of computer owners. The method chosen was to deliver a circular letter in selected parts of Hillingdon. Respondents were invited to return a slip to a freepost address expressing interest in the research. I hoped that delivering the letters by hand, my associations with Brunel University and use of a Freepost address would boost response rates.

DS

Given constraints of time and resources the letter method had a number of benefits. The approach generated contacts in a manageable way. As more subjects were required more circulars were delivered. I was able to select specific locations to circularize using the Hillingdon Census Atlas.[103] This enabled me, initially, to improve my chances of contacting home computer users by selecting relatively affluent areas. Later the same method was used to focus on areas with particular socio-economic characteristics in order to widen the range of respondents.

This method of contact, of all the possibilities considered, embraced the fewest preconceptions about micro owners and the nature of home computing and offered the possibility of exposure to a wide range of computing experiences. It was on this criteria that a number of other means of contacting home computer owners were deemed inadequate. Using a school to generate contacts, for example, would have only gained access to households with children of a particular age range and might also have given an educational slant to interviews. Similarly, 'snowballing' from one user to another might have only generated a particular kind of user from a particular social background. In addition, it would give less insight into the issue of social networks since by definition the study could only consider network members.[104]

The letters (see appendix one) attempted to qualify respondents as little as possible. Criteria for interview was to be simply that people had at some time had a computer in their home. The letter made it clear that I was interested in all levels and types of use and expertise. It made a point of inviting people who no longer used their computers to respond. This was done because I wished to explore non-use of or disappointment with the micro. The letter made it clear that the research concerned all members of households not simply computer users although the reply form did give people the option of responding as individuals rather than as household representatives.

The first stage of leafleting took place in two adjacent wards. Ward A had a high concentration of middle class household whereas Ward B was predominantly working class.[105] Response from Ward A was much higher than from Ward B but in both cases positive enough to indicate that this was a fruitful method of contacting households. Fifteen of the twenty eight households eventually interviewed were drawn from these areas. Initially, attempts were made to talk to all responding households. Partly because of my flexibility about how the interviews were conducted, the drop-out rate at this stage was very low.

At about the mid-point of fieldwork I took stock of the respondents already contacted and decided that, in order to encapsulate a wider range of social backgrounds and computing experiences, an element of selection needed to be built in to the process of generating further respondents. Four issues were of concern at this stage. The first was the lack of respondents from manual occupations. The second was the type of computer owned by respondents. Comparatively large numbers of PC and BBC micro owners, for example, had responded and conversely, given their popularity, Spectrum and Commodore 64 owners were under-represented. A third related to contacting households which would enable me to explore children's use of computers. Although almost all the households contacted had children, in many cases adults were the main users. Finally I wished to find households where the computer was no longer used. A three-pronged strategy was adopted to address these concerns. Additional leaflets were targeted in two other wards each with a high proportion of semi- or unskilled manual workers, the unemployed and local authority housing. Alterations were made to the content of the appeal for help. Two additional letters were produced. One explicitly addressed parents whose children had an interest in computing. A second letter was even more open-ended than the original making even less effort to qualify responses. Also, although this was limited by constraints of time and the difficulty of obtaining respondents in particular areas, an element of screening was introduced. Later replies from Ward A were not acted on. A number of other replies were not taken beyond initial contacts because of the type of computer owned or household composition.

Characteristics of respondents

A problem which confronts any small-scale qualitative study is the applicability of its findings to wider populations.[106] Because of this the 'typicality' of subjects is a crucial issue. Early attempts to make sense of home computing have been criticised precisely on these grounds.[107] As the discussions above show, this was an issue which preoccupied me during fieldwork. My approach had been to find

interviewees encapsulating a wide range of computing experiences with representatives of different social groups to facilitate the exploration of how computing is mediated by social relations and social contexts. A diverse set of respondents was especially useful because of my interest in the cultural event of the home computer boom. It enabled both the study of a common experience and also variations in that experience. The characteristics of each household are tabulated in appendix two.

Age, gender, class, race and household composition

Taken as a whole, the respondents include a broad age range of adults and children although only one couple were pensioners. The appeal for help was aimed at and responded to by adults (and a few older teenagers). Although this had the benefit of gaining access to households it had a bearing on the kind of computer users interviewed. In comparison with the population as a whole, there are a disproportionate number of households where an adult was an active user of the computer.[108] There were, however, enough households where children were main users to provide the basis for meaningful analysis. Interviews with teenagers conducted during the earlier stages of fieldwork also provided insight into this kind of household.

The method of contact offered wider access to female computer users than other techniques.[109] As the research was to confirm, however, computing is a gendered activity. Consequently I was able to speak to less women users than men. The interviews did allow the exploration of gender issues in a variety of ways. Because of the means of approach, I could interview women with little or no active interest in computing. The respondents also included a number of households where parents had purchased computers for their daughters. Two women - one a teenager and one middle aged - with a strong commitment to computing, were also illuminating not because of their representativeness but due to their atypicality.[110]

The group of respondents was less useful as a way of examining class and computing. As already indicated, I was troubled by the over-representation of service class households and the lack of working class households among the early interviewees. Attempts to rectify this were only partially successful. Although the number of intermediate households grew, a relatively small number of the interviewees had working class occupations. This, in part, reflects class differences in computer ownership. More significantly it seems to indicate the unwillingness of working class parents to participate in the research. This appears to be a problem shared by other studies.[111]

All members of the households interviewed were white. This did not adequately reflect the ethnic make up of the area. Three of the teenager club goers interviewed were Asian. The participants contained a broad range of household types including two people living alone, lone parents and couples without children. This contrasts with some other studies which chose to concentrate exclusively on households with children.[112]

Variety of computing experience

I was also aware of certain differences between owners in their experience of computing which I wished to embrace within the group of interviewees.

Date of purchase In common with most qualitative work, the research was concerned with issues of process and chronology.[113] Because of its historical slant, however, longitudinal approaches to 'computer careers' were rejected in favour of comparisons in the experience of people whose involvement in computing had begun at different points in the home computer boom.[114] The interviewees include households whose first computer purchase had been in each year between 1981 and 1987. Two households where the micro had only been obtained a few months before the interview were particularly useful. Almost half had made additional computer purchases -

probably a higher proportion than amongst the population of computer owners as a whole.[115]

Type of machine From early in research I was aware of the possibility that different makes of computer might imply different approaches to computing and/or lead to different experiences of computing.[116] I was able to address this issue by interviewing people with a range of machines and varying amounts of peripherals and software. Interviewees owned both very popular micros and a few rarer ones which had been commercial failures. In comparison with the population of computer owners at that time, on average they owned more peripherals. Households owned a disproportionate number of both BBC micros and the 'PCs' such as those made by Amstrad.[117] This had advantages given predictions about shifts in the market towards higher capacity machines.[118] It would later allow me to reject arguments that my findings were invalidated by recent product and market developments.

Level of involvement with computing Participation in the research was particularly attractive to people with a high involvement with computing. For them the interview was a chance to share their interest in computing. The interviews do, however, encapsulate a wide range of experiences including households where the computer is rarely if ever used. Another feature of the respondents was that wide variations existed in levels of interest within households. Because of this I was able to speak to a relatively large number of people whose interest in computing was minimal or had declined.

Motivations for participating in the research

A major strength of the method used to contact respondents was that it generated subjects keen to cooperate with the research. Did respondents, however, by their

very desire to participate in the research mark themselves out as atypical of home computer owners as a whole? Awareness of this question lead me to consider their motivations.

Two characteristics of the make-up of the group of respondents seem significant. The first has already been mentioned - the appeal participation had to computing enthusiasts. Secondly, I suspect that, in the cases where children are the main users, parental involvement in their use may be greater than average. Taking part in the interview could itself be seen as an expression of this. A pointer in this direction is the high proportion of households where children had been given BBC micros - an expensive machine with a strong educational identity. While they should be noted, such characteristics do not invalidate the research or limit its applicability too gravely. One of the findings of the fieldwork was that most of those with a high involvement with computing did not constitute a distinct group with a separate experience of the micro. They could not be dismissed as 'hackers' or 'hobbyists'.

Interviewees were by no means all enthusiasts wishing to share their enthusiasm.[119] The motivations of those responding to the appeal for help are far more complex and varied. Another contrasting strand of respondents, for example, wished to express disappointment with the micro. Some saw me as a potential source of information who could help them or their children improve their computing. Other factors, cutting across commitment to computing, appear to have contributed to decisions to respond to my letter. Many respondents were interested in and wished to help Brunel University. A number knew students or staff. Another factor - an interesting finding in its own right - was that many respondents themselves saw home computing as an area requiring urgent study.

Interviewing

It had always been planned that interviews would be open-ended. Prior to and during piloting a rough interview schedule was constructed. This contained questions about: the household and its computers, the motivations and circumstances of computer purchase, patterns of computer use, computers and family life and people's expectations and evaluations of the micro. Also included were some general questions about the social impact of computers. A copy of this schedule is reproduced in appendix three but in practice it became little more than a check-list of issues to be covered in discussion.

As the project evolved new questions and issues arose which were broached in later interviews. In addition, given the variety of different experiences of computing, even within a single household, interviews needed to be tailored to particular circumstances. For example, discussions with parents and children or users and non users needed to be tackled differently. Increasingly I saw positive benefits in using a far more flexible strategy not relying on set questions or a single mode of questioning. Experience showed that often attempts to stick to the schedule would stifle rather than promote discussion. Especially in interviews with individuals, the best strategy for generating data was to start by prompting respondents to give an account of their computing and then clarify and add to it using the schedule. A wide range of additional questions would arise out of discussions and I would make a point of developing answers through elaboration. Despite this flexibility, interactions with respondents remained focused interviews - a conversation but with strategies and goals.[120]

Because of my concern to explore variations in use and to place computing within the context of the household the intention before starting this stage of fieldwork had been to talk to as many members of households as possible - not only those with a direct involvement with home computing. The question remained whether to do this by

interviewing households together or each member separately. Piloting and early experience showed it was difficult to set rigid rules about the interview format. As fieldwork continued it became clear that, in part, this could be explained by reference to the complexities of involvement in computing within the household. The difficulties sometimes experienced in turning contact with an individual computer user into interviews with entire households arose because not all household members shared an interest in the micro. It was common, for example, when group interviews had been arranged, to arrive at a home and find some household members missing.[121] I found myself reliant on particular 'gatekeepers' in order to arrange contacts with other members of the household.[122] These were often the keenest users of the micro. Although some were keen to involve other household members both they and myself sometimes found it hard to justify my talking to non-users. On other occasions some household members would drift in and out of meetings. Conversely, in other settings it was hard to conduct individual interviews - other members of the household would butt into discussions.

As the discussion above suggested, interviewing strategies had to be flexible in order to, on the one hand, deal with the variety of different computing experiences within the household and, on the other, the fact that not all household members felt equally qualified to discuss computing. A degree of pragmatism was required. Some household members, for example, would only participate in a group context. Although teenagers were keen contributors, younger children presented a problem. They were best talked to in group situations either with parents or older brothers and sisters. I was aware that the kind of data generated by individual and group interviews could be different but felt the two formats would complement each other and contribute to a rounded picture of the place of the computer in both personal and household projects.

The length of time spent with households varied considerably. The shortest amount of tape generated by a household was fifty minutes while another household produced over five hours of interviews. Typically they lasted between 1-2 hours. In addition to taped interviews, I would often spend considerable time with interviewees after the cassette recorder was turned off. Sometimes this was confined to further conversation about computing or my research. Frequently I would be shown the respondents' computers and they would demonstrate some of the things they did on it. Initially I had ignored respondents' cues to do this but as the fieldwork evolved I came to see this as a valuable part of the research. It offered a chance to continue conversations informally and more significantly it gave an insight into what people meant by 'doing computing'. At the very least I began to ask to see the location of the micro which provided clues to its use and place within domestic life. As with interviews, my own knowledge of computing helped me keep discussions going and understand the implications of what was being said and demonstrated.

Another feature which emerged during household interviews was an element of overlap with earlier work with computer club members. Two members of the households had been involved in the Clubs A and C. Many respondents had also used the shop where Club C was based.

The evolution of the project during fieldwork

One of the characteristics of a qualitative methodology is flexibility in the face of practical obstacles and empirical findings. This allows increased emphasis on particular issues as the research advances.[123] Fieldwork followed this pattern evolving for a mixture of pragmatic and academic reasons.

Fieldwork was more time consuming than initially envisaged. The first drain on time related to contacting households. This became more pressing as I began to deliberately circulate areas where there was likely to be a low response rate and when an element of screening was introduced so that not all those who replied were interviewed. Another set of problems related, ironically, to the success of interviews at generating data. Many were far longer than the expected hour. This impinged on time not so much because of the face to face contact with respondents but because of the effort required to transcribe tapes of sometimes over two hours in length. Other note taking and initial analysis of the interviews, which was on-going during fieldwork, also proved a painstaking process.

As fieldwork continued I had to deal with the paradox that individual interviews often generated more material than group interviews. While I became increasingly attracted to one-to-one meetings this created a far bigger workload since the resulting tapes of each interview were frequently longer than interviews with all household members together. In addition, talking to all household members normally involved more than one visit to the home. Returning to households proved time consuming not only in terms of interviewing and writing up but also simply because of the nuts and bolts of setting up further visits. Although valuable, there was clearly an element of diminishing returns with additional interviews both in terms of the data generated and the access given.

Initially I had planned to interview around thirty households. This had been a rather arbitrary choice designed to balance the requirements of gaining as wide a group of respondents as possible with practical limitations on the research process. Constraints of time and resources, however, meant that mid-way through household fieldwork a major decision had to be taken as to how to keep the project to manageable proportions. Two alternative directions offered themselves. The first was to cut down the number of households interviewed and return to those already contacted for further discussions. The second approach, which I selected, was to

worry less about talking to all members of all households in order to interview a wider range of computer owners. A mixture of practical and empirical considerations lead to a decision to limit further interviews to single visits to households.

Although efforts were made to talk to as many household members as possible, sometimes only computer users were interviewed. Eventually twenty seven households were researched.[124] A list of the interviews is included in appendix four.

To understand this shift we must consider the kind of data that was emerging from fieldwork. While interviews were generating important data about the place of the home computer within households, my approach could not hope to produce as rich or rounded picture of family life as 'ethnographic' studies of ICT use which took the household as their central concern.[125] In addition, because I gained entry to households as someone wishing to talk about computing I sometimes had limited access to those who felt they had little involvement with the micro. At least as important, however, as these negatives in shaping the direction of research were new issues which emerged out the early empirical work. These related to the complexities of what computing as an activity entailed and how people evaluated it.

The validity of my interest in the influence of the discourses of the boom on computer purchase and use was confirmed. Interviews revealed, however, that the boom was not simply about the relationship between households and a wider culture. This was mediated by participation in various social worlds. The social character of computing became an important concern. Initially I had felt frustrated by the seeming inability of the interviews to generate clear-cut data about how much people used computers and what they used them for. Other ambiguities revealed by interviews related to classifications of types of use and evaluations of usefulness. Later I came to see these complexities as a finding rather than a fault of the study - pointing to the need for greater reflexivity when considering categories of use, ownership and involvement and how these developed over time.

The Interview Data

This section discusses the status of the data generated by fieldwork, its analysis and writing up.

Implications of the methodology for the kind of data generated

In retrospect, a number of factors influenced the kind of data generated from interviews. These, in part, relate to people's own expectations of the interview. There were actually considerable variations in the preconceptions they brought to our meetings. Differences existed in their expectations of the format of the interview, for example. I have already discussed differences in whether people expected to be interviewed together or alone and if they felt all members of the household had something to contribute to discussions. There were also differences in the degree of formality people expected in the interview.[126] Some felt happiest with a formal meeting in which they answered set questions as clearly and concisely as possible. Others, particularly keen users of computers, would rather the interview evolved into an informal talk about computing. Differences also existed in expectations of the subject-matter of the interview. *Some respondents, for example, were clearly disappointed that the interview was not primarily of a technical nature - in which we could exchange advice about computing.*

That interviews, largely at the behest of respondents, could differ in format and content should sensitize us to the way that preconceptions could influence the kind of data generated by interviews. Three issues seem particularly important in this respect:

1) The way households were approached for help contributed to what people expected or were prepared to talk about. Access granted to researchers is never unconditional. In many cases there was an implicit bargain that talk would centre on computers. In some interviews, for example, there were problems with developing discussions about family relationships with respondents very far when, in their eyes, I had negotiated entry to their homes to discuss computing.

2) A factor that any researcher has to consider is the impact of the way subjects perceive him or her on the direction and content of interviews.[127] My comparative youth, that I came from what was perceived as a technical university and my knowledge of computers all contributed to many respondents seeing me as an expert in computing. For enthusiasts I was someone to share computer talk with. Although this was helpful in generating data on computing it sometimes got in the way of other lines of investigation, notably attempts to involve non-users in interviews. Another complication relating to my perceived role as an expert was that people often felt uneasy about answering questions that they believed I was in a better position to answer than they were - such as general questions about the social impact of computing.

While I was often perceived as an expert on computing this did not mean that computer users necessarily saw me as 'one of them.' During fieldwork I became increasingly aware of the existence of different computing domains and identities. The way I was placed by respondents in relation to these effected how they interacted with me. My identification as an expert but not a keen games player or computing hobbyist may have influenced the character of interviews. Possibly it contributed to a note of self-justification in some respondents' replies and an emphasis on utilitarian explanations of use.

My age and gender may also have influenced the kinds of data I could collect.[128] It meant that to teenagers I was to be responded to as an adult. More importantly it may have made it more difficult to talk to women without a direct interest in computers although it should be noted that Margaret Shotton's study found similar problems in involving the female partners of male computing enthusiasts.

3) An implication of the relative informality of the approach was its dependence on what people felt able to or keen to talk about. Respondents influenced interview content by the amount of time they devoted to particular questions and how they answered them. Often people devoted long periods to topics they were themselves interested in. They were more at ease and more forthcoming about some issues than they were about others. A finding in itself was that there were some things people were well practiced at talking about. An example of this is the detail with which people described purchases and provided product evaluations. They were less articulate about other issues which they were less used to thinking about and discussing. While questions about who uses a computer or how much time they spend using it were 'strange', perhaps asking interviewees to think about something for the first time, accounts of purchases and evaluations of products are part of the currency of conversation among computer owners.

Empirical data supported from other sources

Confidence in the generalizability of findings from my small sample study was improved by the increasing availability, after fieldwork, of other sources which support and expand the data.

A number of empirical works have also used relatively small and diverse groups of computer users in order to boost understanding of the experience of computing. In the mid 1980s Murdock et al complimented quantitative study of ownership and use with a series of in-depth interviews with computer owning households. Jane Wheelock

conducted a study of thirty nine families with micros in the North East of England in the late 1980s although this appears to be predominantly quantitative in approach. A very different perspective comes from Riva Shapiro's in-depth study of forty six computer users in the USA based on interviews conducted between 1982 and 1986. Although to those outside interactionist paradigm Shapiro's work may appear low on analysis, it is full of detail.[129]

Some studies concentrate on particular aspects of home computing and thus compliment this study by filling gaps in the empirical data. In addition to analysis of the sphere of production, Leslie Haddon, for example, also conducted some research with computer users. This was based largely outside of the home in schools and computer clubs. The focus was on teenage users in general and games playing in particular. He also conducted a small study of female users. Sue Bains is currently engaged in research into home computer use in distance learning.[130] Margaret Shotton's study of 'dependent' computer users conducted in the mid 1980s also involved interviews with a control group of non-dependent users and additional work in schools.[131] Once again, while her work comes from a very different, psychological, perspective it contains much useful data.

Finally a number of recently published studies mean that tentative international comparisons about home computing can be made.[132]

The status of interview data

An issue whose implications I had not fully realised before fieldwork was the extent to which interviews would ask people to engage in reminiscence. Respondents' accounts discussed decisions and actions some of which had taken place as long as seven years before. They were asked to recollect not only events but also motivations. It was clear, for example, that some people were self-conscious about their hopes and expectations for computing at the time of purchasing a micro.

Hindsight is a particularly important factor given the changes which characterized both individual 'computer careers' and the development of computing as a whole. An example of the contradictions thrown up by this is that people sometimes attempted to explain and express their past intentions in terms of types of use and criteria for evaluation which were not yet fully constructed at the time when they purchased a micro.

Hindsight relates to a more general issue about the status of interview accounts - how individuals or households use interviews to present a particular versions of events and a particular identity. A interesting dimension of this was shown by two respondents (Mr F11 and Mr F26) who had prepared notes before the meeting. The correspondence between the kind of issues covered in the notes and those which I wished to discuss was reassuring. The notes did show, however, the lengths gone to by people in order to 'get the story right.' As has already been remarked, people were not talking about many of the subjects covered in discussion for the first time. I often felt I was listening to arguments which had been rehearsed many times before. It was not uncommon for respondents to offer a reasoned defensive about the amount or type of their computer use, for example.

While recollection, hindsight and justification all influenced interview accounts this does not invalidate them. On the contrary, fieldwork showed the limitations of other supposedly more scientific approaches to understanding home computing. As later chapters will argue, attempts to measure use via a snap-shot of a typical day or week either by survey or diary miss two fundamental dimensions of the experience of computing revealed by interviews. Firstly, these use patterns do not remain stable but evolve and fluctuate. Secondly, involvement with computing cannot be measured solely in terms of time spent at the keyboard of a micro. In addition fieldwork was to show considerable problems with interpreting the very typologies of use on which many attempts to quantifying computer use rest.

It would also be wrong to see the interviews as providing a seamless account of motivations, actions and events. Initially I was frustrated by contradictions and inconsistencies in respondents' descriptions and explanations of use. Gradually, however, I began to see these as findings in themselves. Rather than judging one account or statement against another, the task was to reveal and explain the contradictions. As David Silverman writes:

" ... interview data display cultural realities which are neither biased or accurate, but simply 'real.'"[133]

Each account and context must be understood on its own terms even if I (as interviewees themselves did) also understand it as part of a more general experience.[134] The justification of computing and the terms in which it was couched became a central theme of chapter seven. Similarly, some of the problems of fieldwork - setting up interviews and so on - eventually generated some of the most important insights.

While writing up, I began to see interview accounts as attempts to make sense of the experience of home computing both at a personal level and a more general one. In doing so interviewees were engaging in many of the same processes I was and were confronted by many of the same problems.

Analysis and organization of interview data

Interviews with households and with club contacts were taped. In addition, notes were taken immediately after meetings. These concerned my initial thoughts about the interview, details of untaped conversations and other details such as the location of the computer. Most tapes were transcribed and analysed as soon as was feasible after the interview. In addition to producing a written record of the meeting, I made a note of and indexed points of interest that arose and themes which

had cropped up previously in other interviews. The material was also used to generate questions to be used in later interviews.

In developing my thesis I have quite consciously avoided making 'naturalistic' claims of being engaged in simple cultural description.[135] When starting to write up the objective was to develop an analytical discussion based on concepts emerging from the study. Analysis of the notes generated from interviews and other material led to the formulation of initial chapter plans. Before finally writing each empirical chapter interview material was systematically reorganized and reanalysed under the headings of the chapter plan in order to ensure that an accurate picture of the content of all interviews was contained in the final product.

An element of simple counting is sometimes used in the analysis although I am aware of the limitations of seeing the group as a one-to-one mirror of the population as a whole so wish to keep percentages and tables to a minimum.[136] In looking at the data I attempted to establish patterns of events and opinions - seeking to identify both shared and divergent experiences. Counting is most powerful when pointing to things in common across a diverse set of respondents. It is sometimes useful in identifying distinct types or trajectories of computer use.

Especially in the next chapter and throughout the rest of the thesis interview material is supported by other material I have collected during research. It includes historical data on the boom and secondary quantitative and qualitative research. Although aware of some of the limitations of 'triangulation' using multiple sources, I believe that this data plays a crucial role in contextualizing and increasing confidence in the analysis of household interviews.[137] I am certainly not alone in seeking to combine qualitative and quantitative material. [138] In fact, one of the key themes of the thesis is the relationship between personal experience and wider cultural trends. It is for this reason that empirical analysis begins with a historical account of the British home computer boom.

Chapter Five

Elements of the British Home Computer Boom

As the last chapter noted, it is surprisingly difficult to accurately assess the number of households with computers in Britain. What is clear is that prior to 1980 the numbers of home computers were negligible and that the market for such machines grew very rapidly in the period between 1980 and 1985. Estimates of proportions of homes with micros by the end of 1985 vary between 15% and 24%. Statistical sources may differ in their detail but all bear testimony to a similar dramatic trend - a lot of computers were sold in a short space of time.[1] Survey data also indicates that home computer ownership initially predominated in Service Class households. By the mid-eighties, however, home computer ownership was spreading down the social scale.[2]

That millions of people decided to buy a home computer in the space of a few short years is a phenomenon worthy of explanation. An objective of this thesis is to show how the development of home computing is a cultural process not simply a technological one. This is illustrated by the way that much about the British home computer 'boom' appears to be unique.[3]

The chapters that follow will concentrate on the development of home computing at the (if the pun can be pardoned) 'micro' level - focusing on the 'computer careers' of individuals, households and social networks. As the last chapter argued, however, empirical data on computer ownership and use must be placed in the context of both developments in the sphere of production and a broad 'socio-cultural setting' including the powerful discourses which mediated home computing. This chapter, therefore, considers how the technologies, institutions and activities of

home computing developed in the public domain. In this account of the boom the emphasis is on the period up until 1986. This was a key formative period in the history of home computing. The story is brought up to date later.

The chapter is divided into three sections, reflecting distinct elements of the home computer boom. Section one considers the development of home micro in the sphere of production. It is then necessary to add two further dimensions which are not normally included in such histories. The second section looks at organizations in which early computer users actively engaged in the development and promotion of home computing. Section three places the first two elements of the chapter in a wider context. It argues that the home computer boom was a 'public event' which was as much about the discourses which surround computers, home or otherwise, as it was about their purchase and use.

The Development of Home Computing in the Sphere of Production

This section shows that the home computer has been a shifting and contested product category. It uses a wide definition of production which includes the marketing and promotion of computers.[4] In addition to the manufacture of artefacts, the history of home computing involves the development of associated activities, products and institutions.

A shifting and problematic product

It would be easy to use the statistical evidence of the spectacular spread of home computers in Britain to paint a picture of the successful 'adoption' or 'diffusion' of a new technology. The 'home computer' referred to in the statistics, however, encapsulates a wide range of very different products - everything from a Sinclair ZX80 with 1K of memory to an Amstrad PC with disc drives and printer.[5] Hindsight should not lead us to assume that the development of the home computer as a product

category was inevitable. Bald sales figures mask a process of considerable complexity. The home computer has been a shifting and ambiguous product category. If we look back to 1980 we see that the form the home computer was to take, and indeed that demand existed for such a product, was far from certain. Even in the 1980s when demand for home computers was greatest, the micro remained a problematic product for manufacturers, marketers and commentators. Debate and uncertainty about what the home computer should be and, indeed, if such a product was viable continued.

In his detailed study of home computer products and markets, Leslie Haddon makes the point that the development of microelectronics and the significance of the microcomputer was not easy to predict.[6] Micros began to appear in work places in the late 1970s but there was nothing inevitable about them becoming consumer goods. It was by no means obvious to most within the electronics/computer industry or indeed to observers of those sectors that something called a 'home computer' would come into existence. As Batty writes:

" ... the history of personal computers is full of stories about those closest to the industry in the 1970s rejecting the idea of the personal computer as even having a market among hobbyists." [7]

A number of different technological and product lineages can be identified as antecedents of contemporary home computing.[8] A key element in the early history of the 'home computer' as artefact was, however, the development and sale of kit computers. Such machines began to be commercially marketed in the USA in 1975. It was not until 1977 that cheaper and less powerful versions of such kits became available in this country.[9] Both the producers and buyers of these machines came out of a tradition of electronics 'hobbyism'. Makers of computer kits had previously marketed kits and components for hi-fi and ham radio enthusiasts. Constructors of these early kits were often involved in a pre-existing electronics

hobby culture. Many of the computer 'hobbyists' also used computers at work and some were themselves employed in the computer industry. The kits embodied a particular approach to the computer. The point was to construct a computer and understand how it worked. The level of demand for these early hobby machines both in Britain and the US was unexpected.[10] Clive Sinclair, for example, who was often later credited with establishing and expanding the hobby market in Britain was actually slow to see its potential.[11]

Sinclair was an entrepreneur with a long involvement with hobbyist electronics. He used aggressive sales methods to sell kits and components to radio and hi-fi enthusiasts.[24] Sinclair had a chequered history of attempting to transfer products from hobbyist to mass markets, selling cheap 'hi-tech' products using large advertising budgets and mail order techniques. Inexpensive versions of the digital watch, pocket calculator and miniature televisions had been introduced to the readers of the Sunday papers:

" Sinclair's success had always been based on being first with products, often aimed at a market that didn't know it existed." [13]

A recurrent theme was the use of futuristic imagery in his advertisements for consumer electronics. A biographer tells us of the way Sinclair sold amplifiers in the 1960s:

" The X-20 continued to be a lead item in June and July advertisements, when a double-page spread trumpeted 'in step with the SPACE AGE!' in rather wobbly lettering backed by a drawing of the Post Office Tower." [14]

Unexpectedly high sales of Sinclair kits in the late 1970s led members of his company to speculate on the possibility of widening the appeal of such products. In January 1980 Sinclair launched the first product to be named a 'home computer'. The

ZX80 sold for £99.95, or £79 in kit form, and was intended both for the existing group of computer hobbyists and for a wider audience. The rhetoric of the advertising was to be concerned with making computing accessible and affordable to 'everyman'. There were, however, considerable doubts as to whether such a potential mass market existed. Dale recounts the worries of those involved in marketing the machine:

" Sinclair was convinced that people could be persuaded to buy the ZX80 but how to persuade them was a problem. The image of the computer at that time was somewhat Big Brother: clinical, air-conditioned surroundings; huge cabinets with reels of magnetic tape whirring to and fro. How would people relate such a frightening piece of equipment to the ZX80? Why would they want to buy it for the home? Why would they want to buy it at all? It was a very challenging marketing task." [15]

This reflects a more general uncertainty about the viability of a 'home computer'. Once the hobby market for computers was established there was considerable debate within the industry as to whether sales could expand into the 'main stream'. This doubt and debate persisted even after the success of the ZX80. The appearance and popularity of the home computer surprised and puzzled many consumer electronics firms and commentators. This set a pattern which persisted during the 1980s. Throughout the boom in sales, economic viability "was a recurring worry for all the producers of the home computer." [16] Producers disagreed about what direction its development should take and, indeed, whether it had a long term future as a consumer electronic. They were confronted with the recurrent problem of "imaginatively constructing a market which does not exist yet." [17]

The ZX80 and its successor the ZX81 (which was both technically superior and cheaper) were the first computers to find a mass market outside of the work place in Britain. While they established a wider appeal, they had much in common with the earlier hobby machines. The computers had very low technical capabilities and were not renowned for their reliability. [18] They were not designed to run pre-produced

software. The machines were clearly, in Haddon's phrase, 'self-referential' in that their only use would be as a means to teach the user how they worked.

" There were some changes from his previous products - for example, the industrial design was chosen on the basis of having more marketing appeal. And the machine was intended to be more accessible, beyond an electronics elite, to 'Everyman'.... But essentially Sinclair machines invited buyers to explore the world of home computing, while advertising stressed the need to keep up with developments in technology. In design terms, such exploration was virtually the only 'application' feasible with the limited capacity of the first machines." [19]

They were essentially a 'hobbyist' product which found a far wider audience than the equivalent radio or hi-fi goods. Significantly, the claims of these machines to be computers did not go uncontested. As Adamson and Kennedy write:

" Sir Clive's marketing achievement was to downgrade the 'concept' of a computer to a point where it could claim to provide one for less than the magical £100 mark. To this end, efficient keyboards and monitors, useful amounts of memory, effective filing and storage systems and the like were stripped away, to leave an affordable facsimile of a 'computer'." [20]

As they differed so markedly from what was normally accepted as a computer, much attention was given to persuading the public that the Sinclair machines deserved that label. This involved some dubious claims in the advertising copy:

" The ZX80 weighs just 12 ounces, yet it has all the capability of machines many times its size and price. Programmed in BASIC, it can do anything from playing chess to running a power station." [21]

Ironically it was the lack of apparent function that made the establishment of the ZX80s credibility as a computer essential. It was important for such machines to claim the status of computer since being computers was their primary function. They were valued not for what they could do but because of their embodiment of 'computerness' - their association with the computers of the work place and future predictions.[22]

The prominence of Sinclair is evidence of a distinctively British history of home computer products and producers. In the early 1980s a home computer hardware and software industry developed largely serving the UK market.[23] In comparison with the USA, two characteristics, evident in the early Sinclair machines, remained an important part of the British experience. Firstly, although producers began to market more powerful machines which could run commercially produced software, the influence of ^{the} computer's hobbyist roots remained strong. Home computers continued to be marketed as a way of understanding and learning about computing.[24] Although some talked of the 'family computer', males, especially teenage boys were seen as the driving force behind sales. This was in marked contrast to the USA, ~~where~~ more expensive computers were targeted at heads of households. A second feature of the British market was that micros continued to be sold at a lower price and technical specification than their counterparts in the USA. Typical systems involved cassette storage and use of TV as monitor. It was only in mid 1980s that disc drive based systems became established in the home market.[25] Cassettes remained a significant media into the 1990s.

The development of the home computer should be understood in conjunction with a parallel history of the spread of microcomputers into the work place. A key difference between the British and American experience lies in the relationship between machines developed and marketed for the home market and the so-called 'personal computer'. It is harder to distinguish the history of personal computer from that of home computer in the USA than in Britain.[26] During the 1980s, as

personal computers spread into the working environment, they became, for many, the benchmark against which to judge home computers. The distinctiveness of the 'home computer' as a product category left it vulnerable to accusations of not being a 'proper' computer long after its technical capacities had been increased.

" Many people thought them to be a bit makeshift, not proper computers after all. This contrast with the personal computer - the definer of the 'real' micro, in appearance, convenience and capabilities - was continually to threaten its home versions with the status of a toy, regardless of which firm made them." [27]

The market for home computers in Britain between 1980 and 1985 was fast-growing and fast-changing. By 1983 around thirty different machines were available. Those wishing to buy popular brands faced shortages in the shops, long waits as announced products appeared late and faulty goods. Before Christmas 1983 the press reported a 'famine' of computers in the shops. [28] Sinclair machines, particularly the new Spectrum - a more powerful machine with the potential to run commercially produced software - continued to take a large chunk of the market. Even by 1985 around 40% of all machines in Britain were Sinclair and a quarter of all machines were Spectrum's. Two other producers took the lion share of the market along with Sinclair during the first half of the 1980s - Commodore and Acorn. All three companies continued to have large user bases into the 1990s. [29]

Commodore's British strategy was different from Sinclair's and indeed from the one they pursued in the US market. [30] The Vic 20 and its successor the Commodore 64 were, like the Sinclair machines 'engineered down' to meet a target price, but to a higher specification. Less emphasis was placed on the technical aspects of the machines in advertising and instead the computers were promoted as 'software players'. Marketing highlighted the machines' potential to perform a wide variety of different roles within the household as a centre of family entertainment, education and administration using commercially produced software packages. Many of

these packages were to be computer games but Commodore did not emphasise this. Aware of the selling power of games, they were, however, keen to promote them as only one use amongst many in order to exploit the educational connotations of computing and to counter the associations games had with the twilight world of arcades.

Acorn produced the BBC range of micros. More expensive than their major competitors, the BBC machines had greater technical specifications and more potential for expansion. Acorn profited from their association with the BBC computer literacy initiatives and the popularity of the machine in schools. The BBC Micro and the cheaper Electron were marketed as software players as well as a 'serious' computer with which to learn about computing. Acorn took the notion of multiple family use of the home computer more seriously in their marketing than the other major producers.[31]

The design and marketing of Sinclair, Commodore and Acorn computers each reflected different 'underlying conceptions' - versions of what the home computer was, who its users should be and what they would use the home computer for.[32] As the markets and technologies of home computing developed, producers attempted to understand the actual and potential demand for their products. A number of different 'models of computing' dominated their discussions. These involved notions of both actual and potential 'uses' and users of home computers. Talk was of 'games players', 'educational uses', 'programming' and 'working from home'.[33] The emergence of models of computing is a complex process and one that will be discussed in greater detail in later chapters from the stand-point of home computer consumers.

Particular machines and manufacturers came to be associated with particular kinds of user and use but producers were not fully in control of this process. They were surprised and, on occasions, discomfited by the models of computing that came to be linked with their products. While much effort was put into promoting the BBC micro as a 'useful' family machine it became a favourite of computer hobbyists. Commodore

and Sinclair were ambivalent about the great popularity of their machines as players of commercially produced games software.[34]

Sinclair, Commodore and Acorn achieved large sales in an atmosphere of rapid change and considerable uncertainty. The uncertainty and debate amongst producers which had characterized the early stages of the development of the home computer as a product category had not disappeared by the mid-1980s. Despite its popularity, the home computer has proved problematic for producers.[35] Partly due to an apparent slump of sales in 1985 and the economic problems which accompanied it, the sphere of production was in turmoil. How should the product develop? Would a market exist for more powerful but expensive machines? In short, issues about what form the computer should take, what it was for and who should use it were not fully resolved. Doubts continued to be expressed about the long-term viability of the home computer as a product category.[36]

Rather than a single clear-cut future of the micro being established, the second half of the 1980s saw producers follow a number of different strategies. The result was growing market segmentation based on different models of computing. Some products were now aimed squarely at a teenage games market. Commodore, Acorn and (a new player) Atari launched more expensive 'general purpose' disc-based machines. New manufacturers brought with them new visions of what the home computer should be. Amstrad pioneered the promotion of disc-based machines as word processors or personal computers to a home market.[37]

Chapter two argued that ideas about information technology in the home formed an integral part of many visions of the Information Technology Revolution. The home computer which emerged in reality was, however, very different from the predicted technology. Prophecies focused on the possibilities of using IT to aid the practical running of households, facilitate paid work from home or act as a family information and entertainment centre. Producers were themselves inspired by this

vision of an 'infrastructural' micro - an 'appliance' delivering practical benefits to the household.[38] This has, however, proved an elusive goal. One interesting illustration of this is that the technology envisaged in the predictive literature was valuable chiefly because of its communications capacities yet the early history of home computing is marked by the comparative failure of a number of policy and product initiatives based on computers as a communications medium. Experiments in home shopping and banking using IT failed to take off. The development of Prestel provided Britain with the first interactive videotext system in the world. Despite its potential as an information source and communication medium this technology did not provoke mass demand from either domestic or educational consumers. Domestic use of computer modems for communications was also slow to develop.[39]

Selling home computing

The production of the home computer involved developments in promotion, display and retailing.

A triumph of marketing?

Advertising played an important role in raising the profile of the home computer and introducing it to the public. Spending on advertising rose from around £400,000 in 1980 (almost all by Sinclair) to £13 million in 1984.[40] Computer adverts were often criticised for inaccuracy and prompted a large number of complaints to the Advertising Standards Authority.[41] As the last chapter noted, the emergence of a mass market for micros in the space of two or three years from a start of virtually nothing was often dismissed as a product of 'hype'. For some, the home computer was a classic case of the 'creation of demand.' Notes of caution should, however, be sounded in response to the idea that advertising made the home computer boom.

There are dangers in over-emphasising the coherence of promotional discourses used by manufacturers to sell home computers. It is also easy to exaggerate the amount of foresight and strategic planning that went into the development of the market.[42] It would also be wrong to over-estimate the resources of the companies involved in marketing the first home computers. In any case, effective advertising does not operate in a vacuum. It relies on the manipulation of existing beliefs and values. The very successful mail order adverts that Sinclair used to promote the ZX80 and ZX81, for example, consisted largely of a picture of the product and a technical specification. If the early Sinclair machines were a triumph of marketing then the triumph does not belong to the advertising copywriter but rather to the concept of mass marketing a cheap consumer electronic as a computer. This points to a more general question. When people talk about the home computer being "well marketed" are they really referring to much more than the standard and amount of advertising.[43]

The view of the British home computer boom as a marketing success is not uncontested. Some industry commentators suggested that long-term prospects of home computing were blighted by the way that it was marketed in the early years. Clive Sinclair, for example, was criticised in some sectors for 'setting low standards' and for putting off serious investors in new technology. It was said that machines such as the ZX80 "discouraged millions of people from ever buying another computer." [44] Others believed that emphasis on computer games had diverted micro from its true role as a serious 'infrastructural' machine.

Retailing

The development of home computer retailing is an integral part of the history of home computing. The use of mail order advertising in the mainstream press was a crucial early step.[45] A presence in the high street was the next stage in the promotion of the micro. *Large store chains had to be convinced of the viability of*

the computer as a mass consumer good. By 1984 high street shops including W H Smiths, Boots, Currys, Dixons, Debenhams, Lasky's, Tandy and John Menzies were all engaged in competition for a high volume/ low margin market in home computers.[46] Home computers came to occupy considerable physical space in a range of shops. Many had large display areas with computers left on ready to be tried out. This played an important role in the boom - raising the profile of home computing. Shops displayed the products and the activities of computing not only to those already involved but to the uninitiated. The high street became the place where the computer and the cultures of computing were most visible.

By 1983 the majority of machines were purchased from nonspecialist outlets but specialist computer shops still played a significant role in the development of home computing. Some of these establishments evolved from older shops which had catered for electronic hobbyists while others sprung up during the boom. In part they survived due to the lack of help and support offered to computer purchasers by the high street stores.[47] Specialist shops offered expertise and a more 'personal service'. Some shops sought to encourage home computing by running programming courses and computer clubs. This was part of an attempt to establish a close relationship with computer users.[48]

Another important aspect of the display and selling of home computing were computer exhibitions. Rodney Dale tells of one of the first such exhibitions:

" In January 1982 one Mike Johnstone organized a fair for companies selling products for Sinclair computers. Nearly 10,000 people turned up at Central Hall, Westminster, which has a capacity for only a few hundred; the police were called to control the crowds; seventy exhibitors took huge sums of money." [49]

Such events helped to publicise home computing and served as a meeting point for computer users. They continue to be popular. Organized on a money-making basis,

usually by a computer magazine, they charge both visitors for admission and the exhibitors. The majority of stands at the shows belong to producers and distributors of hardware, software and magazines with a few stands given to clubs and other user organizations. Companies often use the shows to launch new products. The most popular stands are those which allow people to try out new pieces of software and the stalls which sell cut-price equipment and software. The computer exhibition was the most common example of a whole range of events which brought home computer enthusiasts together and helped promote home computing.[50]

Associated Spheres of Production

The development of the home computer as a product category and as a mass consumer good was accompanied by the rise of a number of associated spheres of production. The success of the early micros prompted the growth of a range of 'cottage industries' producing peripherals and add-ons, software utilities, books and magazines. Two spheres of production took on a particular significance - software and publishing. These spheres cannot be understood as simply being dependent on the development of home computer hardware - they played an active role in shaping home computing.[51]

Software

The majority of early micros did not have the technical capacities to run software packages. It is not until 1982 that the beginnings can be identified of an indigenous home computer software industry - geared to British machines with a low specification and cassette storage. By 1984, however, it was estimated that home computer software sales accounted for around a quarter of the value of sales of recorded media in Britain.[52] 'Cottage industries' had been overtaken by larger and better organized producers.

The development of home computer software, like that of the hardware, can be understood in terms of competing notions of what the home computer was for and who home computer users were.[53] A number of different models of computing are evident in the categories that came to describe software such as 'games', 'educational', 'home management', 'graphics', 'utilities', 'music' and 'word processing'.

Computers came to be purchased in order to 'use' software. The software producers did not have a neutral role in this process. They promoted particular conceptions of computing. Notably, one particular type of software came to dominate the home market - games.[54] This sector had the advantage of an already existing pool of products, expertise, conventions and consumers developed for arcades and video games consoles. Computer games emerged as a 'cultural industry' with charts and latest releases like pop music. The dominance of games is highlighted by the failure of a number of software companies to develop and sell 'educational' and more 'serious' software for the home market.

The software industry had, therefore, a considerable influence on the direction of the development of the home computer. Manufacturers had to adjust to accommodate the rise of games playing as a model of computing. This is not something they always felt entirely happy with.[55] The development of a thriving market in software also contributed to the success and failure of various machines. It became important for manufacturers to have a pool of software to attract purchasers. The decisions of software producers as to which machines to write software for contributed to the commercial success or failure of hardware and both reflected and reinforced the identities of various computers. The Commodore machines, for example, became closely identified with games software while 'educational' and 'serious' software was most likely to appear on the Acorn machines.

Publishing

Another important sphere of production associated with home computing was

computer related publishing. A feature of the boom was the arrival of computer related books and magazines on the shelves of newsagents, book shops and libraries. A large number of how-to books and manuals on computing were marketed and this continues to be a significant branch of the book trade. This is part of a more general phenomenon of the popularity of books about IT discussed in an earlier chapter. Even more significant was the growth in the production and popularity of computer magazines.[56]

In Britain the first computer hobbyist periodicals appeared in 1978. By the mid 1980s a large magazine sector had been established which rivalled women's magazines in its popularity. Magazines played an important role in the growth of interest in computing. They introduced people to the activity of computing and increased awareness of products.[57] Publications also reported developments in the home computer industry in detail. A large proportion of the content of magazines involved and continues to involve the discussion of products. This emphasis on product evaluation has parallels with other interest centred publications such as hi-fi, photography and car magazines. Advertising in the magazines, both lavish announcements of new products and lists of mail order bargains, is often studied as avidly as the editorial.

Magazines had an active role in the processes of construction of 'models of computing'. [58] They at once responded to notions of who computer users were and what the home computer was for and helped to create these notions. While the early 'hobbyist' magazines attempted to provide general coverage of the world of computing, newer magazines began to specialize in coverage of particular brands of computer and/or particular types of computing such as games playing, hobbyist, 'serious' PC use or educational use. Even when a more general approach was used, magazines tended to compartmentalize activities by, for example, giving over different sections of the publication to the various types of use.

In common with other interest/consumption based magazines, computer publications play an important role as arbiters of taste among readers. Not only are they influential in their opinion of particular products but they are involved in the construction of criteria of judgement of different products. Hobbyist publications promoted, for example, the use of abstract technical measures of hardware and software performance. Another interesting case is the way that a number of the most popular games-orientated magazines developed a formal system of scoring new games on a series of different criteria such as graphics, sound and originality. Field work gave testimony to the influence of these measures on users' own methods of evaluating games.[59]

Development of Computer-Related Activities

So far, this chapter has offered a production based account of the history of the micro. There is a need to widen the parameters of study to understand the development of home computing in the public domain. This section turns the spotlight on a usually neglected element in that history - the way many computer owners actively encouraged others to follow their example. During the boom a range of comparatively small-scale organizations sprung up, notably clubs, which supported micro use. Writing about the US experience, Kling and Iacono view the activities of such computer clubs as part of a 'Computer-Based Social Movement' which aimed to promote the widest possible use of micros.[60] While this may over-estimate the coherence and unity of conceptions of computing on offer, it does sensitize us to the role that, particularly early home computer owners, had in spreading the gospel of computing to a wider public.

As early as 1977 a well attended symposium on hobby computing was held in Britain. During the early to mid 1980s a whole range of user organizations sought to facilitate and promote home computing. These were at once results of and promoters of the growth of interest in home computers. Following a pattern established with

earlier enthusiasms such as amateur radio and electronics, computer hobbyists set up computer clubs.[61] As interest in computing grew, existing clubs began to attract a new membership and new clubs developed around the country. Clubs were encouraged by magazines and manufacturers keen to promote computing. National and regional organizations were set up to co-ordinate their activities, develop membership and aid the establishment of new clubs. In addition a whole range of one-off computing events were also organized. These included library talks, evening classes and programming courses run by computer shops. Evidence from my own work and that of others in the field is that such organizations and events touched a constituency far wider than most hobbyist activities.[62]

The term 'computer club' encapsulates a wide range of organizations and activities. Some clubs were organized around particular makes of computer while others were location or work place based. Teachers organized 'clubs' at lunch breaks or after school for pupils.[63] The early hobby clubs and their national and regional organizations set a pattern of formal rules and structure. Not all clubs could be said to be so formally constituted.[64] Some clubs had an organized programme of events while others were no more than unstructured gatherings of enthusiasts. Computer clubs were only the most formal of a whole range of social networks and out-of-home activities which grew up around computing. Less organized meeting points were school, shops, exhibitions, places of work and the homes of other users. The blurring of the distinction between clubs and other activities of computing is evident from the way that members of clubs often met away from the formal club nights.[65]

Given the variety of different forms computer clubs took, a number of notable characteristics appear to have been shared by them in the first half of the 1980s. Most significantly they all consciously set out to promote home computing. Clearly any organization has an interest in its own self-perpetuation, expanding and maintaining its membership. Many clubs went beyond this - seeing one of their

primary objectives as the spread of expertise in and enthusiasm for computing as widely as possible. They sought not only to promote computing per se but also particular definitions of the activity.

As interest in computing grew the early micro users looked outwards, keen to recruit new members to existing clubs or else to found new clubs. The origins of the new clubs often lead to a clear division between the founders and later recruits. In some cases clubs consisted of a core of hobbyists who saw their role as to pass on expertise to a wider public.[66] Members of the club would teach programming and help computer novices with technical problems. National initiatives such as 'Computown' saw hobbyists offering advice workshops for other users and seeking to give computing a wider public exposure.[67] Other clubs sought to attract a wider membership but the mission to educate and encourage new converts to computing remained. This was not without its problems and tensions emerged within the clubs between hobbyists and newer recruits.[68]

During field work a number of different computer clubs were visited and studied. A short account of two such organizations illustrates the variety of forms they took and their role in the home computer boom.[69] Despite obvious differences, they have in common a strong 'evangelical' element - a desire to educate people about computers and to promote 'awareness' and interest in them. To remark on this is not to reduce all that went on to this. In fact there was considerable tension between the intentions of the founders of the clubs and the practice of many of their members.

A local club

Club A, an example of a club set up to serve a particular locality, began in January

1984 and folded in December 1986.[70] It was one of a number of organizations which had been active in the area where I based my fieldwork.[71] Its genesis was a one-off meeting at the local library with a speaker who was the manager of a local computer shop and a demonstration of home computer equipment. The meeting attracted over seventy people - far more than was expected. Around half of those who attended were teenagers or younger and only a few women were present.[72] The instigator of the meeting and the club was the librarian who saw the club as part of his duty to inform and serve the community and to draw people into the library. Adults who attended the first meeting formed the basis of a club management committee. The club met once a month at the library. It issued membership cards, got discounts from computer shops and produced a magazine for members. The club was publicised in schools, libraries and shops.

The club was initially aimed at both computer owners and those with a general interest in computing. For committee members, the club had a mission to educate its members and to encourage an awareness of the application of computing outside of the sphere of leisure. The minutes of the inaugural committee meeting outline the aims of the club:

" a) The development of computer skills b) General awareness of computers and how they affect our lives c) Trips and outings d) Entertainment for all members."

The constitution of the club stated that:

" The object of the club is to foster the development and interest of computer skills in today's society."

The committee structure indicates that the club was intended to be more than a meeting place for computer enthusiasts. In particular, the committee and ordinary members appear separate - with adults trying to devise ways of mobilizing a

predominantly teenage membership. The original intention was to invite an outside speaker to every other meeting. The committee discussed plans for demonstrations of equipment, visits to computer installations and exhibitions and making contact with companies involved in computing. A speaker addressed them, for example, on 'The Uses of Computers Within the Construction Industry'. Those involved in setting up the club envisaged a strong element of training in its work. They appointed a 'Technical Adviser' who was to help teach programming skills and help with general technical problems experienced by members.[73] Club members were encouraged to give talks or lessons on programming although these often frustrated participating adults because the young 'expert' teaching or his six or so pupils would soon lose interest.

For many of the adult members of the club its initial aims were frustrated by the interest of teenage members in computer games.[74] While those running the club sought structured meetings and to promote 'serious' uses of computers and formalise the exchange of expertise, younger members enjoyed the club as an informal gathering where they could share their enthusiasm with contemporaries. When the club folded it was not through lack of support. It still attracted an enthusiastic core of male teenagers. For adult members, however, it was not fulfilling its original goals. Firstly they felt it was not promoting computing as a 'serious' activity. Secondly the static nature of the club membership meant that the objective of continually introducing new people to computing was not being achieved.

A national group

Club B shared the aim with Club A of broadening interest in computers. It was, however, a very different organization promoting a different conception of computing. The professed aim of Club B was 'networking computers and reaching out to people by computers'. It was an alliance between computer hobbyists and others, often working in the computer industry, interested in using computer communication

as part of a 'new age awakening'. Its small active membership held regular meetings, ran computer bulletin boards, produced newsletters and set up demonstrations of modems and networking. I became aware of them through their presence at a number of computer exhibitions from 1985 onwards.

The founders of Club B were motivated by a belief in the potential of computer communication. They sought to promote awareness of and expertise in the use of this technology. To do this they addressed not only a constituency of computer hobbyists but a wider audience. They had, for example, a heavy presence at the 1987 Festival of Mind Body and Spirit. Members demonstrated computers, conducted lectures, discussion groups and ran a networking game in which festival visitors were encouraged to participate. While all group members were united in a belief in the future significance of computer communications technology some went further and associated this faith with a New Age agenda.[75] One of the founders wrote of a possible future in the festival programme:

" ... individuals will extend their minds by connecting their computer to other computers serving as distributors of shared information and memory banks of unforeseeable wealth.... We will dial computers like we choose radio stations and TV channels, and we will create electronic communities around each machine: a green network, peace people, health enthusiasts - everybody will have 'their' machine and community, and everybody can move from one community to the other: it happens all in our minds, from the comfort of our home or office - on the road towards the global village!"

As with other computer organizations, it would be wrong to over-estimate the level of agreement about aims and objectives or their long-term success in achieving them. The alliance between New Age enthusiasts and technical hobbyists did not always appear a comfortable one. Despite the professed aim of bringing about social and personal transformation via computing much conversation both at meetings and on

computer bulletin boards remained of a technical nature. Similarly while much effort was made by some members to reach outside of the hobbyist community, meetings were unstructured discussions of technology inaccessible to outsiders.

A change in computer clubs

The evangelical zeal displayed by members of Club B was not typical by 1987. Some of the enthusiasts who became involved in Club B did so precisely because of their discontent with the state of the computer club movement in general. By the time I engaged in fieldwork there was considerable evidence of a decline in clubs. The story of Club A does not appear unusual. Many of the organizations which were contacted as part of the research were moribund. Interviews told stories of the decline of clubs or dissatisfaction with them. User initiatives to teach computing had waned.[76] Those organizations which persisted had changed in character. Shortly after Club A folded, for example, a new club was set up in the locality. The club was run by people who worked in the local computer shop and used their premises and equipment. The contrast between the Club C and the other clubs is interesting. It had no formal structure and lacked the pretensions of the other organizations.[77]

To conclude, the discussion of clubs throws up two themes which the thesis will return to later. Firstly it illustrates the social nature of home computing. Secondly it indicates the active role micro owners played in the construction and promotion of home computing. The discussion leaves open the question of what inspired the zeal and popularity of this kind of organization.

The Home Computer and the Information Technology Revolution

So far this chapter has identified a whole range of organizations and interests actively engaged in the production and promotion of home computing. It has also

argued that 'home computing' was a shifting and in many ways contested object for those involved in its production. What has not been done so far is to explain the level of demand and the direction the development of home computing took. What, for example, was the source of the appeal of the 'self-referential' machine? The rest of this chapter starts to shed light on this by placing the history of home computing within a wider picture. The home computer boom must be understood in the context of national and local initiatives designed to generate interest in the possibilities offered by IT. In turn, these initiatives and the boom itself should be viewed as a response to widespread concern and excitement about the future social impact of information technology.

IT as a cultural issue

Chapter two identified a world-wide interest and concern among policy makers, academics, and in the media about the future social impact of IT which had begun in the late 1970s. Computers were put on the 'national agenda' by governments across the industrialized world. There was a powerful institutional response to prophecies of the Information Technology Revolution.[78] As chapter two argued, the potency of such prophecies sprang from economic, political and cultural upheaval. British discussions of IT took on a particular character and intensity because of their association with concerns about Britain's decline as an economic power. By the 1970s it had become increasingly fashionable to understand this as a cultural problem.[79] This had a major influence on the way that the government perceived its role and objectives in relation to information technology.

The Thatcher government shared with its Labour predecessor, and indeed with administrations around the world, a conviction that the Information Technology Revolution presented a major challenge requiring a concerted response.[80] It would be wrong to over-emphasize the coherence of government policy but information technology was often featured in discussions of uncompetitiveness - offering either

nemesis or salvation. IT was presented as a route out of recession and a solution to the problems of the British economy. The British response, however, had a particular character. With a background of severe recession and mass unemployment, a national route to IT which emphasised the cultural aspects of the adoption of new technology took shape. As McNeil writes:

" Internationally, the Information Revolution was being heralded as the dawning of the new age - the harbinger of changes even more dramatic than those associated with the Industrial Revolution. Against the background of the prevailing interpretation of Britain's economic decline as the result of cultural inadequacies, the British road to IT has been 'peculiar'. Far more than other national routes into IT, the British route would emphasize the cultural rather than exclusively economic dimensions." [81]

In contrast with the interventionist approaches of some other nations, such as France or Japan, the government identified the role of information technology policy-making largely in cultural terms - the key element was the promotion of 'awareness' of and 'literacy' in computing. Government saw its responsibility primarily in terms of the need "to encourage people to accept new technology: to know what it offers, how to use it, and how it will benefit them and their businesses." [82] As a symbol of Britain's commitment to computerization in 1981 Kenneth Baker was appointed the first Information Technology Minister in the world. 1982 was declared Information Technology Year using the slogan "There is no future without it". This event involved seminars, exhibitions and a special train all designed to appeal to managers and business people. Its basic premise, however, was that it was crucial that everyone in Britain knew more about the present and future capabilities of computers. [83]

As part of Information Technology Year a series of advertisements ran in the national press which give a flavour of the ethos of the event. The thrust of these

advertisements varied but they had a number of things in common. They promoted the idea of the Information Technology Revolution, claiming:

" As revolutions go, this one is probably the most fascinating and significant of all time."

The appeal of the advertisements was not to organizations but to individuals. One example asks 'Has the revolution started without you?':

" The Information Technology 82 campaign is aimed at bringing this incredible new way of life to you."

The advertisements did not simply refer to the use of IT in the work place. They invited readers to find out about "how you can apply it to your life." The advertisements made explicit reference to home computers as part of a list designed to get across the idea that the power and influence of IT in all aspects of life was growing at a very rapid rate:

" Now you can buy a home computer for under £50 that plugs into a portable TV. It can do complicated tasks which as recently as 1962 would have required a computer the size of the Albert Hall. That's IT in action."

The advertisements also promoted the notion that everybody should be aware of IT and learn about its enormous potential. For example:

" An elderly lady who runs a sweetshop has a thriving computer business because of it. So maybe now is as good a time as any to take a look at what IT has to offer. Because one thing is certain about IT; if we don't learn its lessons now for ourselves, we'll end up having to pay someone else to teach us. And its so easy to learn."

The national advertising was part of a concerted campaign to promote computing in all its forms. The media were encouraged to carry stories about IT "explaining its importance to the country as a whole." Different government agencies including both the Department of Education and Science and the Department of Industry were encouraged to facilitate the most rapid possible take up of IT.

Computer literacy

One of the guiding principles behind initiatives such as IT Year was the need for mass 'computer literacy'. During the 1980s this was an extremely influential idea. The implication was that information technology will take on such a pivotal place in social and economic life that knowledge of how to use it will be essential to active participation in society. Closely related to this is the belief that knowledge of computers will have a direct correlation with economic performance both at an individual and national level. Robins and Webster in a 1985 critique deconstruct some of its underlying assumptions:

" Familiarity with computers is seen to be the key to citizenship and participation in the post-industrial society. Computer awareness is offered as the key to jobs, wealth, democracy and political involvement. The government's belief is that a growing fascination with computers among the young 'could signal a breakthrough in social attitudes to industry and technology'." [84]

A number of commentators have pointed to the emphasis on individual responsibility implicit in the notion of computer literacy. It is a skill everyone has an obligation to acquire:

" The invocation of computer literacy has become a way of encouraging individual responsibility for the national economic profile." [85]

The arrival of information technology is viewed as a cultural problem to be tackled through education. In reality most computer literacy initiatives are less about the acquisition of skills with a direct application than with gaining of an 'awareness' of new technology and a correct attitude towards it. Many of these themes are summed up in this quote from a speech made in 1986 by the Chair of the Manpower Services Commission:

" We still have latter-day Luddites around in all parts of our society. they threaten our future, and the attitudes they reflect must go." [86]

A whole range of writers have questioned the relevance of 'literacy' to issues of economic decline and poor training in Britain. [87] Even if we accept the correctness of the objective, the emphasis on changing attitudes is misplaced. A number of attempts to measure public attitudes towards the future impact of microelectronics has been made from 1979 onwards. While opinions surveyed varied between enthusiasm and acceptance tempered with a belief in its possible negative consequences for employment, researchers found little evidence of opposition to or hostility towards its introduction into the work place. [88] Contrary to much popular belief, for example, union attitudes towards new technology have been positive. [89] W W Daniel in his summary of research on attitudes to change among British workers talks of "the myth of worker resistance to technical change." In fact workers were far less likely to express hostility to technical change than other forms of organizational change. Technical changes were usually welcomed by workers and unions alike. This is true even when technical change brings unpalatable consequences:

" Far from provoking resistance, advanced technology has served as the sugar coating around unpalatable organizational changes, enabling workers and unions to swallow the types of more productive working practice that used to have to be force-fed." [90]

This is backed up by a 1985 Policy Studies Institute survey of acceptance of IT which concluded:

" Acceptance of new technology at the place of work is a non-problem. By and large, up to now, microelectronics has been accepted - in factories and in offices, by manual workers and non-manual ones, by trade unions and by management." [91]

Promoting IT

A whole range of national and local initiatives sought to promote IT to the general public and advance computer literacy. [92] Two examples are of particular relevance to this study.

The BBC computer project

The decision of the BBC in 1980 to promote computer literacy and to commission a home micro which would be marketed under their name reflects many of the same preoccupations that shaped government policy. [93] It launched a series of television and radio programmes encouraging the use of computers based around the BBC micro which was released in 1982. A support service funded by the Department of Industry offered viewers information and advice to compliment the programmes. [94]

The BBC ran a number of different television and radio series on computing between 1982 and 1987 all designed to promote the widest possible use of computers. These won respectable but unspectacular ratings. [95] The tone of the programmes reflected the BBCs public service ethos. They had a strong 'educational' content and related home use to computer applications in the outside world. Stories of the social impact of computer technologies were run alongside practical guides to the use of the BBC computer. [96]

Computers and education

There was thus a small ready made educational market for micros when they appeared. From the mid 1970s individual teachers and schools had shown interest in studying computing. It was, however, government policies and prophecies of the IT Revolution which led to an explosion in the use of computers in education.[97] Children played an important part in the government's thinking on the promotion of information technology. Kenneth Baker MP, Minister of State for Information Technology, said in 1983 of children:

" They are my most devoted fellow missionaries. They are keen, willing and rapidly becoming expert. It is a children's crusade that is leading us into the Information Technology Revolution." [98]

The idea of introducing micros into schools was conceived by the Callaghan government. It was first shelved and then resurrected by the Conservative administration that followed.[99] They wanted Britain to be the first country in the world with a computer in every classroom. It is important to understand that the introduction of micros into school was not simply a 'top-down' process whereby government somehow imposed computers on schools. Head teachers, teachers, school governors and parents' associations actively mobilized support for classroom computing - raising funds and lobbying for resources.[100] The Computers in School Initiative built on work done by individual teachers and schools who had started to teach computing, providing financial and other help to place computing onto the curriculum. It was estimated that more than £36 million of government money (not from the education budget but from the Department of Trade and Industry) was spent on software, teacher training and computers in English and Welsh schools between 1980 and 1984. By the end of 1984 there were 120,000 micros in schools and over

100,000 teachers had attended courses run under the Department of Education and Science Microelectronics Education Programme. Virtually all secondary schools had at least one computer.[101]

Although dissenters about the value of computers in schools were few and far between, there has been considerable debate as to how they should be used. In the wake of the Computers in Schools Initiative a wide range of different types of 'educational' software were produced. It was not clear whether children were to be taught 'computing' (whatever that was) or whether computers should be introduced 'across the curriculum'. [102] Conceptions of how computers should be used in education have often been developed post hoc - after the computers are in situ.[103]

The introduction of computers into schools was part of a more general shift towards 'vocational' training and the teaching of science and business in education.[104] IT played an important role in a whole range of new vocational and industry training initiatives. 'Computer literacy' was, for example, designated a 'core skill' for YTS trainees. ITECS and City Technology Colleges were well-publicised IT related innovations. In the Technical and Vocational Educational Initiative (TVEI), the Manpower Services Commission sought to promote technological awareness among secondary school children. There was a programme to increase provision of IT in universities and pressure to introduce its use across all subjects in higher education.[105]

Promoting home computing?

While not being directly concerned with home computing the various educational and literacy developments outlined above had a considerable impact on its evolution. For example, the commissioning of the BBC computer (which was to become one of the leading brands of micros) provided an impetus to the development of the industry, stimulated demand and added credibility to the home computer at an important time in

its development. Audience research showed that by 1986 a quarter of the viewers of the BBC programmes had home computers.[106] School computers were generally of the same type as home computers. Demand from the educational sector gave an important boost to producers. It also contributed to consumers' perception of the home computer as being 'educational' and blurred the lines between what is educational and what is not. Later, growth of school exam courses in computing directly encouraged the purchase of home machines. In addition many of those charged with implementing educational policies also purchased home micros.

The boom as public event

The rapid growth in sales of micros and associated products and the activities of computer related organizations point to a period of unexpected and unusual interest in home computing. This constituted a 'public event' which amounted to much more than the sum of individual purchases of home computers. During this period the home computer (and the home computer boom) became public property - a topic of media speculation and everyday conversation. Like earlier innovations the arrival of the home computer prompted a series of institutional and public debates about its social consequences.[107] Association with the Information Technology Revolution gave this particular intensity.

As well as the development of a large specialist press, home computers received much attention in the mainstream media.[108] It is now easy to forget the high profile that home computers had in the media and how seriously they were taken. This was part of the attention given to information technology in general and its future social impact. The boom itself was a major concern of the media. They highlighted sales and product developments and helped to create a series of cliches and concerns with which to make sense of the boom, writing of, for example, computer addiction, computer widows, brilliant 'computer kids' and millionaire whiz-kid programmers. Not all media discourses about the boom were positive - it is possible, for example,

to find considerable concern over computer addiction and the threat of computers to family life.[109]

Media attention was part of a more general phenomenon whereby great significance was attached to the home computer boom.[110] The growth in home computing was seen as being of importance in a way that the expanding demand for other consumer electronics such as video were not.[111] In particular, it was thought to be of significance not simply for how life was conducted within the home but to have an impact on wider economic and social issues. It was an often repeated but never satisfactorily verified statement that Britain had the most home computers per capita in the world.

The boom in home computing was considered significant not only because of the number of micros Britain could boast but also due to the perceived commercial and technical success of British producers. This is illustrated by the attention given to the achievements, pronouncements and personality of Sir Clive Sinclair. During the boom he achieved celebrity and gravitas which had eluded him during a long career of marketing technological goods. Described in the tabloid press as "the most prodigious inventor since Leonardo" and named as one of the top ten scientists of all time in a public survey, Sinclair cultivated an image as the people's boffin. In 1983 he was knighted and was named the Guardian's Young Business Man of the Year. Sinclair was awarded a number of honorary doctorates and received the Mullard Award from the Royal Society for 'outstanding contributions to the advancement of science or engineering or technology leading directly to national prosperity in the UK.' He gave his opinions on a wide range of subjects on 'Question Time' and was invited to government seminars attended by Margaret Thatcher to discuss science, technology and industry. He featured briefly in a Daily Mirror comic strip.[112]

Sinclair's public face was reminiscent of the great inventors of the late nineteenth and early twentieth century. Like them he was skillful at developing a personal

mythology and making good use of the media.[113] Sinclair was portrayed by himself, his public relations consultants and others as both a great innovator and entrepreneur. Adamson and Kennedy describe the strategy of Sinclair's advertising agency, Primary Contact:

" Sinclair was marketed as the maverick doyen of hi-tech, the lone entrepreneur with the vision to take on the Americans and the Japanese. The implication was that by supporting Sinclair the consumer was supporting the cause of British innovation in the face of the brute strength of foreign marketing might." [114]

Critics argued that the image of Sinclair as master inventor was a false one and events were to show that his credentials as a model businessman were dubious. Despite this, his mythology was a powerful one which was perpetuated by, amongst others, government.

The prestige and significance afforded to the achievements of Sinclair and other home computer producers must be understood in the context of widespread concern about Britain's response to the challenges of IT. Against a background of anxiety about the failure of Britain to maintain a truly effective independent indigenous computer industry and of fears about lack of IT training, great emphasis was placed on the rapid growth of home computing. Sinclair, Chris Curry of Acorn and, later, Alan Sugar of Amstrad were promoted as information technology saviours of Britain. It has been argued that this had an explicitly ideological motivation, highlighting the pursuit of individual wealth as the route to technological advance and national economic salvation.

" ... Sinclair (and somewhat less obviously, Sugar) were ideal English heroes. More accurately, they were picked up and widely circulated by British media because they embodied this forging of the Victorian self-made man and the IT entrepreneur of the future." [115]

While it overstates the case to view this as part of a coherent and planned ideological strategy, home computing was certainly latched onto by the government and portrayed as an important part of the British response to the Information Technology Revolution. In line with the rhetoric of Thatcherism, it was an individualistic response featuring lone entrepreneurs and lone home computer users. Mrs Thatcher told a conference held in December 1982 to mark the end of Information Technology Year that:

" We must allow private endeavour to flourish; we must let the vision of the inventor, and the flair of the businessman, create the wealth and jobs of tomorrow."

" This is nowhere as true as in the field of advanced science and Information Technology. Many of the greatest innovations and applications have stemmed from personal initiative. The development of the cheap home microcomputer is an outstanding example today. I was pleased during my visit to Japan to be able to present to the Japanese, in the very temple of high technology, a Sinclair home computer conceived, designed and produced in this country, and out into the market ahead of its Japanese rival." [116]

From the late seventies onwards there had been talk in Britain of a crisis in computer training and a skills shortage in information technology. In response to this Britain's large home computer market was held up as evidence of a high level of computer 'literacy'. This individualistic approach to the acquisition of computer skills fits neatly with the Thatcherite conviction that:

" There is no hard and fast line between economic and other forms of responsibility to self, family, firm, community, nations, God." [117]

Despite the media and government attention, the spread of home computing can have had only a marginal impact on the issue of training and building a strong British

computer industry. Even at its height the home computer market in Britain formed only a small proportion of the whole spend on information technology. In the context of a world information technology industry dominated by large multi-national corporations figures like Sinclair or Sugar are "minnows that have found - temporarily - a pool ignored by the heavyweights." [118] Throughout the eighties concern persisted about the performance of the British IT industry and skills shortages remained an on-going concern. [119] Gloomy analyses and predictions, however, if anything heightened the interest in and importance attached to home computing.

Selling futures

As chapter three argued, visions of a future shaped by technology are very effective ways to sell goods. Discourses of the Information Technology Revolution were particularly powerful raw materials for those marketing home computers. This should not be seen as an entirely cynical process. Many producers were themselves inspired by the potential of IT.

Ideas about the Information Technology Revolution were frequently used in home computer advertising. The home computer was sold not as a way to keep up with the Jones but also to keep up with something more nebulous but powerful. By buying a micro the consumer was buying a stake in the computerized future. In 1983 Sinclair promotional material proclaimed:

" In 1980, Sinclair made digital power universally available. Suddenly everyone had access to the most powerful and fundamental technology since the invention of printing."

Other advertisements used the notion of educational computing to sell products. A 1983 pamphlet on Lasky's computer products illustrates this.

" Most schools now have computers. In fact learning about computers is on many school curricula. So it's wise to make sure that you and your children are familiar with micros now. Because the micro makes it easier to teach yourself foreign languages, do your revision and even learn new career skills - self improvement at the touch of a button."

Not only were the positive benefits of computing invoked but also the fear of missing out. A 1983 advertisement for Microvitec computer monitors featured a screen displaying a graph projected career prospects of computer science, arts and engineering graduates. Standing behind the screen is a teacher asking " Is your child's future clear?"

Producers were not above acting as prophets of a future transformed by technology. Sinclair sometimes painted a picture for interviewers of a future transformed by "robot slaves".[120] Computer manufacturers also portrayed themselves as being at the heart of Britain's response to the IT. Acorn ran an advertisement at the climax of the 1983 general election proclaiming its position as one of the companies which had given Britain a head start in computing and celebrating the political consensus that existed about the importance of IT.[121] In the same year advertisements appeared in the quality press which associated Sinclair Research as a model for commercial and social development in the information age. They suggested Sinclair's company as a model of a new kind of enterprise to replace the loss making large employers of heavy industry and manufacturing. One headed 'Silicon Alley' included the following copy:

" The computer age, unlike the mass production age, offers tremendous opportunities for Britain. While British manufacturing industry has languished, British creative talent has flourished. If it doesn't fit into the old patterns, so much the worst for the patterns."

Another advertisement featured a picture of two black youths on a street corner and the headline 'Where wealth accumulates men decay ...' The copy again suggested that large employers were a thing of the past. The alternative was the development of many small employers modelled on Sinclair's example. But how could this transformation come about?

" As a result of Sinclair's success, Britain has more home computers per capita than any other country in the world. We have a huge and growing number of people, old and young, who took to new technology when it was offered to them (not forced on them). From them could come not just the generals, but the rank and file who could ensure that Britain is one of the victors in the coming battle."

The end of the boom?

The rapid rate of growth of sales of home computers in Britain fuelled predictions of near-universal computer ownership. A leading marketer was not untypical when he claimed in 1984 that "the computer is all set to achieve in just ten years the in-home penetration figures that took the telephone 60 years and the television 20 years." [122] As late as 1985 Junior Industry Minister John Butcher predicted that half the homes in the country would have a computer by the end of 1986. [123] These predictions were soon to be replaced by just as dramatic obituaries for the home computer.

In 1984 a number of home computer manufacturers, notably Dragon and Oric, went bankrupt. Other larger manufacturers such as Texas Instruments withdrew from the market. Christmas 1984 and early 1985 saw a glut of computers in the shops. This reflected only a slight slow down or decline in demand but precipitated a crisis in the home computer industry. There followed a period of restructuring - seen most publicly in the sale of the Sinclair brand name to Amstrad in 1986 and the take over

of Acorn by Olivetti. Similar shakeouts took place in the magazine and software sectors.[124]

The shock of the industry's problems of 1985 marked a change in perceptions of home computers. Among producers there was a drop in expectations and loss of confidence in the market. Some market forecasts actually began to predict a decline in the number of home users in the second part of the 1980s.[125] Media coverage of home computing took on a gloomy tone.[126] More generally, the home computer achieved a lower profile. The new scepticism was evident in publishing. Books with titles like 'Who Needs a Home Computer' or '101 Things to do with a Dead Computer', tongue-in-cheek, questioned the usefulness of the micro.[127] In line with the general drop in visibility of the home computer, the end of the boom meant a lower profile in the high street.

The 'end of the boom' became a reference point for commentators, producers and consumers. What, on the face of it, was simply an end to the increase in sales and a slow down in the rate of expansion in the industry, in the eyes of many, came to mean something more - an end in interest in home computing. It became common to assert that "many machines may be gathering dust in cupboards". A new cynicism became prevalent. In a biography of Sinclair published in 1985, for example, the emphasis was on the end of an era.

"And where has it all led? Computer awareness has been generally raised; the dust has settled, much of it on the home computers, leaving a hard core of enthusiasts. The market is saturated; the craze is over." [128]

Such pronouncements were common but unjustified. In the period following 1985 sales of home computing products have remained fairly strong. Although the volume of sales has declined the value of these sales has risen indicating a shift to more powerful machines.[129] Magazines and software continued to sell well.

Conclusion

That the end of the home computer boom did not directly correspond to patterns of computer sales indicates that it was about more than the spread of a consumer electronic. It was a public event - a period when the home computer held centre stage. This can be situated in a more general concern about the future social impact of IT and a range of initiatives designed to promote 'awareness' of computers. Although producers used ideas about the future significance of IT to sell their machines, in doing so they utilized and reinforced beliefs which were already common currency. This suggests that when consumers or commentators talk of the home computer being 'well marketed' they are referring to far more than the promotional efforts of manufacturers.

The events, initiatives and discourses of the boom form a backdrop to the experience of computer owners discussed in the chapters that follow. These will examine the power and limits of ideas about IT and the future to shape home computing. Two other elements are necessary to contextualize 'computer careers'; the way users themselves promoted computing and the turbulent history of the micro as a product category. Study of the boom reveals the home computer as a fluid and problematic product - changing as a technology and changing in how it was understood. The debates about the identity of the micro described earlier have not ended - this was just the first stage of a process of cultural innovation.

Chapter Six

Responding to Prophecy: Buying into the Home Computer Boom

It is now time to consider the home computer boom from the stand-point of those who obtained home computers. Based on accounts of early involvement in home computing given during interviews, this chapter continues to explore the ways in which 'adoption' of micros has been a cultural phenomenon. It does this by examining the processes of consumption decision-making in some detail.[1] Purchase is understood as a response to the prophecies and events outlined in previous chapters - a way of buying into the home computer boom.

The chapter is divided into three sections. The first considers the reasons interviewees gave for purchasing home computers. It argues that purchase should not be viewed as an isolated decision but as a way of participating in the public event of the boom. The second section goes on to explore the particular circumstances in which home computers were obtained. These mark the micro out as a special or unusual good. Home computer purchase presented particular problems and opportunities for people wishing to be seen as 'good consumers'. This is the theme of the third section of the chapter.

In this chapter respondents are treated as a relatively undifferentiated group - distinctions between them are signposted but the emphasis is on a shared experience. Over the next two chapters there is a move towards the study of differences between interviewees. The shift from a common experience to a more differentiated one itself reflects respondents' own histories.

Consumption as Participation

The need to 'denaturalize' and explain demand for home computers has already been established. As the previous chapters have shown, it was, for example, far from certain even to producers of home micros whether such demand existed and what the nature of it was.[2] The motivations behind decisions to obtain a home computer had been a central concern of the research design from its very early stages. All interviews addressed the issue of why people had decided to buy a home computer and what they had intended to do with the machine at the time of purchase. Significantly, for the vast majority of respondents these were not straight-forward questions to answer. While most found it easy to give an account of the processes whereby they came to chose a particular computer, accounts of reasons for wanting a home computer per se were far more complex. Few respondents, for example, said they purchased a computer in order to perform a specific task.[3] It was common to be given a list of different (and sometimes contradictory) reasons and intentions during an interview. People sometimes appeared embarrassed by their initial motivations and expectations. Even so, many interviewees acknowledge the vagueness of their purchase intentions and the gap between these expectations and what they actually did with the computer. This points to the need for a more sophisticated approach to understand demand for computers.

We can shed light on individual purchase histories by placing them in a wider context, using the concept of participation as a way of making sense of consumption.[4] Home computer purchase can be understood as a bid to take part in social worlds. Buyers sought to participate both in their immediate social environment and a wider public culture.

Before purchase

Most conventional approaches to the processes of consumption begin with the actual purchase of goods. An insight into people's decision to buy a home computer can, however, be gained by looking at the 'prehistory' of computer purchases. In fact, this is something interviewees often did themselves in order to help explain their decision to buy a home computer.

Nearly all buyers had some kind of involvement in computing before actually obtaining a micro. A number of interviewees engaged in the sort of exploration of the market which one might expect to precede any major purchase. They told of reading computer magazines in the months before in order to help make the decision. Mr F24 and Mr F27 told of making a number of visits to shops in order to try out or play with computers.[5] For some, however, this kind of 'preliminary' interest went on for some considerable time. Teenager, F14 S's visits to the computer sections of high street shops became a regular activity:

" I'd been lounging around the shops in town playing on the computers so I had a pretty good idea of what they were all about in the early days."

Mr F25 had made many visits to the shops before finally deciding to buy:

" It seemed to be the up and coming thing when you went into Smiths. I was frightened to go near them because all the kids knew exactly what to do. They were in there pushing buttons and the screens were full of information. I was rather frightened to approach these things that I hadn't had much to do with, five years ago."

This highlights the way that many interviewees were 'interested' in home computing long before they actually obtained a home computer. An example of this is the role that the early Sinclair machines (ZX80 and ZX81) had in stimulating interest. In three cases respondents had owned such machines. More significantly, the arrival of these micros on the market had an impact on an audience wider than those who actually bought them. In two cases, interviewees had 'tried out' the ZX80s of friends or relatives. In five further cases people who had not purchased early Sinclair machines, unprompted by any direct questioning, cited the arrival of Sinclair advertisements in the mainstream press as a key moment in the development of their awareness of or enthusiasm for home computing.[6] Mr F11, for example, tells of a colleague at work sparking his interest by showing him an advertisement for the ZX80. The ZX80 also whetted the appetite of F17 Mr but he decided to wait and follow the market:

" I thought they are bound to progress a bit so I'll be patient."

Not only was it common to follow the computer market for some time prior to buying a micro but also many interviewees engaged in computing or computing related activities long before they actually obtained a home computer. Mr F17, for example, had been reading computer magazines for two years before he purchased a machine in 1982. C5 is another example of someone whose interest started with magazines. It began in 1982 when he was thirteen. Even before he persuaded his parents to buy him a micro:

" I had computing coming out of my ears".

C5 found it difficult to explain what prompted him to start reading the magazines:

" I just went into the newsagents and it just went from a football magazine to a computer magazine. Just like that. No reason why. I suppose that things like

Atari you read about that and you read about computers and they are always meant to be sophisticated. And I bought one and I read it and I understood it. It wasn't all this jargon.... I just liked the idea. Computers seemed fascinating - James Bond stuff. The magazine was 30p - it was fairly cheap."

Many interviewees had used micros before obtaining one themselves. In seven cases, for example, children had had some sort of contact with computers at school before getting a home micro. The role of the school was not confined to formal lessons - the playground was also a place where children came across the talk and artefacts of computing.[7] The majority of adults and children interviewed reported knowing friends with computers before they had purchased one themselves. These machines were seen, used or even borrowed before the purchase was made.[8] This sometimes went beyond 'trying out' the computer. A number of teenage boys, for example, had been exposed to computer hardware, computer magazines and computer talk by their contemporaries a considerable time before obtaining a machine. Another interesting dimension of some prehistories of home computing - discussed later in the chapter - is the way adult respondents sometimes cited experience of computers in the work place as an important part of the accounts of the development of their interest.

This short discussion of the prehistory of home computer purchases should sensitize us to three issues. Firstly, home computer ownership must be situated within a broader range of activities which constitute 'home computing'. Buying a computer was itself an expression of interest in and commitment to home computing. For many, it implied an on-going series of purchases of equipment and software. In fact, for around half those households interviewed this interest led to more than one home computer purchase. Secondly, this discussion suggests that it is likely that many people will have engaged in the activities and been exposed to many of the influences which have been categorized as precursors to home computer purchase without ever consummating this by actually obtaining a home micro. All those who investigated buying a computer, played with them in shops, read computer magazines,

attended computer exhibitions or used the computers of friends or relatives could be said to have been involved in home computing. Finally, and most importantly at this stage, the accounts of prepurchase show that individuals' interest in computing did not develop in isolation but as part of a public event - the home computer boom. The pages that follow explore different dimensions of that event as they were experienced by computer owners.

Dealing with public culture

Many interviewees situated their own personal or household histories of interest in home computing within the wider context of the home computer boom. Take for example Mr F5, a middle aged designer, who, asked to when he and the rest of his family first got interested in computers, replies:

" I suppose we are the classic example... When was it 1982? When there was this great emphasis on buying home computers. It was Christmas and someone offered to help me get one at the office. And the children at school and all the publicity about computing and how it is going to affect our future. I thought, like everyone else, that it was something we should get to know about. I knew that I would eventually be involved with them at the office."

Of course, most respondents were not as forthcoming, but Mr F5 touches on many of the factors which influenced purchase decisions of the group of interviewees as a whole. Like him, their experience of the boom must be understood at a number of distinct if interrelated levels. It involved exposure to prophecies about the future impact of computers, contact with events and initiatives aimed at promoting computing, the publicity afforded the home computer itself and last but by no means least 'mini home computer booms' among social networks of friends, neighbours or colleagues.

Mr F5 is not alone in explicitly placing the decision to buy his family's computer in the context of the discourses and initiatives outlined in previous chapters. It was not uncommon, for example, for interviewees to make reference to the way that the home computer was marketed as a way of explaining their own purchase decision or that of others. Mr F3, for example, describes the home computer as "a good piece of marketing." Mr F9 explains that he got the Sinclair Spectrum because "it got such a glossy write up as the thing to have." A number of respondents gave the impression of feeling that, with hindsight, the marketing of the home computer was in some way manipulative or deceptive. At the end of a household interview, for example, after the tape recorder had been turned off, Mrs F5 asked me with reference to both her family's decision to get a home computer and the boom in general "were we conned?" Others expressed similar doubts:

" I think people were hyped at the beginning". (Mrs F13)

" It was almost as if it was generated by the market makers for Christmas a few years ago." (Mr F25)

" I think that the advertising people did a good job of selling and it was just a craze for a lot of people." (Mr F27)

It should be noted, however, that there does not appear to be any correlation between the expression of cynicism about the marketing of the home computer and whether the respondent felt that their own experience with the computer had been a positive one. Both Mr F25 and Mrs F13, for example, remain keen users of their computers.

As the last chapter suggested, when people talk about the home computer being 'well marketed' they often appeared to be referring to more than the standard amount of advertising. A whole range of institutions were engaged in promotion of home

computing and computing per se.[9] The high profile of IT, in general, the coverage of home computers in the media and computer literacy and awareness initiatives were all part of the 'marketing' of the home computer. These are much in evidence in accounts of early interest. Most computer users and purchasers interviewed had read computer magazines. There was a high level of knowledge of events within the computer industry. Many interviewees had visited computer exhibitions and watched computer television programmes. Some had taken part in computer clubs and a couple had attended 'computer literacy' courses at evening classes run by local authorities. In the interviews frequent mention was made of TV programmes and newspaper articles concerning computing. The media provided the raw material for answers to more general questions about IT. On one occasion an interviewee produced newspaper cuttings to support his arguments!

The introduction of micros into schools and the publicity afforded it offer a concrete example of the influence of outside events and initiatives on people's decision to buy a home computer. Almost without exception, the young people interviewed had some contact with computers at school, often before they had been exposed to computers at home. Interviews confirm that the arrival of computers in schools created demand for computers at home. The first and perhaps most obvious dimension of this is the way parents felt home micros would help their children with computer related studies at school. There are other elements as well. Parents wished to know more about computing in order to help their children. Teachers, whose work was affected by the various policy initiatives, also purchased machines. Mrs F13, a primary school teacher, says that she decided to buy a computer in 1983 because they were about to be introduced into her school:

" I just wanted to get the hang of it so that I could teach the children how to use it."

Another teacher, Mr F19, bought his computer the same summer he attended a course on developing school-industry links. He now works on the Technical and Vocational Educational Initiative.

So influential was school computing that, in interviews with families with children over five, in all but two cases it was mentioned as part of the rationale for buying a home computer. For Mr and Mrs F15 the decision to buy a home computer in 1985 was directly linked to their daughter's decision to do Computer Studies 'O' level.

During the first few weeks of the course she realised that "everybody" had a home computer and "knew exactly what to do." Although the teacher on the course had said that it was not necessary to have a home computer, the daughter soon came to the conclusion that she was at a grave disadvantage ("I felt the thickie of the class"). Like a number of other teenagers interviewed, F15 D used her computer to prepare the project which was an important part of the assessment of her 'O' level.

Despite the all pervasive influence of school computing, household F15's account of purchase is not typical. In no other case did objectives appear as clear-cut and single-minded.[10] Educational motivations were often as nebulous as they were powerful. Mr F24, for example, says that it was the fact that his daughter had started using computers at school prompted him to buy a home computer:

" I just thought it would be a good thing for her at that stage. "

It was, however, the father himself who was to become the dominant user of the home computer. Typically, among adult respondents with children, the role of computers in education was usually cited as part of a series of factors which influenced purchase - leading people, for example, to select an Acorn computer because of its link with school computing. It should also be noted that while there was a widespread conviction that having a home computer would help children with school, how this would work in practice was not always clear.[11]

The complex role of computing in schools in purchase accounts highlights the way different events, initiatives and prophecies of the boom overlapped and reinforced each other. The introduction of computers into the education system was itself a response to ideas about the importance of computers and of universal computer literacy. It, in turn, contributed to people's own perceptions of computers, raising their profile and reinforcing ideas about the computer being 'educational' and associating it with future job prospects. Just as importantly, computers at school contributed to a vague but powerful feeling that computers were 'everywhere' and affecting 'everything'. It was a widely held belief, for example, that children were the real computer 'experts' and that adults had to 'keep up' with them.[12]

"Everyone was talking about them"

The influence of computers in schools is one way in which home computer purchase can be understood as a way of dealing with public culture. For interviewees purchase was not, however, simply mediated by the events and discourses outlined in the last chapter - it was an active attempt to take part in the home computer boom.

A phrase which cropped up in interview transcripts again and again when people told of their early interest in home computing was that "everyone was talking about them". Mr F9, a building contractor in his early thirties, explains why he started reading computer magazines in 1982:

" To see what was going on. To see what everyone was talking about."

Later in the same interview he explains:

" I think people have got to find out about them. I like to find out about everything that is going on, especially if there is a big burst of enthusiasm for

it. I don't like to be the only one who doesn't know what everyone else is talking about."

Mr F2, when asked when he first got interested in computers, replies:

" I think it was the time that everyone else did about four or five years ago when there was a boom in home computers."

Mr F20 talking about the period (1983) when he and his wife decided to buy their daughter a computer:

" It was the 'in thing' five years ago - everybody had computers and everybody went computer mad."

Phrases like "everybody was talking about them" or "everybody had computers" should alert us to the way that in the early to mid 1980s the home computer became public currency. They reflect the high profile that computing had, for example, in the high street and the media. They also show, however, the way that home computers became a topic of conversation among social networks of friends, neighbours, relatives, workmates and school colleagues.[13] For a while, discussing and using computers became part of their everyday activities.

Many interviews included accounts of what could be called 'mini booms' in home computing among the social networks. A number of respondents, for example, told stories of colleagues at work.

" When home computers first hit the scene, five or six years ago, it suddenly seemed that quite a lot of my colleagues were going home and playing with computers. It struck me then that they were doing something frightfully clever ... "(Mr F12)

Mr F15, a worker in a Mainframe computer installation, told of his boss who owned a Spectrum and who used to come into work bleary eyed and telling stories of being up until two or three in the morning wrestling with the computer. Like many of his other colleagues "he'd been bitten by the bug."

Mr F12 and Mr F15 did not directly relate their own (later) purchases to this experience. In other cases, however, growth in interest in computing is described not simply at an individual level but as something that took place among social networks. Mr F25 tells, for example, how "about a dozen" colleagues at work decided to buy a BBC computer before he did in 1983. Mr F2 and a friend both purchased the same type of computer in a short space of time and later attended a programming course together. Other respondents portray their purchase as 'keeping up' with or following those of friends. When Mr and Mrs F23, who had purchased a computer only three months before their interview, were asked whether any of their friends had computers they were amused:

Mr : "Everybody in the whole world."

Mrs (laughing) : " Before us."

It was in interviews with teenage boys that the strongest sense of computer ownership as part of a shared experience emerged. At the start of fieldwork, for example, an interview was conducted with a group of boys who ran a computer fanzine. They lived close to each other and had been friends for many years. Right from the start they had shared their interest in computing. They encouraged each other to obtain home computers. In fact they had some difficulty in remembering which one of them had got a home computer first.

" I got mine as the result of seeing James'. I think James got his as a result of seeing Alan's. David got his because he has to be better than everybody else."(laughs)[14]

The same point is illustrated by the interviews with ex-members of Club A. Three of these teenagers had been friends before they started attending the club and obtained home computers.[15] Discussion of the growth of their interest in computing is inseparable from discussion of their friends. C6 got his computer in 1983:

" Me and a couple of friends had been interested in Commodore because they were developing a new computer. We just kept telling our parents that we'd like our Christmas present to be a computer. There were three or four of us and we all got Commodores. Then it was just our little game - getting software, swopping it around and copying it."

Other boys placed the arrival of their home computers in a period in which "everybody knew about computers." This is evident from talk of school and other out-of-home activities. C5, another ex-member of Club A gives a flavour of the kind of enthusiasm shared by thirteen year olds in 1982.

" Friends at school started getting interested because it was on the telly and more magazines came out and it got interesting to a wider range of people. All my friends were into computers - plenty of people to discuss it with. I was one of the first so I had a headstart."

C7 remembers what the club used to be like:

" At the start of it there were bunches of you in the library and it used to be packed with people just wanting to see and loads of people came with their computers. It just gradually died down."

A recurring theme of fieldwork was to be the distinctiveness of male teenage computer users . In this case, however, what was writ large with teenage boys held true for almost everyone interviewed in the sense that their growth of interest in home computing could be situated within a wider social setting. While this was most obvious among those who had obtained micros in the first half of the 1980s but, once again, it was a general finding.

Promoting the micro

One illustration of the way the boom was a local phenomenon as well as a national event is the way existing micro users actively engaged in promoting and facilitating the spread of home computing. The last chapter highlighted the ways formal organizations of computer enthusiasts attempted to do this. A number of those who took part in household interviews had been involved in such activities. F14 S, for example, now works in a computer shop and helped to run Club C based in the shop. Mr F11 had for a short time helped run Club A. Mrs F13, the primary teacher, as well as teaching her pupils to use the school micro, promoted computing amongst her colleagues and ran a club for parents who wished to know more about computers in order to help their children. The week before he was interviewed Mr F3 had given a demonstration of computers to the residents of one of the homes for the elderly which he administers:

" Kids pick it up so easily.... The grandparents are very much in awe of the way the kids use them because it is something so strange to them. The people that I was talking to were very much amazed at what they were doing."

This kind of activity did not have to take place within formally constituted organizations. Some interviewees clearly enjoyed the status of expert within their social networks. Part of this role as 'computer expert' among friends, neighbours, fellow pupils, colleagues or even within a family is to encourage an interest in

computing among others and recruit new computer owners.[16] A number of those I spoke to saw the interview itself as an extension of their role as a promoter of computing. When F8 D was asked, for example, why she had decided to take part in the research she replied that she was interested in anything "if it gives the computer a good name."

F8 D is an interesting example of someone who enjoys a position of computer expert and promoter. Her interest began in 1982 when she was aged twelve. She has established a niche as an expert among adult friends, neighbours and at her old school. She used to run a club for younger children at school and help her computer studies teacher (also a woman) prepare classes. She has also computerized the membership records of her local sailing club.

One of the advantages of constructing a location-specific sample was that, occasionally, links would emerge between different people who had agreed to take part in the research. A case of this emerged during the interview with household F15. F8 D who lived close by and had attended the same school, had 'helped' F15 D with her computer studies 'O' level project. F15 D had not asked for assistance but F8 D had somehow discovered that she was having problems with the work.

" She came around and said this is what's wrong and whatever - whizzing away and writing my program for me. I didn't understand what she was doing at all. That's one of the reasons that I didn't tell her that I was having problems with it because I know she'd come along and take the whole thing over. She's that kind of person."

As this quote suggests, the position of computer expert was sometimes a difficult or contested one.[17] Nevertheless such people played an important role in the spread of home computing.

By no means all interviewees had pretensions to be experts in computing. Even those with a transitory interest, however, also took part in promoting the micro. Mr F19, for example, whose computer was rarely ever used, tells how he actually spent more time "showing off" his purchase to friends than he did using it on his own.

Eventually he lent the machine to a friend who then went on to buy his own micro. Many others told of demonstrating, displaying and talking about their purchases to friends, family or colleagues.

" Obviously when we first got it we'd say 'Oh come and have a look at our new computer.' Everyone does that. And I think they were impressed with it although I think a lot of them were put off by the fact that they didn't actually know anything about computing."(Mr F27)

To sum up, this section of the chapter has located individual purchases as part of the event of the home computer boom. Interviewees have their own history of the boom and they relate their personal experience to an assumed general experience of home computing.[18] Those who had owned a micro for a number of years placed their own purchase decision in the context of a time when *"everyone was talking about" the home computer*. The developments in the public domain described in the last chapter helped shape their experience of the computer. But this should not be understood simply in terms of the relationship between individuals or households and public culture. The boom also took place at a lower level, among networks in a variety of social settings.

The Thing of the Future

The circumstances in which home computers were obtained mark them out as unusual or special goods.[19] This section will develop this theme, pointing to a number of characteristics shared, more or less, by all the purchase histories examined. Once

again, the focus is on the nature of decisions to buy a home computer and the interviewees intentions at the time of purchase.

Buying a computer

As the last chapter argued, the early home micros had such limited technical capacities that their only possible 'function' was as a way of knowing about computers in general. They were marketed and valued because of their ability to embody 'computerness'. [20] Interviews with owners of these machines showed that their attraction was the possibility of owning something called a **computer**. Mr F3, for example, explains that it was the thought of being able to own a micro at a low cost that attracted him to the Sinclair ZX81:

"I knew that there was a potential in computers - that it was going to take off particularly as home computers for whatever reason. I wanted to know more about it so we got the ZX81."

That the home micro was often valued not for its capability to perform a clearly specified task but because of its ability to embody computerness is shown by the significance owners attached to the question of whether home micros were 'real' computers. Mr F2 explains, for example, why he decided to buy a Commodore 64 in negative terms. The alternative would have been to buy a Sinclair Spectrum but that "appeared one step up from a calculator." Thus he rejects the Sinclair not on the basis of what it could or could not do but rather because it does not conform to his idea of what a computer is. These kinds of arguments have continued among owners (just as they have in the sphere of production) long after the technical capacities of home machines improved.

The strong 'self-referential' element in the conception of the early products marketed as home computers has been noted already. The purpose of these machines

was to explore how they worked and understand more about computing in general. To understand the widespread appeal of this kind of product - well beyond a typical 'hobbyist' constituency - we have to consider the influence of ideas about the future social significance of computers. The home micro was valued for its connection with the computers of the work place and of prophecies of a computerized future. C5, for example, explains his purchase in terms of general enthusiasm for computers:

" In five years its gone from James Bond stuff to everyone thinking about them in the home." [21]

So does Mr F25:

" It certainly seemed at the time - four years ago - that everything was going to be computer-orientated.... I wanted a piece of that action."

Like many others, Mr F25 wished to explore and own a piece of the Information Technology Revolution. For him knowing the home computer would somehow be to know all computers.

Preparing for the future

What the discussion of 'computerness' points to is that many purchase histories could be seen as an expression of excitement or concern about the future social impact of computing. [22] The home computer boom is testimony to the popular influence of ideas about the IT Revolution. Particularly for adults, buying a home micro was a response to 'millennial' hopes and fears about a society transformed by the computer.

The power of predictions about the future impact of information technology within the home are evident in some accounts of computer purchase. Some purchasers saw their machine as the first step to a computerized home of the future. Mr F2 cites this as part of the reason why he wanted a computer.

" It was the view at the time that every family would have one. It would be the centre of the home. You could do your home accounts on it. Maybe some of your business and play on it. Which seemed like a good notion."

Like a number of other respondents Mr F2 had toyed with the idea of setting up home accounts and files of recipes on his new computer.[23] Most respondents were, however, less interested in predictions about a computerized home than they were about the more general future social impact of information technology. Consider again, the account given by members of household F3 of their decision to buy a micro. Mr F3 explains that:

" I could see that it was going to be the thing of the future."

In a separate interview Mrs F3 confirms this line of thinking. She says of her husband:

" He realized that this was going to be the thing from now on."

This should not be seen simply as an expression of excitement about IT. Just as important are concerns about its impact. For Mr F3 the micro was an investment in his sons' future. From his own (troubled) experience he concluded that his children would "have to get involved with them at work." In both his account and that of his wife, personal and global fears for the future mix. At the time they were worried about their twelve year old son. He had been playing up at school although they knew that he was bright. An elder son had been away from school ill for eighteen

months. The computer was an attempt to help them both at school and in their future careers. The computer arrived in the household during what Mrs calls "a pretty traumatic year." The first day with the computer involved taking it to the hospital where the elder son was recovering from a spine operation.

In other accounts of purchase the home computer is also seen as a way of keeping up with and being part of perceived changes.

" You don't like to get left behind with this technology. I mean talk to these kids and they are all so into it now that you'd feel stupid if you knew nothing about it. That's another reason why I thought I'd better get into it - not get too left behind. Jesus kids! I'm only thirty myself."(Mr F2)

This reflects a common feeling among respondents that the purchase of the home computer in itself marked them out as people who were prepared to understand and embrace new technology. There is a sense of people needing to respond to and take part in changes which are going on around them. By participating in the boom home computer owners were showing themselves to be on the right side of prophecy. While sometimes less than totally positive about their own experience of the home computer, interviewees could be scathing about unspecified 'others' who rejected computing out of hand.

" I don't reject new technology. I can't stand people who say 'we refuse to have television.' You don't have to watch it but how marvellous, for instance, to get up in the middle of the night to watch them land on the moon. Like computers, that's why we've got one. I would like to know about it whether I use it or not. I feel it will be like television and have a big influence on our lives." (Mr F5)

" It amazes me that people are frightened of computers. I think it is because they are superstitious and Luddite on the whole. I'm surprised they don't just find out about them rather than just criticising them."(Mr F9)

Mr F25 explains that he thinks "technology is a wonderful thing" and that "I like progress and change."

" I think it is as well to be aware of what is happening around us More information could be given to people to show them just how little of a threat they really are. "

Mrs F13 is one of the few interviewees to openly acknowledge that home computer purchase could be an effective bid for social prestige. This itself springs from a faith in the significance of computing.

" It gives you street credibility. There is something about computing which always impresses people. Even if you'd had one and absolutely failed, the fact that you've had one, particularly when you meet new people puts you up in their estimation. I always get odd remarks It's a bit like saying you've had breakfast at Tiffany's."

The power of predictions of a computerized future is further illustrated by the almost universal agreement among those interviewed that it was important for 'everybody' to 'know about' computers.[24] Sometimes this was explicitly linked to notions of an Information Technology Revolution. Mr F11 argues that knowledge of computing is crucial because:

" ... considering what is happening in the world today. We are moving into an information explosion - another industrial revolution but more importantly an information revolution."

Mr F9 shares this conviction:

" We are an industrial country and we've got to become an electronic county now."

Such statements are testimony to the influence of the ideas about 'computer literacy' discussed in the last chapter. It should be noted, however, that although a consensus was evident about the importance of understanding computing, what "knowing about" computers actually entailed was a vague and contested notion.[25] This is a theme that will be returned to later in the thesis.

Belief in the importance of computer awareness and literacy for all reflects broad agreement among interviewees about the significance of information technology.[26] Although they sometimes voiced concern about the implications of developments in IT for employment prospects or personal privacy, that computers were 'a good thing' and 'important for the future of the country' was common sense. These statements appeared so self-evident to many respondents that they found it difficult to know what to say when they were asked about them. As one exasperated interviewee repeatedly said in response to a series of general questions about the significance of information technology - "that goes without saying."

General discussions of computing illustrated the powerful place technology has in popular conceptions of the future. An expression that cropped up many times in interviews was that computers were effecting "everything". This turn of phrase fits in with a conception of an all-encompassing, all-transforming Information Technology Revolution. Yet when asked to describe the kind of change taking place, people gave very mundane examples. They talked of computers at work or everyday contact with computers in places such as shops, travel agents or banks.

" To be able to go along to two of the building societies in the high street and check what's in my National Giro Bank account is quite incredible really."(Mr F1)

Such 'small wonders' were taken as a sign of a greater transformation to come.[27]
It was ideas about the importance of computers in the future that were most potent.

" You see pictures now of what you think your grandchildren will be like. You know, they won't go to school they'll just have a computer in front of them that teaches them all day. That's the general impression I get of what people think the future will be like - computer run."(F15 D)

" In another twenty years time it will be all important. If you are a young fellow in the business world and you don't know how a computer works or if you don't use one all the time you're going to be really out in the cold. Hopefully then I'll be near retirement age and won't have to worry about it."(Mr F14)

Thus home computer purchase can be seen as a response to beliefs about the growing significance of computing in general. In fact, for many the home computer boom itself reinforced such beliefs. As a previous discussion suggested, the coherence of popular attitudes about technology and the future should not be exaggerated.[28]
The association of computers and the future is, however, a strong one. Actions and attitudes reflect a feeling of relative powerlessness in the face of what are perceived as inevitable changes. Home computer ownership is, therefore, as much a search for security in a changing world as an expression of excitement with the possibilities of transformation offered by IT.

The home computer and the outside world

The association of the home micro with the computers of the Information Technology Revolution was manifested in an important characteristic of purchase histories. Home computers were often seen as significant for outside the home in the way that other domestic technologies were not.[29]

One element of this, the role of educational initiatives in shaping demand, has already been highlighted. Purchase histories show, however, that the home computer was thought to be 'educational' in a broad sense - not simply, for example, a route to exam success. Computing was perceived as an important and worthwhile activity. Parents bought computers for their children in the belief that it would help prepare them for a future where the computer played a central role both at school and work. An interesting dimension of this was the way a number of people purchased computers with the intention that their very young children would eventually use them.[30]

Mr and Mrs F27 bought their computer when their daughter was only two years old. Despite that, one of the reasons they cite for the purchase was to help their child. They make the explicit link between the purchase and their toddler's future job prospects.

" As I work in computers I'd like to think she'd have an interest in it as well."(Mr F27)

Mr and Mrs F18's daughter was less than two years old when they purchased a machine but part of the reason they did it was the hope that it would be "her first step into computing." Mr F14 told me with delight that his fourteen month old son had started playing on a computer keyboard. He is clear that parents had a major responsibility to expose their children to computers:

" My son will be used to computers as long as his parents have one in the home. My neighbour down the road borrowed a Spectrum but has now got rid of it. His son, who is just two years old, has fallen behind my son.... There are going to be haves and have nots depending on whether the parents take an interest."

Many parents saw a link between owning a home computer and their child's future job

prospects.[31] Mrs F20 explains the motivation behind buying her twelve year old daughter a computer:

" If she is going to use computers in her later career, the quicker she gets used to them and gets less afraid. Because when she goes to work its going to be all computers."

Mr F23 explains why he bought a second-hand Acorn Electron three months previously:

" I realised that sooner or later the children would have to be computer literate for their future careers."

Some adults also saw a home computer as being of significance for their own career. A number of people cited past experience in the workplace as the spark of their interest in home computing. This experience was not always positive. Both Mr F3 and Mr F4, for example, began *their accounts of interest in home computing with long and involved stories of disastrous computer installations at work*. In a number of cases the recent or imminent arrival of computers in the workplace was mentioned as part of the reason for home computer purchase. This should be seen in the context of a period of economic recession and restructuring which took place during the 1980s and in particular the rapid introduction of IT into the workplace.[32] The inference was that ownership of a home micro would help people use and adjust to computers at work. These ideas were not, however, always very concrete nor were they always acted upon once the computer arrived in the home.[33]

A number of interviewees were eventually to use home computers as a direct part of their paid work. But, once again, plans at time of purchase were often vague. In the majority of these cases the computer was not initially purchased to perform a specific work related task.[34] Although primarily intended for his sons, the "possibility" that Mr F1, for example, might use the computer in his work influenced

the decision to buy a computer and, in particular, their choice of machine. Mr F2, who runs his small business from home, said that work use was "half the reason" he bought his first computer. In both cases, however, these plans came to nothing. Mr F4 purchased his first home computer in order to "know more about computers." He had an ill-defined notion that it might help him in his business but at the time he was unclear how. Later he was to develop a work application, buy additional computers and use them as he started to work from home. Both Mr F9 and Mr F11, who now use PCs at home as part of their paid work, initially bought other micros in order to explore the possibilities of computing.

The role of educational or work considerations in accounts of the decision to buy a micro show that the home computer was seen as importance to life outside the home. Other researchers, most significantly Jane Wheelock, have also made this link.[35] She rightly situates the popularity of this conception of the micro in the context of changes in the labour market (with an emphasis on self-employment and self-training) and the rise of 'entrepreneurial culture' in many walks of life. It is a big leap, however, from acknowledging this to a conception of the micro as a material resource aiding the reproduction and economic activity of the household. As the discussion above showed, purchase was inspired by a mixture of motivations and intentions some of which were extremely vague. Many people who were convinced that the computer would be of benefit to their career prospects or those of their children's did not have a very clear idea of how this would work. The success of such bids to utilize the home computer as an economic resource is, in many cases, open to question.

The Problems and Pleasures of Home Computer Consumption

The nature of the early home computer market presented people with considerable problems in their quest to be 'good consumers'. This is illustrated by examining

the motivations and processes involved in the choice of particular brands of computer.[36]

Who was the home computer for?

Chapter four identified an ambiguity around whether the household of individuals were the appropriate unit of analysis for understanding home computing.[37] This is evident even when we consider the purchase of micros. In some cases this is fairly clear-cut - an individual adult decided to purchase a computer for exclusively his or her own use.[38] In the majority of purchase accounts the picture is, however, more complicated. Purchase accounts reveal a complex interplay of different family members.

One common pattern was that parents would buy a computer for their children. In nine households, for example, computer purchase was associated with Christmas and in a further case it was a birthday present. Sometimes the role of parents was little more than to provide the cash to buy the machine children requested. More typically, parents played an active role in the choice of machines for their children. In some cases the computer was purchased for children with little or no prompting from them. C8, for example, told how one day, when he was ten, a computer "just arrived" at home. F17 S1 tells of a similar experience when he was nine:

" My dad just came home one night and said 'look we've got a computer. "

In other families, parents and children could not agree in interviews whose idea it had been to buy a computer. Both F6 S and F20 D told how they had expressed an interest in computing but were surprised when their parents spent hundreds of pounds on computers. The willingness of parents to buy their children a computer confirms the prestige and significance ascribed to the home micro. It was not a run of the mill purchase. All parents interviewed who had purchased a computer for their

children as a gift, for example, said that they would not normally have spent as much on a present.

A striking feature of many purchase accounts is that considerable uncertainty often existed as to who the intended users of the computer were to be. While it was common for one main user to emerge, the initial purchase was often described as being "for the family". Frequently a range of family members were seen as potential users. As two households who had recently obtained computers (F21 and F23) showed, the notion of a machine used by all family members can still influence purchase and use plans. The next chapter will show, however, that, in a number of households, purchase was only the start of a complicated and shifting set of involvements with the computer.

The difficulties of selecting and obtaining a home computer

Consumers of home computers faced a particular set of difficulties in obtaining and, most importantly, selecting a micro. These in part related to the home computers' status as a novel good and to the special circumstances of the home computer boom.

One of the things that is striking about accounts of purchase at the height of the boom were the lengths people went to in order to purchase a home computer. This is testimony to the intensity of interest at that stage but it also suggests that decision-making took place in a pressured atmosphere. Particularly before Christmas 1982 and Christmas 1983, shops sold out of popular makes of computer. Both Mr F7 and Mr F5, for example, tell of having to "track down" a computer at that time. Others experienced long waits for mail order machines. C8's BBC arrived nine months after it had been ordered. Mr F9 had a ten week wait for his Spectrum but "it just added to the tantalization." He was far more frustrated because he had to send it back twice because of technical difficulties.[39]

An important problem facing many buyers was that, although convinced that they wanted to obtain a computer, they lacked the knowledge to make effective purchasing decisions. More profoundly, they struggled for criteria on which to judge between products.[40] This can be seen even when we examine the basic question of how much people decided to spend on their computers.

For most interviewees the home computer purchase represented a considerable financial outlay.[41] Faced with an array of different makes of micro, price was often a crucial deciding factor in machine selection. In six cases, for example, interviewees reported that they would have liked a BBC computer but they were unable or unwilling to spend the £400 or more it would have cost. Other commentators have seen low levels of disposable income as an explanation of the preponderance of relatively cheap machines.[42] This factor should not be discounted but the role of price in the selection of a home computer highlights two other important issues. It shows that considerable doubt existed among many buyers as to the long term viability of the computer. Many early purchases in particular were 'experimental'. The emphasis on price also reveals, in some cases, considerable naivety and lack of product knowledge among buyers. They were unclear about the benefits of buying a more expensive machine and discovered the limitations of the cheaper machines only after purchase.

As the last chapter explained at some length, the home computer market, especially at the height of the boom, was a volatile one. Owners talk of the problems of "making the right decision" in what is perceived as a rapidly changing environment. There were a large number of machines on the market, with new arrivals announced all the time. The prices of machines were subject to sudden and dramatic falls. This was confusing and frustrating for consumers.

" One of the problems at that time was that they were coming in and going out at such a rate that one hesitated to spend a hundred pounds or more. So many of those early computers are unheard of now." (MrF26)

Potential buyers attempted to predict which machines would become popular. Successful machines generated a body of software and peripherals and systems of formal and informal support. Ending up with a discontinued or unpopular machines presented problems for owners.[43]

The account given by the teenager C5 of obtaining a computer highlights some of the difficulties which confronted purchasers. In the six months between the start of his interest in computing and the actual purchase of a machine he changed his mind about which micro he wanted a number of times. The magazines he read constantly presented him with newer and better computers. He persuaded his parents to spend £230 on Texas TI99. Asked why he selected this machine, he replied that "for the time it had a lot of features". Later in the interview, however, it emerged that he only bought this machine because the one that he really wanted was out of stock.

C5 later got rid of his Texas computer when he read that the machine was going to be discontinued. He sold it to someone he knew for £130. He proudly told me that the next week his 'friend' could have bought the machine new for £29! His first choice for a replacement machine was a BBC B but he could not afford it. Instead he chose a Commodore 64. After six months or so he started to lose interest in computing.

Another example, this time from 1985, illustrates the way that people often lacked the expertise, information and confidence when buying a micro they might bring to other consumption choices. This was compounded because, as already noted, the buyers of computers were not necessarily those intended to use them. Like many respondents, Mr and Mrs F1 were anxious to show that they had made a 'rational' choice of computer. Mrs told me they had spent time looking around, trying to

understand the market, and reading "various reports". Their eventual purchase was an Amstad micro. They had previously decided on the BBC computer but were put off when they visited the main BBC dealer in the area. They were confused by the large range of configurations available, presenting them with a decision they had no way of making. They also felt alienated from the assistants in this hobbyist orientated shop.

Mr: "All we seemed to be presented with there were a load of boffins. A whole load of real freaks."

Mrs: " There was nobody there who could really talk to us in a language we could understand."

Like a number of other interviewees Mr and Mrs F1 complain about a lack of knowledge or information about the computer market and the capabilities of the available products on which they could make a reasoned choice. Such complaints reflect, however, a more profound deficit of knowledge. Purchasers often did not have a clear idea of what they were going to do with the computer once they had bought it. It was this that left them struggling to establish criteria by which to evaluate and select products. The difficulties that people had in selecting machines and the mistakes some of them later felt they had made reflect not simply a lack of product knowledge but the vagueness of their own plans for the computer.

Being a good consumer

Many interviewees, like Mr and Mrs F1, were anxious to portray themselves as being 'good consumers' who had attempted to make a reasoned choice of computer. People do not wish to be 'made fools of' or seem bad consumers. The constantly shifting nature of the home computer market and, indeed, the home computer itself often made this difficult. Purchasers struggled to establish criteria on which to judge

between computing products. In doing so, they laid a heavy emphasis on what might appear the abstract qualities rather than those directly related to the ability of the micro to perform a specific task. These included memory size, speed, colour, type of keyboard and so on. Such criteria are used in advertising and in reviews of equipment in computer magazines. Of course, the use of such technical criteria is not confined to consumption of micros - one has only to think of hi-fi or cars - but the particular emphasis placed on them reveals considerable uncertainty among buyers as to what the computer was for.

Mr F9 explains why he plumped for a Sinclair Spectrum:

" Price and supposed technical specification which I didn't really understand anyway. But it said it was 48K colour computer. It sounded like the be all and end all."

His cynicism shows how quickly the criteria for judging machines shifted. Machines which were the 'be all and end all' rapidly become 'toys'. This can be seen in the account by Mr F12's account of the experience of his workmates during the boom.

" It struck me at the time that they were doing something frightfully clever but now I think about it they were playing with 128K machines it must have been pretty trivial stuff that they were actually doing." [44]

Once again rather than talk about what use the machines were put to, it is enough to dismiss them via abstract measures of their capabilities. [45] This quote is particularly striking because Mr F12 almost certainly exaggerates the size of memory of the computers he refers to, presumably because 1K, 32K and 48K machines are now inconceivable to him.

Computer owners are constantly confronted with products which they are told are superior to existing machines. This is something which purchasers often portrayed as a problem. Mr F1 selected a machine which was new on the market to avoid a machine which is "out of date." He spoke of "trying to look ahead because technology changes every moment." Asked if he made the right decision buying an Amstrad, Mr F10 says it was the correct decision at the time but "technology marches on so quickly." Once again, this preoccupation with being 'up to date' cannot be understood in purely functional or task related terms.

The fast changing home computing market was a source of frustration for some interviewees. For others, however, it appeared to be part of the appeal of the micro. Rather than being a one-off expense, for some the computer was something to be upgraded, added to or traded in for a 'newer', or 'more powerful' machine. The extreme case of this among those interviewed was Mr F11. He has owned nine different types of computer since 1981. Mr F11 got his money back on the first micro he purchased, arguing that the advertising claims made about the machine were false. He returned the ZX81 " on the basis that it was advertised as being able to run a power station and if it can't handle my home accounts forget it." This began a pattern of purchasing new machines and then rejecting them on the basis of their technical inadequacies. How did he decide on each new machine?

" That they seemed better than the last and that they might be able to achieve what I wanted which is a justifiable use from one of the machines."

On one level Mr F11's purchase history could be seen as testimony to the enormous problems facing home computer consumers. It is a tale of misrepresentation and failed plans. But it begs the question why did he not simply give up. Despite unfulfilled expectations, disappointment is averted and hope engendered by a new purchase. Far from being a hindrance to effective computing, Mr F11's continual selection, purchase, evaluation and rejection of different computers appears an

integral part of his interest in computing. This should alert us to the fact that what for some were the problems of home computer purchase were for others the pleasures. Mr F11 was not the only person I met who had collected a number of different computers. F14 S has six computers and a large number of disc-drives and other peripherals. He has not sold any of his 'old' computers.[46] Three computers are set up in his bedroom. The collection of new machines is a way that he maintains his interest in computing.

" I played and played with the Spectrum and I've been getting extra attachments like disc-drives, faster storage systems and joy-sticks. That expands the interest. You play with it and get bored and you buy something else and you play with it. If you get bored with one machine you get another one and find your interest again."

He says of his interest in computers:

" It's just my way of spending money".

While neither Mr F11 or F14 S could be said to be typical of interviewees in the number of machines owned, they do highlight a more general tendency. For many actively engaged in computing participation in a complex and fast changing markets for hardware and software is an important element of their interest in computing.

From buying a computer to buying a model of computing

So far this chapter has highlighted elements of a common experience of computer purchase. In doing so many differences between interviewees have been put aside. One cannot be ignored at this stage. By comparing purchases made in the early years of the boom with those made more recently we can see that the circumstances and experience of consumption has altered over time.

One important factor is that some of the excitement generated around the micro in the early 1980s has died down. Just as significantly, during the second half of the decade the market for home computers became increasingly segmented. This reflected the 'firming up' of a series of different models of computing - conceptions of the micro, of the activities of computing and of computer users. One dimension of this was the way that different types of computer became increasingly closely linked with particular models. For example, the BBC computer became strongly associated with 'educational' and 'hobby' computing, the Commodore 64 became a games players' machine and the Amstrad PC, when it appeared, was viewed as a 'business' or 'word processing' machine.

Models of computing have come to play an important role in purchase decisions. Two accounts of purchases made in 1986 are illuminating. Both Mr F10 and Mr F12 obtained PCs. What is striking in their accounts of purchase, in contrast to many other histories, is how clear their intentions were when they purchased the computer. Mr 10, a freelance journalist, required a word processor in order to write a book. Mr F12, along with a number of colleagues at work, had purchased a PC in order to help him with the writing up of his medical research. He need a word processor and a database he said. Both Mr F10 and Mr F12 had a firm understanding of what they wanted from a home computer based on a well defined conception of the computer as word processing 'tool'. In comparison with early purchasers, they had a clear set of criteria by which to judge between products. Rather than selecting their machine from a relatively undifferentiated market of micros they sought a *particular type of computer*. They consider, for example, their machines very different from those of 'others' who play computer games or are computer hobbyists.

The cases already discussed where people owned a large number of different machines are unusual. Nearly half the households interviewed had, however, upgraded or changed their first machines. The way that people discuss later acquisitions differs from accounts of first purchase. They have a far clearer idea of what they

are getting and what they want it for. An interesting example of this was the way a number of teenage boys purchased their own computers, rejecting the 'family' computer bought for them for their parents. This phenomena is tied up with the association of different computers with different models of computing. In households F3 and F6, for example, teenage children no longer use BBC computers bought for 'educational' reasons and have purchased Commodore 64's for the express purpose of playing games.[47]

Why did F6 S reject the BBC in favour of the Commodore?

" Basic is good on it. You get a few good games on it like Elite but the rest ain't that good.... Every game that comes out goes straight onto the Commodore. If you have a BBC you could be waiting a month before a good new game comes out. And when you're playing with the old ones you get bored on them by that time."

These examples point to the development of stronger criteria by which to judge products. The examples of change over time, drawn both from new purchasers entering the market at different points and existing owners buying new machines, points to a complex shift involving technical and cultural changes on the one hand and personal experience on the other. This is a theme that will be returned to later in the thesis.

Conclusion

The accounts given in interviews of home computer purchase point to the need to get away from a conception of home computing which considers it to be merely the sum of individual decisions to buy and use home computers. Buyers participated in the public event of the home computer boom and shared their experience with members of social networks. The interviews also show the crucial role of ideas about the future importance of computers outside of the home in mediating demand for the home

computer. To highlight this is not to discount other factors. As later chapters will show there were differences even within households in expectations of the micro.

Purchase is one stage in the processes of home computer consumption. The chapters that follow consider what happened to the computer once it entered the routines of everyday life. This chapter has suggested a number of factors which might make the shift from good to household object particularly difficult. Purchase decisions were made in a fast-changing environment and consumers often felt poorly equipped to make informed purchase decisions. Most significantly, questions about what the computer was for and even who was to use it remained to be resolved after purchase.

This chapter has shown how complex the answer to the deceptively simple question of why people wanted a micro actually is. It problematizes conventional notions of demand for goods. Buying of a home computer was not simply a way of satisfying a pre-defined 'need'. As the next chapter will show the usefulness of and need for computers were troubling issues for many interviewees.

Chapter Seven

Finding a Use for the Home Computer

The last chapter was built around a basic question - why did millions of people in Britain decide to buy home computers? This chapter asks an equally fundamental question - how were these home computers used? Based on the histories of computer use given by interviewees, it examines the activity of home computing. Having situated purchases in the context of the home computer boom, it is now appropriate to ask what happened to the hopes, expectations and intentions of owners once computers entered everyday life.

The home computer has been a shifting and problematic product category for both commentators and producers to understand.[1] An issue which has preoccupied makers and researchers of micros is the usefulness of the home computer. This chapter will show that consumers were also concerned with the value and utility of the micro. As a previous chapter argued, consumption should be understood as a process (or series of processes) rather than simply the act of purchasing goods.[2] Time and skill are required to integrate goods into ways of life and utilize them as cultural resources. Accounts of home computer use show that this is a particularly difficult process in the case of this novel good. For many consumers, the home computer has remained a problematic object.

The chapter is divided into three sections. It begins by considering the nature of accounts given of home computer use, arguing that, rather than a fixed regular pattern, involvement with computers is best understood as a trajectory or 'computer career'. The next section goes on to consider the use of micros. Early home computing was clearly 'self-referential' in that the home computer was seen primarily as a way to explore the computer. Later when particular 'uses' developed, a strong exploratory element persisted. Despite this the 'usefulness' of the home

micro was something which preoccupied many of those interviewed. They talk of 'finding a use' for the home computer. The final section of the chapter explores the contradictions inherent in that phrase.

Computer Careers

One of the objectives of fieldwork was to chart respondents' own histories of involvement in home computing. While the interviews were flexible in structure, in all cases a concerted attempt was made to understand the amount and type of computer use. It was not always easy, however, to obtain what has often been seen as key data about home computer use - objective measures of the amount of time spent per day or week on the micro. Some interviewees seemed unable or unwilling to explain this except in the most general of terms.[3] Take the following exchanges with Mr F9:

DS: " Did you use the Spectrum much?"

Mr F9: " Yes and no."

DS: " How often do you use the Amstrad?"

Mr F9: " Only when I need it."

Initially, respondents' difficulties in quantifying their home computer use or explaining what they did with the micro was frustrating. As fieldwork continued, however, I came to see this as a finding of the study which suggested limitations with conventional approaches to computer use. It reflected the fact that measurement of hours spend in front of a VDU is an inadequate way to understand involvement in home computing. There is, for example, the need for a far wider definition of what 'doing computing' constitutes. For many of those interviewed,

computing as an activity included reading magazines, talking about computing, browsing in shops and using computers at school or at friends' houses. The second issue thrown up by interviews is that they show how patterns of use shift over time, giving insight into computer careers. A fundamental problem with some other approaches is that they understand patterns of computer use in an ahistorical way. Interview data confirms that this gives a misleading picture. Rather than having a fixed pattern, computer use is better seen as a trajectory in which individuals' relationships with computers change over time.[4] This is the way that people themselves found it most appropriate to talk about their involvement with computers.

The concept of a computer career has important implications for how computer use is studied and understood. Use data may only provide a 'snap-shot' of computing at a particular point in the career and should not necessarily be seen as evidence of an on-going and fixed pattern of behaviour. This can be seen from the interview data. In almost all those households which had a computer for some length of time, patterns of use have changed considerably. This occurs in a number of different ways. Often accounts of use describe a shift in the amount of time invested in the machine. Those using the computer within a household may also change. The nature of computer use alters as does the way the activity of computing is described. It is also possible to identify shifts at the more nebulous level of how involved people felt with the computer and the meaning that computing had for them. Interviews often, for example, dealt with unfulfilled expectations and altered perceptions of home computing.[5]

It may not always be helpful to think of the experience of computing in terms of a simple, single trajectory. In some cases we have to think about a multiplicity of overlapping careers and trajectories. An example of this would be the computer careers of members of the same household. The complexity of defining the boundaries of a career can be seen from interviews. Some began accounts of their interest in home computing by discussing contact with computers at work or school while for

others this was a totally separate experience. While some of those with a series of home computer purchases saw this as part of the same trajectory, for others different purchases marked a fundamental shift in their experience of computing. Similarly, while some were happy to describe their own experience in terms of household careers, for others their history of computing belonged to them alone.

The development of computer careers can be explained on a series of different levels. Careers have much in common, reflecting the complex interrelationship of private and public domains. Just as home computer purchase must be seen in a wider social context so too must the development of computer uses. Accounts of careers tell of the evolution of computer use in the light of the experience of individuals, households or even of social networks. But they cannot be understood simply at these levels. Changes in the public domain also impact on individual careers. They reflect, for example, the, sometimes troubled, development of computing products and identities. More than this, individual use histories should be placed in the context of the history of the public event of the home computer boom.

Beginnings

The arrival of a computer was often a significant occasion for households, involving family members who were later going to play little part in the computer's use.[6] The new micro was also something shared with members of social networks. It was common, for example, to display the new home computer to friends and relatives. Family F5 describe the first time they used their computer - a scenario no doubt being repeated around the country on December 25th 1982:

Daughter: "We couldn't get it to work. The tape recorder didn't work."

Mr: "We had to borrow the neighbour's tape recorder on Christmas day. ... A very frustrating day with mothers in law and everybody standing around ."

Mrs: "She [her mother] was very excited because she was eighty but could type - so she could type everything in."

Typically among those interviewed, the computer was put to heavy use in the period immediately after purchase.[7] More members of the household than later would be drawn into this initial enthusiasm. For example, Mr F2 estimates that, at first, his computer was used forty hours a week. His wife was also involved:

" We'd spend virtually all evening playing around with the damn things."

Family F3's accounts give an impression of the intensity and excitement of early computer use. Father and son were both keen to use the machine as much as possible. Their opportunities were limited because the lone family television had to double as computer monitor. They did not use the computer in the evening when the rest of the family wished to watch broadcast TV. The youngest son would use the computer in the afternoon when he returned home from school. His father made other arrangements:

" So it was a question of waiting until everybody else had gone to bed ... trying to catch up ... two or three hours a night to keep up with him."(Mr F3)

Mr F25 tells how the arrival of their first home computer at Christmas 1983 sparked off great enthusiasm among himself and his children (aged 12, 10 and 7 at the time):

" It was just murder in that my children were on the computer all of the time when they came home from school. They couldn't leave it alone. I was using it to play games until two or three a.m. It was very addictive ... It was just total fascination."

Although such bursts of activity were a common pattern, they differ considerably in length and intensity between households. In two cases computer use stopped altogether after the first few weeks of exploration. Mr F19, for example, estimates his entire use at no more than two sessions with the computer! Comparison of accounts of more recent purchasers and those who became involved at the height of the boom hint that perhaps initial enthusiasm of new owners is now likely to be less intense than it once was.[8]

The early enthusiasm described by many interviewees was the start of a history of shifting involvements with the computer. Take two of the households cited above. Mrs F2 no longer uses the computer while her husband may not use it for weeks on end. In household F3 the father's use has declined. Although both he and his son remain interested, they no longer share their experience of computing on a regular basis. These examples illustrate a more general phenomenon. Engagement with the computer often changes over time. This can be plotted on two axes - who within a household is involved with the micro and the amount of time allocated to the computer.

Shifting involvements within the household

Chapter four raised the issue of whether the household was an appropriate unit of analysis for understanding home computing. It cited evidence to suggest that home computer use was often very unevenly distributed within a household.[9] Interviews support this contention. It was common for some family members to have little or no involvement with a computer in their home. The most striking illustration of this relates to gender and computer use. The dominant pattern amongst households with a male-female couple, with or without children, was that adult women would have little or no direct contact with the computer. Out of twenty three applicable households interviewed, in sixteen cases it was reported that adult women had never used the micro. A phrase which cropped up repeatedly was that they had "never touched" the

home computer.[10] In another two cases women no longer used the machine after a little initial use together with other family members. Four women use the computer very rarely and in only one case was an adult woman the main user of the computer. In this instance she in turn reported her husband "never touched" the home computer.

Just as simplistic as any notion of a family computer, however, is the conception of the computer as being simply the concern of a single member of the household. One significant complication to this is the way that the persons who used the computer often changed over time. As was noted in the last chapter, many purchase histories show a vagueness about the intended users of the computer. In some cases the machine had always been destined for the sole use of a single household member. Intentions, however, had been vaguer or more complex in the majority of households. Some of these have yet to be fulfilled. In household F1, for example, the father's tentative plans to use the computer for work influenced the choice of machine. These have not come to fruition and the micro has become the exclusive domain of his sons. F8 D tells how 'her' computer was originally intended for the use of the whole family but in practice has always been her sole preserve.

A familiar pattern within households was that one main user of the computer would emerge after an initial period when other members shared an interest in the micro.[11] This sometimes confounded the expectations of purchasers. One of the teenage club goers interviewed, C9, told how his micro had originally been purchased for his older brother. His parents hoped that owning the micro would boost his chances of passing a computer studies exam. It was, however, C9 who developed a long-term interest in computing.

Another dimension of change within households related to whether people used the computer together with other family members. This includes not only engaging in computer use together at the same place and time but also the sharing of the experience of computing. A common pattern was for people to gradually use their

computers less with other members of the family.[12] In the case of household F3, cited above, for example, both Mr F3 and his son remain involved in computing. While previously, however, they had used the same machine, sometimes sharing activities and uses, the son now has his own computer which he uses 'on his own'. Instead of discussing his interest with his father he shares it with friends outside the home. In household F7 one computer was initially intended for both father and his eight year old daughter. Now they each have their own machine and rarely engage in computer use together. Teenager F6 S was always the main user of his computer but would sometimes play games with his brothers and sisters. One of the reasons why he purchased his "own" computer was to avoid having to share it or be policed by his parents.

That involvements with computers shift within households provides an important and novel angle on the individual versus household debate on how best to conceptualize home computing. This is a theme which will be developed further in the next chapter.

Shifting commitments to the computer

Among the households interviewed there was a wide range of levels of commitment to computing. The micros of, for example, households F18, F19, F20 and F26 had could be described as moderately used at best. For five interviewees, on the other hand, computing was portrayed as one of the central activities in their lives.[13] F3 S, for example, reported that he used the computer most of his time when he was not at work, spending an estimated three to five hours a night in front of the micro.[14] Mr F17 says that he'll work on his computer every night. He describes a typical weekday evening:

" I'd probably start at around twelve o'clock and do two hours a night. That's why

my wife hates computers ... once you get involved in something you don't want to stop. I'll happily go on until eight o'clock the following morning." [15]

Such accounts of intensive use patterns should not necessarily be taken literally but they are evidence of great commitment to computing. These people were proud of this commitment and were keen to share it. [16]

While the use accounts encompass a very wide range of levels of interest in home computing, significantly, the majority show some kind of shift in the amount of time devoted to the machine. [17] I was confronted with this issue early in the field work when contacting teenage boys who had been involved in computer clubs. While their interest varied, all five teenagers had in the past spent a considerable proportion of their time on computing - some said they had done and thought of little else. For all the five interviewees, however, the amount of time spent on computing had now declined, ended or was in abeyance. During household interviews this emerged as a familiar story. A common pattern was for use to have declined and, in some cases, ended. Interestingly this holds true even for some of the most committed users. [18] Here are two quotes from accounts of people who retain an interest in computing but say the energy they devote to computing has declined. Mr F25 describes his current use of the computer as regular but not excessive - perhaps two hours a week. This was not always the case.

" I found in the first couple of years that my house was just falling apart ... A lot of people I knew were in the same trap. There were certain games that I used to play. You just couldn't leave these games alone... Luckily my wife's of a passive nature. The machine then was in our bedroom. I might get in at night from work at ten thirty, have a cup of tea and then I'd be on the machine until three or four a.m."

Mr F11 tells a similar story. He now say he uses his computer "in moderation".

Previously things had been different:

" Time has flown by since I've played with these things. I've found myself coming home from work, having my tea, doing a few jobs around the house and disappearing into what I've called the 'computer room' - the spare bedroom - and looking at the clock and seeing it was quarter past eight and the next time I looked in was quarter past two in the morning. That happened for day^s and days on end."

Others' use has declined from less grand beginnings but similar changes are still clearly perceptible. Career patterns are, however, often more complicated than a period of enthusiasm for a new acquisition followed by the establishment of a steady routine of use. For many use did not follow a weekly or daily pattern but varied according to bursts of enthusiasm, perhaps associated with obtaining a new piece of equipment or software.

" We had a period over Christmas [some time before] when we were sitting up until one in the morning. I had a tapestry and Bob was messing around on the computer." (Mrs F27)

Variations in the amount of time devoted to computing can take quite a complex form. Take the example of household F16. It comprises of Mr F16, a school teacher, his wife, a part time school nurse, and their two sons. The boys were aged nine and six when the computer was purchased two and half years before. Although it had been obtained chiefly for his two young sons, Mr F16 also used the micro for a short time. While both boys utilize the computer it is the elder who has the greater interest. This is, however, a comparatively recent development. After a brief period of enthusiasm, he did not touch the computer for a year. It was only when his friends became involved in computing that his interest was sparked again and took on a new intensity. Now he used the computer "most days".

Mrs F13, the primary school teacher discussed in the last chapter, provides another interesting example of how patterns of use vary over time. Her initial experience of the BBC computer was not entirely positive. After six months, exasperated with trying to load software from a tape player, she was ready to "give up". She hardly used the machine for the next six months then, determined not to be beaten, purchased a disc-drive and has used the computer regularly ever since. While she considers that the computer is "hers", there have been periods when her teenage son and daughter have shown an interest in it. At the time of interview, however, neither had used the machine for some months.

The most graphic examples of changing patterns of use are the cases where the home computer is no longer used. Although other sources and my own data confirm that the assertion that most home computers are 'gathering dust in cupboards' is a gross exaggeration, it is possible to find examples of households interviewed where, sometimes after quite prolonged interest, the home computer is now never or rarely used.[19] Household F15's computer, for example, remained in their spare bedroom unused. During the interview family members debated whether it should be sold. Mr F19's computer was packed away as was that of household F27.[20] Both Mr F5 and one of his daughters had invested considerable time and enthusiasm in computing. When I visited the family, however, their computer had been rescued from obscurity and returned to a place of honour in the living room.

" I found it when you said you were coming. It's been upstairs in a little room like so many, I'm sure. When I set it up again I realised that I'd forgotten a lot....When I look at it I'm amazed at what I did."(Mr F5)

We should not simply consider the end of use at the level of households. As the discussion above suggested, within families particular members have terminated their interest in computing.

Fluctuations in the amount of time devoted to the home computer can be explained on a number of different levels. As might be expected, accounts of use patterns show how they fit into the rhythms and conventions of everyday life. Some computers were used more in the winter than the summer, children used computers more in the school holidays and so on. Accounts of reasons for changes in the level of use also include altered personal circumstances and life events like exams and moving house.[21] But the striking patterns of home computer use - both the bursts of intense enthusiasm and the declines in that enthusiasm - should alert us to the special and often problematic character of computer careers. In particular, that use patterns so often changed over time reflects the extraordinary conditions under which home computers were purchased. While buying was an act of faith in the potential of the home computer to be useful, as the last chapter showed, purchase accounts revealed the vagueness of intentions of many buyers and their lack of product knowledge. More than this, many interviews suggest an uncertainty about what the home computer was for and how it would fit into their lives - these were issues to be resolved after purchase.

Exploring the Computer

The discussion of the fluctuations in computer careers leads us on to consider the nature of home computer use. What did the people interviewed 'do' with their computers? This section examines interviewees accounts of home computing and argues that it is hard, in many cases, to make sense of their activities in terms of particular goals or types of use. At both an individual and collective level, rather than the micro being simply a route to a particular end-product, users were exploring the potential of the home computer.

As previous chapters have argued, early home computers were clearly 'self-referential' in that their only function could be as a means to teach the user how they worked.[22] This approach to computing continued to be influential long

after the technical capacities of home micros increased. Computers were marketed as a way of understanding and learning about computing. Analysis of the purchase of home micros show they were often valued not for their capability to perform a clearly specified task but as an embodiment of 'computerness' - a way of knowing computers in general.[23] As a number of studies have noted, 'learning about computing' was a major use of home computers.[24] Although this is normally seen as a 'hobbyist' approach, it appealed to a far wider constituency than other technological enthusiasms.

Types of use

Discussion of home computing by those who seek to analyse it and, indeed, those engaged in it, usually focuses on different types of use. Popular classifications of uses include 'programming', 'educational', 'games playing', 'home management' and 'work'. Such classifications provide the framework for much quantitative analysis of home computing. They were utilized, for example, in the market research on home computing and played an important part in producers' attempts to understand demand for the home micro. It is important to remember, however, that these use classifications did not emerge ready made and stable - they evolved along with the home computer. Commercially produced games software, for example, was not widely available until 1983 and the concept of the home word processor came to the fore in the mid 1980s.[25]

It became apparent during fieldwork that classifications of computer use had meaning for interviewees. They discussed their own use and the use of others in terms of 'games playing', 'programming', 'education', 'work', 'running the home' etc. Analysis and comparison of their accounts of home computing show, however, these typologies of use are actually more complex and ambiguous than often portrayed. This is a significant finding since much analysis of home computing relies on drawing inferences about different categories of use. The classifications are, for

example, often associated with judgements about home computer use. Games playing may, for example, be considered a passive activity and a waste of the potential of the computer while programming or educational uses are viewed in a positive light. These kind of judgements are not confined to researchers of home computing - later in this chapter there will be a discussion of the values interviewees themselves attached to different types of use.

Accounts of use highlight two major problems with conventional typologies of computer use. Firstly, comparison of interviews shows how diverse the activities classified under a particular banner such as 'programming' or 'education' could be. While use categories had meaning for respondents and are part of the currency of conversation of home computer owners, they do not, for example, always place the same activity under the same use heading. A second, and perhaps more fundamental, issue thrown up by data was that an ends-orientated view of computing implicit in the idea of 'uses' was problematic. Much micro use contains a strong exploratory element - investigating and taking pleasure in the computer itself. This was especially true in the case of the activities which users and researchers have rather unsatisfactorily classified under headings such as 'programming' or 'education'. Many of the same tendencies were, however, present in other forms of supposedly instrumental computing. The pages that follow illustrate and develop this argument by considering the nature of activities classified under various use headings.

Programming

A surprising finding, given other quantitative use data, was the high proportion of respondents who said they had, at some time, engaged in 'programming'. In only two cases did adults who had been regular micro users report they had no involvement with programming. Although a large proportion of those interviewed stated that they had programmed computers, for many this had been quite a short-lived activity.

Typically it was associated with the early stages of computer careers and, although the amount of time devoted to it varied a lot, the majority of interviewees commitment to this kind of use had declined.

The term 'programming' was used by subjects to cover a whole range of activities, some of which did not fit in neatly with my own common sense notions of the term.[26] Often interviewees would classify their first exploratory steps with the micro in this way. More generally these activities included a strong element of learning about programming and in particular the programming language of the machine. Usually this involved trying the worked examples in instruction manuals. This process would often go on for some time. Copying listings of programs out of books or magazines constituted the sum total of the experience of 'programming' for the majority of respondents. Long painstaking hours were spent keying in such listings, often only to discover that a typing error or, indeed, a error in the listing had led the program to crash. Another popular activity classified as programming involved the alteration or 'playing around with' existing programs or program listings.

Activities encompassing very varied levels of commitment and skills were all deemed to be 'programming'. While the interview method has limitations as a way of assessing programming skills, it is clear that respondents had attained very different levels of knowledge and productivity.[27] The young 'programmers' interviewed included, for example, both F16 S who, when asked for an example of his programming, talked of following the instructions from the computer manual in order to change the colour of the screen and F8 D who has had her own games and utilities published in magazines.

It is also worth noting that not all my respondents agreed as to what constituted programming. Take, for example, the use of commercially produced data base software. Such packages give the user the opportunity to specify the dimensions of

the data base, how it is presented on screen and on a printer and often provide a sophisticated language which allows the user to sort, manipulate and interrogate their data. Both Mr F4 and Mr F12 are frequent users of such software. While Mr F4 classifies this use under the rubric of programming, Mr F12 is convinced that he has never programmed. Similar ambiguities concerning the alteration of commercially produced games software will be discussed below.

Descriptions of programming show that it frequently did not involve the generation of a clearly defined end-product. Initially, using a notion of programming developed from working in the computer industry, I had expected programming to be about the writing and perfecting of a finished program. Most of the activity termed programming did not fit easily with this ideal type. Respondents often found it hard to explain what their programming entailed and, in particular, to come up with examples of programs they had written. The results of an evenings' programming would frequently not even be saved on tape or disc. This, in part, is a function of the difficulty some respondents had at getting to grips with the languages and skills of programming. F6 S tells that he had eight different unsuccessful versions of a 'football manager' game:

" You get to a certain point and you can't go on."

More importantly, it indicates the strong exploratory element in most programming. Even when respondents persevered with programs, the project was likely to be considered an interesting challenge to test and develop programming skills rather than the final product being of particular importance. Mr F3 told how he had been trying for months, so far unsuccessfully, to program his computer to solve a particular mathematical puzzle:

" It's amazing how difficult it is to do it especially since it only took me ten minutes to do it in my head. That's the difference between the home computer and

the human brain."

As will be shown later in the chapter, this same approach can be seen in many attempts to write more 'practical' programs. Mr F3 says of one such attempt:

" If the result is useful - fine. But I enjoy the mental exercise of programming."

The themes and structure of programs were sometimes copied from commercial games or from a program friends had written. Once again this indicates that programming was seen as a challenge or learning exercise rather than a way of generating 'useful' software.

Another insight into the nature of most activities categorized under the heading of 'programming' is to contrast them with the computer programs some of the teenagers interviewed had to produce as part of school courses on computing. The development of computer programs forms a major part of the assessment of such courses. For all the teenagers involved, these projects - designing, writing, debugging and documenting a program to perform a specific predefined 'useful' task - was something very different from their normal programming. Many felt alienated by the practical ends-orientated ethos of the project.[28]

Educational uses

The notion of computer being educational played an important part in the promotion of and demand for the home computer. It was noticeable, however, that the ways in which computers were deemed to be educational were often ill-defined. This uncertainty was reflected in the way that interviewees discussed 'educational' uses for the home computer.

Talk of the educational micro usually took place among adults but referred almost exclusively to children's' computing. The computer was seen not only as a way of

children learning about computing but as a route to education in a wider sense. Respondents classified a variety of activities under the heading of 'educational' uses. Some parents had purchased or written what they termed 'educational software' for their children. The kind of programs placed under this classification included mathematical programs, reading exercises and spelling programs such as Hangman. Also included were 'revision' programs - a kind of computerized multiple choice - used by teenagers to prepare for 'O' levels.

As the range of examples suggests, there were considerable differences among interviewees about what constituted an educational use of the micro. Some, such as Mr and Mrs F1 had come to doubt whether any such uses existed. They complained that their sons played "too many games." Had they tried to get their children to do anything else?

Mr: " Oh yes but what can you do? Tell me more. This is what we are waiting to hear from somebody."

Mrs: " I suppose it should be us that should look around to see if there are more educational games. But we did look initially and there really wasn't anything for the Amstrad."

Mr: " We need to know more about the potential of the computer.... Playing games is one thing and learning is another."

The kind of doubts expressed by Mr and Mrs F1 above are particularly striking given that, for many marketers and purchasers, the computer was inherently educational. They reflect the existence of a more general debate about what constituted educational computing among not only users but producers of software and, ironically, amongst those working in education.[29]

Just playing games?

Figures on the production and ownership of commercially produced software and use statistics indicate that games playing was the most popular use classification to emerge from the home computer boom.[30] By the late 1980s it had been a common assertion of commentators and indeed many of my respondents (usually talking of 'others') that the majority of home computer users were 'just playing games.' Implicit in that statement was not only a conception of what people were doing with computers but often (suggested by the 'just') a value judgement.

Games were a popular use classification among respondents. In all but four cases, interviewees with any kind of long-term involvement in computing said they had used games. This is hardly surprising, especially since, from 1983 onwards, it was common to include games as part of a parcel of software provided with home computers. Although games were a popular use classification, the experience of interviewees contradicts the portrayal of most home computing as 'just playing games'. For most adult users interviewed, games had constituted part of their experience of computing - one of a number of 'uses'. Interestingly, among the group with the highest commitment to computer games - teenage boys - not one interviewee's computer career had involved only games playing.[31] It is also worth noting that in a couple of cases parents' description of their sons as 'just playing games' proved inaccurate.[32]

When considering the activities associated with games playing the first thing to note is that a wide range of different kinds of software are classified as games. This does not simply refer to the different types of games discussed by respondents such as 'arcade' or 'adventure' games. The boundary between games and other use classifications is far less clear than some analyses suggest. It is not always obvious to interviewees, for example, when a program ceases to be simply a game and becomes an 'educational game'. Some youngsters included software as diverse as

music packages, graphics packages and a program to calculate biorhythms under the classification of games.

There are strong links between computer games and the culture and formats of games played on video consoles and in arcades. It would be a mistake to assume, however, that games playing mediated by the computer does not have different characteristics.[33] One dimension of this is the blurring of the line between games playing and games programming among computer users. This can be seen when we consider activities such as the use of machine code assembler to explore and alter games - so called 'pokes'. [34] It was also common to program games into the computer using listings printed in magazines or books. On early models of micros all games playing first entailed programming the computer in this way.[35] A number of keen games players had attempted to write their own games. F14 S designed a version of 'Battleships' as a school project. Mr F11 wrote a computerized version of 'Yahtzee' which he eventually sold to a magazine for £50. Other games players had less successful attempts at games writing but the dream of producing a successful program was a potent one.

For some commentators games playing is something very different from other forms of computing. We should be careful not to make quick judgements about the nature and appeal of 'games playing'. As the discussion above suggests, there are dangers in drawing sharp distinctions between either games playing and other forms of computing or games players and other types of computer user.[36] As with the other 'uses' discussed above, there is a strong exploratory element in the activity.

People play with the computer as well as with the games. For most adults interviewed, games were described as part of a whole range of activities which amounted to ways of testing out the potential of the computer. For many teenage boys who shared a deeper interest in games, they ^o were a way of stretching and demonstrating the capabilities of the machine.[37] Many of them spent as much time

exploring games software - loading it, copying it and learning about it - as they did 'playing' it.[38]

Practical uses of the computer?

A common line of reasoning shared by many practitioners and analysts of home computing is that, while the kind of activities outlined above had a strong exploratory or playful element to them, a clear line could be drawn between such activities and other (actual or potential) practical ends-orientated uses of the computer. A related argument suggests that as the technical capacities of home computers increase, a qualitatively different approach to computing is developing based around task related use. In comparison with the population of home computer owners as a whole, the group of users interviewed contained an unusually high proportion of people with such 'practical uses'. Higher capacity computers were also over-represented. Despite these two factors, interviews suggest that care needs to be taken when interpreting data about changes in the computer market and the spread of 'instrumental' computing.

The computerized home

The imaginative pre-history of home computing is full of predictions of a home of the future in which the computer plays an important role in the servicing of the household. This was also one of the themes of the marketing of micros and software. A number of interviewees attempted to use their micros for 'home management'. Detailed consideration of their activities should, however, lead us to question any simple ends-orientated view of their computing.

The appeal of home management applications for the home micro was confined to (almost exclusively male) adult interviewees. For some this amounted simply to enthusiasm for future possibilities of information technology in the home or to

unfulfilled use intentions and nothing more. Others went as far as to attempt to set up home management applications. They wrote or purchased programs which, for example, held personal telephone directories, produced shopping lists or monitored central heating costs. In doing so, users were clearly inspired by visions of a computerized household. The utility of such programs was, however, open to question. Often they were seen primarily as an interesting exercise on the computer - as a way to learn about programming, for example. In all cases more time was spent designing and attempting to implement the application than was spent using it.[39]

Some plans to use the computer to perform a household task never came to fruition. Mr F7 told how he had attempted to set up a household accounting system and put the family Christmas card list on a data base - both plans had not worked. Mr F22's and Mrs F13's attempts to computerize home accounts also did not get very far. Mr F22 also set up a data base to index magazine articles. Mr F27 wrote a program to calculate the electricity bill and evaluate the benefits of changing his central heating but as he says:

" I was just playing really."

Three respondents who went further in their attempts to develop home management applications are worth considering in more detail. Mr F3 who has a small telephone directory on his BBC B said he may use it to address his Christmas cards. Another application sprang from the family's rather complex financial relationships. Mr F3 wrote a program to calculate the interest on a loan of some of his redundancy money that he made to one of his sons. A, presumably fairly simple, interest calculation generated "a suite of programs". Mr is conscious that utility does not explain the energy invested in the program.

" I suppose it is another minor use but it doesn't get used very often It is more the challenge of writing it than the need to work it out."

Mrs F3 takes another view. When she fell behind with repayments to her husband for a loan for a television he presented her with a computerized bill:

" I was mad ... The boys thought it was hysterical."

When Mr F11 obtained a Sinclair ZX81 he "tried to get a use out of it in the home." He wrote a "personal finance program" which he evaluates as both "quite good" and "totally useless" due to the data storage and retrieval limitations of the micro.

Mr F11 also created a "home shopping program" on which he stored the details and prices of every item purchased during the weekly shop at the local supermarket. He would use this information to produce detailed shopping lists with prices for his wife. Looking back, Mr says that while it was an interesting programming exercise it was " a total waste of time." He did not continue his interest in this kind of application as his computing career continued through the purchase of a series of more powerful micros.

Mr F17 also wrote software to calculate his personal finances and tax bill. In addition, a great deal of effort was invested in a series of programs designed to help monitor the performance of the central heating system which he had installed himself. Mr F17 constructed an elaborate suite of programs which is menu driven and uses graphics to represent shifts in the costs of heating. Mr F17 was justifiably proud when he showed the programs to me but when asked if they had help him run the central heating more efficiently he conceded "in all honesty" that it had not.

The three examples outlined above do not fit easily the vision of the home computer as 'infrastructural' machine. Respondents themselves were troubled about the usefulness of such applications.[40] Never-the-less that people should experiment

with them is testimony to the influence of visions of a computerized home of the future and the appeal of the ideal of a 'useful' home micro.

The computer as work tool?

The use of the home computer for paid work is often portrayed as the archetypal 'practical' application. As with other types of use, however, closer examination shows that 'work' use of the home computer is a more complex and problematic category than it might first seem.[41]

Among interviewees there were a larger proportion of people whose computer careers included work-related computing than might be expected from statistical use data. It would be a mistake, however, to assume that for these people the computer was simply an aid to their paid work. In only two cases were computer careers described simply in terms of work related uses.[42] Work uses more usually were (a sometimes minor) part of a range of activities attempted on the computer.

As the last chapter showed, while the notion of the computer being of value for paid work influenced some decisions to purchase a home micro, any notion of people buying a computer to perform a pre-defined work task is, in the majority of cases, wrong.[43] Some work plans were never acted upon. Users often found it hard to separate out their 'work' use from their general interest in computing. Attempts to use the micro for work were often tentative and exploratory. Take for example Mr F5. He remembered two occasions when his micro use had some connection with his work. Investigating the possibilities of the use of computer graphics in his job as a designer, he set up a program about an exhibition stand. He took it together with his home computer into work to demonstrate to his colleagues:

" They were all agog and said 'can't you twist it around' and of course you couldn't."

On another occasion he designed the symbol for an exhibition about computers on his home micro. He worked four or five hours an evening for a week " so that I could say that I did it on the computer."

Even in cases when work involvement was more pronounced or regular, it usually developed during computer careers. Four examples of this should caution us against any simplistic notion of the home micro purchased as a way of answering a clearly defined need. In each case the interviewee regularly utilized his computer as part of paid work and was keen to impress on me its value to them in this respect.

Mr F11 now uses an Amstrad PC at home as part of his work in the building trade. He reports work use now takes up around half the time he spends on computing. His current use of the machine, however, must be seen in the context of his computer career which had lasted seven years before his current work use began. The PC he uses is the eleventh computer which he has owned or had on loan![44]

Mr F4 was the Chairman of a number of film and marketing companies. He is now semi-retired but still has business interests. He works from home using two Apricot PCs each with a disc drive and a printer. He has commercial accounting, word processing and database software. On the face of it, a snap-shot of Mr F4's computer use could portray him as someone with a utilitarian approach to computing - using the computer as a tool to aid his work. When, however, we consider his own historical account of his computer career a far more complex picture emerges.

Mr F4 had initially bought a Commodore 64 with disc drive and printer three years before because, he said, he wanted to know more about computers. He slowly taught himself to use the Commodore working through manuals and books. The idea germinated of computerizing a number of aspects of his work. He spent "hundreds of hours" trying to set up his job on the Commodore before realizing that it did not have the capacity to handle the quantities of data he required. Undeterred he then began

again using the Apricot machines. To start with, as he was still working outside the home, he had one of the Apricots in his office which he used during the day. He had spent "an enormous amount of time" on the computers.

" It must have monopolized at least a half of my waking life since I got involved." [45]

Retirement from full-time work offered more opportunities for computing.

" There always seemed to be so much to be done on the computer that I used to grab every minute to keep updating."

Both the Apricots are now set up in an office in his home. He has the accounts of his various businesses on the PCs and uses word processing for correspondence. He was keen to show off his pride and joy - a database system for music and film royalties. This appeared to be meticulously developed and documented. He had spent two years developing it and, so far, had written half the system using a database program. There was historical data on his machine going back to the 1960s all of which he entered himself. He estimates that half his working time is spent modifying and adding to the system.

" Eventually I must reach the point when I've got everything I could possibly need on the computer and it's just the input of data and the running of reports."

The two cases outlined above show the difficulty of applying a simple utilitarian framework to work use of home computers. For both Mr F4 and Mr F11 the development of a work application for their computers sprang from an interest in computing per se. The amount of time they have invested in achieving this represents an act of faith in the potential of the computer to be useful. [46] A further twist is added to this if we consider Mr F17 and Mr F25. Both have developed work applications for

their home micros but in each case the material benefit they gain is hard to quantify.

Mr F17 manages a small engineering firm with six employees. His interest in computing had begun five years before. He did not have any clear idea of what he was going to do with his computer when he obtained it.

" I just got it and thought I'll see what I can do with it."

Initially his efforts were concentrated on producing programs such as a system to monitor the efficiency of the household central heating system (see above). Later, when he took his present job, he began to develop work related applications on his home computer. There is no computer at his place of work. Instead, each evening Mr F17 uses his Sinclair Spectrum late into the night. He has written a program which converts the metric measurements of modern engineering specifications to the imperial measures which the ancient machinery at his workshop understands. The Spectrum is also used to process orders and calculate wages. Mr F17 finds it impossible to estimate the time it has taken to set up these applications but he spends virtually every evening using, improving and expanding them.

" I do most of it for nothing, just for the pure joy of sitting down and writing a program."

Mr F25 is employed as a building supervisor. He had been involved in computing for three and a half years. Over that time he maintains his perception of the computer has altered - it is now a "tool" which he uses for practical purposes. An example of this is the way that he now uses the computer to help him in his work. This is done in his own time "a couple of hours a week" for work related tasks - mainly word processing in order to produce and up-date stock control lists and keep records. So why do his employers not get a computer?

" This only benefits me. It benefits the Department in the long term but I wouldn't be able to interest the Department in a computer system. They wouldn't see the direct benefits They'd have to see something more than just enhancing the image. They'd have to see it in pounds and pence."

Asked what he enjoys about using the computer, Mr F25 replies that he likes well written and planned documents.

" I used to draw all of this longhand. A lot of people I work with don't even bother to do that. They may just scribble out what's on here.... The computer has given me the ability to make a document look almost perfect."

This use is hard to justify in terms of economic rationality - Mr F25 makes no money out of it and it involves extra time spent outside of normal working hours. He enjoys, however, the order and 'efficiency' which the computer brings to his work. This shows how complex the relationship between *pleasure and duty, the symbolic and the rational* can be. Along with the other examples cited, it suggests there are problems with drawing a sharp distinction between 'practical' work related use of the micro and other forms of exploratory computing.[47]

The cases cited above highlight elements which exist, to a greater or lesser extent, in all the computer careers of interviewees who utilized the micro for work. For them the application of the computer to their work involved more than the simple computerization of existing tasks. It entailed a process of discovery of how the machine could be of benefit and the development of new ways of working to accommodate the micro. Distinctions between necessity and enjoyment in this process are hard to make. Mr F12, a doctor, uses a database and word processing to help with his medical research. He takes real pleasure in using the computer. Talking of his word processing he says:

" Every week I find a new trick.... That's why it's fun."

Asked if he ever played games on his computer, he replies:

" Actually I get as much fun sitting down and playing with the data than I think I would playing bridge on it."

Mr F9 had once owned a Sinclair Spectrum. Now he has an Amstrad PC to help with the running of his small building firm. Although he is keen to tell me that his computer is a "tool" for work he too takes pleasure in the machine and what it can do.[48] He had, for example, "played around" with the idea of developing an estimating program.

" When I first saw a spreadsheet in action I just couldn't help laughing. It was just so brilliant."

More powerful machine = more useful machine?

A common assertion, among both commentators and some interviewees, was that higher specification home computers, with more memory or additional peripherals such as printers or disc drives, would allow the home computer to become 'useful'. An associated line of reasoning contends that the potential for 'real' home computing has been held back by the high cost or non availability of suitable equipment.

Interview data suggests, however, that it would be dangerous to assume that once the technical capabilities of home computers increase this inevitably means that the nature of home computer use will be qualitatively different.[49] Fieldwork shows the dangers of drawing inferences about the nature of computer use from the level of ownership of particular pieces of equipment and software. Further insight into this issue is provided by considering the attitude of respondents to purchasing additional pieces of equipment.

As the last chapter noted, rather than being a one-off expense, for some an interest in home computing has entailed a series of purchases. The computer was something to be upgraded, added to or traded in for a 'newer', or 'more powerful' machine. The acquisition and evaluation of new products played an important role in the activity of computing itself. Interviews indicate, for example, a rise in interest and time spent using computers in the period following the purchase of a new peripheral or piece of software. For many buyers, new pieces of equipment were valued as something to be investigated and mastered rather than as a better route to a particular goal. This was apparent, for example, from meetings with some of the teenagers contacted via computer clubs. They had acquired a whole range of equipment and software including a second-hand portable PC, disc-drives and even a ROM which made their machines write in Arabic! These were played with and shared with friends as something 'interesting'. Similar ambiguities existed in relation to software. Seemingly ends-orientated software such as word processing and data bases were explored and demonstrated rather than used to produce an end product. A number of respondents, for example, owned and used word processing software but had no printer.

The exploratory theme also emerges when interviewees discussed future plans to buy new pieces of equipment. F8 D had used the same Dragon computer since 1982 but the time had come to think about a new machine:

" I've explored all its possibilities now and I'd like to move on."

As this quote suggests, the impetus behind the purchase of newer and more powerful machines and software was in some cases clearly based around the same 'self-referential' motivations which inspired early use. This is further illuminated if we consider the example of computer modems. The combination of computing and communications is central to many visions of 'real', 'useful' home information technology. The experience of communications recounted in interviews

is, however, very different from the telecommuting, information seeking, utilitarian view of the technology in the future predictions about home IT. The motivation for getting (or considering getting) a modem was usually curiosity. Among those interviewees who had obtained a modem, the equipment was experimented with and demonstrated to friends and then often put aside. Their use was not consistent or ends-orientated, it was exploratory and playful.[50] One dimension of this is that a primary use of modems seemed to be to talk to other users about computing and communications.

Understanding home computing: beyond psychological or use value approaches

This section has identified a series of ambiguities with the use classifications commonly utilized to make sense of home computing. These often appear rather premature attempts to impose order on a far less differentiated or defined set of computing activities. In identifying the persistence of a strong strand of reflexive home computing - often tentative attempts to explore the potential of computing rather than pursuing set goals - fieldwork data illustrates difficulties with two dominant ways of understanding our preoccupation with the micro.

Chapter four has already suggested limitations with the work of Turkle and others who seek to explain fascination with the micro largely by reference to the relationship between individual and computer.[51] Rather than looking at the inherent qualities of computer technology, we require a cultural explanation of the appeal and nature of computer use. This involves going beyond a view of users 'loving the machine for itself.'[52] The intensity and extent of the appeal of computing reflects the status of the computer as a symbol of the future. It is also evidence of the powerful imperatives people felt to learn about computing. Finally, it points to the influence of prophecies of a world transformed by IT. As the discussion of home management and work related uses illustrates, some people were inspired by visions of how the computer might revolutionize life within the home.

The discussion of 'uses' also suggests that analysis of computing based around notions of fixed use values is flawed. This applies both to approaches which seek to explain computer use in terms of the instrumental pursuit of pre-defined objectives and to those who seek to make judgements about the value or otherwise of various forms of computing. Rather than working with absolute criteria of 'usefulness', it is more fruitful to look at how conceptions of utility are developed and negotiated.[53]

The problem of defining a particular activity as 'useful' is not something confined to researchers of home computers. It is also the subject of debate among home computer owners. Although their attempts to explore the potential of the micro may appear to have much in common with self-referential hobbyism, many interviewees, particularly adults, are concerned with utility. They want the computer to be 'useful'.

Finding a Use for the Computer

The last section showed that the utility of home computing is a difficult and contested issue. Given this, it is remarkable that home computers are so often discussed, both by commentators and by users, in terms of uses and use values. Although they may acknowledge other satisfactions, many micro owners, particularly adults, seek to make sense of their own experience, and of the boom in general, in the language of utility.[54] That people choose to discuss the home computer in terms of uses and usefulness is an important finding. It is not, however, always evidence of an unquestioning belief in the utility of the home computer. Rather, it reflects the self-consciousness of consumers in the face of a novel good. The computer has been a shifting and problematic category for both producers and owners of home micros. As the last chapter argued, the role of the computer was often unresolved at the time of purchase. This continued to be a troubling issue during

computer careers. Interviewees frequently chose to articulate uncertainty or unease about the place of the micro in their lives in terms of abstract notions of utility.

That accounts of computer careers so frequently tell of shifts in the types and amount of use and, in some cases, the end of use altogether reveal the shifting and, sometimes, troubled identity of the home computer. Some interviewees explicitly describe their careers as attempts to 'find a use for the computer.' Mr F11 describes his seven year, eleven micro, involvement with computing in this way. He tells how he rejected a whole succession of computers on the basis that he "couldn't get a use out of them in the home." Now he can only "justify the existence" of his Amstrad PC because he uses it for work.

" The very first conversation I had with a friend [about home computing] was based around the fact that the computer is going to save time. It's so simple. I can just buy one, plug it in, type a program in and, there you go, I've saved time. But it's taken me seven years to get to a stage where I can say that the machine is saving me time. But it's not the machine that is saving me time really - it's determination and effort to get the thing to save me time."(Mr F11)

This process of 'finding a use' was not always described in such a cynical fashion. It was remarked in the previous section that a common feature of computer careers was that people explored applications for their micro after purchasing it. Mrs F13, for example, has gradually developed a whole range of uses associated with her work as a school teacher. Now she can see "all kinds of possibilities" for the computer. She has, often, suggested to her self-employed husband (as yet without response) that his business could benefit from the micro.

Mr F17's account of his computer career reveals some of the contradictions lurking in the concept of 'finding a use' for the home computer. He tells how he has "found many more uses" for his computer now that he applies it to his work (see above).

Initially his interest had been in utilizing the machine for 'home management' but he had not been entirely convinced by the usefulness of his attempts to do this. Recently a new product had rekindled this interest, holding out the possibility of using a home computer to monitor and control light and heating systems. When Mr F17 investigated this further he was disappointed:

" The computer really had nothing to do with it. You only really used the computer to program the Red Box... You could throw the computer in the bin after that."

Thus the product is rejected not because of its performance as a means of regulating the household lighting but because it fails to provide a real use for the computer.

In some accounts of computer careers the issue of 'finding a use' emerges as part of a story of changes, the motivations and expectations behind use. Mr F11 says he now sees his computer as a useful "tool." This sentiment is echoed by Mr F9, a builder. The ownership of an Amstrad PC was associated with an attitude very different to the one with which he approached his first computer, a Sinclair Spectrum.

" Now I know what computers are. They are just tools. They are no different from the bow saws and hammers we use at work."

Mr F25 perceives his computer career as being in two stages. The more recent period is characterized not only by a decline in the intensity of his involvement in computing but by different kinds of use. Now he uses the computer as a "tool" for practical purposes or for "relaxation."

" Now I look back a couple of years to what I did on the machine almost with resentment. In that I'm not really bothered about knowing why things happen on the screen. Now I just use the machine to get exactly the end-result that I want."

A number of more recent buyers of micros were keen to emphasise the clarity and utility of their purchase decisions. Mr F10, for example, considers his PC an indispensable aid for the book he is writing. In asserting this he is keen to differentiate himself from others whom he considers have no such practical use for their computers.

" I'm fairly hard-nosed about this. I didn't buy it to play around with."

" I'm yet to get the bug - wanting to do things for their own sake."

These kind of statements reflect a common tendency to discuss and evaluate the home computer in terms not only of individual experience but also a perceived general experience of home computing.[55] These are also accounts of 'finding a use'.

" I think at the end of the day most people are disappointed with them and end up only playing games. Perhaps they have not achieved as much as they would have wished with them. A lot of things which were sold as software to help you are not really computer applications."(Mr F15)

" If I was doing your work, my prejudice would be that people who use their computers as a serious tool probably use it quite a lot and get quite a lot out of it and go on using it. Whereas people who use it for games ... their computers are on a box in a shelf after six months."(Mr F12)

Not finding a use

As the last three quotes indicate, for many, the process of 'finding a use for the computer' had not reached a satisfactory conclusion. Much can be learnt about the issue of 'usefulness' by considering the accounts of those micro owners whose computer use has ended, declined or, indeed, never really began. Although stronger

among some groups than others, common pattern among such interviewees was that they felt it necessary to explain and justify their non use of the computer. Their 'failure' to get to grips with the micro offered considerable potential for embarrassment. This can be understood as the result of two factors already discussed in previous chapters. Firstly, the need to justify non use reflects the powerful imperatives and notions of propriety lying behind computer use - one of the themes of the boom was that 'everyone' should be involved in computing. A second factor is that people's need to be seen to have been 'good consumers' - an unused or underused purchase requires careful explanation.

Family F5 present their story of use followed by eventual neglect of the computer as archetypal.

" I think we must be the typical average family that's struggled with all this."(Mr F5)

They saw the interview as an opportunity to tell this story and to ask me 'why did we fail?' Outlining their declining use, they talk of a series of technical difficulties and frustrations operating and programming the machine. Mr F5 suggests that if he had a disc drive his interest might be sparked again.

This kind of account of declining use appears to fit neatly with an explanation common among industry commentators and expounded by Murdock, Hartmann and Grey.[56] The 'failure' of some computer users is explained with reference to the inadequacies of the technology they had access to and a lack of information and support to underpin their use. Like Murdock et al's sample, some of my interviewees complained of technical faults, problems of loading programs using a tape player or the inconvenience of wiring up their computers to the family television set. It was also not uncommon to hear complaints about a lack of information and support to aid

their computing. There are, however, considerable problems with taking such explanations at face value.

The first complication to note is that interviews revealed considerable disagreement as to the inadequacies of particular machines, types of use or sources of information.[57] More importantly, fieldwork suggests that Murdock et al were too fast to blame the technical limitations of particular types of micro for computing 'failures'. Among the, admittedly self-selected, group of interviewees there appeared no direct relationship between the level of computer equipment owned and interviewees level of use or whether they deemed their use 'successful'. [58]

A second complication to the Murdock argument about declining use is that interviewees' response to perceived inadequacies of their micros varied. Dissatisfaction with existing technology often led not to giving up computing but the purchase of new equipment. Once again, among the group interviewed, it is hard to find a direct relationship between the the number and complexity of perceived technical problems and persistence of use. For many keen users, overcoming technical problems was part of the activity of computing itself.

The availability of information about and support for computing is an interesting issue highlighted by Murdock et al. Once again, however, it is necessary to take their analysis one stage further. Some interviewees clearly felt they lacked the information and support necessary to aid successful computing. Indeed, a number of them saw the interview situation as a way of obtaining just this sort of information. The nature of this information, however, is interesting. More than inadequacies of technical expertise, interviewees were troubled by not knowing to what use the home computer should be put. Discussing their non use, for example, the adults in family F1 bemoan a lack of knowledge and support.

Mr: " If I had a neighbour who had an Amstrad I would probably pop over and see what he was doing on it."

Mr: (explaining later that he is unlikely to use the computer) " Until somebody pops up and says here is an idiot's guide to the Amstrad saying how to use it and what you can achieve by using it. It's more the potential of the machine that I'm not really aware of. I know it can do accounts but I can do accounts myself on paper. It can do household accounts. That would be interesting and useful."

Mrs (laughing): " I'm not so sure."

The complaints of people such as Mr and Mrs F1 reflect the problems confronting all consumers of home computers. They had to learn not only how to operate the computer but to what uses to put it.

Two further issues arise out of rationales given for computer 'failure'. The first (and one which the next chapter will return to) is that expectations and disappointments were not necessarily shared by all members of households. There were, for example, important generational differences. To return to family F1, while the parents expressed considerable disappointment and frustration with the computer, their young sons appeared content with it. Secondly, few of those whose use had dramatically declined or ended maintained that this necessarily marked an end to their interest in computing. A number of those whose computers were currently put away in a cupboard were keen to explain that they might well use the computer in the future. This reflects a general finding among non users that, whatever problems they had experienced with home computing, their belief in the "potential" of the micro remained. An example of this is the way that, just as people use 'technological' explanations for their decline in interest, they also suggest that obtaining more equipment might rekindle it.[59] People see a panacea in both newer and 'better' products currently or soon to be available and in long term

predictions about technology in the future. Usually, however, how this will enable them to 'find a use' remains unclear.

Debating the usefulness of the micro

As we have already seen, discussions about utility are an integral part of accounts of computer careers. Interviewees not only evaluate their own experience, but also a perceived general experience of home computing. This is not to say that all interviewees come to the same conclusion. There is considerable variation in the criteria with which people judge the home computer. Debates among interviewees about the value of home computers mirror those among those who market and produce computers, about what the home computer is, what it is for and how it should develop. As with the equivalent producer debate, discussions about the value of the micro among users involve both enthusiasts and doubters.

Some interviewees came across as enthusiasts for computerization in all its form - both at home and in the workplace.[60] But the vehemence and defensiveness of some of their statements indicate that this enthusiasm was not always shared by friends, family or colleagues. Other interviewees are prepared to challenge the value of home computing. This is generally expressed in the language of usefulness.

" We haven't really come across any uses for it. I'm not sure there are many uses for it apart from games. Perhaps you can enlighten me? I certainly wouldn't want to put my home finances on it. It's quicker to do it on a cheque book stub isn't it." (Mr F16)

" I've always been rather cynical about it. Perhaps I'm just a little bit too late ... I can see the merits of learning to program if you are going to do something with that skill. I wouldn't really see the merit of learning to program per se

Unless you are actually working with computers for a reason I can't really see that there is much point." (Mr F16)

It was more common for doubts to be expressed about the value of particular types of computer use rather than computing as a whole. The rejection of certain applications is part of the process of establishing owners' own conceptions of what makes the computer useful. To illustrate this I will concentrate on one particular type of use which came in for repeated criticism on the grounds of its lack of utility - attempts to involve the micro in the servicing of the household.

The previous section discussed how a number of adult respondents had considered or actually attempted to set up household applications on their micros. In two cases, somewhat defensively, interviewees volunteered that they found such applications to be useful. Mr F25 has a program which monitors the state of his bank account. He insists that, while "cynics" say this could be done by hand, "I found it useful." Mr F17 describes a similar program as "very useful".

"I wouldn't like to operate a bank account without it now."

Other respondents who had developed similar applications were more dubious.[61] Mr F3 who invested considerable time in setting up a computerized telephone directory doubts its value:

"There is no way, if I wanted a telephone number, that I'm going to go upstairs and get my data disc out and switch the disc drive and computer on and wait for the telly to warm up and put the disc in and boot up."

Early in his computer career Mr F11 had developed a shopping list program for his micro. Later he was scathing when another computer user argued the benefits of a similar program.

" I said to him 'I've gone through that and it's useless. It doesn't actually do anything does it? How much time have you spent writing the program?'

' Oh a long time but at least I know what my bill is before I go to the shop.'

I said 'So what. Who cares? Are you that tight for money that it matters?'"

Such condemnations of household applications do not only arise from personal experience but are part of a more general process of evaluating computing - cited as an example of a 'useless' application of the micro. Mr F15, Mr F16 and Mr F26 tell me it would be easier to calculate home accounts 'on the back of an envelope.'

Others express similar sentiments.

" I can't see what use they are for domestic accounts."(Mr F10)

" One shouldn't let it get too out of hand. It would be easy to put all one's addresses and bank statements and God knows what on the computer. In practice you'd spend all the time keying it in, playing with it and getting it out. Most people have a perfectly good system for that as it is."(Mr F15)

Debating the benefits of computing

Another kind of debate that can be identified in user discussions is about the benefits or propriety of certain types of use. Put crudely, this involved classifying good and bad uses for the computer. The value of different uses of the home computer was a matter of debate both within and across households. One topic illuminates this well - games playing.

It is common among commentators on home computing to be disparaging about the emergence of games playing as a major use classification. This sentiment was echoed

by many respondents. This is not unconnected to the debates about the usefulness of the computer discussed above since, for many, games represented a waste of the potential of the micro.

" They are a complete waste of time - like reading fiction books."(Mr F17)

" It was games and nothing else for a long time. Then I thought that if this machine could talk it would say that it was rather insulted at sitting there just playing games all the time."(Mr F25)

It was common for adults to express disappointment that children were 'just playing games' on their computers. This emerged in discussions with parents. Mr F1 complained that his children's computing involved "too many games." Mr F14 sees his son's interest in games as a "waste of a logical mind." F6 S told how his parents encouraged and were interested in his 'educational' computing but complained about his games playing. Most dramatically, Mr F15 stopped his daughter playing games.

" They do develop some skills but I wanted her to develop programming."

It would be wrong to assume that all respondents shared the same evaluation of games playing. The fact that almost all users had at sometime or other played games points to a certain ambiguity in their attitudes. Male teenagers, in particular, defended their games playing. Some parents, their defensiveness itself revealing their awareness of the debate, could also see benefits in computer games. Interestingly their justifications are based on educational grounds.

" I think that the motor skills involved in playing a lot of these games are actually developing their minds."(Mr F16)

Mr F16 (a teacher) is keen to tell me of the educational benefits for his sons of playing computer games. He prefers to call them "simulations". Although their content is often "bordering on the obscene", it is more rewarding for children to use them than watch television.

" I would say that it is higher quality entertainment than watching the television because it is slightly interactive."

Mr F25 also sees educational benefits in his children playing games.

" The games taught them logic and their reaction time was enhanced So they were learning all the time."

What is most significant about this particular debate is that both sides accept the premise that computing should be judged on educational grounds. While such criteria might be used by parents to discuss, *for example, their children's television viewing*, notions of propriety seem particularly strong in this case. Once again this illustrates the particular expectations computers brought with them when they entered the home.

Conclusion

By tracing the shifting patterns of computer careers, this chapter has attempted to show the ways in which the role of the home computer is negotiated and, for many, remains problematic. In doing so it has confirmed two of the arguments developed in the earlier theoretical discussion of consumption. Firstly it illustrates some of the ways in which, rather than being absolutes which determine demand, the use values of goods are socially constructed. Secondly, it is testimony to the power of the rhetoric of utility and efficiency in discussions of consumption.

The association of the home micro with prophecies of the Information Technology Revolution and the imperative for computer literacy - highlighted in the last two chapters - can be seen at work in accounts of computer careers. It influenced the kind of uses attempted by interviewees and the way they assessed such uses.

Discussions of computing reveal, however, that many respondents found difficulty in reconciling the reality of micro use with the predictions and expectations of the home computer boom.

Chapter Eight

Models and Domains of Computing

It is now time to explore the implications of two findings which have emerged from the discussion of empirical material. Firstly, the last three chapters all point to ways in which the home computer and home computing have changed over time. Interviews revealed that to own and use a home computer in Britain in 1988 meant something different than it did in 1982. To understand this fully it is necessary to develop a second line of argument from early chapters. Just as purchase decisions should be situated in the context of the event of the home computer boom, so to must computer careers. By exploring and debating the value of the micro, computer owners took part in the development of cultural conceptions of computing.

This chapter is divided into two parts each of which, from a different angle, traces the evolution of home computing and suggests a structure within which to place computer careers. Part One focuses on the emergence, during the 1980s, of distinctive models of computing - ways of understanding and evaluating the activity. The development of these models can be traced across the spheres of production and consumption. Part Two builds on the argument developed in the last chapter that the value of computing springs from its place in social life. It does this by considering how home computer consumption is implicated in the construction and maintenance of personal, household and collective identities in a variety of social domains. Understanding micro use in this way sheds light on the appeal or otherwise of particular models of computing.

**Part I: The Development of Models of Computing Across the Spheres of
Production and Consumption**

A theme which unites accounts of home computing in public and private domains is that the identity of the home micro has been the subject of debate. It would be a mistake to see this process as one in which a single predominant vision of the micro inevitably emerges. While more than one conception of computers and computing are evident from early in the history of the micro (in, for example, producer debates about the home computer), the marketing and consumption of micros has become increasingly differentiated. This has involved the emergence of distinct models of computing. These imply not only conceptions of home computing but of existing and potential computer users. The development and promotion of new computing products has been based around such models.

While considerable disagreement and uncertainty persisted within the sphere of production as to what direction the evolution of the home micro should take, by 1987/1988 when fieldwork took place, producers' view of the market was coloured by a few dominant models of computing. This was illustrated by the highly successful strategy of Amstrad. Through the take-over of the Sinclair computer company, Amstrad acquired a large share of micro sales. Their computers, however, were projected into two segregated markets. The Sinclair machines were repackaged as dedicated games machines. This was entirely separate from Amstrad word processors and personal computers which were aimed both at a home-office market and a business market. Other manufacturers continued to promote more powerful multi-purpose micros.[1]

Conceptions of computing and computer users implicit in the design and marketing of micros have clearly influenced their consumption. Models of computing cannot, however, be understood as creations of computer manufacturers.[2] As earlier chapters argued, there is a danger of overestimating the coherence and influence of

producer strategies. Most significantly, examination of the evolution of the micro shows that associations between particular products and particular models of computing have evolved over time rather than entering the public domain ready-made.[3] Producers have not been fully in control of this process. An illustration of this is the emergence of games playing as one of the dominant conceptions of computing. For producers, particularly of hardware, games software was initially promoted as one use among many for a multi-purpose micro. They greeted the eventual importance^{of} games with ambivalence. On the one hand, it provided a strong demand for their products but, on the other, it threatened the potential of other 'serious' infrastructural models of computing they wished to promote.[4]

To understand the development of home computing fully it is necessary to look beyond the sphere of production and address consumption. This point has already been made in Leslie Haddon's largely production-based study of the development of the micro. His examination of the early history of the home computer shows that various groups of users, notably male adult hobbyists and teenage games enthusiasts, "played key roles in determining the way that micros had evolved." [5] Fieldwork confirms and expands this insight, suggesting that home computer owners - not only the enthusiasts highlighted by Haddon - have played an active role in the development and evaluation of models of computing. By exploring and discussing the potential of home computing, consumers have mirrored debates in the sphere of production. They have been involved in a 'circuit of cultural production', participating in the *development of the computer and computing*. [6]

The relationship between changes in public and private domains of home computing is the subject of the remainder of this part of the chapter. It is in three sections, the first of which highlights the closeness between the spheres of production and consumption in the case of home computing. The next section finds distinct models of computing at work in consumers' evaluations of products and types of use. The

final section concludes, however, that the relationship between models of computing and computer careers has not always been an easy one.

The Relationship Between the Spheres of Production and Consumption of Home Computing

As earlier chapters have noted, the history of home computing is notable for the intimacy between its producers and consumers and the active role early users played in the production and promotion of the micro. Maureen McNeil rightly remarks:

" In this sense, the story of IT is far more obviously a social history than those of many technologies." [7]

The first 'home brew' computers and earliest computer kits were produced by people we might now describe as hobbyists. At that time there was little to distinguish producers and consumers of home machines.[8] Elements of this close relationship remained as the home micro developed as a commercial product category.

Chapter six has already outlined some of the ways that that computer owners were involved in the promotion and facilitation of computing (and by implication of particular models^{of} computing), running clubs, teaching computing in schools, and, more informally, giving advice and acting as an example for others to follow. There are many other dimensions to close producer-consumer relations. Early home computer software, peripherals and magazines often sprung from cottage industries run by computing enthusiasts.[9] In addition, writing for magazines and the existence of a black economy in pirated software point to an informal sphere of production in which people engaged in the development of computers and associated products for little financial reward. A number of computer-related products encouraged and were dependent on consumers' participation. Many magazines, for example, relied on readers' letters, articles and program listings. They sought to foster an

atmosphere akin to a club in which readers were active members rather than a passive audience. Communications services such as Micronet shared many of the same characteristics. More generally, those involved in the sale of home computer products sought a rapport with their consumers. Games magazines and software houses, for example, promoted young writers with whom their potential customers could identify.

While the development of a mass market for home computing inevitably brought with it a greater distancing of the spheres of production and consumption, elements of the hobby tradition remained in the industry. Interviews provide evidence of a high level of involvement with production among consumers. The ambiguity of the term 'involvement' is interesting and useful in this case - it encompasses both engaging in production and engaging with production in the sense of feeling a strong interest in and identification with producers.

Participating in production

Connections between the sphere of production and consumption became apparent during the first stages of fieldwork. Early contacts were often both producers and consumers of home computing. Interviews were conducted, for example, with two of the first British computer hobbyists. They had gone on to run organizations promoting home computing and had close contacts with the computer industry. These interviewees were interesting as home computer owners and as key informants who had played an active role in the development of home computing in Britain. The first group of teenage computer users interviewed wrote a computer fanzine. Another early fieldwork contact was with a local computer shop which was the venue for Club C. The two people who ran the shop were also computer enthusiasts.

Similar issues emerged in household interviews. A number of respondents had Saturday jobs in computer shops, had program listings published in magazines or had

attempted to market games they had written. F14 S is an interesting case. I had already met him via the local computer shop and the club he helped run on its premises. Later his father arranged a household interview. F14 S's interest in computing led him into a part-time job at the shop. Initially, he was paid 'in kind' with software and equipment. Now working full time, F14 S still sees it as a way to get cheap equipment and software and is permanently paying off loans to the shop for new equipment. Despite 'crossing the line' from consumer to producer F14 S remains an enthusiast - his work and home use are part of the same interest in computing.

Two examples show the diverse ways in which an intimacy between producers and some consumers of home computing persists. Mr F17 is a keen user of his Sinclair Spectrum whose computer career is discussed at some length in the last chapter. He told of how he had discovered that an interface had been developed (by "a couple of chaps in Cambridge") which would enable him to use a disc drive with his machine. He saw a prototype at a computer exhibition and became one of the first purchasers of this equipment. He found flaws in the operating system which he reported back to the makers. They had to supply him with a number of newer versions before it was perfected.

" Which is quite reasonable since they had quite a tricky job on their hands."

Mr F17 clearly enjoyed what he saw as his active part in the development of the product and is keen to identify himself with the producers who are themselves computer enthusiasts. He now gives advice to other users of the equipment via a 'club' for owners of disc-drives.

F3 S devotes much of his spare time to a 'multi-user game' (MUG), played using a computer and a modem. One of the objectives of the game is to accumulate enough points so that you cease to be a player of the game and instead help to administer

it. F3 S was close to achieving this status of 'God'. This would put on a formal footing what is already a close relationship with the producer of the game. He makes an active contribution to the running and design of the game.

Identification with the sphere of production

Many people demonstrated a high level of involvement with the sphere of production even if they did not directly intervene in it. For example, an idea which inspired a number of those interviewed was to produce a commercially successful program and cross the line from consumption to production.[10] More generally, respondents had a high knowledge of and interest in the sphere of production. Dealing with a fast changing, novel good required effort to understand the market, especially in the early years of the boom. For many, however, the exploration and evaluation of new products went far beyond this. Owners watched the evolution of the micro closely - revealing an interest and involvement in the development of the home computer as a product category. Many felt part of this process of development.

Interviews show that interest in the sphere of production extends not only to new products but to the industry itself.[11] It was common, for example, for people to voice an opinion of Clive Sinclair the person as well as the products his company marketed. For Mr F17 his enthusiasm for his Sinclair Spectrum requires a defense of the owner of the company which produced it:

" Alright he's a bit of a funny extrovert guy but he's a clever old sod."

F8 D expressed very different opinions, volunteering a number of times how much she "detested" Sinclair the person - not just his computers. This was because he was "just in it for the money" and stole others' ideas. An early hobbyist asked to explain why he thought the promise of the boom had in his opinion not been fulfilled replied cryptically "blame Uncle Clive."

Consumer involvement with the sphere of production is, of course, not confined to home computing. A similar element exists among, for example, 'hobbyist' users of cars or hi-fi. Other cultural industries, notably those producing music and film, are marked by a high knowledge of producer activity by some enthusiasts. What distinguishes home computing is the extent of this - the number of people who share an interest in and identification with the sphere of production - far beyond a normal hobbyist constituency.[12] Two broad kinds of computer owner appear to be the most involved. The first type includes adults who, generally, had begun an interest in computing during the early 1980s. Some would fit neatly into the category of 'hobbyists' but this group encompasses a wider constituency of people drawn into computing during the boom. Many have no technical background and now portray their computer use in practical terms. A second group fascinated with production is made up of teenage computer enthusiasts. This is particularly pronounced in relation to the games software industry but, in contrast to other 'youth' interests such as recorded music, it extends to a long running involvement with the makers of hardware. In both the above cases, interest in producers often goes hand in hand with an on-going commitment to buy computing products.

Another type of owner can be contrasted with those discussed above. As chapter six noted, *respondents included a number of recent purchasers of computers who intended to use them for word processing and other 'home office' applications. They were characterized by comparatively little interest in the sphere of production after purchase. Examples like these may point to change but involvement in the sphere of production still marks out home computing as a special case. Computer magazines, for example, continue to constitute the largest and most widely read of all specialist publishing sectors.*

The closeness of consumers to the sphere of production highlighted in this section should be borne in mind when we go on to consider the development of models of

computing among micro owners. This intimacy points to their active role in the construction of such models.

Developments and Divisions in the Sphere of Consumption

Three, interrelated, tendencies stand out when we consider the evolution of home computing during the 1980s. Firstly, people are less likely to view computing in terms of a relatively homogeneous interest in the computer and instead understand it in terms of particular types of use. Secondly, the appeal of certain forms of computing (notably programming) has declined while other kinds of use such as word processing and games have emerged during the boom. A third trend is that, for some of those initially involved in home computing, interest has declined or ended. The establishment of models of computing provides a context within which to understand all three of these developments. The trend is away from computing as a relatively undifferentiated activity to one divided between models, each involving different conceptions of the activity of computing and different criteria for evaluating products and uses. It is thus increasingly difficult to see a single common experience of those involved in home computing or, indeed, to talk of a single home computer.

The establishment of distinct models of computing has made it harder, for example, for producers of micros and associated products to deal with computer users as a unified group. This is illustrated by the way products aimed at a constituency spanning all micro users - the norm in the early years of the boom - brought a mixed response from interviewees. Television programmes associated with home computing are a case in point.[13] The influence of models of computing in the sphere of consumption is apparent in the ways that people make sense of their own experience and of the home computer boom in general. We can see them at work in interviewees' evaluations of computer products, computer uses and other computer users.

Association of products with models of computing

Significantly, given the preceding discussions of the relationship between the development of computing in the spheres of production and consumption, the area in which divisions between home computer owners are most pronounced is in their evaluation of computer products. In chapter six it was remarked that early buyers of home computers often lacked adequate criteria by which to judge between micros. By the late 1980s, however, thanks to a mix of personal experience and wider cultural and market developments, those involved in home computing were well practiced at making judgements of and distinctions between products.[14]

Much of the talk between computer owners involves discussing and evaluating products.[15] It was common for teenagers, for example, to refer to arguments about the merits of different computers. C5 says of Sinclair machines.

" If you buy one you either send it back straight away or you love them. You swear by them. It's like car owners, you're very loyal to your computer. I had so many arguments with my friends, like 'mine's better than your's', it's not but you stick by it."

Discussion is not only of goods already owned but also those aspired to. New products have a special place in conversations between computer owners.[16] What does F14 S do when he visits the homes of friends he has made through computing?

" Play games together, talk, see what they've got new." (my emphasis)

Owners often share a common sense of machines. An important example of this was the association of brands of micro with particular types of computing. Thus, for example, the Commodore 64 was seen as a games machine and the BBC micro had a hobby and educational identity. These links are strong in the minds of interviewees -

even many of those with little direct contact with computers.

An illustration of the increasingly strong connection between products and models of computing is the way that PCs such as the Amstrad PCs - at the time of fieldwork a comparatively new type of mass market home micro - were discussed not only by their owners but by all interviewees. They were strongly associated with a 'practical' work related approach to computing. Some recent purchasers were, for example, keen to distance their ownership of PCs from 'home computing.' For others, the actual or projected move from earlier machines to a PC marked a major shift in their approach to computing. Significantly it was common for non users whose interest had either declined or never got going, such as parents of computing children, to see a PC as something that might spark their own involvement in computing.

Linking particular machines with particular models of computing was not always so clear-cut for respondents. Most of those who mentioned the Sinclair Spectrum associated it with computer games playing. For Mr F9 and Mr F11, for example, it is a "toy" which they rejected in favour of serious computing on a PC. F8 D says ^{she} did not want to have Spectrum "because I wanted something I could program on." Yet these evaluations are not shared by everyone. Mr F17, who has no interest in games, is keen to defend the Spectrum which he describes as "an enormously powerful machine."

" *The reason why people sneer at the Spectrum was because most people used computers for games.*"

Thus, for Mr F17, ownership of the Spectrum identifies him not as a games player but as someone involved in 'real' computing. Similarly when a group of teenagers were interviewed at the start of fieldwork they clearly felt that their ownership of Spectrums differentiated them from other youngsters whose interest in computing was confined to games. It was another computer which deserved the label 'games machine':

" The reason there is a keyboard on a Commodore 64 is so that you can select the joy-stick option you want."

Such ambiguities highlight general features of the use of models of computing by interviewees. Although they had meaning for them, models were an imperfect match with their own experience of the micro. It also illustrates the way that associations between machines and models of computing have changed and firmed up during the period spanned by respondents' computer careers. Mr F17's stout defense of the Spectrum as a powerful all-purpose computer relates back to an earlier time. This was precisely how the Spectrum was marketed and consumed when it was first launched in 1982.

Differences in the evaluation of products

The association of products with different models of computing does not mean that there is a universally agreed hierarchy or typology of machines. On the contrary, divisions exist between interviewees in the way products are evaluated. This involves much more than arguments among friends over the merits of pieces of equipment. Discussion of products is informed by a number of distinct systems of taste and criteria for judgement. These like all systems of taste, in Bourdieu's phrase, both unite and separate people.

Once again interviewees' evaluation of the BBC micro throws up interesting data. The attractions of the BBC micro to many adults - not necessarily themselves computer users - during the boom has already been noted. The BBC was valued as a more expensive but higher quality alternative to machines such as the Spectrum and Commodore 64. Its comparatively high technical specification and association with school and literacy initiatives gave it a special appeal to parents who were tempted to make the financial sacrifice to purchase BBCs for their children.[17] Many

teenagers did not, however, share the conviction that the BBC micro was a qualitatively superior machine to the popular alternatives. As noted already, in households F3 and F6 teenagers no longer use BBC computers bought for 'educational' reasons and have purchased Commodore 64's. They did not consider the BBC an adequate machine for their games-related activities.

The cases of F3 S and F6 S reflect the ways that models of computing have become more powerful and distinct. The stronger association between machines and types of computing is paralleled by an increased definition and differentiation of 'uses'. F3 S and F6 S's early use had encompassed a wide range of activities but by 1987 their computing was centred on games. Similarly at a time when households F3 and F6 first obtained their BBCs (1982) the difference between this machine's marketing and that of the Commodore 64 was comparatively subtle - both were seen as multi-purpose micros. In both cases, games were envisaged as one use for the computer among many.

For interviewees, preferences for one computer over another were 'practical' decisions. They cite, for example, the availability of software on particular machines. We should be careful, however, when interpreting such statements. For example, it was frequently asserted that the BBC was not a 'games machine' yet many games were available on this type of machine and most BBC owners played them.[18] F6 S gives his verdict on the BBC:

" Basic is good on it. You get a few good games on it like Elite but the rest ain't that good.... Every game that comes out goes straight onto the Commodore. If you have a BBC you could be waiting a month before a good new game comes out. And when you're playing with the old ones you get bored of them by that time."

The objection of F3 S and F6 S and other teenagers who rejected the BBC was not that it in any absolute sense prevented them from playing games. Rather, the smaller range of software available and the slowness of it to arrive on the market did not

allow them to participate fully in the discussion and evaluation of software in magazines and among contemporaries who owned 'games machines'. It is when people are involved in subtle distinctions of taste that the availability of thousands of games and of the latest games becomes crucial. Many teenagers were imbued in such a system. F14 S is a master of it:

"An instinct has developed. You tend to know if something is going to be bad or interesting. It's hard to describe. It's like a feeling that you get - like wines."

The above discussion should caution us against using a simple abstract technical hierarchy by which to judge micros.[19] To understand what makes one machine 'better' than another we have to see how it fits into people's lives. Evaluations of machines and other products relate to the activities and networks with which they are embedded. Another illustration of this relates to computer peripherals.

Many interviewees expressed the opinion that a disc-drive is essential for effective computer use. Loading software via a tape player was seen as time consuming and unreliable. This was a frequent complaint of respondents and seen as a disincentive to computing. Some such as Mr F2 and Mr F5 went as far as to see the frustrations of the lack of a disc drive as, in part, explaining their decline in interest in computing. This evaluation of the strengths and weaknesses of various forms of data storage is not, however, shared by all. By the mid 1980s machines with disc-drives had become increasingly common in the home market. Mr and Mrs F1 are not the only parents to feel they had advantaged their children by buying an 'up to date' machine with a disc-drive. Their son had a different judgement of the disc-based machine. It put him at considerable disadvantage when he tried to share his interest in computing with friends. He does not have a machine in common with them. Fewer games are available on the new micro than on older established ones and software is expensive to buy on disc. His solution was to buy a tape player for the computer.

Evaluation of uses and users

The emergence of distinct models of computing helps us make sense of the disagreements about the value of various applications of the computer highlighted towards the end of the last chapter.[20] Implicit in many of the differences between interviewees in their evaluation of products are variations in the way that they understand kinds of use and, by implication, types of users.

As discussions have already hinted, two dominant models, influential in the sphere of production, can also be seen at work in people's judgements of types of use. The 'home-office' approach to computing involving applications such as word processing, data bases and spreadsheets and associated with PCs was seen by many adults as a 'serious' use of the micro for practical ends - distinct from other forms of home computing such as hobbyism or games playing. The growing influence of this model is linked to the spread of PCs in the workplace. A *second model* was based around 'games playing' although encompassing more uses than that. The appeal of this conception was strongest among teenage boys. Both these views of computing had emerged after the first rush of enthusiasm of the home computer boom. In 1987, for example, word processing had only established itself comparatively recently. An older and more troubled third model of computing, however, was also evident in *interview accounts*. *It had its roots in hobbyism and the literacy initiatives of the boom*. Although often justified as both 'serious' and 'practical' it involved a more general interest in computing per se.

These three models of appropriate computer use are present in interview accounts. As we shall see later, however, this does not mean that all respondents can be neatly pigeon-holed into one of these three categories.

Different conceptions of the 'real world' of computing

Although couched in terms of the intrinsic qualities of computing, divisions between interviewees in their evaluations of products, uses and users are, in effect, different views as to how computers allow participation in social worlds. This is illustrated by discussions that took place between father and son of F14 during a group interview. The son, an eighteen year old now working in a computer shop, is scathing about computing in schools. He describes the BBC micro as "alright for schools but in the real world no one ever uses them."

" I often felt very sorry for the schools. They were lumbered with this really naff machine which nobody seems to like and is not very popular with kids."

The "real world" to which he refers is the world of the teenage games player. It is within this world that "nobody" likes the BBC computer. Later in the same interview an argument began between father and son about IBM PCs. For the father (who has comparatively little direct contact with computers) the IBM is a 'serious' useful computer in contrast to games-playing machines owned by his son.

" I hoped one day that he would move into a small IBM system because that's more work rather than games."

" Once you talk about an IBM there is an automatic break. Up until then everything is a games computer. When you are talking about an IBM you are talking about a small business machine."

His son had a different view, arguing that the IBM PC is an inferior machine because of technical specification compared to other machines of a similar price. His work at the shop means he will soon have to adapt one of his machines to run like an IBM. He sees this as "downgrading" the computer.

" Technology is so advanced that plugging an IBM in would be decrepit. It's that boring."

A similar clash of computer worlds was evident when F8 D was interviewed. When we met her mother was upstairs using a portable PC she had borrowed from her work place (she is a social worker). F8 D still claimed during the interview that none of her family were involved in computing. When asked about her mother's word processor she clarifies this by stating:

" She's not actually using it as a computer."

Expectations, Experiences and Models of Computing

The last section showed how a number of different conceptions of computing can be seen at work in interview accounts. Interviewees sometimes found it hard to reconcile these with their own experience or expectations of the computing. This can be seen by considering the way people discuss 'others' involved in computing and in the difficulties of matching computer careers with models of computing.

Models of computing and computer careers

Although models of computing influence the way that producers and consumers make sense of home computing, individuals' relationship with these models is not straight forward. Rather than encompassing and explaining all of a computer career, people borrow models to make sense of a far more complex reality. Thus while at the time of fieldwork two models of computing - the home-office and games playing - were extremely influential, few of the people interviewed could fit their experience of the micro neatly into such classifications.

Ironically, as computing has become more defined it has become less attractive to many. Among the households interviewed, some members' involvement was minor and sporadic. Respondents also included those who no longer use their micro (although many do not discount future use). For these people the dominant models of computing can be said to have little appeal. Also slipping through the cracks between models of computing appear to be people attracted to other conceptions of micro use promoted during the boom. They refer back to earlier threatened visions of computing based around, for example, educational or 'infrastructural' views of the micro. Some express disappointment with the development of the micro.

What of the people who could be slotted into one or other of these models? Many of them, as the last chapter showed, have had careers which have encompassed a variety of 'uses'. These ambiguities in operationalizing models of computing reflect the way that people's attitudes and uses have changed during computer careers.

Contradictions present in many interview accounts sprang from attempts to understand computing in terms of types of use and criteria of evaluation which only emerged during the period covered by the career. Commitment to models of computing is not static or unproblematic. Careers can involve the dumping of one model for another - such as a move from hobbyism to word processing. It would also be dangerous to assume that allegiances to these types of computing will remain static and firm. A number of interviewees, for example, saw word processing as a panacea - a practical alternative to previous types of computing. How the reality of PC use would match up to these expectations is open to question. This reiterates the argument in the last chapter that debates among consumers about the role or 'usefulness' of the micro are not yet fully resolved.

Evaluation of 'others'

As we have already seen, it was common for interviewees to talk not only of their own experience of computing but that of others. Sometimes this was drawn from

direct knowledge of the activities of friends, neighbours or colleagues at work but it was also part of the process of making sense of the home computer boom in general. Talk of 'others' was a popular means by which interviewees attempted to define themselves and establish notions of inappropriate computer use.[21] One might expect this kind of discussion to be couched in terms of models of computing. Respondents do talk of, for example, 'games players' and 'serious users' but the dominant language for discussing others is rather different. The four most common archetypes used to describe 'others' can be arranged in two pairs.

Just playing games and 'boffins' The last chapter remarked on how frequently respondents referred to 'others' (usually teenage children) who are 'just playing games' on their home computers.[22] Mr F2 expresses a widely held sentiment when he talks about teenagers involved in computing that he knows:

" They all seem to have computers but none of them actually program. All they do is play games and swop games."

A common statement from adults, for example, was that games players were using the computer as "a toy". It was notable, however, that such statements often came from people whose computing encompassed games playing (like Mr F2). Many adults were just as keen to differentiate themselves from a world of computer hobbyists - in Mr F1's words "boffins". Mr F9, for example, with a career encompassing both a Spectrum and a PC explains that he had not considered attending a computer club because " they wouldn't be my sort of people." Such distinctions are two-sided. On the one hand they reflect a feeling of non-expertise and exclusion and, on the other, unease with non-utilitarian computer use.

Addicts and Luddites A number of respondents' heavy use of the micro has already been discussed.[23] They, and indeed others with less commitment to computing, were happy to joke about being a computer 'addict'. [24] In contrast to people's rather

ambiguous attitudes towards their own or other family members 'addiction', when the label of addict was attached to others it was as a cause for concern. Mr F2 describes a friend who is an 'addict':

" You couldn't talk to him about anything else.... He'd be on the machine all hours of the day and night. It nearly broke his marriage up."

Many interviewees were keen to differentiate their computing and that of their children from those who (as Mr F5 put it) "abuse it and let it take over their lives." This held true even for those who had earlier been very heavily involved in computing. In the last chapter Mr F25 was quoted describing how computing had taken up a large portion of his life.[25] He distinguishes himself from others he has met in clubs and shops who are addicts:

" I may be playing with a program once in a while until three o'clock in the morning but these people regularly do that. Their lives have been taken over."

As chapter six noted, even more common than condemnations of obsessive use was a near-universal contempt for those who were perceived as rejecting computing.[26] Criticism of others who do not use computers was present right across the range of interviewees - shared by 'games players', PC owners and computing enthusiasts. Even those with chequered computer careers such as Mr F5 and Mr F9 were quick to damn Luddites (an expression which cropped up in a number of interviews). For some such as Mr F11, Mr F17 and Mrs F13 this was tied up with their promotion of computing at work.

" People don't like the idea of change but when they actually see and use it they see it is not so frightening."(Mr F17)

The two pairs of archetypes outlined above pepper discussions of computer use.

Although those just playing games, hobbyists, addicts and Luddites often cropped up in interviews, the application of these categories is full of ambiguities. Many of those who would be classified as 'game players' by respondents differentiate themselves from those 'just playing games'. Similarly someone seen as a hobbyist by others defines him or herself as a serious practical user, distinct from other technical enthusiasts. Once again, while the users' world is haunted by Luddites, these sceptics are hard to find.

Rather than a reflection of their direct experience, interviewees' discussion of 'others' reflects insecurities about the validity of their own computing and concerns about the direction(s) of development of home computing in general. While talk of Luddites is evidence of a continued belief in the importance of computing, many people do not appear at ease with the dominant models of computing. Criticisms of addicts, boffins or games players should be seen in the context of people's own uncertainties about the value of the computer and how it should fit into their lives.

Part II: Computing, Involvement and Identity

While interviewees discuss the value or usefulness of computing largely in terms of the intrinsic qualities of the micro, these issues are, in fact, resolved socially. Models of computing may be equated with particular types of use but they are better understood as sets of values and activities. To understand the origins, appeal and future prospects of such models we need, therefore, to consider computing in its various social contexts.

The second part of the chapter focuses on the role of computers in the construction and demarcation of collective and personal identities. The emphasis is on interviewees' use of the micro as a cultural resource.[27] Acknowledging that the home computer, like any other good, can be implicated in a "plethora of projects"

even within a single household, this section concentrates on one particular dimension of this - the way that goods enable us to participate in a variety of social domains. While illustrating that computers are used to establish social similarities and differences, the section also raises two complications. Firstly it shows that this process must itself be grounded in existing social conditions by exploring the relationship between gender, age and class and the adoption of particular models of computing. Secondly, continuing the argument developed in the last chapter and earlier in this one, it argues that the place of the micro in the everyday continues to change and, for many, remains problematic.

Computing and the Household

Previous chapters have already touched on the debate as to whether the household or the individual is the appropriate unit of analysis of home computing.[28] We have seen that among respondents the micro was rarely used by all members of the household and, typically, one main user emerged. Interview data shows that use tends to be increasingly individualized. This reflects not only the development of computer careers but also the evolution of distinct models of computing. To understand the place of the micro in the household, however, we need to go beyond direct machine contact as a measure of involvement with home computing.

The complexity of involvement with computing within households became apparent when attempts were made to organize interviews. Not every family member wished or, indeed, felt qualified to take part. Some respondents clearly did not see the computer as a household issue. This was indicated in a number of ways. It was hard, for example, to develop early contacts made via computer clubs into family interviews. One teenager went as far as to arrange an interview away from home and withheld his address to ensure no contact could be made with his family. These problems continued when I set out to interview households. Some replies to my appeal for help were explicitly from an individual rather than a family. A number

of times, after expressing an interest in the household, I arrived at a house to find a respondent alone or other family members 'just leaving'. This should not always be seen as users excluding others from discussion of the micro. Sometimes they appeared to have difficulty in persuading other family members to join in - the two female enthusiasts F8 D and Mrs F13 were cases in point.

Even when whole households were interviewed, differences of involvement in the micro were still apparent. Sometimes respondents expected and were extremely keen that I should talk to all family members. This enthusiasm was not always shared by other household members.[29] Interviews with adult women, in particular, were sometimes strained as they could not see the relevance of their taking part in discussions about the micro. In one case, for example, during a joint family interview the mother kept leaving the room. In three other cases (F26, F18 and F12) wives were present but literally in the background - limiting themselves to occasional interjections and resisting attempts to be drawn into the interview. Women such as Mrs F26 were hard to involve because neither she or her husband saw her having anything to contribute to a conversation about computing. The diffidence of some women in group situations and bemused approach to individual interviews testified to them not seeing the computer as their concern.

The exclusion of family members from or their non interest in discussions of home computing is a significant finding. Perhaps even more interesting, however, were those who felt qualified to talk about the computer despite using it rarely if ever. Many interview discussions were with people who had little day to day contact with the computer yet still felt they had an investment in and knowledge of it. An obvious example of this is parents' involvement in their children's computing.

It is possible to find differences in the level of knowledge and involvement in computing among non-users even within a household. Consider these two examples. Mr and Mrs F15 purchased a computer for their daughter and both have a background of

working within the computer industry. Mr F15, however, is far more involved in his daughter's computer career than his wife. Although most of his own plans to use the micro have not come to fruition, he has purchased software, read magazines and attended exhibitions and computer clubs with the express aim of facilitating his daughters' computing. Similarly, while neither Mr or Mrs F16 regularly use the computer they obtained for their sons, it is Mr F16 who went through the manual in order to help them and felt qualified to talk to me about their computer use.[30]

As earlier examples suggest, within a single household different members may make competing claims to define and discuss the computer. These claims were more likely to be expressed as struggles over the ownership of the machine rather than direct access to it. Household members take a stake in the micro on different basis and for different reasons. Particular members see the machine as theirs because of their financial contribution to its purchase, because they were involved in the purchase decision, because it was a gift, because it was intended that they should use it, because they use it, because it is in 'their' bedroom or study, or simply because they have knowledge of it. Seen in these terms, ownership can also change over time.

Differing conceptions of the micro within households

Claims to and disagreements about the ownership of the computer within the household reflect the way that computer can be used as a cultural resource outside of the home in a variety of social contexts. As the last chapter noted, different evaluations of the value of computing are often expressed within the same household. This can make it difficult for households to present a coherent and unified view of their computing to the outside world - not only in interviews but in other social settings.

Differences between family members are further illuminated by considering the

potential for conflict within households offered by the micro.[31] Preconceptions had initially led me to focus on conflict in terms of struggles over access to the machine. In reality this appeared, at most, a minor issue. A far more important source of tension was the amount of time devoted to the micro by particular household members. Although the seriousness with which it was taken varied, this was an issue in the majority of households. Parents would complain about the amount of time children spent computing - either too much or, in a few cases, too little. This was also a potential source of conflict between husbands and wives. Rather than being an issue about access to the micro, disputes were about access to the person. Computing was often an activity that separated household members - "an intruder that comes between us" as Mr F17 put it. Interestingly, in two cases such tensions were lessened by physically moving the computer out of a separate room and into the communal living room.

Disagreements about time spent on computing relate to a second area of tension within households - differences about the value of computing and certain types of computing in particular. Once again, clashes of the hopes and expectations of various family members and different notions of appropriate computing are to the fore. The debates and differences about the value of computing and particular types of use described towards the end of the last chapter are evident within households.[32] Most commonly this was expressed via parental dissatisfaction that the children's use of the micro for games. In two cases parents restricted children's use of games and in F3 they confiscated equipment for a period. In F25 the micro was moved out of children's bedroom to prevent 'over use'.

At their heart such disagreements rest on differences in how family members perceive the role of the computer as an aid to participation in social life. C5, for example, was 19 when he was interviewed and working as a shop fitter. When younger, he had been keen on a broad range of computing activities. Although they had little knowledge of or contact with the computer, his parents encouraged him to program and

discouraged his games playing. Programming they believed would improve his job prospects. C5 did not share this enthusiasm:

" I never wanted to make money out of it. I never wanted to be a computer programmer or anything like that. It was all pathetic. I couldn't sit in front of a keyboard twenty four hours a day."

Examples like this show that the household can be a site of struggle between different conceptions of computing. They suggest that we need to look beyond the home to understand how models of computing are sustained.

Domains of Computing

As the household discussion indicated, ownership of a computer was about participation in social worlds - both existing social milieus and special computer worlds. By exploring different dimensions of this we can understand better the viability and sources of appeal of particular models of computing.

Clubs

At this point it is worth returning briefly to the computer clubs discussed in chapter five. Clubs are the most obvious illustration of the ways computing can be a shared interest which is fuelled and gets meaning from outside of the home. As social organizations, however, they were not always a success. Divisions were evident between the participants in the clubs.[33] These involved clashes between conceptions of computing, cross-cut by generational differences. The chequered history of many organizations shows the difficulty of maintaining some conceptions of computing.

The overwhelming impression given by those adults interviewed who had set up and

administered computer clubs was one of frustration. This tone was set by C3, a middle aged hobbyist, who had run both a club and a regional organisation of affiliated clubs. These were both in "disarray" due to conflicts between two groups of members he termed 'enthusiasts' and 'games players'. The experience of his own club was typical. The founders of the computer clubs, including C3, were often hobbyists who had earlier technological interests like wireless and electronics. There was a "great divide" between them and the 'games players' who were "arcade youths" although a few were "very old arcade youths". Tensions between the two groups lead to bitter political struggle for control of the club.

Adults involved in the setting up and running of Club A told a similar story of division and disappointment. This time the split among members was not characterized as between hobbyists and games players, but between games players and those with more serious educational aspirations for the club. Mr F11 who had been involved in the early months of the club describes how soon "all the ideals fell apart." Initially, attempts were made to manage the diversity of members' expectations and objectives by such things as segregating 'members evenings' with the games playing going on in the children's library and a "non games room" in the reading room.

Differences within Club A were also generational.[34] Most of the adult members attracted by early meetings drifted away and soon between fifteen and twenty teenage boys regularly attended meetings. The basis of the continued appeal of the club to this group was its grounding in social networks. Despite extensive efforts made by the adult organizers to publicise the group, the new membership continued to be drawn from the friends and school mates of existing teenage members. Eventually, the two adults still involved ended the club not because of lack of interest but because they felt they were "only running a youth club." They did not feel it was fulfilling its goals of introducing new people to computing and promoting 'serious' use of the micro.

Club histories given by adults portray their decline in terms of clashing models of computing. A number of notes of caution should be sounded, however. As already remarked, those teenage members of Club A contacted during fieldwork were not only interested in games. On the contrary, they had a far broader interest in computing. In fact, adults sometimes relied on them to run abortive educational initiatives such as programming courses. Differences within the club were based less on interests and expertise than on contrasting expectations of the purpose of the club - a split along lines of generation as much as type of computing.

One of the ironies for those involved in running computing organizations was that, while it was hard to maintain a model of computing based around serious educational aims, supposedly frivolous kinds of micro use grounded in games formed the basis of long standing commitments to computing shared by social networks. The complaints of adult club members have characteristics in common with the protestations of parents about their children's computing and, indeed sometimes, adult respondents' own disappointment with their careers. While they were convinced of an unfulfilled potential, they are unsure what to put in the place of computing as it is.

Complaints about the prevalence of games playing should be seen in the context of the uncertainty among many enthusiasts about what the club members should be doing instead.

A further complication is that - as previous discussions have hinted - one person's games player is another's serious user. This was highlighted at the meetings of Club C. The participants were almost exclusively male teenagers who clustered around the computers in the shop where the club was held, playing and discussing games. The club was an opportunity to try out any game or computer in the shop. It was clearly a success for the majority of those who attended. Most teenagers were happy with what they got - a meeting place at which to talk about *and use computers* with others in their peer group. This sentiment was not shared by those in charge

(including F14 S). They were exasperated by the lack of structure and frustrated in their plans to do 'serious computing' involving teaching programming and demonstrating new pieces of equipment.

" There was nothing to do. At other computer clubs you could see really flash stuff - people would show off their programs and have a general talk. Our club never really got off the ground."(F14 S)

The club ended soon after, partly because of thefts from the shop. What makes the splits within this club so interesting is that those in charge including F14 S would in other settings be considered "arcade youths."

Computing and social networks

It would be wrong to think of clubs as bringing together otherwise isolated computer users. Membership of all three clubs studied tended to shadow existing social networks. Three teenagers contacted during fieldwork, for example, who had attended Club A, lived close to each other and were friends before visiting the club. For them, the club was part of a network of friends and activities centred on (but not exclusively about) computing. Meetings formalized activities which took place elsewhere such as playing, swopping, and discussing software and trying out new products with other users.

As chapter four noted, a number of studies have remarked on the social nature of home computing.[35] Fieldwork confirmed that it is among teenage boys that the social character of computing is most pronounced. There are similarities between the male teenage computer culture and other shared interests, sometimes understood as youth subcultures, which are organized around particular objects - for example motorcycles or records. Subjects are aware of the parallels with other 'youth culture' activities. C5 tells how he was "infatuated" with computing:

" When other people were listening to music, I was playing on my computer or talking about it."

Groups of friends with an interest in computing in common often own the same type of computer. They may swap, borrow or copy software and other products from one another. They also share information and give advice about products.[36]

Commentators have argued that such a social network is important to 'successful' and continued home computer use.[37] There is, however, a danger of misunderstanding what is going on. It is wrong to view the social network simply as supportive to 'real' computing without considering that the network itself might be the heart of the activity. Talking about computing, for example, cannot be seen simply as a route to more effective micro use - it is an end in itself.

The social nature of computing is not confined to teenagers. The discussion of computer purchase in an earlier chapter showed that it was often shared with networks of friends or workmates. This did not cease after purchase - even if computer talk did not have such a high profile. Most respondents knew friends, neighbours or workmates also involved in computing. Discussions and comparisons of computing careers is a feature of their relationships. Mr F11, for example, tells of a regular institution "computer night" which involved meeting with a male friend and discussing computing and swapping software. These evenings were not exclusively about computing and usually culminated in a visit to the pub, leaving his wife at home to look after the baby. Computing was part of a repertoire of interests Mr F11 shared with his friend. In a different dimension of this process some users of word processing such as Mr F1 and Mr F12 developed an interest with and pooled expertise with colleagues in the workplace.

In a substantial number of cases, computing was the basis of new relationships.[38] F14 S told how computing had "given me a social life." Other teenagers spent time

outside the home sharing their interest with contemporaries. F3 S provides an interesting twist to this phenomenon. His devotion to playing a multi-user game (MUG) via a modem is discussed above. At first glance, this might fit neatly into a vision of an isolated individual living out aggressive fantasies via the computer. An interesting dimension of this game, and the one F3 S particularly enjoys, is, however, that rather than confirming preconceptions about the competitiveness of games, the MUG is built around cooperation. A major part of its appeal is that it generates social contacts with other players. F3 S spends as much of his time using the modem to talk to friends he has made via the MUG as actually gaming.[39] He now regularly meets other players, first contacted using a modem, face to face.[40]

Once again, the use of the micro to make social contacts was not confined to teenagers. Although their computing is very different - one is mainly interested in games while the other concentrates on 'practical' applications - Mr F17 and Mr F24 have much in common. They are both middle aged men who have networks of friends who have the same type of equipment and with whom they share their experiences and expertise. Mr F25's interest in computing led to a new intimacy with people (many of whom were computer programmers) who worked in the building he managed.

" Moving around departments I'd introduce myself and ask them what personal computer they'd got... I gained lots of new software that way and lots of new friends. Or I'd go knocking on somebody's door who I knew had a BBC micro and introduce myself and ask them about a particular problem. I always found people most helpful."

Different worlds of computing

What is notable about the ways that computing is part of the common currency of social networks and, indeed, can form the basis of social contacts and groupings, is the variety of different social domains in which computing can be implicated. Each of these environments - work, school classroom, school playground, friends, computer

club - may involve a different language and different criteria by which to discuss and evaluate computing. [41] This requires presentational sophistication among micro owners. How individuals describe and understand their computing may vary from context to context. This also suggests that 'knowing computers' is not about the methodical attainment of certain fixed technical competencies but the ability to negotiate and utilize computer talk in particular social domains. [42]

The existence of different computing domains is illustrated when we consider the role of 'the expert' within social networks of both users and non-users of micros. Some of the ways in which interviewees enjoyed the status of expert - encouraging and facilitating computing - were discussed in an earlier chapter. [43] Their expertise, however, is exercised in a number of quite distinct environments and indeed the nature of expertise itself differs between computing worlds. Once again, F14 S provides an insight into the world of teenage enthusiasts. Ownership of the 'latest' or 'best' equipment or software invests him with prestige within his particular social network:

" It always seems to work out that I have a group of friends who come around during the week or on Saturdays. Like another computer club really. It seemed to me that I was always the one who had all the equipment and computers and everything and everyone else just came around. It seems to work like that so why not stick with it. Every time someone has a special interest in a computer I'll be the first to get it. "

F14 S's knowledge of new games and new pieces of equipment, affords him a special status among his contemporaries. The role of opinion leader which he plays among his friends is now formalized (and no doubt given new strength) because he works in a computer shop.

Other respondents were experts in quite different social contexts. For users such

as Mr F11, Mr F3 and Mrs F13 ownership of a micro was part of a bid for expertise in the workplace. Mr F11, for example, achieved the status of expert at work to the extent of being put in charge of the new computer system. Mrs F13 is the computer expert at the primary school where she teaches - advising others on the computerization of not only teaching but also school administration. These bids for expertise can face problems outside communities of users. For both Mr F11 and Mrs F13 the role of the expert *brought* frustrations as well as rewards. They were confronted by what they saw as indifference or resistance to change among colleagues.

Δ5

Gender, Age, Class and Computing

The social nature of computing activity and, in particular, the existence of different domains of computing is further illustrated by considering how computing is structured by class, age and gender. This also helps us to understand the appeal of different models of computing.

Class

The interview group had limitations as a sample of the social structure.[44] The research data also showed the difficulties of operationalizing class as a fixed variable. The micro itself sometimes appeared to be part of a strategy of upward class positioning. As the respondents drawn from council estates attest, a number of respondents with middle class occupations had come from working class backgrounds. *Never the less* data from interviews does provide insights into the ways that social class (and particularly occupation) mediates home computing.

Δ5

To remark that a persons' occupation is likely to affect the attractiveness of the home-office approach to the home micro is perhaps stating the obvious.[45] Applications such as word processing held little appeal to a supermarket storeman

(F6 S) or a factory fitter or school dinner lady (Mr and Mrs F24). Mr F17 and Mr F25, both employed in supervisory capacities, had to work hard to justify their home-office approach to computing.[46] It is small business people, teachers, journalists, researchers and those employed in the computer industry who were most at ease with the computer as a 'work tool'. As earlier chapters on purchase and use have shown, however, the relationship between such people's work and home use is often a complex one.[47] They are, for example, likely to use word processing not only for work related tasks but for other domestic reasons.

One important dimension of the links between occupation and home computing was the way that the reality and/or possibility of computerization at work influenced conceptions of the home micro. Many in middle class occupations had direct contact with computers at work before purchase of a home computer. They were exposed to the spread of computing and of PCs in particular, in workplaces which gathered pace during the 1980s. This, for example, made them aware of applications such as word processing as potential micro uses. Among middle aged men, in particular, computerization at work was perceived as a disruption and possible threat to their position. Mr F3, Mr F4 and Mr F5 all, in different ways, described their own interest in the computing as springing from excitement and/or concern about computerization in their workplace. Thus the computing worlds that people moved in outside the home helped to mediate their domestic use of the micro.

Class appears to influence not only the attractiveness of particular conceptions of computing but also to affect the successful adoption of those approaches. A striking example of this relates to the educational conception of the micro. This is an important issue which deserves more attention and investigation than the small group of respondents allowed. Differences did seem, however, to exist between (the few) working class families and those from the middle class. This was not in their initial commitment to the educational micro - an idea which influenced purchase decisions and evaluation of both sets of parents - but in parents' ability to

maintain this model of computing once the micro had entered the home.

Age

Interviews confirmed that interest in home computing can be found among people of all ages. Age differences exist, however, in the appeal and experience of home computing. Most dramatic of these is the contrast between teenagers and other (older and younger) computer users. A contradiction which emerged consistently in discussions with adults, in both household interviews and through computer club contacts, is evidence of this. On the one hand, adults had a high estimation of the knowledge, skills and speed of learning of teenagers with computers. On the other, they were quick to condemn the nature of these same youngsters' computer use.

This chapter has already touched on the peculiarities of teenage computing on a number of occasions. While teenage interviewees were not 'just playing games' the world of commercially produced games software was more attractive to them than to many adults. Not surprisingly, home-office and home automation applications held less appeal than they did for adults (some teenagers did engage in this kind of micro use, however). Teenage computing is distinctive not simply because of the types of use involved but also because of the nature of the activity itself. It was influenced on the one hand by school contact and parental encouragement and, (for boys at least) on the other, by far more frequent and intensive social contacts based around computing.

The significance of the sharing of an interest in the micro among contemporaries in shaping teenage computer use is illustrated by contrasts not only with adults but with younger children. In families F1 and F16, for example, the interest of the elder sons is of a different character and intensity than that of their younger brothers. The computer career of F16 S1, discussed in the last chapter, is again particularly illuminating.[48] Initially his interest had been sporadic. He used

software that came with the computer or chosen by his parents. In the few months before the family was interviewed the son had gained a new level of interest in the computer. Computing was now an activity which took place with his contemporaries. It had been integrated into an independent social life which was beginning to emerge. Most of his friends now have computers. One had visited on the evening he was interviewed. They had played a game together which they both owned, seeing who could achieve the highest score. S1 talked about learning Basic and about how he and his friend "find things out together." A key part of the shift in F16 S1's career is a change in the role of consumption within the activity of computing. He now plays, discusses, swops and copies games software with his friends. They visit the local computer shop together and plan a visit to a computer exhibition. Mr F16 measures his sons new interest in the computer in terms of consumption:

" In the back of his mind all the time is what the next game is that he is going to buy."

This kind of commitment, shared by contemporaries and implicated in a range of social activities outside of the family, is a distinct, thriving and robust world of computing. Two notes of caution should, however, be sounded before we assume that it has a firm and secure future. Firstly, just as young people's interest changes and intensifies in their teenage years, this approach to computing loses appeal for many of them when they get older. This was acknowledged by interviewees such as F6 S, F3 S and F14 S. All three were aged eighteen and retained a strong interest in the computer. As they had got older and left school, however, their experience of computing had changed. Many of their contemporaries were no longer so interested in computing. These three cases have had to look for new basis for computing as a social activity. F6 S used to share his interest with school friends. Now he works in a supermarket and his workmates are not interested in computers. What of former class mates?

" Their computers are probably sitting in cupboards or been taken over by their younger brothers."

He was not alone in associating interest in computing with the middle teenage years. Both F3 S and F14 S have had to shift the basis of their identification and engagement with the micro as they have grown older. F3 S now devotes his time to games playing via a modem. F14 S's ambiguous position in relation to teenage games playing is well illustrated by his opinions about Club C described above.

The vulnerability to aging of the model of computing adopted by many teenagers was highlighted by the careers of four ex-members of Club A. All were now aged between seventeen and nineteen and three lived close to each other, were friends and shared similar backgrounds, aspirations and opinions. A common experience of teenage home computing came out strongly from all these interviews. Part of this experience, however, was a recent change in the character and intensity of computing. In the face of exams or leaving school or simply getting older, allegiance to computing declined or was in abeyance. This change was itself explained in collective terms.

" It's mainly because, during the craze, other people's interest used to rub off onto you. Everybody used to talk about it and get together. Everybody's interest has gone down. You don't get that many people in shops now. It's dead in there."(C7)

This quote points to a second complication to assertions that teenagers have found a stable model of computing. Sales of games software and magazines are testimony to the continued popularity of this form of computing. It may be wrong, however, to assume that commitment to computing among later cohorts of teenagers is as intense and widespread as it was for those whose introduction to the micro came at the height of the boom. There was considerable disagreement, for example, among teenagers themselves as to whether interest in *computing* had declined.

Gender

Interview data confirmed that computing, particularly among adults, is a heavily gendered activity.[49] This is reflected not only in differences in use but through other measures such as involvement with children's computing or future intentions. Such divisions were often sharp and unquestioned. Mr F5 explains that their micro was a "family Christmas present". It was never intended, however, that Mrs F5 would be involved. Even now this possibility is the source of humour to both her husband and seventeen year old daughter:

(Mr F5 to Mrs F5) " We didn't seem to think it would be any good for you did we? ... You can't cook on the computer."

It would be wrong to assume that users always wished to exclude other members of the household from computing. Outwardly at least they were as likely to talk about encouraging non-users to participate. This held true for women non users.

" I'd love it if Alison used it. She toys with the idea but has never got around to being sat down and shown how."(Mr F12)

Mr F25 has purchased a typing tutor programme for his wife to use but complains that "she will only use it at my suggestion."

Adult women, in particular, were seen as representatives of Luddites and those frightened of computing. This opinion was not confined to men:

" My mum used to say 'I'm not computer literate.' I used to get really bugged by this. I kept saying 'It's like reading a book - if you don't try you will be illiterate.'"(F8 D)

In a number of cases husbands were keen to impress on me the hostility their wives felt not only towards their own computing but towards computing in general. Mr F10 asked if I wished to speak to his wife in order to investigate why it was she would not use the computer.

" At the moment she is a computer Luddite.... She's got a mental barrier to overcome. I guess there are a lot of people like her around."

Other men such as Mr F17, Mr F3 and Mr F9 talked of their wives' "hatred" of the computer. When Mrs F3 and Mrs F9 were interviewed, however, their views were far subtler.[50]

Husbands' protestations that they encouraged their wives' interest in computing should not simply be taken at face value and were usually made with the confidence that they were unlikely to be acted upon. They do suggest, however, that the gendering of the micro is not reproduced via the exclusion of women from computing within the home. It should also be noted that, certainly among the households interviewed, parents saw their daughters involvement with home computing as of equal importance to sons. F8, F20 and F15 are all cases where parents purchased micros for their daughters. In F5, F24 and F7 daughters featured in the rationale for computer purchase. In other cases they were included in family purchases.

In part, gender differences in computer use can be explained by placing them in the context of existing domestic and occupational divisions of labour. Numerous studies have pointed to the deprivation of women in relation to access to time to be devoted undivided to 'leisure'. They also point to unequal distribution of household financial resources to underpin interests.[51] Put crudely, it is hard to imagine some of the women interviewed having the time to pursue an interest in computing. Mrs F22 when asked whether she uses the 'family' computer which she and her husband recently purchased, replies:

" I keep popping in and using it for ten minutes."

Discussion of gender differences and computing has tended to focus on access to computer equipment and expertise on the one hand or the 'inherently masculine' qualities of computers or software on the other. As discussions above suggest, lack of access is not an adequate explanation on its own. Fieldwork also empirically supported Haddon's assertion that studying computing activities rather than the qualities of computing texts or artefacts is a more fruitful route to understanding gender differences.[52] The social nature of computing and the existence of different computing domains helps to explain the gendering of computing in general and certain types of micro use in particular.

Respondents included a number of female teenagers who had an interest in computing. Their experience was, however, very different from that of boys of the same age. They did not share computing with contemporaries even when friends also had computers.[53] This appeared to have two consequences. It was more difficult for girls to maintain an interest in computing over a long period of time and their interest was likely to be less intense. Because of this they often found it harder to categorize their computing into different types of use. Thus, while there is a good deal of interest in computing among girls, their position in relation to the micro often appears marginal.[54] They may, for example, play computer games but this was likely to be restricted to software they were given or came with the machine. This did not develop into a long-term involvement with games production and playing.

These kind of findings have lead Haddon to argue that much of women's computer use is hidden or isolated. Even relative to differences in use, women are less interested in the public arenas of computing such as magazines, exhibitions or clubs.[55] It is certainly true that the two visible poles of attraction for

computer users - games playing and hobbyism are very male worlds. Significantly the two females interviewed who had, unusually, sustained an long interest in computing were unable or unwilling to participate in these particular domains.

Computers have played an important part in the life of F8 D since she got a machine in 1982 when she was aged twelve. A number of characteristics differentiate her computer career from those of teenage boys interviewed. Firstly, although she has contributed to computer magazines and had a Saturday job in a computer shop, she is relatively uninterested in the discussion, evaluation and acquisition of computer equipment. This is in marked contrast to male enthusiasts such as F14 S or the ex-members of Clubs A and C interviewed. She has spent comparatively little although she does now own a printer and disc drive. Throughout her interest she has kept the same computer - one of the machines which were commercial failures and seen by many as a handicap to successful use.[56] A second characteristic differentiates her from male enthusiasts of equivalent age is that she has virtually no interest in computer games. Indeed, she has bought very little commercially produced software:

" If I want something I'll write it myself. "

F8 D's relatively low interest in acquiring or discussing further hardware or software, considering her very high commitment to computing, must be understood in the context of her position outside of the world of male teenage computer users. She talks of "male chauvinist" enthusiasts she knows. Her scorn for the boys is expressed in being dismissive of games playing and of others who own a lot of equipment. She is also critical of "male domination" of the computer worlds she attempts to inhabit:

" Every job interview I've been to there have been more boys than girls. If I've got this place at college I'll be the only girl which doesn't really bother me. "

While portraying male computing in a negative light, she is still frustrated by women and girls who are not interested in computers. This annoyance is focused on her sister who is now the same age as she was when her enthusiasm began. She does not share her sister's passion being, according to F8 D, only interested in "dancing and all that rubbish."

F8 D is not able to share her enthusiasm with contemporaries in the way many male teenage enthusiasts do. Her computing is, however, sustained socially on a number of fronts. She helps manage the computer system and runs a computer club at the school which until recently she attended. She describes her (female) computer studies teacher as her "best friend." An earlier chapter showed she has achieved notoriety as a computer expert in her local neighbourhood.[57] Her skills in computing have enabled her to get a number of part-time jobs and she plans a career in computing.

Many of the same issues are thrown up by the career of Mrs F13. She is a primary school teacher in her early forties with two teenage children who uses her computer regularly both at home and at work. Like F8 D she is not happy in many of the arenas inhabited by males with a similar level of enthusiasm. Conventional clubs are "a waste of time" and she feels she gets inferior service in computer shops because of her gender. She says she "would not dare" talk to her (female) friends or work colleagues about computing. Once again, however, it would be wrong to see this as evidence of isolated use. Mrs F13, instead, has looked for other sources of meaning and contact than those open to many men. She has become the computer expert at her workplace and made contact with a number of parents of her pupils who are also interested in computing.

The effort put in by both F8 D and Mrs F13 to generate social contacts via computing (also reflected in their keenness to participate in the research and the length of

interviews given) and their non involvement with the worlds of computer games players or hobbyists paradoxically give us clues as to why female involvement with computing is low. They have had to work hard to utilize their computer as a cultural resource. Their marginal position in relation to networks and cultures which appeal to men suggests that women's supposed fear of or hostility towards the micro is actually directed towards particular dominant models of computing. As Sue Bains writes of her own recent empirical work, the home computer boom has "passed by" many women.

"... for the women I spoke to male hobbyist computing was irrelevant rather than excluding or threatening." [58]

Despite their long running, and in the case of F8 D all-absorbing, interest in computing both females discussed above insist on the utility of their computing. This suggests, as others have argued, that women find it especially hard to justify computing on non-utilitarian grounds. [59] This may be reflected in Mrs F13's success in encouraging female parents to attend a computer club on the basis that it would help their child's schooling. It may also help explain an ambiguity which exists in a number of women's opinions of computing. Home computing was seen as, by turns, a stupid waste of time and an important area from which they are excluded. [60]

Women may be even more preoccupied than men with the usefulness of the micro but the interplay between their everyday lives and models of computing shows just how complex the whole issue of utility is. This is illustrated by their attitudes to what, for many adult men, were two 'useful' forms of computing. While women had the primary responsibility for domestic labour it was almost exclusively adult men who were excited by the 'labour-saving' potential of IT in the home. Similarly women's position within the labour market appears to make the home-office approach to the micro less attractive. While their over-representation in white collar occupations means that they frequently have contact with computers, their experience is often

mediated by a lowly position in the occupational hierarchy. Put crudely, women (even middle class women) are more likely to have to adapt to technological change in the workplace rather than manage it. This helps to explain why it is that while many adult men cite work contact as part of the reason for their preoccupation with home micros, a number of women saw it as an explanation of their non-interest in home computing. It also shows that the appeal of work related home computer use is less about self-training for specific tasks (which is often of more relevance for women) than acquiring more nebulous forms of cultural capital.

Conclusion: Looking Backwards and Forwards

This chapter has highlighted a number of dimensions of the development of cultural conceptions of computing. The first part charted the emergence of different models of computing. Rather than any abstract use value - it is their embeddedness in social life which helps to explain their power and persistence. The second part of the chapter developed this theme by pointing to the development of different domains in which the computer could be a cultural resource and some of the ways in which the experience of computing is mediated by social relations of class, age and gender. Both parts show that it is (increasingly) difficult to talk about a single experience of computing or a single evaluation of that experience.

While the identities of the computer and computer users have become more defined during the second half of the 1980s, as the last chapter showed, the role of the micro and its value remains a contested issue. The dominant models of computing are not attractive to all. We should not overestimate the stability of these models or the permanence of the place they have established in social life.[61]

The development of models and domains of computing seems a long way from the universal enthusiasm of the early boom and visions of the impact of IT which inspired many home micro purchases. Never the less these ideas are still present in

interview accounts and can act as disrupting influences when people evaluate computing. Their continued presence helps to explain a number of contradictions in the way interviewees look back at their experiences of computing and forward to the future. Earlier models of computing, for example, based around ideas of computer literacy persist, prompting disappointment with computing as it is.

Disillusionment with computing is most pronounced when people discuss the experience of the boom in general. Some teenagers were prepared to argue that interest in computing remained buoyant - it was only the media's interest that had declined. Most adults did not share this opinion. They believed that many of ^{the} computers purchased during the boom were now unused and that the majority of home computer users only play games. The home micro is often described as a fad or novelty. When people discuss their personal or household experience of the micro, however, the picture is far more complex than ^{the} one of simple disappointment suggested by some commentators.[62] People note unfulfilled expectations about, for example, the micro's impact on career prospects and home life but this itself implies belief in the possibility of something more:

" The original intention was that it was going to be an educational toy but it didn't educate anyone about anything except zapping things."(Mr F14)

None of those interviewed were prepared to write the computer off.[63] Even those who have not 'found a use' still acknowledged the potential of the micro. They took pains to point to often intangible benefits at school or work. Sometimes the dashing of expectations about the micro is itself seen as positive:

" Now I know I don't want to be a computer buff."(Mr F9)

" I now appreciate that computers are not as powerful as a lot of people think they are going to be."(Mr F9)

In this way accounts of careers can be contradictory. Take Mr F2, at some points in his interview he says how he "never stretched the computer" and talks of future plans to purchase a disc-drive. At other times he is more cynical:

" I sometimes think if I could get all the money I've spent back I'd do it because I don't get the use out of it."

" A computer is useful to someone who uses it in his business or a real enthusiast but for everyone else they are really pretty useless pieces of equipment."

Mr F2 is not alone in being unsure whether he wishes to get rid of his computer or purchase additional equipment. Many who are presently discontent or have never used a home micro also talked of acquiring new equipment or software or making different uses of an existing micro.

Similar contradictions are present when we consider how interviewees perceive the future of home computing. Personal plans for the future were often based around the dominant models of computing but people discuss the prospects of home computing in general almost exclusively in terms of visions of a computerized home of the future. They talk of home shopping and banking, home security, regulation of lighting and heating all as future uses for the computer in the home. This should not be seen as an indication of universal enthusiasm for such developments. Many were dubious about the benefits of such changes but still perceived the future in these terms. Once again this suggests that notions of the future significance of information technology continue to destabilize models of computing. On the one hand they fuel discontent with things as they are and, on the other, they prompt continued belief in how things might be.

III: THEMES AND IMPLICATIONS

Chapter Nine

Themes and Implications

This end-piece restates the key themes of the thesis, points out some of their implications and suggests areas for further research. In doing so it argues that, while the micro may be an unusual product and the boom may be an exceptional event, its study is of relevance to discussions of innovation, consumption and technology as culture.

Innovation as a Cultural Process

Analysis of home computing confirms the importance of understanding the cultural life of technology. More than this, it shows some of the ways that the very development of technology - innovation - is itself a cultural process.

Conventional models of the diffusion or adoption of innovations proved inadequate means to understand the development of home computing. The home computer did not emerge ready-made and gradually spread throughout society. The period of 'adoption' or 'diffusion' of the micro actually involved the development of technologies, institutions and practices of computing. The home computer had to establish an identity and place in social life. What the micro was, what it was for and who it was for were all questions which remained to be resolved. Thus, a whole range of interests and publics were engaged in 'inventing' the home computer.

One of the themes of thesis has been the changing character of computing. This has involved a series of different, interrelated, temporalities including personal computer careers, product histories and wider cultural shifts. Debating the identity and value of the micro has been an integral part of the development of computing. This takes place across the spheres of production and consumption. It

would be wrong, for example, to understand the process of 'finding a use' for the home computer as being resolved simply at a personal/household level. Consumers were part of the establishment of models of computing - conceptions of micro use which encompass both notions of who users are and criteria for evaluating products and activities.

The Power of Prophecies of the IT Revolution

The production and consumption of home computing must be placed in the context of the home computer boom - a public event which touched many more people than those who were eventually to become regular micro users. This was a small but significant part of the cultural changes which took place in Britain during the 1980s.

A crucial facet of the boom was the association of micros with predictions of the future social impact of information technology. These were often millennial in tone, forecasting the transformation of society or self via computers. The home computer boom is testimony to the power of such prophecies among ordinary people. Beliefs about the general significance of IT shaped the agenda for both academic and public discussion of home computing. Home micros became signs under which deep-seated hopes and concerns about the future were gathered and expressed.

The link to prophecies of the future importance of IT both inside and, most importantly, outside the home helps to explain the appeal of the computing. Many purchasers were responding directly to such predictions, seeking to own part of the Information Technology Revolution. The much remarked ability of the micro to fascinate or repulse is often portrayed as a consequence of the inherent qualities of the technology. Another dimension should be added to this - the way our contact with computers is mediated by beliefs about the social significance of IT. This, in part, explains the sense of magical possibility many interviewees felt about micro use. Associations with the IT Revolution also help us understand the nature of

activities classified as 'doing computing'. The thesis has discussed in detail examples of micro owners who attempted to make forecasts of an infrastructural or teleworking micro a reality. More generally, belief in a future where computer literacy is a requirement for citizenship contributed to an emphasis on exploring and 'knowing' the computer.

That predictions of a society transformed by computers inspired not only commentators but a far wider constituency is an important finding. It is reasonable to speculate that such prophecies have also exerted a powerful influence in other areas outside the home, notably the workplace and the school. Additional work could be done to map out in detail who deploys these ideas and among which social groups their appeal is strongest.[1] It would be a mistake, however, to see them as simply part of a dominant ideology serving economic and political elites.[2] So pervasive has the vision of a future shaped by IT been that it is more appropriate to see it as something claimed and contested by a whole range of different interests.

Understanding Consumption

The thesis illustrates the significance of consumption in contemporary society. It shows, once again, the wrong-headedness of blanket critiques of 'consumerism' which portray consumers as passive dupes. Consumption is an active and creative process and goods play an important part in the conduct of everyday life. To understand this fully, goods must be viewed as cultural resources - means to take part in and make sense of the social. A number of writers, notably, Colin Campbell, have linked the drive to consume to people's inner fantasy lives.[3] Campbell is wrong to suggest, however, that this makes consumption somehow asocial. The case of the micro shows that the dreams engendered by goods can be about social as well as personal transformation.

A number of theorists of postmodernism argue that the dynamism of the sphere of

production - both of goods and images - and the sheer range of products available threaten the status of goods as cultural resources.[4] Because consumption practices have grown in both their complexity and diversity, so the argument goes, it is increasingly hard to map the cultural onto the social. The over-supply of goods and accompanying cultural disorder leads to a crisis of meaning. Empirical work suggests we should treat such abstract theorizing with caution. The home computer boom illustrates the importance of novelty in the culture of consumption and the difficulties experienced by consumers as they attempted to deal with an unfamiliar and fast changing good.[5] Consumption of computers is, however, mediated by and rooted in social differences. Whatever complications people faced, they were still willing and able to construct meaning and identity using goods.

The thesis has, I hope, shown the value of studying the cultural life of particular classes of goods as a route to understanding the significance and variety of consumption practices. Its findings have particular bearing on issues raised in chapter three.

The creation of demand?

A potential weakness of 'symbolic' approaches is neglect of the role of institutions which influence or mediate consumption. The example of the micro shows the dangers in this. Interviewees were acutely aware of a range of influences over their experience of the micro. In doing so they demonstrate the requirement for a sophisticated approach to the forces and mechanisms involved in the mobilization of demand. The promotion of the micro as a product and home computing as an activity encompassed a far wider set of factors than those normally considered under the rubric of 'marketing'. A number of initiatives to increase awareness of IT were, for example, significant. The media also played a crucial part in raising the profile of the micro.

The generation of interest in computing was not simply a 'top-down' process. An important factor, for example, was the way early home computer users communicated the gospel of computing to wider audiences. More generally, existing owners helped to spread interest in the micro among networks of friends, work colleagues and school mates.

The relationship between the spheres of production and consumption

Just as demand cannot be seen as the creation of producers, similarly they could not be said to have 'invented' home computing on their own. The case of the micro illustrates the ways that goods are (re)constructed in both public and private domains. As discussions above have already suggested, producers and consumers can be seen as part of the same circuit of cultural production. This study has empirically supported earlier work, notably by Leslie Haddon, which pointed to the active role of consumers in the making of the micro.[6]

A notable feature of the development of home computing was the way that the line between producers and consumers was sometimes blurred. This is indicative of, particularly in the early years of the boom, a close relationship between the two spheres. Micro owners displayed a high knowledge of and involvement in the activities of producers. This is a dimension that should be added to studies which focus squarely on the relationship between producers and consumers.[7]

The processes of consumption

By developing the concept of a computer career, this thesis has supported the argument put forward by, among others Silverstone, Morley and Hirsch that consumption is best understood not as a single act but as a process whereby mass produced goods are integrated into the everyday and become personal objects.[8] The experience of micro owners highlights the particular difficulties faced by consumers

of a nascent product category. Analysis of careers shows that interviewees had to resolve a series of fundamental questions about the place of the computer in their lives after purchase. These often included questions about who the micro was for, to what uses it was to be put and what benefits it provided.

My empirical work also suggests serious complications to the processes of consumption. Many owners have clearly not absorbed the computer fully into their lifestyles. This should sensitize us to the existence of problematic goods which, either at a personal level or as a class of objects, do not find a role. Some interviewees felt unable to lay claim to the machine they owned. This could be a source of considerable unease. The case of computing also shows, however, that the problems of consumption can also be sources of pleasure. For some interviewees participating in a novel and unstable market was part of the attraction of computing. They enjoyed following, discussing and evaluating new products. Home computer consumption offered many opportunities for displays of expertise.

Needs and use-values

Analysis of computer careers shows the inadequacy of seeing fixed needs as an explanation of demand for micros. This issue is writ large in the case of a novel good but examination of home computing reveals more general features of consumption. My data supports attacks made on the notion of objective utility. The value of goods is best understood not as an absolute which determines consumption but something constructed and negotiated by consumers. Evaluations of goods are context dependent - embedded in people's lifestyles.[9]

A reflexive approach to needs and use values has important implications for the research and analysis of consumption. A whole range of work (not only market research) attempts to ascertain the needs and desires of consumers. In interpreting this work we must consider carefully what people mean when they talk of their needs

for and the 'usefulness' of goods. The case of the micro also reveals the poverty of work which seeks to judge and classify goods according to abstract criteria of utility. Attempts to draw distinctions between the use value and symbolic value of goods also appear hard to justify.[10]

Those who seek to study notions of need and utility as cultural phenomena are confronted by a dominant perspective which understands demand in terms of fixed material requirements, and consumption decision-making using a model of rational choice borrowed from the sphere of production. An important finding of the study was the power of this utilitarian and materialist view among ordinary people. The need for and usefulness of the micro were issues which preoccupied many interviewees. Adults, especially, used the language of utility to make sense of their experiences. This may be particularly prominent in relation to the home computer because of its associations with the world of work and the 'labour-saving' home of the future. However, the rhetoric of utility and efficiency is deployed in the promotion and consumption of other goods. This is a significant contradiction running through contemporary consumer culture.

Interviewees' emphasis on the rationality and benefits of their purchases highlights a certain ambivalence towards consumption. They were often uneasy about the visibility of process of utility construction taking place around the micro. They were sometimes unhappy about the role of promotional discourses in the boom and anxious to demonstrate that unlike 'others' they were not duped into making bad purchase decisions. Similarly, few were prepared to acknowledge social benefits offered by the micro in, for example, status competition. This ambivalence is an important facet of modern culture. It helps to explain, for example, the emphasis, until recently, in social science on critiques rather than analyses of consumption practices.

Consumption as participation

The study of home computing illustrates the eminently social nature of consumption. Ownership and use of computers was about participation in a variety of different domains including the workplace, classroom and playground. One important dimension of this is the way that consumption spreads and is shared among members of social networks. An awareness of the use of goods to participate in different social worlds helps to problematize the household as a unit of analysis of consumption. While the home and the family are important sites of consumption, the study of home computing raises important complications to any notion of households 'owning' goods. The extent to which family members shared involvement in and evaluations of computing varied considerably.

Home computing was not only about participating in specific social domains but also in the event of the home computer boom. Examination of the boom raises questions about the nature of public culture in contemporary society. There are certainly parallels between it and other attempts to mobilize opinion and behaviour around issues such as heroin addiction and AIDs during the 1980s.[11] More specifically, the boom illustrates the way that consumption can be about responding to and taking part in public culture. In the case of the micro, it was a means by which people sought to make sense of and engage with social change. Other examples of this phenomenon, such as so called 'green consumerism' deserve attention.

Understanding Computing

This thesis has shown that the nature and appeal of computing should be understood as cultural phenomena. In doing so it questions the powerful agenda written by prophets of the IT Revolution. Present developments should not be studied as signs of greater changes to come. Far from devaluing computing, such an approach invalidates many criticisms made of the micro. In particular, it suggests that we

should be careful about utilitarian critiques of existing micro use which suggest that it is a fad or a betrayal of the promise of 'real' computing.[12]

Qualitative and quantitative data

This research demonstrates the value of a qualitative approach to the study of home computing and, by implication, to other new technologies. As has already been noted, it reveals dangers in making assumptions about the demand for and use of computers. In particular, it suggests a number of practical and phenomenological difficulties with the collection and interpretation of quantitative data on computing.[13] This may also have a bearing on the compilation and discussion of statistics on the consumption of other ICTs.

Variations in the level and kind of involvement with computing mean that care must be taken when using particular members as spokespeople describing and assessing computing within the home. They may often lack the knowledge to report accurately on other household members' activities.[14] There is, however, a more profound difficulty. As the empirical data showed, the household is often the arena for quite different (sometimes conflicting) experiences and evaluations of computing.

Studies have frequently attempted to quantify involvement in computing in terms of the amount of time spent with hands on a micro during a day, week or month. Discussion of 'computer careers' shows that such snap-shots of computer use only capture moments in what are often quite complex trajectories of use. An equally fundamental problem is that involvement with computing includes much more than the hours spent physically using the machine. In seeking to measure computing in this way, researchers are in danger of simply counting things that are countable rather than really getting to grips with IT consumption.

As chapter seven outlined in some detail, research revealed considerable ambiguities

with the application and meaningfulness of the classifications of types of use which form the basis of quantitative work on computing. This has important implications not only for academics but also for producers of micros and associated goods. They often base their marketing strategies on just such classifications drawn from commercial research and other sources.

As the next section will discuss at greater length, research showed difficulties with drawing inferences about the nature of home computing from type of machine, software or peripheral owned. There is, for example, little evidence to support the assertion, common among commentators, that sales of more powerful hardware and software necessarily brings with it a qualitative shift in the nature of home computing.

Exploring the computer

A key theme of empirical work was the inadequacy of any simple ends-orientated view of computing. The activities of users had a strong exploratory element - investigating the capabilities of the micro. This can be understood further by relating it to other themes of the thesis. It can be explained in part because of the micro's status as a novel good - interviewees self-consciously tested out possible applications of the machine. Just as importantly, because of its links with the computers of the IT Revolution, the home micro was viewed as a way of knowing computers in general.

Leslie Haddon developed the concept of 'self-referentiality' in order to understand the exploratory nature of computing among owners of the early low-capacity micros and those who could be described as 'hobbyists'. [15] My empirical research demonstrates the power of this concept. In addition, it shows that this approach to computing is shared by a far wider constituency of computer owners. It persists among users of more powerful and supposedly 'practical' *pieces of hardware* and

software. This kind of use might be expected to decline as the micro becomes more established, research suggests it continues albeit in different forms.[16]

Domains of computing

One important component of the rhetoric of the IT Revolution is the assertion that computers will be important for everyone. Similarly, a theme which united many of the promotional discourses of the boom was the need for universal knowledge of computers. Empirical work reveals, however, large variations in the appeal and experience of the micro. Interest in computing must be understood in terms of the development of different domains of computing - distinct social contexts often implying different conceptions and evaluations of the micro.

The need to understand the use and evaluation of computers in ^{their} socio-cultural setting opens up important areas for further analysis. In particular it suggests that we need to think carefully about the nature of computing competency. Rather than a single canon of technical knowledge and skill, this appears highly context-specific. 'Knowing computers' is as much about getting by in particular social situations as it is obtaining abstract technical know-how.

The concept of domains of computing suggests that many of the old questions about age, class and gender inequalities in micro use must be rewritten. Researchers have been too willing in the past to assume that all differences in commitment or access to home computing have significant consequences for life chances. That, for example, many women are not attracted to models and domains of computing based around games playing or 'hobbyism', may well have little or no bearing on their position in the labour market or their ability to be enthusiastic for and utilize computers in other contexts. There is, therefore, room for further study of if, how and why involvement or noninvolvement with home computing impacts on school or employment prospects.

The future of the home computer

Given the parallels between the home computer boom and the early histories of other now well-established domestic ICTs, it would be easy to assume that the thesis has examined a transitional phase before, inevitably, the home computer achieves an equally stable and established role. It has already been suggested, however, that any simple model of diffusion is inadequate to understand the future of the micro. The home computer has been a shifting and, to some extent, troubled product. While research confirmed that interest in home computing persists, debates about its long-term viability continue across the spheres of production and consumption.

By installed base, the Sinclair and Commodore machines which emerged in the mid 1980s are still the most popular micros. There is considerable uncertainty about the demand for and character of the next generation of computers. The most significant development since the height of the boom has been that it has become increasingly difficult to talk about a single unified experience of computing or, indeed, a single home micro.[17] The growing differentiation of products and users has important implications for the analysis of home computing. Now more than ever ownership data cannot be interpreted using assumptions about the homogeneity of home computers or computer owners.

During the second half of the 1980s we can trace the development of distinct models of computing, implying notions of computer use and computer users. Care should be taken, however, not to overestimate the coherence and stability of these models. The identity and role of the micro is far from resolved. This can be seen by examining the two models that appeared most firmly established at the time of fieldwork.

The home-office approach to computing based around ownership of PCs and applications such as word processing held considerable appeal to adults' interviewed, even those

with little current involvement with computing. This interest was, however, often tentative and, in many cases, yet to come to fruition. While the PC appeared to offer a real practical application of the computer how this would fit into people's lives was often unclear. In fact the home market for 'business' machines has grown more slowly than many commentators, myself included, predicted. Conversely, comparably priced machines promoted as general purpose micros continue to sell well.

Similar uncertainties surround the games-based model of computing. The age-specific appeal of this model makes it vulnerable to rapid change or decline. What happens, for example, if the next cohort of teenage boys are no longer excited by the possibilities of computers? It will, for example, be illuminating to see what impact the recent resurgence of the video games console market has on the nature and extent of interest in computing.

These two examples suggest that considerable uncertainty remains about the future of the micro. Producers of the next generation of home computers will have to deal with three dilemmas:

1) Many interviewees described striving for a clearer view of the micro and its applications. As the identity of the micro has become more defined and models of computing 'firm up' the micro has, however, become less attractive to many people drawn by the promise of the universal machine of future predictions.

2) As already argued, part of the appeal of the micro remains exploring and owning a computer. There is no certainty that this will change, whatever marketing or technological developments take place. Some commentators (and interviewees) suggest that the long-term future of the micro rests on it becoming an easier to use, less intimidating piece of equipment. The very things sometimes seen as obstacles to the expansion of the market - technical complexity and a fast-changing unstable market - are, however, actually part of the attraction of computing to many existing users.

It would be tempting at this point to draw a distinction between two camps of actual or potential computer users, one a group of technical enthusiasts and another group of 'ordinary' people simply seeking the easiest and most efficient way to utilize the micro as a tool for the pursuit of practical or entertainment ends. Research has repeatedly highlighted the difficulty of making such hard and fast distinctions. It also suggests that we cannot always take non users' complaints about technical problems and knowledge gaps at face value. These can reflect a more profound difficulty - uncertainty about the value of the micro in their lives.

3) An important facet of the appeal of the home computer has been its novelty and its associations with the future prophecies. It remains to be seen how resilient this is as the distance from the events and enthusiasm of the boom grows. Ironically, simply by becoming an everyday object the micro risks losing some of its magic.

Finally, empirical data suggests that attempts to market a 'family computer' will continue to confront difficulties. Interest in the micro is unevenly spread within homes and get its meaning from outside. The household is likely to be the site of competing conceptions of the micro. The increased popularity of the term personal computer as opposed to home computer reflects the decline of the notion of a multi-purpose micro used by the household as a whole. It also suggests that the 'home computer' as a distinct product category is under threat.

Further study of IT

Findings suggest a number of areas for additional research into computing - not least the continued development of the market for micros and other forms of home IT. Given the argument, implicit in my analysis, that there was a distinct British history of home computing, comparative work using a similar framework to study the development of technologies and activities in other countries would be enlightening.

The thesis also opens up areas for study best addressed through 'ethnographic' approaches. The data on shifting involvements in and differing evaluations of computing point to possibilities for further research on the place of the micro and other technologies in the dynamics of home life. Is, for example, the tendency towards individualized computer use part of a wider shift in the way domestic ICTs are consumed?

This project deliberately aimed to consider a broad constituency of computer owners. There is scope for further detailed work on a whole range of social groups and computing domains.[18] One group of particular interest are those owners who see a connection between their home computing and their work. It is likely that this type of micro use will continue to grow in importance but, as the study suggests, links between home and work are varied and complex.

One future scenario, taken seriously by some commentators and producers, is the 'dissolution' of the home computer as microchip technology becomes hidden within a range of IT goods.[19] This study suggests questions for researchers seeking to study the development and prospects of chip-based entertainment, communication and home automation products. We have seen that such 'practical' domestic applications may not appeal to all. For example, women were unconvinced of the merit of a 'labour-saving' computer in the home. It could well be that the early demand for 'home informatics', even for products such as sophisticated heating control systems, will come from people excited by the technology itself and keen to play with the idea of a computerized home of the future.[20]

This research into home computing suggests a new agenda for the study of technological change in the workplace. I have already suggested that further research could trace the role of ideas about the future importance of IT in shaping the experience of computerization in other contexts such as the education system and industry. It may also be that employees and firms have 'computer careers'

comparable to those of micro owners. Also worth consideration would be the nature of consumption decision-making and the negotiation of utility within organizations. Finally, since one of the findings of the study has been the blurring of the lines between recreational and work use of computer, we have to look at the activity of workplace computing in a new light. A number of respondents, for example, told of 'playing with' and exploring computers at work.

Technology, Consumption and the Future

This thesis has sought to extend discussion of technology and culture into consideration of the place of ideas about technology in everyday life. While we should not overestimate coherence of our common sense of the future, technology clearly has a special place in it. Popular interest in science and technology, of which the home computer boom is evidence, is double-edged, expressing both excitement and concern. This reflects the 'millennial' character of ideas about technology - it promises or threatens not simply social change but social transformation.

As the example of the home computer boom shows, people try to live with and make sense of the flux and complexity of modernity from a position of relative powerlessness. Micro purchase was a tactical response to what was perceived as technology-driven changes beyond political or other forms of control. The paradox is, of course, that this sense of inevitability inspired active interventions on the part of consumers - they helped to make the micro. All this suggests that it is not enough to ritually reject technological determinism and assert the social nature of technology. We need to explore further why technological determinism has such appeal and why people find it a useful idea to get by with.

The thesis has highlighted the special status of goods seen as the embodiment of 'technology'. This is something worthy of further comparative investigation. It

may well be that, for example, in a less extreme form, their consumption shares elements with that of the micro. 'Self-referentiality' and consumer involvement in the sphere of production may not be confined to home computing.

Analysis of home computing suggests that the appeal of technological goods springs, in part, from their association with the future. They provide a bridge to an imaginary future just as other goods serve as a bridge to a nostalgic past.[21] Many different types of goods offer the prospect of personal renewal. With goods such as the home computer this promise is increased to the power of two because of their association with prophecies of a world transformed by technology.

REFERENCES

Footnotes

Chapter One

[1] For examples of unashamed technological determinism see M McLuhan Understanding Media, Routledge Kegan Paul, London, 1964 and W J Ong Orality and Literacy, Methuen, London, 1982. For examples of attacks on technological determinism and an alternative approach emphasising the social shaping of technology see D MacKenzie and J Wajcman (eds) The Social Shaping of Technology, Open University Press, Milton Keynes, 1985.

[2] R L Heilbroner 'Do machines make history' in M Kranzberg and W H Davenport (eds) Technology and Culture, Meridian, London, 1972, pp28-40. This argues that technological determinism is a 'problem' of our epoch.

[3] This seems particularly true of approaches influenced by labour process theory and some feminist work in this area. See D Albury and J Schwartz Partial Progress: The Politics of Science and Technology, London, Pluto, 1982 and W Faulkner and E Arnold (eds) Smothered By Invention: Technology in Women's Lives, Pluto, London, 1985. It has also proved a surprisingly small leap from an approach which sees technology as a manifestation of social relations to one in which the willfully exploiting subject is no longer fundamental to the system. For examples of such theories of 'technological society' see H Marcuse One Dimensional Man, Routledge Kegan and Paul, London, 1964 and J Ellul The Technological Society, London, Cape, 1965. S Hill The Tragedy of Technology, London, Pluto, 1988 starts from the premise that technological development is a cultural process but at times, as Hill admits, the analysis comes close to technological determinism.

[4] D Bell The Coming of Post-Industrial Society, London, Heinemann, 1974, describes the birth of a new society in which "the planning and control of technical growth" is "a new dimension of societal change." L Winner Autonomous Technology: Technics-Out-of-Control as a Theme in Political Thought, Cambridge Mass, MIT Press, 1977.

[5] Winner, 1977, op cit p8.

[6] Hill, 1988, op cit p24.

[7] H Jennings Pandaemonium, London, Andre Deutsch, 1985. The title comes from 'Paradise Lost' where Milton talks of the building of Pandaemonium - the Palace of All the Devils. Not surprisingly, the task of encapsulating the entire experience of industrialization was not one Jennings ever completed to his own satisfaction.

[8] See also William Cobbett's 1830 description of "black Sheffield", Dickens' 1854 sketch of Coketown in 'Hard Times' as "a town of unnatural red and black like the painted face of a savage" and John Ruskin's talk of Manchester's "devil's darkness" twenty five years later. Quoted *ibid* p165, p170, p273, p339.

[9] James Nasmyth quoted *ibid* p171.

[10] E J Hobsbawm Industry and Empire, Harmondsworth, Penguin, 1969.

[11] M Berman All That is Solid Melts into Air, London, Verso, 1983, p15.

[12] D Harvey The Condition of Postmodernity, Oxford, Basil Blackwell, 1990, p11.

[13] Berman, 1983, op cit p85.

[14] More generally, P Anderson 'Modernity and revolution' in New Left Review, 144, 1984, pp96-113, points out that Berman does not discuss the uneven geographical distribution of his modernist texts.

[15] R Williams Culture and Society 1880-1950, Harmondsworth, Penguin, 1958, p119. Others raise similar points to Williams about the British response to industrialization. W H G Armytage Yesterday's Tomorrows, London, Routledge, 1968, for example, identifies a tradition of English "mechanophobes".

[16] M J Weiner English Culture and the Decline of the Industrial Spirit, Cambridge, Cambridge University Press, 1981, and others have argued that a uniquely anti-industrial culture grew up in Britain in the second half of the nineteenth century. This does not appear to be a valid claim, at least in the sphere of intellectual activity. Mainland Europe had its share of anti-modernists such as Nietzsche, Burckhardt and Weber and of radicals like Tolstoy, Proudhon and Kropotkin who echoed the distrust of industrialization shown by Morris or Ruskin.

[17] D Meakin Man and Work, London, Methuen, 1976. The book begins with a contradiction Berman would be proud of:

"Looking back from our vantage-point, it seems ironic that the Industrial Revolution leads to a conscious realization of the ethical value of work in all its fullness - and especially of those qualities enshrined in the artisan - at the very moment when these same values are seriously threatened and perhaps doomed by the advent of machino-fracture."(p11)

The idealization of fulfilling work is a search for salvation in the face of the on-rush of modernization.

[18] This is the vision of Chaplin's 'Modern Times' and of the German expressionists. It is articulated in the concern of H G Wells and Aldous Huxley with the separation of thought and labour.

[19] Meakin, 1976, op cit p59. Organic living has two major facets:

"First of all, the ideal of integrated, non-fragmented life for the individual, in which work can make further contact with certain basic or elemental realities; and secondly, the ideal of a true community and a true culture, whether projected into the future or into the past." (pp148-149)

This vision can be found in the writings of Tolstoy, Camus, Simone Weil, Solzenitsyn and others. It is behind William Morris's idealization of the medieval artisan and Herbert Marcuse's rejection of the ideology of technical rationality. Anarchism respects the inherent worth of work and the need to 'simplify' life.

[20] Every age appears to have a propensity to regard itself as in a state of destruction and confusion and to hark back to a golden age of stability. I Todd and M Wheeler Utopia, London, Orbis, 1978, p16 show that the myth of a Saxon Golden Age was a powerful one in medieval England. Similarly, U Eco Faith in Fakes, London, Secker and Warburg, 1986, p65 claims that "people started dreaming of the Middle Ages from the very beginning of the modern era." Harvey, 1990, op cit p272:

" The ideological labour of inventing tradition became of great significance in the late nineteenth century precisely because this was an era when transformations in spatial and temporal practices implied a loss of identity

with place and repeated radical breaks without any sense of historical continuity."

[21] P Wright On Living in an Old Country, London, Verso, 1985, p165.

[22] R Williams The Country and the City, London, Chatto & Windus, 1973, p35. Williams talks of "...that very powerful myth of modern England in which the transition from a rural to an industrial society is seen as a kind of fall, the true cause and origin of our social suffering and disorder. It is difficult to overestimate the importance of this myth, in modern social thought."(p96)

[23] T P Hughes American Genesis: A Century of Invention and Technological Enthusiasm, New York, Viking Penguin, 1989, sees technological enthusiasm as a fundamental aspect of 'Americanness'.

[24] C Marvin When Old Technologies Were New, New York, Oxford University Press, 1988, p32.

[25] This theme is developed in Hughes, 1989, op cit p3 and chapters six and eight.

[26] Berman, 1983, op cit p24.

[27] Harvey, 1990, op cit p31.

[28] *ibid*, p23:

" Le Corbusier in his plans and writings took what he saw as the possibilities inherent in the machine, factory and automobile age and projected them into some utopian future."

See also S Gardiner Le Corbusier, London, Fontana, 1974.

[29] T Roszak, The Cult of Information, Cambridge, Lutterworth, 1986, pp146-153, makes similar points about the blend of 'sophisticated-scientific' and 'natural-communal' in the writings of McLuhan and Buckmaster Fuller. J Miller, McLuhan, London, Fontana, 1971, argues that McLuhan's work can only be understood in terms of his Catholicism and earlier agrarian conservatism.

[30] This does not pretend to be a comprehensive history of ideas about the future. Every era and culture displays a complex set of attitudes towards the future as Armytage, 1968, op cit, shows in his survey of 'yesterday's tomorrows'.

[31] Harvey, 1990, op cit p31, argues that Enlightenment thought came under pressure from the turmoil of the nineteenth century and he quotes Huysens:

" Reason coming to terms with its mythical origins, becomes bewilderingly tangled with myth ... myth is already enlightenment and enlightenment relapses into mythology."

T Olson Millennialism, Utopianism, and Progress, Toronto, University of Toronto Press, 1982, pp231-232:

"In response to the cumulative effects of the break-up of the enclosed medieval cosmos, the bankruptcy of religious politics, the rise of the new science, the delayed Reformation in England, the development of new economic thought and its practice, the loss of nerve of the Enlightenment, and the persistence of the ancient regime in France we have a confused, unsystematic, but quite perceptible bringing together of these two traditions and the creation of the

doctrine of progress."

[32] Its hey-day as an influential and popular idea was not in the Enlightenment but rather in the first rush of European and American industrialization. R Nisbet History of the Idea of Progress, London, Heinemann, 1980, p225, makes this connection without realising its full implications.

[33] This is the central argument of Olson, 1982, op cit. The religious roots of the idea of progress have been highlighted by Nisbet, 1980, op cit.

[34] Olson, 1982, op cit p265, sees the fundamental characteristic of the doctrine of progress as being the belief "that there is a blind force, uncontaminated by historical contingency, dedicated to the continued improvement of man." The enlightenment project was based around a single history - the sense of the unilinear flow of time complemented by an advance in knowledge and the perfection of humanity.

[35] The influence of religious myths of paradise on the modern utopia is discussed in K Kumar Utopia and Anti-Utopia, Oxford, Basil Blackwell, 1987, chapter one and F E Manuel and F P Manuel 'Sketch for a natural history of paradise' in C Gertz (ed) Myth, Symbol and Culture, New York, W W Norton and Co, 1971, pp83-128. In Utopian Thought in the Western World, Oxford, Blackwell, 1979, pp13-14, Manuel and Manuel argue that the power of utopia "evoke associations remote and deeply rooted in Western consciousness." They highlight the Judeo-Christian roots of the idea of utopia. This point is also made in H P Segal Technological Utopianism in American Culture, Chicago, Chicago University Press, 1984, chapter four which points to the links between science and religion in utopias.

[36] Manuel and Manuel, 1979, op cit p33. M Barkun Disaster and the Millennium, New Haven, Yale University Press, 1974. The main theme of Barkun's book is that the experience of actual disasters can be the source of commitment to millennial movements. The idea of the coming of heaven on earth has always been associated with total destruction and the damnation of unbelievers.

[37] Kumar, 1987, op cit chapter four.

[38] N Cohn The Pursuit of the Millennium, New York, OUP, 1970, p13.

"Millenarian sects or movements always picture salvation as (a) collective, in the sense that it is to be realized on this earth as a collectivity; (b) terrestrial, in the sense that it is to be realized on this earth and not in some other-worldly heaven; (c) imminent, in the sense that it is to come both soon and suddenly; (d) total, in the sense that it is utterly to transform life on earth, so that the new dispensation will not be mere improvement on the present but perfection itself; (e) miraculous, in the sense that it is to be accomplished by, or with the help of, supernatural agencies."

[39] *ibid*, p281.

[40] P Worsley The Trumpet Shall Sound: A Study of 'Cargo' Cults in Melanesia, New York, Schocken Books, 1968, p221. Worsley provides a graphic account of the power of millennial ideas:

"The people therefore prepare themselves for the Day by setting up cult organizations, and by building storehouses, jetties, and so on to receive the goods, known as 'cargo' in the local pidgin English. Often, also, they abandon their gardens, kill off their livestock, eat all of their food, throw away their money." (p11)

Millennial cults have been identified in Polynesia, Micronesia, Africa, North and South America, China, Burma, Indonesia and Siberia.

[41] Manuel and Manuel, 1971, op cit p85. Cohn, 1970, op cit p19 argues that "if traditional phantasies about the Last Days constantly influenced the way in which political happenings and personalities were viewed and the language in which political struggles were conducted, it was only in certain social situations that they functioned as a dynamic social myth."

[42] Cohn, 1970, op cit p88, talks about the followers of millennial movements:

"These were the people who were most frequently hit by disasters and least able to cope with them. And these were the people who, when faced with overwhelming problems and tormented by intolerable anxieties, were prone to seek messianic leaders and to imagine themselves as warrior-Saints."

Cohn sees the rise in the number of millennial movements as a direct result of the growth in commerce and population from the eleventh century onwards. This was a period of rapid social and economic change which saw the creation of a landless 'rural proletariat' offered the new opportunities and frustrations of town life. The millennial movements sprung up in areas where over-population, poverty, disorientation and raised expectations were greatest and among those who felt this most keenly. It was the surplus population on the margins of this new turbulent society who had a strong propensity to follow a messiah and prepare for the immanent millenium.

[43] Worsley, 1968, op cit p35.

[44] L Festinger, H W Riecker and S Schachter When Prophecy Fails, Minneapolis, University of Minnesota Press, 1956, show that, in certain circumstances, disconfirmation of prophecies can increase commitment to millennial ideas.

[45] Worsley, 1968, op cit, argues that millennialism is only 'historically important' at a particular stage in development. Commentators on European millennialism, however, emphasise its deep roots in Judeo-Christian culture and the profound influence it has had on Western culture. Cohn, 1970, op cit p68, writes:

"No other element in Christian thought has had as profound and far-reaching effect on the entire world, not merely the West, as has its millennialist vision."

Millennial sects often dissipated into longer lasting and more respectable passive millennial groupings. Classic millennial movements continue to spring up in the twentieth century and some commentators detect a possible revival in millennialism. Barkun, 1974, op cit p31, cites the Townsendites in the U.S., Jehovah's Witnesses, the Weathermen, The Black Muslims, the Cultural Revolution, the German Youth Movement, Sokka Gakai in Japan, The Social Credit movement in Canada as examples of modern millennial groups.

[46] Cohn, 1970, op cit p286, argues that the religious idiom has been replaced by a secular one but "revolutionary millenarianism and mystical anarchism are with us still." Cohn and others highlight a close affinity between millennialism and the teachings and appeal of later philosophers of history such as the German Idealists, Comte, Saint-Simon, Rousseau, Marx and the Nazis. They also point to its influence on the idea of nationalism. Barkun, 1974, op cit p183 sees the distinction between revolutionary and millennial movements as "largely artificial".

- [47] Festinger et al, 1956, op cit, details the activities of a millennial group prophesying the immanent arrival of flying saucers and destruction of the earth.
- [48] H P Segal 'The technological utopians' in J Corn (ed) Imagining Tomorrow, London, MIT Press, 1986, p123. See also Segal, 1984, op cit chapter two.
- [49] For a discussion of Bellamy's influence see Kumar, 1987, op cit pp133-140. Kumar also writes at great length about scientific utopias and anti-utopias. The anti-utopians expressed horror at mechanization.
- [50] John F Kasson quoted *ibid*, p139.
- [51] Segal, 1984, op cit chapters four, five and six.
- [52] *ibid*, pp153-154.
- [53] For discussion of theories of industrial society and post-industrial society see K Kumar Prophecy and Progress, Harmondsworth, Penguin, 1978. Direct links between these theories and utopianism are made in Kumar, 1987, op cit p388, and Segal, 1984, op cit pp135-136.
- [54] Winner, 1977, op cit p140. For examples of this kind of social critique see T Roszak 'The technocracy' in N Cross, D Elliot and R Roy (eds) Man-Made Futures, London, Hutchinson, 1974, pp71-79. Kumar, 1987, op cit p402, links ecological theory in with this strand of thought.
- [55] For example, this critique is implicit in G Ross 'The second coming of Daniel Bell' in Socialist Register, 1974, and explicit in R Williams Towards 2000, London, Chatto and Windus, 1983, pp83-101.
- [56] Olson, 1982, op cit p4.
- [57] Wright, 1985, op cit.
- [58] M de Certeau quoted Harvey, 1990, op cit p214.
- [59] P Bourdieu quoted *ibid*, p345.
- [60] M de Certeau The Practice of Everyday Life, Berkeley, University of California Press, 1984, chapter two.
- [61] B Martin 'Review of All That is Solid Melts Into Air' in Theory, Culture and Society, Vol2, No3, 1985, pp162-165 asks where Charlie Chaplin fits into Berman's picture.
- [62] S Ewen and E Ewen Channels of Desire, New York, McGraw-Hill, 1982, chapter one, provide an example of this. Discussing the American cultural response to technology in the last century they contrast the perceptions of the machine by those who worked under them and the wonder of the middle classes who saw the machines in the sanitized environment of the great exhibitions.
- [63] Winner, 1977, op cit p86.
- [64] One does not have to agree with, for example, P Virilio and S Lotringer Pure War, New York, Semiotext(e), 1983, that the dictates of technological development and the speed of technology itself are destroying civil society to see that in the twentieth century we are confronted by technology.
- [65] L Winner 'Do artifacts have politics?' in MacKenzie and Wajcman (eds),

1985, op cit pp26-37. Winner argues that in this way technologies can be said to have political properties as, for example, a way of closing social debates or because they are strongly compatible with certain kinds of political organization.

[66] H Brooks 'Technology-related catastrophes myth and reality' in S Fiedlaner, G Holton, L Marx and E Skolnikoff (eds) Visions of Apocalypse: End or Rebirth, London, Holmes and Meier, 1985, pp109-136. Barkun, 1974, op cit p206, writes that "with the advent of television we are all potential disaster victims."

[67] Winner, 1977, op cit p45:

"The gap between the realities of the world and the pictures individuals have of that world grows ever greater. For this reason, the possibility of directing technological systems toward clearly perceived, consciously chosen, widely shared aims becomes and increasingly dubious matter."

For discussion of the magical qualities of technology see A Gell 'Technology and Magic' in Anthropology Today, Vol4, No2, 1988, pp6-9.

[68] Hughes, 1989, op cit chapter five, argues that the modern world is a world of technological systems but usually technology is associated in the popular imagination with objects. The mechanical and physical are easy to grasp unlike the organized and controlled technological systems of which they are part.

[69] Hill, 1988, op cit pp52-53. For general discussion of the changing role of technology in the economy see, for example, I Benson and J Lloyd New Technology and Industrial Change, London, Kogan Page, 1983.

[70] See, for example, Marcuse, 1964, op cit and J Habermas Towards a Rational Society, London, Heinemann, 1971.

[71] Hughes, 1989, op cit p1, p138 and chapter nine and Corn (ed), 1986, op cit p1. Attempts to gauge public attitudes to science show it is still generally held in high esteem. R N Khan 'Science, scientists and society: public attitudes towards science and technology', Impact of Science and Society, Vol 38, No2, 1988, pp257-272 is a longitudinal survey of surveys in Europe and the USA of public opinion on science reveals that this remains overwhelmingly positive.

[72] Winner, 1977, op cit p45, believes that a sense of technological-change-out-of-control is part of the modern experience. He identifies "...a fundamental shared perception that modern history is characterized by a process of continuing change and that somehow machines and other manifestations of new technology are at the center of this process." This is also one of the themes of Hill, 1988, op cit.

[73] J F Lyotard The Postmodern Condition, Manchester, Manchester University Press, 1984. Lyotard is fascinated by the opportunities for production and use of knowledge and information offered by new information and communication technologies sharing many themes with post-industrialists. He situates a discussion of the changed status of knowledge by talking about computerization and other technological changes (pp3-6). As the meta-narrative scientific truth declines the criteria of technological 'performativity' takes on a growing significance. This aspect of postmodern theory is highlighted by Harvey, 1990, op cit p49 and p117.

[74] Further time-space compression lies at the heart of the 'postmodern condition' making it increasingly hard to maintain a sense of historical

continuity. Harvey, 1990, op cit p303 identifies a key shift in political, economic and cultural practices since 1970s " bound up with the emergence of new dominant ways in which we experience space and time." Postmodernism is a response to a new round of 'time-space compression' which is characteristic of capitalist development.

[75] L Haddon The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro, University of London PhD, 1988, p19. Hill, 1988, op cit p4.

C Cipolla Clocks and Culture 1300-1700, London, Collins, 1967, provides a cultural history of clock technology without slipping into a crude determinism. In Western Europe the clock changed lifestyles, ways of thinking about the world and even modes of expression. The clock was a symbol of civic pride and mark of individual status. In China, however, imported clocks were prized as beautiful toys and enthusiasm for them soon waned. This illustrates the dangers of assuming that all cultures and epoches value and use machines for the same reasons.

[76] R Williams Television, Technology and Cultural Form, London, Fontana, 1974, p23.

[77] R Schwartz Cowan 'How the refrigerator got its hum' in MacKenzie and Wajcman (eds), 1985, op cit pp202-218.

[78] The complexity of the forces at work are evident in case studies of technical change in industry. B Wilkinson The Shopfloor Politics of the New Technology, London, Heinemann, 1983.

[79] A GAWSON, L Haddon and I Miles, The Shape of Things to Consume, Sage, forthcoming, refs from draft, p59, points to an increasing recognition in the mainstream innovation literature that consumers play an active role in this process.

[80] B Keen 'Play it again, Sony': the double life of home video technology' Science as Culture, No 1, 1987, p9 quotes David Noble

" ... close inspection of technological development reveals that technology leads a double life, one which conforms to the intentions of designers and interests of power and another which contradicts them - proceeding behind the backs of architects to yield unintended consequences and unanticipated possibilities."

[81] R Silverstone and D Morley 'Domestic Communication - Technologies and Meanings', paper presented to International Television Studies Conference, 1988, p6.

[82] C Perry 'The British experience 1876-1912: the impact of the telephone during the years of delay', J Attali and Y Stouridge 'The birth of the telephone and economic crisis: the slow death of the monologue in French society' both in I de Sola Pool (ed) The Social Impact of the Telephone, London, MIT Press, 1977, pp69-96 and 97-111. This book also contains material on the US experience. National variations in the development of broadcasting are discussed in A Smith The Shadow in the Cave, London, Allen and Unwin, 1973, chapter two.

[83] One neglected dimension of this is the imaginative pre-history of technologies. For a discussion of this in relation to the telephone see Pool, 1977, op cit pp12-13.

[84] R Silverstone, D Morley, A Dahlberg and S Livingstone 'Families, technologies and consumption: the household and information and communication technologies', paper presented at PICT Conference May 1989, p63 quote Pinch and Bijker:

" Closure in technology involves the stabilization of an artefact and the 'disappearance' of problems. To close a technological 'controversy' the problems need not be solved in the common sense of the word. The key point is whether the relevant social groups see the problem as being solved."

[85] Marvin, 1988, op cit p4.

[86] *ibid*, especially chapter one.

[87] S Moores 'The box on the dresser': memories of early radio and everyday life', *Media, Culture and Society*, Vol 10, 1988, pp23-40. This theme is developed in relation to contemporary examples in Silverstone and Morley, 1988, op cit.

[88] S H Aronson 'Bell's electrical toy: what's the use? The sociology of early telephone usage' and A Briggs 'The pleasure telephone: a chapter in the prehistory of the media' both in Pool (ed), 1977, op cit pp15-39 and pp40-65. Both these papers highlight debates about the form and value of telephone technology. See also Marvin, 1988, op cit chapter four.

[89] A Briggs *The Birth of Broadcasting*, London, Oxford University Press, 1961. Smith, 1973, op cit chapter two. Williams, 1974, op cit.

[90] Marvin, 1988, op cit p7.

[91] See, for example, Aronson, 1977, op cit p25.

[92] Spigel's work is discussed at length in Silverstone et al, 1989, op cit pp36-38. See also W Boddy, 'The shining centre of the home': *ontologies of television in the 'golden age'* in P Drummand and R Paterson (eds) *Television in Transition*, London, BFI, 1986, pp125-134.

[93] Marvin, 1988, op cit identifies just such a period in late nineteenth century " when Anglo-American culture was fascinated by the communicative possibilities of the telegraph, the telephone, and the incandescent lamp." (p3) The notion of innovation as a cultural event will be developed in later chapters.

[94] Corn, 1986, op cit p224.

[95] Marvin, 1988, op cit p14:

" ... late nineteenth century electricians stood guard over popular efforts to interpret electrical phenomena in ways that seemed to undermine the credibility of scientific experts. Though generally convinced of both the magic efficacy of electricity and the authority of the magicians who manipulated it, popular interpreters drew their own conclusions when it suited them."

[96] S J Douglas 'Amateur operators and American broadcasting: shaping the future of radio' in Corn (ed), 1986, op cit pp35-57.

[97] Moores, 1988, op cit.

[98] This is the central theme of Hughes, 1989, op cit.

[99] Marvin, 1988, op cit p6.

[100] Segal, 1984, op cit p93.

[101] Marvin, 1988, op cit p119.

[102] Body^d, 1986, op cit describes how the early years of television saw hopes and fears about TV voiced in the public domain about its impact on everything from eye fatigue to housework. Marvin, 1988, op cit chapter two examines hopes and fears for home life engendered by electricity. See also L Rakow 'Women and the telephone: the gendering of a communications technology' in C Kramarae (ed) Technology and Women's Voices, London, Routledge, 1988, pp207-228.

[103] See A Forty Objects of Desire, London, Thames and Hudson, 1986, pp190-193.

[104] Moores, 1988, op cit p26.

[105] Corn, 1986, op cit p219. This is evident in much that was written in the early years of nuclear technology. Predictions made about nuclear energy forecast that electricity would be "too cheap to meter". Even cars would in the future be nuclear powered and nuclear technology would lead to improvements in medicine, agriculture and even the weather. See also S L Del Sesto 'Wasn't the future of nuclear engineering wonderful?', *ibid*, pp58-76.

[106] *ibid*, p221.

[107] *ibid*, p222.

[108] Chapter three pp109-111 discusses how they are actively used in the marketing of technological consumer goods.

[109] Marvin, 1988, op cit p56.

" Expert appeals for popular support often implied that universal electrical prosperity was not far off, especially for groups that had not been visible beneficiaries of industrialization." (p45)

" For them, electricity was the transformative agent of social possibility. Through their power over it, it would be the creator of social miracles." (p63)

[110] *ibid*, chapter four. See also Briggs, 1977, op cit.

[111] Hughes, 1989, op cit chapter one and pp88-95.

[112] Corn, 1986, op cit p228. See also Segal, 1984, op cit p48 who remarks on the number of technological utopians who also were practical technologists. An interesting dimension of this is the relationship between science and science fiction. Many of the authors and most avid consumers of this genre are scientists and technicians. It is also worth noting that many science fiction authors have also been science popularizers. See P Parrinder Science Fiction, London, Methuen, 1980, p33 and p79 See also Armytage, 1968, op cit pp133-144 and pp182-186 on fascination of science fiction amongst readers in science and technology related occupations. He also highlights mythological elements in science fiction.

Chapter Two

[1] L Winner 'Mythinformation in the high-tech era' IEEE Spectrum, Vol 21 No6, 1984, p91.

[2] This point made by, among others, K Robins and F Webster The Technical Fix, London, MacMillan, 1989, pp22-25 and D Lyon The Information Society: Issues and Illusions, Oxford, Polity, 1988. Predictions also rest on dubious assumptions about the relationship between knowledge and power - see Winner, 1984, op cit pp92-92.

[3] D Lyon 'The information society: ideology or utopia?' in H MacKay, M Young and J Beynon (eds) Understanding Technology in Education, London, Falmer, 1991, pp93-108, sees this as one of the 'ideological aspects' of the idea of the information society.

[4] The phrase belongs to W I Thomas.

[5] This is the theme of M McNeil 'Heritage Computing' Marxism Today, July 1991, pp40-41.

[6] See chapter one, pp14-17.

[7] These are by no means the only popular books of this kind. See, for example, J Naisbitt Megatrends: Ten New Directions Transforming Our Lives, London, MacDonald & Co, 1984.

[8] N Macrae The 2024 Report: A Concise History of the Future 1974-2024, London, Sidgwick and Jackson, 1984.

[9] *ibid*, p104:

" A startling feature of the information revolution was that the successful new producers in it were generally small and always entrepreneurial. "

[10] *ibid*, p87.

[11] Z Brezezinski Between Two Ages: America's Role in the Technetronic Era, USA, Viking, 1976. This is discussed in Collettivo Strategie 'The 'technetronic society' according to Brezezinski' in T Solomonides and L Levidow (eds) Compulsive Technology: Computer as Culture, London, Free Association Books, 1985.

[12] Quoted in Collettivo and Strategie, 1985, op cit p128.

[13] A Toffler The Third Wave, London, Collins, 1980, p341.

[14] *ibid*, p15 and p23.

[15] *ibid*, p24-26.

[16] *ibid*, p135.

[17] *ibid*, p169, p193, p181, p51, p275, p382 and p436.

[18] In 1983 David Owen said that "Alvin Toffler has more to offer the Left today than Karl Marx." Toffler, ironically, later came to influence Marxism Today and the Communist Party's New Times.

[19] This is highlighted by R Curnow, 'The growth and pattern of the unfolding

debate' in T Jones (ed) Microelectronics and Society, Milton Keynes, Open University Press, 1980, pp53-71.

[20] As Lyon, 1988, op cit, notes at the start of his book, there is some national variation in terminology. IT is a British term while in Germany talk is of Informationstechnik and in France l'informatique or telematic are used. Such catch-all terms are less popular in the USA. L Haddon The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro, University of London PhD, 1988, chapter three, shows that, rather than focusing on the micro, earlier predictions were based around Mainframe computers, terminals and new forms of communication such as cable or else microelectronics were envisaged as being dispersed throughout a wide range of products.

[21] S Nora and A Minc The Computerization of Society, London, MIT Press, 1980 and Y Masuda The Information Society as Post-Industrial Society, Washington DC, World Future Society, 1981 are examples of the international concern with this issue. See Curnow, 1980, op cit for discussion of national variations within Europe in discussions of IT. He maintains that even in the late 1970's it was possible to detect different national approaches. While in West Germany the microchip was the 'job destroyer', in France discussion was of a new 'telematic society'. Concern about the employment consequences of the new technology was largely confined to Europe.

[22] See, for example Robins and Webster, 1989, op cit p12.

[23] Tom Stonier and Cathy Conlin quoted ibid, p14.

[24] Winner, 1984, op cit p90.

[25] C Evans The Mighty Micro, London, Victor Gollanz, 1979, p9 and p11.

[26] Winner, 1984, op cit p90 highlights this aspect of the discourse:

" According to this standard view, the computer revolution will, by its sheer momentum , eliminate many of the ills that have vexed political society since the beginning of civilization. "

[27] Evans, 1979, op cit p130, for example, believes that the 'cashless society' will mean less crime. Later (p235) he broaches the subject of computer judges. J Martin The Wired Society, Englewood Cliffs, Prentice Hall, 1978, p8 argues that robbery will cease to be a problem in the future thanks to new technology. Both Evans and Macrae, 1984, op cit, see computers as the solution to the problems of the third world. Robbins and Webster, 1989, op cit p250, discuss those prophets who see IT bringing an end to war. Winner, 1984, op cit, discusses claims about abolition of poverty.

[28] Evans, 1979, op cit p208.

[29] Martin, 1978, op cit p6. He sees his 'Wired Society' as a solution to the evils of industrial society, notably the ecological and population crises:

"It is technology that has created this dilemma, and yet the only way out of the dilemma is more technology." (p4)

[30] Masuda, 1981, op cit p156.

[31] Robins and Webster, 1989, op cit chapter one, provide a picture of a unified group of computer enthusiasts making utopian prophecies. Winner, 1984, op cit, is an early example of this kind of analysis of IT texts. See also F Webster and K Robins 'The selling of the new technology' in MacKay, Young and

Beynon (eds), 1991, op cit pp66-92, McNeil, 1991, op cit, J D Slack 'The information revolution as ideology' Media, Culture and Society, 6, 1984, pp247-256 and T Roszak The Cult of Information, Cambridge, Lutterworth, 1986, chapter two.

[32] J Weizenbaum Computer Power and Human Reason, Harmondsworth, Penguin, 1984 places himself firmly in the tradition of humanitarian critics of 'technological society' such as Mumford and Ellul. A perspective shared by Roszak, 1986, op cit and M Shallis The Silicon Idol, Oxford, Oxford University Press, 1984. In these books the computer is seen as 'dehumanizing', undemocratic and a threat to our powers of reason and social communication. For examples of early Marxist critiques of IT see Conference of Socialist Economists Microelectronics Group, Microelectronics, London, CSE Books, 1980; Counter Information Services, The New Technology, London, CIS, 1979; and G Locksley, 'Information technology and capitalist technology' Capital and Class, No 27, 1986, pp81-105. Robins and Webster, 1989, op cit, combine elements of both critiques. They treat the IT Revolution as ideology and but also see the spread of computers as part of a new turn in history:

" Those who promise that an 'information society', courtesy of IT, will bring us all unimagined benefits construct their Cockaigne in profound ignorance of power. It is our conviction that, seen from this point of view, the 'information age' will be best understood in terms of Jeremy Bentham's Panopticon: an all-seeing authority without physical walls."(p99)

[33] This is the basic premise of books such as P Sieghart (ed), Microchips with Everything, London, Comedia, 1982.

[34] T Forester (ed), The Microelectronics Revolution, Oxford, Basil Blackwell, 1980 and T Forester (ed), The Information Technology Revolution, Oxford, Basil Blackwell, 1985.

[35] P Sadler 'Welcome back to the 'automation' debate' in Forester (ed), 1980, op cit pp290-296.

[36] C Jenkins and B Sherman, The Leisure Shock, London, Eyre Methuen, 1981, p20.

[37] Union leader Clive Jenkins claimed in Seighardt (ed), 1982, op cit p70, that new technology had not started decimating jobs yet:

" ... if you are employed, working with information on paper, you ought to be on the World Wildlife Fund's list of endangered species."

[38] E Goldwyn 'Now the chips are down' in Forester (ed), 1980, op cit p301.

[39] See for example G Simons, Silicon Shock: The Menace of the Computer Invasion, Oxford, Basil Blackwell, 1985, pp64-73; Shallis, 1984, op cit p114. For a critical outline and assessment of the notion of a leisure society see Robins and Webster, 1989, op cit pp20-22. Evans, 1979, op cit p150, writes not of unemployment but

'affluent redundancy':

"The whole issue is placed in a much less threatening framework if we accept that all the changes that will take place in the remaining decades of this century are the continuation of an unvarying trend towards increasing world affluence which advances in parallel with a decreasing requirement to work."

[40] Robins and Webster, 1989, op cit pp22-25 point to a contradiction in

future predictions which they do not fully develop - technological determinism is combined with the rhetoric of choice.

[41] Jenkins and Sherman, 1981, op cit p15, p117, p167.

[42] In the preface to A Gorz (ed), The Division of Labour: the Labour Process and Class Struggle in Modern Capitalism, Brighton, Harvester, 1976, talked of the impossibility of using capitalist production technology for truly socialist ends. A Gorz, Ecology and Politics, Boston, South End Press, 1980, provides us with a bitter attack on every aspect of the technocracy.

[43] A Gorz, Farewell to the Working Class, London, Pluto, 1982, p126. A Gorz, Paths to Paradise: On the Liberation from Work, London, Pluto, 1985, p29.

[44] Gorz, 1985, op cit p24.

[45] Locksley, 1986, op cit p104, may view IT as a "new ingredient in the giant recipe of capitalism" but he believes that:

"I T really offers the prospects for a liberated leisured, egalitarian society but I T remains a capitalist machine and is used to sustain capitalism."

Similarly, Counter Information Services, 1979, op cit p1, argue that information technology offers the opportunity to abolish drudgery:

"The new technology based on microelectronics could do away with dreary and tedious jobs, allowing all of us to work only a few hours a week. It could mean that enough goods are produced to give everyone in the world a decent standard of living. But it won't."

[46] The idea of an information society is international. See, for example, Brezinski, 1976, op cit; Macrae, 1984, op cit; Masuda, 1981, op cit; Nora and Minc, 1980, op cit. Martin, 1978, op cit is a prime exponent of the idea of a 'wired society'. For a critique of the meaningfulness of the concept of 'information society' see Roszak, 1986, op cit.

[47] Evans, 1979, op cit, for example, predicts the spread of lateral communication which he believes to be inherently anti-autocratic. These technologies also make possible new forms of direct democracy. Martin, 1978, op cit, for example, talks of 'public response systems'. He likens it to the Athenian City State or the New England Town Meeting. Masuda, 1981, op cit, also articulates this idea. Winner, 1984, op cit p91, outlines many other examples of the argument that information society will make centralized control impossible and revitalize democracy. Lyon, 1988, op cit pp80-90 gives examples of this idea from both Left and Right. Roszak, 1986, op cit chapter 7, highlights the appeal to members of the 'counter-culture' of 'electronic populism' inspired by democratic access to information. For case studies of radical communication and information networks see J Smith and E Balka, 'Chatting on a feminist computer network' in C Kramarae (ed), Technology and Women's Voices, London, Routledge, 1988, pp82-97, and T Athanasiou 'High-tech alternativism: the case of the community memory project' in Radical Science Collective (ed), Making Waves: The Politics of Communication, London, Radical Science, 1985, pp37-51.

[48] D Burnham, The Rise of the Computer State, London, Wiedenfield and Nicolson, 1983, p7 and p153.

"Control of the computer networks resides in the large bureaucracies of our society, the organizations who build and control the amazingly complex systems

that gather data, organize it for their various needs and spit it forth again as policy, product and their view of the truth. The computer state is the welfare agency, the police, the tax collection office, the insurance company, the bank the telephone network, the security force and the credit rating firm quietly cataloguing all our works and days." (pviii)

For examples of others expressing concern about the implications for surveillance and democracy see Robins and Webster, 1989, op cit; Lyon, 1988, op cit; Roszak, 1986, op cit.

[49] Martin, 1978, op cit p33.

[50] Evans, 1979, op cit p229.

[51] For example, Burnham, 1983, op cit p226 onwards.

[52] Simons, 1985, op cit p113. Simons quotes the work of psychologist Thomas McDonald who claims to have traced a number of anxieties and marital troubles to the use of computers and believes that this makes people psychologically disorientated and distorts attitudes towards human relationships.

[53] Toffler, 1980, op cit p183.

[54] J D Bolter, Turing's Man, Harmondsworth, Penguin, 1986, p9:

"For us today, the computer constantly threatens to break out of a tiny corner of human affairs (scientific measurement and business accounting) that it was built to occupy, to contribute instead to a general redefinition of certain basic relationships: the relationship to science and technology, of knowledge to technical power, and, in the broadest sense, of mankind to the world of nature."

The development of 'Turing's Man', as Bolter calls him, is really about changing patterns of thought.

[55] Weizenbaum, 1984, op cit. Roszak, 1986, op cit. Burnham, 1983, op cit.

[56] Evans, 1979, op cit p120: "... it signals the imminent emancipation of Man from, on the one hand, the rule of the committee and, on the other, the inspired hunch of the autocrat." This idea is also present in both Alvin Toffler's and Norman Macrae's future visions.

[57] *ibid*, p198. Evans believes that there would be a real chance that "computers will be seen as deities, and if they evolve into Ultra-Intelligent Machines there may be an element of truth in the belief." (p221)

[58] Simons, 1985, op cit chapter five.

[59] There is a strong visionary component to the whole enterprise of AI. The creation of a human-like thinking machine is at the heart of the AI project. Great claims are made for AI. Marvin Minsky, one of the main protagonists in the field said in 1970:

"In 3 to 8 years we will have a machine with the general intelligence of a human being. I mean a machine that will be able to read Shakespeare, grease a car, play office politics, tell a joke, have a fight. In a few months it will be at genius level and a few months after its powers will be incalculable."

This is quoted in J Reichardt, Robots: Facts, Fiction and Prediction, London, Thames and Hudson, 1978, p163. For analysis of debate about how great

achievements in AI or expert systems are see S Woolgar 'Why not a sociology of machines? The case of sociology and artificial intelligence', Sociology, Vol 14, No4, 1985, pp557-572. Woolgar describes how many of the protagonists present limited achievements with, for example, expert systems, combine with persistent optimism about the future:

"On the one hand, expert systems is generally regarded as one of the most active areas of AI research. On the other, there is considerable concern about the fact that the field currently faces 'fundamental problems'."(p558)

[60] Shallis, 1984, op cit. Roszak, 1986, op cit, also talks of 'the cult of information.'

[61] Simons, 1985, op cit pix and p166.

[62] Shallis, 1984, op cit p19.

[63] F Webster and K Robins 'Information technology: futurism, corporatism and the state', Socialist Register, 1981, p50 touch on this when they argued that many visions of an Information Society were "a caricature of, the image of a socialist society."

[64] I should reiterate that it is not my intention to provide a detailed assessment of the predictions here. It should be noted, however, that some attempt will be made in later parts of the thesis to evaluate predictions made about IT in the home.

[65] Forester (ed), 1985, op cit pxiv.

[66] For an example of this kind of assessment see T Allen 'The world transformed', Guardian, 10/8/89, p27

[67] Chapter one pp2-6.

[68] For Bell's updating of his ideas in the light of IT see D Bell, 'The social framework of the information society' in T Forester (ed), 1980, op cit pp500-549. For discussion of the relationship between post-industrial theory and the idea of the Information Technology Revolution see D Lyon, 'From "post-industrialism" to "information society": a new social transformation?', Sociology, Vol20 No4, 1986, pp577-588.

[69] Winner, 1984, op cit p91.

[70] Some of the claims made for the power of microelectronics, for example, to automate are simply wrong. Gorz, 1982, op cit p126, believes that eight typists can be replaced by one word processor. Such exaggerations may not affect the long term predictions of Gorz and others. What is significant is the willingness of those who talk of a post-work society - many of them, like Gorz, profoundly critical of industrial society - to believe the wildest claims of the electronics and telecommunications industries. The stable, all-powerful computer of the technological utopia and dystopia is very different from the computer of my experience which always offers a contingent and incomplete solution to any problem. B Rothery The Myth of the Computer, London, Business Books, 1971, p44, argues that visions of a world run by computers ignore the reality that "all systems have one natural tendency - towards disintegration."

[71] Robins and Webster, 1989, op cit; Webster and Robins, 1991, op cit; Webster and Robins, 1981, op cit; Slack, 1984, op cit; Lyon, 1991, op cit.

[72] Robins and Webster, 1989, op cit pp264-270. See also M McNeil, 'The old

and new worlds of information technology in Britain' in J Corner and S Harvey (eds), Enterprise and Heritage: Crosscurrents of National Culture, London, Routledge, 1991, pp116-136.

[73] M Thatcher, 'Closing address', PITCOM, Vol 1 No2, p113. Speaking at the end of IT Year Thatcher said:

"Innovation and initiative cannot flourish if they are smothered by a state that wants to control everything. We shall not blaze again the trail that Brunel, Morris and Marconi found, if we consign their successors to the consensus of committees and excessive and irksome regulation. We must allow private endeavour to flourish; we must let the vision of the inventor, and the flair of the businessman, create the wealth and jobs for tomorrow."

[74] F Pym 'The revolution laissez faire and socialism cannot handle', Guardian, 10/10/83, p9. S Williams, A Job to Live, Harmondsworth, Penguin, 1985.

[75] I have already discussed the work of Andre Gorz. T Morris Suzuki 'Robots and capitalism', New Left Review, 147, 1984, pp109-121 argues that moves towards the automated factory will take us towards the 'inner limit' of capitalism by eliminating surplus value.

[76] Roszack, 1986, op cit chapter seven. In chapter five, pp184-186 I will discuss my own contact with a group of computer users influenced by New Age ideas.

[77] *ibid*, discussing the US shows how IT became integrated into the rhetoric of politicians across the political spectrum.

[78] Chapter one, pp28-29.

[79] Reichardt, 1978, op cit, has two recurring themes:

"Firstly, that man is fascinated by the possibility of artificially created life. Secondly, that he has used all possible ingenuity to cause inanimate matter to perform the functions of living beings: whether it be human or animal, playing musical instruments, eating or whatever else was stirring people's imagination before the time of the industrial revolution." (p8)

This is also explored in J Reichardt (ed), Cybernetic Art and Ideas, London, Studio Vista, 1971 and J Cohen, Human Robots in Myth and Science, London, Allen and Unwin, 1966. Cohen writes of the Automaton:

"It pops up here, there and everywhere, in myth, legend and poetry, religion and mysticism, and in the history of physics, chemistry and biology. It has intrigued philosophers, inventors and mechanics throughout the ages, and is a prince of ideas in contemporary science, bidding fair, in the near future, to transform our entire domestic and social life." (p7)

The place of the computer is explored in A Mo showitz, Inside Information: Computers in Fiction, USA, Addison-Wesley, 1977, pxv:

" Computer technology serves as a microcosm of technology as a whole, and it is heir to all the misgivings that have been expressed in anti-utopian writing."

For collections of fiction on thinking machines and computers see I Asimov, P S Warrick, and M H Greenberg (eds), Machines That Think, Harmondsworth, Penguin, 1983 and T F Montelone(ed), Microworlds, London, Hamlyn, 1984.

[80] Reichardt, 1978, op cit p25.

[81] Witness computer pioneer, Alan Turing's faith in AI and the willingness of the press to consider his work as the building of an 'electric brain'. See A Hodges Alan Turing: The Enigma of Intelligence, London, Unwin, 1985, pp347-349 for 1946 press reaction.

[82] P Ceruzzi 'An unforeseen revolution: computers and expectations, 1935-1985' in J Corn (ed), Imagining Tomorrow, London, MIT Press, 1986, pp188-201.

[83] Bolter, 1986, op cit, for example, sees the computer as a 'defining technology' acting as the metaphor of the age.

[84] Evans, 1979, op cit p102.

[85] Bolter, 1986, op cit p6.

[86] Simons, 1985, op cit, chapter one and M Shotton, Computer Addiction? A Study of Computer Dependency, London, Taylor and Francis, pp8-11, 1989, for review of predictive literature expressing concerns about computer phobias and addiction. The need to 'denaturalize' fascination with computers is argued in P Linn, 'Microcomputers in education: dead and living labour' in Solomonides and Levidow (eds), 1985, op cit pp36-57.

[87] This is the starting point of K Kumar, Prophecy and Progress, Harmondsworth, Penguin, 1978.

[88] This draws heavily on the analysis in D Harvey, The Condition of Postmodernity, Oxford, Basil Blackwell, 1990.

[89] This is discussed in chapter one, pp19-20.

[90] For example, Robins and Webster, 1989, op cit pp11-13.

[91] P Horringan, 'The home of tomorrow, 1927-1945' in Corn (ed), 1986, op cit p159. For a discussion of the influence of the idea of a 'labour-saving' in the home on design and consumption see A Forty, Objects of Desire, London, Thames and Hudson, 1986.

[92] The long history of prophecies of domestic robots discussed in Reichardt, 1978, op cit pp112-7. The idea of the domestic robot is one of the key themes in the imaginary history of robotics. Professor Meredith Thring ended a lecture to the Royal Society in 1967 by saying:

"Probably more routine work is done by intelligent people in the home than anywhere in modern civilization. All the cleaning, scouring, dusting and daily tidying jobs, preparation of vegetables and so on are routine and require no judgement or intelligence on the part of the person doing them. The development of a robot at a reasonable price to act as a slave and do the dull jobs in the home is therefore as worthwhile an objective as the development of a robot for industry or the farm." (quoted *ibid* p112)

Many domestic robots have been built. In 1927, for example, Westinghouse constructed "Televox" which was supposed to take instructions over the phone. In 1976 Ben Skora completed 'Arok' which can be programmed to do a number of chores. 'Quasar' built in 1977 can supposedly mow lawns, clean floors and cook.

T O Knight, Robots and People: the Age of the Personal Robot, USA, McGraw

Hill, 1984, pp1-2, provides a contemporary vision:

"Imagine a morning, not many years from now, on which you awaken after a long and safe slumber. The night before you drifted to sleep with absolutely no fear that your house would be robbed or that you would be in any danger. Your household computer informs you that your breakfast is ready, so you proceed to the kitchen to enjoy the meal that your robot has prepared."

"As you eat, you glance at the headlines of the morning news on the nearby video monitor, noting that unemployment has been virtually eliminated, the gross national product has increased 15 percent in the last year, and your stocks are doing well. Before you leave, you remind the household robot to test the children on their math lesson, review them on their other studies, and finally, join them in a game of catch. You then step into your transportation vehicle, which whisks you away to the office for a full four hours work. As you plan the remainder of the day, you decide to spend the rest of the day playing racquetball with some friends, followed by some good reading. After you eat your already prepared meal with your family, you will work with one of the household computers for the rest of the evening, then drift off to a pleasant sleep once more."

Knight is convinced that robots will change virtually every aspect of our lives but he is especially interested in the possibilities of the "probot" - the personal robot - which is the robotic equivalent of the home or personal computer. The probot will "carry beverages to guests, read stories to a child, serve as a baby-sitter, play games or even teach people the fundamentals of computers or robotics." Owning one of them will be like having a servant "without having the guilt." Probots act as sentry and provide entertainment. Eventually probots will be able to "care for humans without supervision" and undertake "whatever labour is required in the home." The claims Knight makes for the future are difficult to square with the very limited abilities of existing 'personal robots' and the problems any designer of the technology which could perform the tasks Knight sets it. The appeal of a personal robot about the house can be seen from their ubiquitous presence in science fiction. Knight, who is in the personal robot business himself, plays on this when he talks of R2D2 and when he suggests that a probot on sentry duty should pretend to a burglar that it will zap him with it's phaser. A currently available robot RB5X can sing 'Daisy, Daisy' like HAL 9000 in '2001'. (ibid, p6, p96, p109)

[93] U Huws, 'Telework: projections', *Futures*, Jan/Feb 1991, pp19-31.

[94] *ibid*, p21.

[95] The idea of teleworking has a fairly long history. There was a spate of forecasts, for example, in the wake of the 1970s oil crisis. *Ibid*, p22 and U Huws, 'Terminal isolation' in *Radical Science Collective* (eds), 1985, op cit p25, cites many predictions.

[96] See Huws, 1991, op cit pp24-26, for examples of this argument

[97] Williams, 1985, op cit p69.

[98] Toffler, 1980, op cit p364. For discussion of the electronic cottage see pp204-217.

[99] *ibid*, pp214-215.

[100] *ibid*, p217.

- [101] M Aldrich, Videotex: Key to the Wired City, London, Quiller, 1982.
- [102] Evans, 1979, op cit pp218-9.
- [103] Martin, 1978, op cit p9 and p12.
- [104] R Mason and L Jennings, 'The Computer home: will tomorrow's housing come alive?', The Futurist, Vol 16 No1, Feb 1982, p35.
- [105] Macrae, 1984, op cit p179.
- [106] Toffler, op cit, p184. This environment gives us a new kind of social memory which is both more extensive than that of our literate culture and active as it is in our oral culture. J D Bolter, 1986, op cit p162, makes a similar point:
- "The computer's technology of memory fits into a tradition at least as old as Greek civilisation. It is in one sense a triumphant extrapolation of the mechanical technology that proceeded it. In another sense, its flexibility recalls an earlier era, before the book or the tabulating machine."
- [107] Part of the IT Revolution discourse concerns the break up of old educational structures and the rise of the home as a centre of education. See, for example, T Stonier, The Wealth of Information, Thames Methuen, London, 1983, chapter eleven. For critical discussion of this idea see Robins and Webster, 1989, op cit, pp260-261.
- [108] Outlined in Huws, 1991, op cit p26. See also L Haddon, 'Teleworking: literature review' in A Lewis (ed), Attitudes to Homeworking: the Views of TMS Personnel, University of Bath Centre for Economic Psychology Report, 1989.
- [109] Quotes from Huws, 1985, op cit p17 and 24. For further examples of this kind see Huws, 1991, op cit pp24-25.
- [110] Huws, 1991, op cit p20.
- [111] Huws, 1985, op cit p20.
- [112] Simons, 1985, op cit, p126 and p138.
- [113] H Vail, 'The home computer terminal: transforming the household of tomorrow', The Futurist, Vol 14 No 6, 1980, pp52-58, uses the example of designing a menu to show how IT would 'transform the household.'
- [114] Evans, 1979, op cit pp80-81 and p88.
- [115] Weizenbaum, 1984, op cit especially preface to 1984 edition.
- [116] Lyon, 1986, op cit p576.
- [117] Government and business initiatives around the world are in the introduction to T Forester, High-Tech Society, Oxford, Basil Blackwell, 1987. For an example national research initiatives see Nora and Minc, 1980, op cit, originally 1978 report to French President. Examples of transnational initiatives see H Inose and J R Pierce, Information Technology and Civilization, New York, W H Freeman and Co, 1984, originally report to Club of Rome 1982 and J Rada, The Impact of Microelectronics, Geneva, International Labour Organization, 1980. The idea of IT being on the 'national agenda' comes from the discussion of the US experience in R Kling and S Iacono, 'Computerization as the product of social movements' in R Gordon (ed), Microelectronics in Transition, Norwood, NJ, Ablex, 1985.

[118] Lyon, 1988, op cit pp35-40, outlines initiatives in a range of countries. For examples see M Batty, 'Technology highs', Guardian, 22/6/89, p29, which claims that Singapore's 1986 seven-point national plan amounts to "what must be the world's first blueprint for the design of an information society." Masuda, 1981, op cit, is written by one of the architects of Japan's 'Plan for the Twenty-First Century' and contains examples of 'wired city' experiments in Japan and the rest of the world. M Cooley, 'Why our vision of the next century should be in a class of its own', Guardian, 11/8/89, p13, also discusses Japanese plans. The fear of national defeat or failure is also reflected in US work which seeks to highlight the Japanese IT threat to American economic supremacy. See E A Feigenbaum and P McCorduck, The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge to the World, London, Pan, 1984.

[119] Kling and Iacono, 1985, op cit, acknowledge that dystopian visions were also influential but people found it harder to organize around them.

[120] Quoted Robins and Webster, 1989, op cit p27.

[121] For example, C Freeman, 'Unemployment and the government' in Forester (ed), 1980, op cit pp308-317.

[122] Goldwyn, 1980, op cit p302.

[123] This interest is described by Curnow, 1980, op cit.

[124] Robins and Webster, 1989, op cit p27.

[125] There are many examples of this. For labour movement attempts to assess predictions see J Bratton and J Waddington, New Technology and Employment, London, Workers Educational Association, 1981; CSE Microelectronics Group, 1980, op cit; TUC, Employment and Technology, London, TUC, 1979; Benson and Lloyd, 1983, op cit; APEX Office Technology Working Party, Automation and the Office Worker, London, Apex, 1980. Other attempts at assessment include T Jones (ed), 1980, op cit; and Council for Science and Society Working Party New Technology: Society, Employment and Skill, London, 1981. Examples of attempts to assess the impact on women's employment include SPRU Women and Technology Studies, Microelectronics and Women's Employment in Britain, SPRU Occasional Paper No17, SPRU University of Sussex, 1982; and U Huws, Your Job in the Eighties, London, Pluto, 1982.

[126] See Lyon, 1988, op cit for a review of these.

[127] This is discussed in chapter five, pp187-195.

[128] See chapter one, pp27-31.

Chapter Three

[1] This productivist bias in classical theory has been highlighted by a number of recent writers. Two examples will suffice here. Jean Baudrillard, The Mirror of Production, St Louis, Telos, 1975, offers a radical critique of Marx. He argues that Marx's emphasis on labour as the key to self-creation reflects a general western perspective. Marx is infected by "an unbridled romanticism of productivity." (p17) From a very different tradition, Colin Campbell, The Romantic Ethic and the Spirit of Modern Consumerism, Oxford, Basil Blackwell, 1987, offers a similar critique of Weber. Campbell argues that, in concentrating on the role of the protestant ethic in the the development of capitalism, Weber ignored the other equally important facet of the culture of capitalism - a romantic ethic which drives the desire for goods. So from two very different perspectives we are offered an inversion of the thought of a 'founding father'.

[2] This is a theme of, among others, G McCracken, Culture and Consumption: New Approaches to the Symbolic Character of Consumer Goods, Bloomington, Indiana University Press, 1988, chapter one.

[3] McCracken, 1988 op cit, identifies three decisive moments in the development of modern consumer society in the sixteenth, eighteenth and nineteenth centuries. N McKendrick, J Brewer and J H Plumb, The Birth of Consumer Society: The Commercialization of Eighteenth Century England, London, Europa, 1982, describes a 'consumer revolution' in eighteenth century England. Contributions to S J Bronner (ed), Consuming Visions, New York, Norton, 1989, point to the deep roots of the consumer way of life in America. Bronner himself quotes Alexis de Tocqueville writing in 1840:

" A native of the United States clings to this world's goods as if he were certain never to die."

" Besides the good things that he possesses, he every instant fancies a thousand others that death will prevent him trying if he does *not* try *them* soon." (quoted p37)

[4] The starting premise of Bronner (ed), 1989, op cit, is that the period 1880-1920 saw the flowering of modern consumer culture in the USA. See also S Ewen and E Ewen, Channels of Desire, New York, McGraw-Hill, 1982.

[5] Campbell, 1987, op cit, p25, argues that " ... contrary to popular impression, the manufacturing industries most closely associated with the early Industrial Revolution were those producing consumer rather than capital goods and among these, those which produced objects for 'luxury' consumption predominated." For an example of this early mass production and marketing see the discussion of Wedgwood china in A Forty, Objects of Desire, London, Thames and Hudson, 1986, chapters one and two.

[6] This is the theme of Forty, 1986, op cit, chapter four, especially pp87-93.

[7] M Featherstone, 'Consumer culture: an introduction', Theory, Culture and Society, Vol 1 No 3, 1983, pp4-5:

" It was not just the increase in the amount and range of mass produced goods which was crucial, but the way in which the experience of purchasing and the consuming were transformed by the proliferation of mass produced images and the creation of new sites of consumption."

[8] For examples see J Lears, 'Beyond Veblen: rethinking consumer culture in America' in Bronner (ed), 1989, op cit pp73-97.

[9] See Ewen and Ewen, 1982, op cit and D Chaney, 'The department store as cultural form', Theory, Culture and Society, Vol 1 No 3, 1983, pp22-31.

[10] S J Bronner, 'Reading consumer culture', in Bronner (ed), 1989, op cit p26.

[11] W R Taylor, 'The evolution of public space in New York City: the commercial showcase of America', in Bronner (ed), 1989, op cit pp287-310. Ewen and Ewen, 1982, op cit p6, write:

" We live and breath an atmosphere where mass images are everywhere in evidence; mass produced, mass distributed. In the streets, in our homes, among a crowd or alone, they speak to us, overwhelm our vision."

[12] Chaney, op cit, 1983 p27.

[13] Ewen and Ewen, 1982, op cit p58 and p54.

[14] For discussion of the 'education' of consumers see Introduction in Bronner (ed), 1989, op cit p2 and pp8-9:

" Immensely popular 'how-to' books, etiquette books, and social advisers used a rhetoric of technique to turn the consuming passions of turn-of-the century America into productive activities."

[15] C Campbell 'The desire for the new', paper presented at ESRC/PICT Workshop on Domestic Consumption and ICTs, Brunel, May 1990, argues that it is the desire for novel goods, epitomized by fashion, which is distinctive about consumption in the modern era.

" Thus to understand modern consumerism means to understand the nature, origin and functioning of the processes through which novelty is continuously created, introduced into society and then disseminated through all social classes."(p14)

[16] Fordism and flexible accumulation are discussed in D Harvey, The Condition of Postmodernity, Oxford, Basil Blackwell, 1990, chapters eight to eleven. Harvey (p156) argues that:

" Flexible Accumulation has been accompanied on the consumption side ... by a much greater attention to quick changing fashions and the mobilization of all the artifices of need-inducement and cultural transformation that this implies."

For an account of the development of the 'management of consumption' see K Robins and F Webster, The Technical Fix, London, MacMillan, 1989, pp41-47.

[17] See M Barton, 'The Victorian jeremiad: critics of accumulation and display' in Bronner, 1989, op cit pp55-72.

[18] A Swingewood, The Myth of Mass Culture, London, Macmillan, 1977, shows that pessimism about mass culture common to a whole range of perspectives. Examples of critical approach to consumption and debates about it are discussed by Bronner, 1989, op cit pp4-5.

[19] The Frankfurt School are sometimes accused of productivist bias but Featherstone, 1983, op cit p5, argues that this misses the point - their concern was that "consumption under capitalism is too ascetic, disciplined and instrumental." The management and control of free time undermines autonomy and personality. For discussion of the debasement of need see H Marcuse, One

Dimensional Man, Boston, Beacon Press, 1964, p9:

" The people recognise themselves in their commodities; they find their soul in their automobile, hi-fi set, split-level home, kitchen equipment."

" The products indoctrinate and manipulate; they promote a false consciousness which is immune against its falsehood."

[20] Ewen and Ewen, 1982, op cit p27.

[21] Adorno quoted in D Held, Introduction to Critical Theory, London, Hutchinson, 1980, pp90-91

[22] Ewen and Ewen, 1982, op cit pp74-77, characterize the developments outlined above as amounting to 'the shaping of the American consciousness.' Consumerism breaks up old social bonds and relationships, producing passivity and conformity. Demands for a better life are channelled by the consciousness industries into aspirations for goods.

[23] D Kellner, 'Critical theory, commodities and the consumer society', Theory, Culture and Society, Vol1 No3, 1983 p70 and p74.

[24] It is argued that the energy put into consumption and the pleasures derived from it reflect a basic powerlessness to affect change in other spheres of life. Ewen and Ewen, 1982, op cit, for example, acknowledge the pleasures and freedoms of the experience of consumption. Z Bauman, 'Industrialism, consumerism and power', Theory, Culture and Society, Vol 1 No3, 1983, pp32-41, recognises the spaces people make for themselves via consumption but he argues that control over their consumption is itself a symptom of domination. The effort put into the sphere of consumption reflects a lack of real control over their lives. The quest for autonomy which is unfulfilled in other spheres, notably the workplace, is the source of the insatiable demand for goods.

[25] Featherstone, 1983, op cit p7. There are parallels here with early theorizing in media studies.

[26] D Miller, Material Culture and Mass Consumption, Oxford, Blackwell, 1987, p11.

[27] M Featherstone, Consumer Culture and Postmodernism, London, Sage, 1991, pviii.

" ... despite the populist turn in analyses of consumer culture some of the questions raised by the critical theorists such as 'how to discriminate between cultural values' 'how to make aesthetic judgements', and their relation to the practical questions of 'how we should live', it can be argued have not actually been superseded but have merely been put aside."

[28] S Zukin, 'Socio-spatial prototypes of a new organization of consumption: the role of real cultural capital', Sociology, Vol24 No1, p48.

[29] The term is mine. It refers to a perspective that can be found in economics, sociology and anthropology. It has adherents across the political spectrum. It appeals, for example, to Marxists who view the household primarily as the site for the reproduction of labour power.

[30] J Gershuny, Social Innovation and the Division of Labour, Oxford, Oxford University Press, 1983. This was part of a process of labour-saving within the household which has now slowed down. Gershuny looks to new information and communication technologies to bring about a new phase of labour-saving,

extending the self-service principle to new areas such as health, education and shopping itself.

[31] *ibid*, p4.

[32] The dilemmas and contradictions thrown up by this is a major theme of the thesis. See chapters seven and eight.

[33] Gershuny, 1983, *op cit*, p1:

" Let us assume that households have a certain range of needs, a set of 'service' functions that they wish to satisfy - food, shelter, domestic services, entertainment, transport, medicine, education, and, more distantly, government services, 'law and order' and defense."

For discussion of the 'institutional model of the household' see J Wheelock 'Personal computers, gender and an institutional model of the household', paper delivered at ESRC/PICT Workshop on Domestic Consumption and ICTs, May 1990, pp4-10.

[34] Feminists, for example, question whether simple economic rationality can explain the shape of and demand for domestic appliances. See R S Cowan, More Work for Mother, London, Free Association Books, 1989. J Wajcman, 'Domestic technologies', paper delivered at PICT workshop on gender and IT, Eastbourne, May 1989, pp12-13, uses Cowan's argument to challenge Gershuny.

[35] S Wallman, Eight London Households, London, Tavistock, 1984.

[36] R Pahl, Divisions of Labour, Oxford, Blackwell, 1984, p256.

[37] Wallman, 1984, *op cit* p29.

[38] McCracken, 1988, *op cit* pxi.

[39] For outline and discussion of Veblen's and Simmel's ideas see Lears, 1989, *op cit*; Campbell, 1987, *op cit* pp49-57; Miller, 1987, *op cit* pp68-81

[40] M Douglas and B Isherwood, The World of Goods: Towards an Anthropology of Consumption, Harmondsworth, Penguin, 1980, p5. Goods mediate in social relationships, make visible statements about values.

" In the protracted dialogue about value that is embedded in consumption, goods in their assemblage present a set of meanings, more or less coherent, more or less intentional. They are read by those who know the code and scan them for information."

[41] *ibid*, p57 and p62.

[42] This view echoed by M Sahlins, Culture and Practical Reason, Chicago, University of Chicago Press, 1976

[43] Douglas and Isherwood, 1980, *op cit* p75.

[44] A Appadurai (ed), The Social Life of Things: Commodities in Cultural Perspective, Cambridge, Cambridge University Press, 1986, Introduction, p31. Sahlins, 1976, *op cit* p178.

[45] Douglas and Isherwood, 1980, *op cit* pp180-181.

" Ethnography suggests that, left to themselves, regardless of how evenly

access to the physical means of production may be distributed, and regardless of free educational opportunities, consumers will tend to create exclusive inner circles controlling access to a certain kind of information."

[46] P Bourdieu, Distinction, London, Routledge and Kegan Paul, 1984. As Miller, 1987, op cit p153, writes:

" It is this structuralist mode, through which the particularities of the object world at a given time may help generate the objectifications by which a set of social relationships come to know itself through an array of everyday taxonomies which makes Bourdieu's work such an advance on previous analyses of consumption. It accounts for the way in which goods not merely reflect distinction, but are an instrument of it."

[47] This point is made in Miller, 1987, op cit on a number of occasions. For example, he argues that Bourdieu's approach to working class culture has limitations:

" Projects based on religion, morals, the nature of the self and so forth cannot be fully incorporated within this framework."

See also Lears, 1989, op cit p75, on Veblen:

" Veblen realized that all consumption enacted cultural meaning, but he was willing to assign it only one meaning: status striving."

"Veblen's polemical intent led him to a sweeping dismissal of art, religion, and nearly all sensuous or material cultural forms in the name of a utopian alternative: a rational state where sturdy producer-citizens would be ruled by the discipline of the machine rather than the irrationalities of consumption."

[48] This is addressed in J Baudrillard, For a Critique of the Political Economy of the Sign, St Louis, Telos, 1981, which argues that we need to go beyond correlating objects with social structures and instead see them as part of the dynamic tactics of social groups.

[49] D Hebdige, Subculture: the Meaning of Style, London, Routledge, 1979.

[50] Forty, 1986, op cit chapter four, describes how during the nineteenth century product design came to represent social distinctions of age gender and class.

" To look at the range of goods illustrated in the catalogues of the nineteenth century manufacturers, department stores and mail order houses is to look at a representation of society. Through designs of knives, watches, clothes and furniture to suit every rank and station of life, one can read the shape of society as manufacturers saw it, and as the customers learnt to see it."(p93)

[51] The phrase 'attack on culture' is Adorno's. Sahlins, 1976, op cit, criticises Douglas and Isherwood for only understanding goods in terms of their social effects. This is, according to Sahlins, 'the cannibalism of form by function.' Miller, 1987, op cit p146, challenges Sahlins on similar grounds, arguing that material artefacts are an important aspect of all cultural life.

[52] See for example, Forty, 1986, op cit pp104-107; Lears, 1989, op cit p82; J C Agnew, 'A house of fiction: domestic interiors and the commodity aesthetic' and K Halttunen, 'From parlour to living room: domestic space, interior decoration, and the culture of personality' both in Bronner (ed), 1989, op cit p136 and p189.

[53] Miller, 1987, op cit p9.

[54] Sahlins, 1976, op cit p215, suggests that this fundamentally alters the relationship between the social and the symbolic:

" The peculiarity of this bourgeois totemism perhaps lies merely in its *sauvagerie*. For by the development of market-industrial production, that is the institutional dominance given to the economy, the traditional functional relation between the cultural series and the natural series is today reversed: rather than serving the differentiation of society by a differentiation of objects, every conceivable distinction of society is put to the service of another declension of objects."

This is also explored in W Leiss, 'Icons of the market place', Theory, Culture and Society, Vol 1 No 3, 1983, p10. Leiss argues that " much of what occurs in the marketplace in contemporary society is governed by symbolic processes, that is to say by a rich, ever-changing play of imagery about the relationship between persons and things."

[55] Leiss, 1983, op cit p14, quotes a study by McCracken and Pollay which argues that advertising now has a crucial role in the transmission of culture:

" To purchase these objects is to purchase meaning. It is advertising which instructs us in this meaning and advertising that makes us participants in its creation."

McCracken, 1988, op cit p79, sees advertising and 'the fashion system' as conduits "through which meaning is constantly being poured in its movement from the culturally constituted world to consumer goods."

Leiss's own historical study of magazine advertising is enlightening. Analysis shows that there has been a decline in text in favour of visual imagery, 'lifestyle' representations and vaguer notions of the association between products and satisfactions. *Producers supply consumers with much 'lifestyle imagery' as well as 'rational argument information'*. To understand this as distortion or deception would be inadequate - it is a vital part of " the social construction of meaning through the consumption process."(p20)

[56] Douglas and Isherwood, 1980, op cit, understand the uniqueness of modern consumption in terms of two trends. Firstly, growing social differentiation and the weakening of 'grid and group' means that the individual must engage in a game of status and identity management using goods. Secondly, increasing technological sophistication means that new goods and services are constantly available. This presents problems for consumers who have to include them in their universe of meanings.

[57] Harvey, 1990, op cit p286.

[58] M Featherstone, 'Perspectives on consumer culture', Sociology, Vol 24 No1, 1990, p11.

[59] Postmodernism can itself be seen as a response to such 'inflation.' See Harvey, 1990, op cit chapter three.

[60] For a picture of changes in his thinking see J Baudrillard, Selected Writings, M Poster (ed), Cambridge, Polity, 1988; M Gane, Baudrillard: Critical and Fatal Theory, London, Routledge. Gane makes the point that Baudrillard does not see himself as a postmodernist.

[61] This is a recurrent theme of Featherstone, 1991, op cit.

[62] Campbell, 1990, op cit footnote p26. This perspective underlies Campbell, 1987, op cit.

[63] ibid, p22.

[64] Featherstone, 1990, op cit p15.

[65] Lears, 1989, op cit p77. W Leach, 'Strategists of display and the production of desire' in Bronner (ed), op cit, 1989, pp99-132, gives an account of the development of commercial display techniques in the USA and points to the strong element of fantasy in them. Leach tells us that one of the first advocates of window displays was L Frank Baum creator of the land of Oz.

[66] McCracken, 1988, op cit chapter 7, argues that goods play an important role when ideals are displaced into the past or the future. They act as bridge to the past or future and are used to recover 'displaced meaning.'

[67] Miller, 1987, op cit p172.

[68] This point is well made in R Silverstone, D Morley, A Dahlberg, S Livingstone, 'Families, technologies and consumption: the household and information and communication technologies', paper presented at PICT Conference, May 1989, p92.

[69] The conflict between mass production and the marketing rhetoric of individuality is touched on by many authors. For critical discussion of the notion of lifestyle see M Featherstone and M Hepworth, 'The midlifestyle of George and Lyn: notes on a popular strip', Theory, Culture and Society, Vol 1 No3, 1983, pp85-92; J Winship, 'Options' - for the way you want to live now, or a magazine for superwoman', Theory, Culture and Society, Vol 1 No3, pp44-65.

[70] Miller, 1987, op cit pp99-100 and pp104-106.

[71] Hebdige, 1979, op cit p18, argues that within subcultures artefacts such as safety pins or Vaseline are "open to a double inflection."

" These 'humble objects' can be magically appropriated; 'stolen' by subordinate groups and made to carry 'secret' meanings: meanings which express, in code, a form of resistance to the order which guarantees their continued subordination."

As Hebdige (pp92-96) argues, however, these practices soon become 'incorporated' into the capitalist economy.

[72] A Cawson, L Haddon, I Miles, The Shape of Things to Consume, Sage, forthcoming, p59, ref from draft, highlights an increasing recognition in mainstream innovation literature that consumers do not have a passive role in this process.

[73] See I Kopytoff, 'The cultural biography of things: commoditization as process', in Appadurai (ed), 1986, op cit pp64-93.

[74] Miller, 1987, op cit pp168-169.

[75] For call to study 'the circuit of cultural production' see L Haddon, 'The cultural production and consumption of IT' in H Mackay, M Young, J Beynon (eds), Understanding Technology in Education, London, Falmer, 1991, pp157-175. Producers' attempts to understand markets are discussed in Cawson, Haddon and Miles, forthcoming, op cit pp79-89, ref from draft.

[76] Hebdige, 1979, op cit p85, makes this point in relation to subcultures.

[77] Miller, 1987, op cit p170.

[78] *ibid*, p144. Miller remarks on the parallels between much market research and contemporary Critical Theory in that both are concerned with the point of sale of goods and give little attention to the work that consumers put into actually using the goods.

[79] Barton, 1989, op cit p77, detects the emergence of a cultural tradition critical of consumption in the later part of the last century in the USA. 'Prophets of affluence' were countered by 'jeremiads' intolerant of luxury.

" The jeremiad produced, at first, a successful defense of wealth ... and, eventually, a strategic change in the lives of the very rich, who developed a form of self-control called "good taste" - a subtle form of display that would not excite mass envy. Thus the jeremiad was effective , but not in the ways that the authors intended."

A similar argument is put forward in Lears, 1989, op cit pp81-82, in his discussion of the development of consumer culture in nineteenth century USA. He identifies a whole range of moral fears about this new culture amongst bourgeois America. In response an idiom of controlled consumption developed which 'domesticated' and 'moralized' fashion.

[80] D Miller, 'Appropriating the state on the council estate' in J Putnam and C Newton (eds), Household Choices, London, Futures, 1990, p53. In looking at the practices of residents on a council estate these issues are writ large.

[81] Miller, 1987, op cit p190.

[82] McCracken, 1988, op cit pp83-89.

[83] R Silverstone, E Hirsch and D Morley, 'Information and Communication technologies and the Moral Economy of the Household', paper presented at ESRC workshop on Domestic Consumption and ICT, May 1990, pp7-14.

[84] This issue will be addressed in the discussion of my empirical data.

[85] It should be noted that, for many commentators on consumption, absorption of goods into everyday life will inevitably be tenuous. For them goods provide not the raw material for the practice of everyday life but the stuff of dreams , of escape from the everyday. Inevitably, they argue, the reality of an acquisition will not match up to the fantasies it inspired and rather than 'absorbing' goods we cast them aside in search of new experiences. This is a theme of Campbell, 1987 and 1990, op cit. This is also a theme of much Critical Theory - see, for example, Kellner, 1983, op cit, who writes of 'false needs' which " are for commodities that do not fulfil genuine human needs and produce expectations which the products cannot possibly fulfil."

[86] McCracken, 1988, op cit p85.

[87] *ibid*, p71.

" Meaning is constantly flowing to and from its various locations in the social world, aided by the collective and individual efforts of designers, producers, advertisers and consumers."

Appadurai, 1986, op cit p34, makes the distinction between this 'cultural

biography' and the social history of classes of objects.

[88] Silverstone, Hirsch, Morley, 1990, op cit pp14-18.

[89] This is the thrust of Miller, 1987, op cit chapters nine and ten.

[90] See discussion of ethnography of families in Silverstone, Hirsch, Morley, 1990, op cit, and Silverstone, Morley, Dahlberg, Livingstone, 1989, op cit. Wallman, 1984, op cit p163, for example, discusses two 'typical' households with very different systems of resource management.

" And of these two typical households, who is to say which has the more typical livelihood."

[91] A personal stereo can be a gift from a father to a son, a way the son establishes barriers between himself and the rest of his family, an item of fashion expressing identity and a route to consumption of heavy metal music and thus subcultural membership all at the same time.

[92] E Goffman, The Presentation of Self in Everyday Life, Harmondsworth, Penguin, 1969, p51. Hebdige, 1979, op cit pp100-102, argues that 'spectacular subcultures' differ from orthodox culture because of the coherence and self-consciousness of the ways that they construct identity.

[93] Campbell, 1990, op cit; Zukin, 1990, op cit and Bourdieu, 1984, op cit, all address this.

[94] The key role that consumption plays in mediating public and private worlds is the thrust of Silverstone, Morley, Dahlberg and Livingstone, 1989, op cit pp82-97. It should also be noted that modern conceptions of 'the public' developed hand-in-hand with consumerism. This is the theme of Taylor, 1989, op cit.

[95] The classic text which argues for and operationalizes a relative approach to poverty is P Townsend, Poverty in the United Kingdom, Harmondsworth, Penguin, 1979. In this he identifies a 'poverty line' for household incomes. If income drops below this level participation in normal social life, measured by a whole range of indicators, rapidly declines. Other studies such as J Mack and S Lansley, Poor Britain, London, Allen and Unwin, 1984, use a different approach to reach similar conclusions. Mack and Lansley used a survey method in order to establish a social consensus about what constitutes a normal way of life. An example of recent attempts to relate issues of poverty to the question of 'citizenship' is R Lister, The Exclusive Society: Citizenship and the Poor, London, CPAG, 1990. The issue is also raised in G Marshall, In Praise of Sociology, London, Unwin and Hyman, 1990, pp73-77.

[96] Campbell, 1990, op cit p1, argues that what distinguishes modern consumerism from more traditional patterns is 'the desire for the new'. Fundamental issues are the processes which produce cultural novelty and lead people to prefer and champion the novel over the familiar.

[97] Gershuny, 1983, op cit, for example, makes assumptions about the rationality and utility of the purchase of household goods. New products 'free time' within the household by increasing productivity. The household acts in much the same way as the firm does in economic theory. Consumers make a " choice between alternative technical means of provision for particular functions" based on such things as prices and the unpaid work time necessary to use the goods.(p4

[98] Marcuse, 1964, op cit p9. Marcuse in his later work modified his

perspective, arguing that rising consumer expectations could undermine capitalism rather than serve it.

[99] Kellner, 1983, op cit, p77, for example, argues against Marcuse's wholesale condemnation of consumer needs and asserts that socialists must take needs seriously. Kellner evaluates goods according to their use-value, attempting to draw a distinction between commodities which can be used in a rational, useful, creative and life-enhancing way in contrast with 'consumerism' which is a life built around the hollow striving for goods. This involves the development of empirical criteria for the judgement of true and false needs:

" If a commodity, after critical scrutiny, reveals itself to be life-enhancing, truly useful, well-constructed , and fairly priced, then a need for it can be said to be a 'true need.' If the commodity fails to offer the satisfactions promised, if it is not beneficial, life-enhancing, and useful but is rather needless, poorly constructed or overpriced, then a need for it can be said to be a 'false need'."

[100] Campbell, 1987, op cit p47, says that from this rational and utilitarian perspective "... in so far as emotion and imagination, rather than rational calculation enter into the process through which the consumer chooses and purchases goods and services, then 'manipulation' and 'exploitation' are involved."

[101] See Baudrillard, op cit, 1975, which highlights the dominance of a productivist conception of use-values based on notions of fixed, often biological, needs. The basis of Baudrillard's critique of Marx is that he is wrong to portray 'need' and 'utility' as rooted in certain universal and natural basic human requirements.

[102] A key theme of Sahlins, 1976, op cit, eg p176. See also Leiss, 1983, op cit p10.

[103] Appadurai, 1986, op cit p29.

[104] Sahlins, 1976, p169.

[105] The phrase comes from Leiss, 1983 op cit p12.

[106] This is raised as part of a wider issue in Bourdieu, 1984, op cit p194:

" Behind their apparent neutrality, words as ordinary as 'practical', 'sober', 'clean', 'functional', 'amusing', 'delicate', 'cosy', 'distinguished' are ... divided against themselves, because the different classes either give them different meanings, or give them the same meaning but attribute opposite values to the things named."

[107] Sahlins, 1976, op cit p167.

" Utilitarianism ... is the way the western economy, indeed the entire society, is experienced: the way that it is lived by the participating subject, thought by the economist."

[108] Miller, 1987, op cit p118.

[109] See Forty, 1986, op cit pp108-119 and chapter nine.

[110] This notion developed in Miller, 1987, op cit especially chapter nine.

[111] This phrase is used in Hebdige, 1979, op cit p84.

[112] Campbell, 1990, op cit pp17-18.

[113] *ibid*, pp22-23, argues that consumers have particular problems in 'justifying' the purchase and use of novel goods.

[114] This is a theme of Ewen and Ewen, 1982, op cit and Lears, 1989, op cit. Silverstone, Morley, Dahlberg and Livingstone, 1989, op cit, p84, highlight the particular place of information and communication technologies in contemporary consumption. They are 'doubly articulated' as both commodities in their own right and also carriers of a second set of meanings which enable and mediate consumption.

" Information and Communication technologies are profoundly and essentially implicated in the dynamics of consumption, through their double articulation in culture. They are themselves consumed (with meanings that are both predefined in design and marketing, and negotiable) and they also enable consumption: through their consumed messages they bring news of consumption possibilities, and through them decisions to consume are communicated, goods ordered, objects and identities displayed."

[115] Silverstone, Morley and Hirsch, 1990, op cit p7.

" It is also the matter of technology's status in contemporary society, a status that, arguably at least, marks it as the commodity par excellence in the modern world, and as a commodity to be consumed as simultaneously an expression of irredeemable dependence and (false or genuine?) freedom."

[116] For discussion of utopian promise of consumption see Bronner, 1989, op cit, p4, pp13-53 and pp217-254. Technology, consumption and progress were the intertwined themes of the World's Fairs which took place from the late nineteenth century onwards. See R W Rydell, 'The culture of imperial abundance: world's fairs in the making of American culture' in Bronner, 1989, op cit pp191-216 and F T Kihlstedt, 'Utopia realized: the world's fairs of the 1930s', in J Corn (ed) Imagining Tomorrow, London, MIT Press, 1986, pp97-118. For discussion about consumption and technological utopias see H Segal, Technological Utopianism in American Culture, Chicago, University of Chicago Press, 1985, pp125-126 and K Kumar, Utopia and Anti-Utopia, Oxford, Basil Blackwell, 1987, pp158-167.

[117] A Gell, 'Technology and magic', Anthropology Today, Vol 4 No2, 1988, pp6-9. McCracken, 1988, op cit, chapter seven. It is also worth noting that the Cargo Cults were inspired by both Western technologies and Western goods.

[118] Gell, 1988, op cit p8.

[119] Forty, 1986, op cit pp190-193. See also J L Meikle, 'Plastic, the material of a thousand uses' in Corn (ed), 1986, op cit pp77-96.

[120] Forty, 1986, op cit p12. See also pp200-206.

[121] *ibid*, p206.

Chapter Four

[1] This will be explored in more detail in chapter five.

[2] Some have gone as far as to argue that social scientists operating in the sociology and management of computing are explicitly or implicitly acting as promoters of computerization. R Kling and S Iacono, 'Computerization as a product of social movements', in R Gordon (ed), Microelectronics in Transition, Norwood, NJ, Ablex, 1985, p7, refs from draft, sees them as part of a 'Computer Based Social Movement'. T Roszak, The Cult of Information, Cambridge, Lutterworth, 1986, pp31-32 makes a similar point.

[3] There have been numerous research initiatives from business, unions, policy-makers and academics in a number of different countries to assess development of telework. U Huws, The New Homeworkers, London, Low Pay Unit, 1984, is a well known British example which sees existing teleworkers as pioneers of greater changes to come. L Haddon, 'Teleworking: literature review' in A Lewis (ed), Attitudes to Homeworking: the Views of TMS Personnel, University of Bath Centre for Economic Psychology Report, 1989, offers a review of research on teleworking and an extensive bibliography. For discussion of attempts to understand the consequences of IT on home life see W Dutton, P Kovaric and C Steinfield, 'Computing in the home: a research paradigm', Computers and Social Sciences, 1, 1985. They suggest (table p6) some areas of domestic life which micros might change: learning and education; 'family functioning'; personal development; leisure activities; work from home; household routines; and privacy, civil liberties and property rights. T R Lindlof, 'New communications media and the family: practices, functions and effects', in B Dervin (ed), Progress in Communication Sciences Vol 10, Norwood, NJ, Ablex, 1989, discusses recent US work on computing and the family. Many other examples will be considered later in the chapter. M McNeil, 'Turing's men, cyborgs and wise women: information technology, gender and culture', paper delivered at PICT conference on gender and IT, Eastbourne May 1989, pp2-4, identifies a strand of research into cultural transformation. One dimension of this is considered in M Shotton, Computer Addiction?, London, Taylor and Francis, London, 1989, which reviews attempts to understand 'computer dependency'.

[4] For example, M Batty, The Spatial Impact of the Computer Culture, UWIST Department of Town Planning Papers in Planning Research No.91, July 1985 and M Batty, 'Danger: there be no micros', Guardian, 15/5/86, p16, speculates about the economic consequences of regional imbalances in computer ownership. J Wheelock, 'Personal computers, gender and an institutional model of the household', paper presented at PICT workshop on domestic consumption and ICTs, May 1990 understands the home computer as an economic resource effecting household members' job prospects.

[5] This should be seen in the context of a growing awareness in the study of consumption of both material goods and media texts of the dangers of extrapolating from developments in the sphere of production to the sphere of consumption. See chapter three, especially pp93-96.

[6] Dutton, Kovaric, Steinfield, 1985, op cit p7. The need for further understanding of basic questions is also argued in W Dutton, E Rogers and S Jun, 'The diffusion and impacts of information technology in households' Oxford Surveys in Information Technology, Vol 4, 1987, p135 and conclusions.

[7] This often amounted to blindness to the computer's status as a consumer good. This absence reflects a more general problem with the studies of innovation which often fail to address their subject adequately as a phenomenon of consumption and springs, in part, from the inadequacy of economic models in which demand and taste for goods is assumed rather than explained. Examples of predictions of universal computer ownership are given in chapter five.

[8] For a general discussion of the diffusion of innovations approach see A Cawson, L Haddon and I Miles, The Shape of Things to Consume, Sage, Forthcoming, pp6-11, refs from draft. It is most evident in North American work on home computing - summarized and discussed by Dutton, Kovaric and Steinfield, 1985, op cit. For examples of seeing present computer owners as 'early adopters' see A Venkatesh, and N Vitalari, 'Households and technology: the case of home computers - some theoretical and conceptual issues', in M.L.Roberts and L.Wortzel (eds) Marketing to the changing household, Cambridge mass, Ballinger Press, 1984, pp.187-203; N Vitalari, A Venkatesh, and K Gronhaug, 'Computing in the home: shifts in the time allocation patterns of households', Communications of the ACM, Vol 28, No 5, May 1985, pp.512-522; W Danko and J MacLachlan, 'Research to accelerate the diffusion of a new innovation: the case of home computers', Journal of Advertising Research, Vol 23 No 3, 1983, pp39-43; M Dickerson and J Gentry, 'Characteristics of adopters and non-adopters of home computers', Journal of Consumer Research, Vol 10, 1983, pp225-235.

[9] It lies, for example, behind writing which views home computer users as the vanguard of a new 'computer culture.' See, for example, S Turkle, The Second Self: Computers and the Human Spirit, London, Granada, 1984 and J Weizenbaum, Computer Power and Human Reason, Harmondsworth, Penguin, 1984.

[10] S Bains, 'Research on home computers', unpublished draft paper, 1990, p5.

[11] I am grateful to Leslie Haddon for this insight. I Miles, Home Informatics, London, Pinter, 1988, especially pp93-99, distances the home of the future from the home micro.

[12] See Dutton, Kovaric and Steinfield, 1985, op cit; Dutton, Rogers and Jun, 1987, op cit; W Dutton, E M Rogers and S H Jun, 'Diffusion and social impacts of personal computers', Communication Research, Vol 14 No2, 1987(b), pp219-250.

[13] G Murdock, P Hartman and P Grey, 'Home computers: the social construction of a complex commodity', mimeo, 1988, p3, now published in a different form as 'Contextualizing home computing: resources and practices' in R Silverstone and E Hirsch (eds), Consuming Technologies: Media and Information in Domestic Spaces, London, Routledge, 1992. Cawson, Haddon and Miles, forthcoming, op cit pp13-14, refs from draft, argue that, in general, the diffusion of innovation approach does not fully recognize the implications of the way products change over time.

[14] L Haddon, 'The home computer: the making of a consumer electronic', Science as Culture, 2, 1988(a), pp.7-51. L Haddon, The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro PhD Imperial College University of London, 1988(b). Murdock, Hartmann and Grey, 1988, op cit, pp10-11, emphasise the importance of understanding differences between types of computers. This was to become a theme of my own empirical work.

[15] Haddon, 1988(b), op cit chapter nine, points out, that even in the late 1980s the home computer's future was neither fixed nor certain. Many continue to question its long-term future as a product category.

[16] L Haddon, 'The cultural production and consumption of IT' in H Mackay, M Young and J Beynon (eds), Understanding Technology in Education, London, Falmer, 1991, pp157-175. The complex interplay between the spheres of consumption and production is a theme of L Haddon and D Skinner, 'The enigma of the micro: lessons from the British home computer boom', Social Science Computer Review, Vol 9 No3, 1991.

[17] Dutton, Rogers and Jun, 1987(b), op cit p220:

" Patterns of use, versus adoption per se, are viewed as major determinants of the impact of computing in the home."

As *Cawson, Haddon and Miles, Forthcoming*, op cit p2, refs from draft, point out there is a general lack of empirical investigation into the innovation process in 'consumer technology'.

[18] Dutton, Kovaric and Steinfield, 1985, op cit p5.

[19] See chapter three, pp96-100.

[20] Dutton, Kovaric and Steinfield, 1985, op cit p6.

[21] Venkatesh, A., and Vitalari, N., 1984, op cit p189. The quote continues:

" As an economic system the household will be inclined to evaluate technologies in terms of their potential to produce goods and services that are appropriate to the functioning of the household. Households with better educated members can be considered to be better able to use a variety of household technologies, to organize their time more efficiently, and to minimize the routine, repetitive, and mundane aspects of life. Finally, as social systems, households adopt new technologies because they may add power and prestige and improve their social status."

See also Vitalari, Venkatesh, and Gronhaug, 1985, op cit especially pp513-514.

[22] See chapter three, pp80-82. It is also worth noting that IT is seen as a, potentially, very powerful household resource in J Gershuny, Social Innovation and the Division of Labour, Oxford, Oxford University Press, 1983.

[23] The quotes are from Venkatesh and Vitalari, 1984, op cit p191.

[24] This will be developed further in chapters five and seven.

[25] For example of this argument see J Wajcman, 'Domestic technologies', unpublished paper, 1989, p15.

[26] The supposed collapse of home computer sales is discussed in chapter five, pp201-202. For examples of claims about non-use and disappointment with the micro see G Murdock, P Hartman and P Grey, 'Contextualizing home computing: resources and practices' in R Silverstone and E Hirsch (eds), Consuming Technologies: Media and Information in Domestic Spaces, London, Routledge, 1992;

G Murdock, P Hartmann and P Grey, 'Home truths', Times Education Supplement, 7/3/86; G Murdock, P Hartmann and P Grey, 'Family failing?', Times Education Supplement, 19/6/87, p68. Similar issues are raised in Shotton, 1989, op cit pp80-81. Evidence of 'disappointment' with the micro is mixed. G Murdock, P Hartmann and P Grey, 'Interim Report on 1985/86 Sample', 1986(b), p16, reports that only 26% of those interviewed said that the computer had not come up to expectations. Other surveys have found very low levels of disappointment. See for example Gowling Marketing Services, The Home Computer and Software Market, Liverpool, GMS, 1985, p30.

[27] Vitalari, Venkatesh and Gronhaug, 1985, op cit p512.

[28] Haddon, 1988(a), op cit p16. See Shotton, 1989, op cit chapter seven, writes of 'dependent' computer hobbyists. Although Shotton's book appeared after my fieldwork I had been in contact with her prior to this. Shotton, argues that for her interviewees computing was the latest in a series of hobbies. These invariably included one or more "technological hobbies" such as

amateur radio, photography, cars and motor cycles or electronics; coupled with interests in science fiction, war-gaming, astronomy, music and mythology, hobbies which may perhaps be described as having a fantasy aspect to them.

[29] Wheelock, 1990, op cit p24. This insight does not shake Wheelock's faith in an 'institutionalist theory of value' as a route to understanding home computing.

[30] Reviewed in the Dutton, Kovaric and Steinfield, 1985, op cit; Dutton, Rogers and Jun, 1987, op cit; Dutton, Rogers and Jun, 1987(b), op cit; Lindlof, 1989, op cit.

[31] For a comprehensive review of quantitative sources see L Haddon, The Origins and Nature of Statistics on Household ICTs, Centre for Information and Communication Technologies Working Paper No 8, SPRU, 1990. For examples of British official sources see Office of Population and Surveys, General Household Survey, London, HMSO, various years. The major market research in this area was conducted for Gowling Marketing Services by BMRB in January 1983, 1984 and 1985. The main data for these reports comes from surveys of 2000 households using grid sampling methods. The 1985 data is supplemented by interviews conducted by GMS on 750 purposely selected carried out late 1984. See Gowling Marketing Services, 1985, op cit; Gowling Marketing Services, The UK Computer and Software Market, Liverpool, GMS, 1984; Gowling Marketing Services, The UK Home Computer Market, Liverpool, GMS, 1983. Market Surveys include Wood McKenzie, Home Computers, London, Wood McKenzie, 1985; British Radio and Electronic Equipment Manufacturers Association, Annual Report, BREEMA, various years; Euromonitor, Consumer Electronics in Western Europe, Euromonitor, 1984; Financial Times Media Intelligence Unit, Home Computers in the UK and USA, FT, 1984; Keynote, Home Computers and Software, London, Keynote, 1985; Keynote, Market Review: Computers, London, Keynote, 1986; I Abbot and N Manuel, Home Electronics: The UK Market, London, Economist Intelligence Unit Special Report No 217, 1985. The Murdock survey data is summarized in Murdock, Hartmann and Grey, 1986(b), pp10-17 and G Murdock, P Hartmann and P Grey, Interim Report of 1983/1984 Sample, 1984, pp59-61. I am grateful to Paul Hartmann for sending me copies of this unpublished material.

[32] Many of the same conclusions could be drawn from the North American material. Dutton, Rogers and Jun, 1987(b), p238, reviewing survey data conclude that:

" At present, computers are seldom used for communication or for household routines."

For British data see, for example, Murdock, Hartmann and Grey, 1986(b), op cit p16. Computer households were asked which things they did at least once a week:

Games	48%
Education	21%
Calculations	14%
Storing Info	8%
Biz records etc	5%
WP	5%
Home Finances	5%

[33] See, for example, Gowling Management Services, 1983, 1984, 1985, op cit.

[34] One exception to this is Market Intelligence, Home Computers, Mintel, 1990.

[35] Haddon, 1990(a), op cit.

[36] *ibid*, p24, p27.

[37] This is recognized by Murdock et al, for example, who compliment their quantitative research with qualitative study.

[38] For an overview see N W Jankowski and F Wester, 'The qualitative tradition in social science inquiry: contributions to mass communications research' in K B Jensen and N W Jankowski (eds), A Handbook of Qualitative Methodologies for Mass Communications Research, London, Routledge, 1991, pp44-74. See also D Morley, Family Television: Cultural Power and Domestic Leisure, London, Comedia, 1986; D Morley and R Silverstone, 'Domestic communication - technologies and meanings', Paper presented to the 1988 International Television Studies Conference.

[39] A Bryman, Quantity and Quality in Social Research, London, Unwin Hyman, 1988, chapter three, discusses the characteristics of qualitative research.

[40] D Sudnow, Pilgrim in the Microworld, London, Heinemann, 1983. Sudnow relates his account to home computers and applies his approach to word processing at the end of the book.

[41] For example, Sudnow challenges the idea that playing games such as 'Missile Command' reflected or produced aggression.

[42] *ibid*, p61.

[43] For example, Sudnow collects his son from a video games arcade. He describes the arcade as "the strangest human conduct I've witnessed in a public place." (*ibid*, p7) At other points he touches on gender differences in attitudes towards games. Sudnow's first exposure to video games is at an academic's party in Berkeley. Most of the men are drawn away from the centre of the party to huddle around a new games console. What about the women?

" Most of them hung out in the kitchen, but every so often a new one stuck her nose in the game room, feigning utter disinterest. I thought I spotted some female fists clenched." (*ibid*, p18)

[44] Turkle, 1984, op cit pvii, is interested in:

" ... how ideas move out from a sophisticated technical world into the culture as a whole and, once there, how they shape the way people think about themselves."

[45] So that, for example, *ibid* part one, looks at the role of the computer in children's development of a sense of self.

[46] *ibid*, p3 and p168.

[47] *ibid*, p328.

[48] *ibid*, chapter two.

[49] *ibid*, p334.

[50] *ibid*, pp92-93. Turkle discusses her work with children and computers.

" The problem here is the search for universal effect. I have found that

different children are touched in remarkably different ways by their experience of the computer In a sense, I turn the usual question around: instead of asking what the computer does to children I ask what children, and more important, what different kinds of children make of the computer."

[51] *ibid*, p11.

" ... as computers become common place objects in daily life - in leisure and learning as well as in work - everyone will have the opportunity to interact with them in ways where the machine can act as a projection of part of the self, a mirror of the mind."(*ibid*, p5)

It is the starting premise of part three of 'The Second Self' is that we are moving 'Into a New Age.'

[52] *ibid*, p3.

[53] *ibid* p333.

" ... in this book, the focus is on people's relationships with an object and on how these relationships themselves become building blocks of culture."

[54] P Linn, 'Microcomputers in education: dead and living labour' in T Solomonides and L Levidow (eds), Compulsive Technology: Computers as Culture, London, Free Association, 1985 p98. This kind of critique is summarized in L Haddon, 'Explaining ICT consumption: the case of the home computer', Paper presented at the workshop on domestic consumption and ICTs, Brunel University, May 1990(b), pp2-3.

[55] McNeil, 1989, *op cit* p14, makes precisely this point. Linn, 1985, *op cit* p94, accuses Turkle of studiously avoiding the gender implications of her findings.

[56] For quantitative data on gender differences within the households see various market research data and Murdock et al. That these differences persist is shown by the data in Mintel, 1990, *op cit*. One study of 'early adopters', Danko, 1983, *op cit*, found so few women users that they excluded them from the research. Shotton, 1989, *op cit* chapter five, considers data on gender and computing including her own a survey of school children. This showed that boys were more likely both to have access to a micro at home and to want such access. Only four out of one hundred 'computer addicts' studied by Shotton were women. Research such as M Hughes, H Macleod, C Potts and J Rogers, 'Are computers only for boys', New Society, 11/10/85, pp75-76, point to gender difference from a very early age.

[57] S Bains, 'Personal computing, gender and distance education', unpublished paper, 1991(a), p3. Haddon, 1988(b), *op cit* p32 and pp34-36.

[58] L Haddon, 'Researching gender and home computers', Paper presented to the workshop on 'Technology and everyday life: trajectories and transformations', University of Trondheim, May 1990(c), p2, quotes Cynthia Cockburn's talk of the "latent masculinity" of *micro*. Murdock, Hartmann and Grey, 1988, *op cit* p9, seek to explain the gendering of the micro by referring to the 'male' content of most computer games and the arcade games they are descended from:

" Reviews and advertisements for games appear mainly in the popular computer magazines which newsagents tend to put in the hobbies section of their displays, along side the titles devoted to other male enthusiasms such as hi-fi and motorbikes, and well away from the magazines directed at women and teenage girls."

[59] Dutton, Rogers and Jun, 1987(a and b), op cit, for example, in a meta-survey of US research points to the importance of socio-economic status for adoption of computers and the types of use they are put to.

[60] Murdock, Hartmann and Grey highlight class inequalities in access to home computing. In 1987, op cit, for example they suggest this is of serious concern. But 1984, op cit, and 1986(b), op cit, indicate a lessening in gaps in ownership between their two surveys. GMS, 1985, op cit p15, shows that while ownership is highest in groups ABC1, the volume markets are among groups C1 and C2. This is confirmed by more recent market research. Mintel, 1990, op cit p14, estimate that the percentage of households owning home computers is as follows:

AB	34%
C1	25%
C2	27%
D	19%
E	12%

[61] Dutton, Kovaric and Steinfield, 1985, op cit pp9-14. In the agenda they propose for further empirical study they suggest an integrated model of factors which shape the use of personal computing which includes not only indicators of stratification such as social/educational background and social status but also the environment in which technology is used.

[62] *ibid*, p12, cite evidence from meta-research to back assertion that such things as networks of friends and co-workers effect adoption and use of the home computer.

" For instance, Kling and Gerson's (1977) characterization of the social world of computing suggests that personal computing should be viewed as an array, system or network of hobbyists (eg the "Apple Corps"), retailers, hardware and software vendors, users, and others linked, through magazines, personal friendship, electronic mail, common interests, and shared ambitions. According to this conception the users who became more and more integrated into this network will increasingly integrate the personal computer into their lives by employing it more, more regularly and for different applications."

[63] Murdock, Hartmann, Grey, 1988, op cit p4; 1991, op cit, p5-6 reports that almost 60% of computer users surveyed talked to others users about computing and 50% swapped software.

[64] It also challenges, once again, a narrow materialist view of why people use computers. Haddon, 1990, op cit p33, argues, for example, that the way uses are conceptualized in quantitative data misses the role computers can play in social relationships eg entertaining children or friends.

[65] Linn, 1985, op cit p91.

[66] Goffman's adage about research is quoted in M Hammersley and P Atkinson, Ethnography: Principles in Practice, London, Tavistock, 1983, p52.

[67] See for example work already cited by Murdock et al, Dutton et al, Venkatash and Vitalari, and Silverstone et al.

[68] Haddon, 1990(a), op cit p22. This can be related back to the discussion in chapter three, p99, about whether the household is the appropriate unit of analysis for understanding consumption.

[69] GMS, 1985, op cit p1, for example, doubts the validity of the notion of the 'family computer', pointing to variations between levels of usage between ages and genders within households with home computers. Indicates that children were the most common users. Boys are more likely to use computers than girls especially in the case of heavy use. Adult men, although less likely to use than boys or girls, are much more likely to use computers than women. 62% of women had no contact with computers and a further 30% were occasional users.

[70] Haddon , 1990, op cit p27.

[71] See for example, Morley, 1986, op cit, and A Gray, 'Behind closed doors: women and video' in H Baehr and G Dyer (eds), Boxed in: Women on and in TV, London, Routledge, pp38-54.

[72] Murdock, Hartmann and Grey, 1988, op cit p12 and GMS, 1985, op cit p18, both show that home computers are concentrated in households with children. GMS, 1983, op cit, estimate that December 1982 saw a 25% increase in the total number of micros in Britain. Abbot and Manuel, 1985, op cit; Wood MacKenzie, 1985, op cit; GMS, 1985, op cit; and Keynote, 1985, op cit estimate pre Christmas sales in 1984 as accounting for between 40-70% of the total annual sales.

[73] Murdock, 1988, op cit p14.

[74] Shotton, 1989, op cit pp210-226 and 231-232. 45% of the 'dependent users' "reported that their computing caused problems with others." 82% of those married reported that computing caused friction with their wives. Shotton writes that wives complained that their partners tended to neglect them, the children, their home and duties. In the main they found it impossible to understand their husband's fascination with the computer and felt unable to compete with it for their attention. Despite these problems only one of the couples had separated because of computing and that for only a relatively short period of time.

[75] Linn, 1985, op cit p61.

[76] This is even touched on in market research and surveys. For example, Financial Times Media Intelligence Unit, 1984, op cit p12.

" Many adults see home computers as a way of learning about the technology of the future, either for themselves or their children."

This is not confined to Britain. Turkle, 1984 op cit, pp188-89, for example acknowledges the cultural/promotional baggage that comes with computers. The symbolic power of computers is also acknowledged in J Nissen, 'Computer captivated youth: a Swedish picture', Paper presented at 'Children in the Information Age' Sofia Bulgaria, May 1989 and G Paul, 'Selfimages and approaches towards life among young computer fans in Germany', in K Monzi(ed) The Private Household in Technology Research, 1991. This issue will be considered in detail in chapters five and six.

[77] Murdock, Hartmann and Grey, 1988, op cit p3.

[78] This is discussed in chapter five.

[79] D Skinner, Microelectronics and British Society, Unpublished undergraduate dissertation, Bedford College University of London, 1984.

[80] For a discussion of reliability/validity trade-off in mass communications

research see F Williams, R E Rice and E M Rogers, Research Methods and the New Media, New York, Free Press, 1988, p69. See also J Kirk and M L Miller, Reliability and Validity in Qualitative Research, London, Sage, 1986.

[81] Bryman, 1988, op cit chapter four, discusses the different rationales behind the choice of a qualitative methodology. I would argue that qualitative and quantitative methods do not belong to distinct and incompatible theoretical perspectives - see Hammersley and Atkinson, 1983, op cit chapter one. D Silverman, Qualitative Methodology and Sociology, Aldershot, Gower, 1985, p70:

" While research data are often mainly gathered at either a structural or at an interactional level, sound analysis and intelligent conceptualization requires that both levels (and their relations) should be addressed."

[82] Hammersley and Atkinson, 1983, op cit, for example, pp42-44, cast doubt on the 'naturalistic' pretence of some ethnographers to enter fieldwork without an agenda or preconceptions.

[83] There are many precedents for the use of multiple data collection strategies. See the discussion in R G Burgess, In the Field, London, Routledge, 1984, chapter seven.

[84] For a discussion of market and product trends see Mintel, 1990, op cit.

[85] Although it is sizable, the growth in this sector of the home market has not since been as dramatic as many commentators, including myself, expected.

[86] Exceptions to this were some early informal discussions with users and the work with Club B.

[87] Office of Population Censuses and Surveys, National Report Great Britain Part One, HMSO, 1983, pxix, Hillingdon has the highest proportion of children of any Outer London borough.

[88] For discussion and outline of these inequalities see Centre for Urban and Regional Development Studies, Fact Pack, February 1988; D Massey, Spatial Divisions of Labour, London, MacMillan, 1984; D Massey, 'A new class of geography', Marxism Today, May 1988, pp.12-17. Massey acknowledges differences within regions can be as great as those between regions.

[89] For discussion of unemployment see P Halsall, Director of Planning Hillingdon Memo to Chief Executive on Unemployment Statistics, December 1987, and A P Watson, Annual Position Statement 1987, London Borough of Hillingdon Planning Department, September 1987. I am grateful for a discussion with Stephanie Wakefield of the Borough Economic Development Unit 24/4/88. The relative prosperity of the Borough see OPCS, 1983, op cit; J D Wardell, Hillingdon Census Atlas, London Borough of Hillingdon Planning Department, May 1984; J D Wardell, Hillingdon Census Monitor 1981 Census, London Borough of Hillingdon Planning Department, September 1982.

[90] J D Wardell, Hillingdon Employment Monitor 1981 Census 10 Per Cent Statistics, London Borough of Hillingdon Planning Department, December 1983. D Rhind (ed), A Census Users Handbook, London, Methuen, 1983 was a useful guide to interpretation of census data.

[91] See for example M Hepworth, A Green, and A Gillespie, 'The spatial division of information labour in Great Britain', Environment and Planning A, Vol. 19, 1987, pp.793-806; M Hepworth, and K Robins, 'Information versus the regions', Intermedia, vol. 16 no. 1, January 1988, pp.40-44; and J Howells, 'Developments in the location, technology and industrial organization of

computer services: some trends and research issues', Regional Studies, vol 21 no 6, 1987, pp.493-503.

[92] See Batty, 1985 and 1986, op cit, who argues that there are serious regional imbalances in the distribution of micros and of 'computer culture'. The notion of 'information gaps' is criticised in B M Compaine, 'Information gaps: myth or reality', Telecommunications Policy, March 1986, pp.5-12.

[93] Contrary to Batty, quantitative data suggests that regional differences in computer ownership are not that great. The 1985 Family Expenditure Survey estimated the following percentages of households owning computers:

South East	15.1
East Anglia	10.8
North West	15.2
South West	14.6
West Midlands	13.8
North East	12.8
North	10.6
East Midlands	13.5
Wales	15.9
Scotland	12.9

[94] London Borough of Hillingdon Economic Development Unit, Register of Industrial and Commercial Companies, 1988.

[95] Murdock et al's research is based in the East Midlands. Wheelock, 1990, op cit, is based on research in the North East.

[96] My work is complimented by Leslie Haddon's empirical work with two very different computer clubs - an adult 'hobbyist club' and a school club. This is discussed in Haddon, 1988(b), op cit.

[97] Three of the interviews lasted over two hours.

[98] Haddon also found clubs an unsatisfactory way to contact female computer users. He had to develop another strategy to meet them.

[99] The three adults interviewed who were involved in the clubs all lived alone.

[100] It will be discussed in chapter eight.

[101] Murdock, Hartmann and Grey, 1988, op cit p2, criticise research based on the membership of clubs on the basis that it involves atypical users. Murdock, Hartmann and Grey, 1986, op cit p17, showed, however, that one in ten of the computer users they interviewed had attended computer clubs.

[102] Nobody suggested, for example, that programmable consumer electronics such as video games machines, music keyboards or intelligent phones were home computers.

[103] Wardell, 1984, op cit. The Hillingdon Census Atlas displays information from the 100% Census in map form at the lower Enumeration District level.

[104] Both Wheelock and R S Shapiro, Analytic Portraits of Home Computer Users: The Negotiation of Innovation, PhD University of California San Francisco, 1988, use this technique to generate respondents.

[105] Ward A had a high rate of house and car ownership and low rate of

unemployment. Using the Registrar General's scale the ward had relatively high proportions of households with economically active heads in classes I and II. The areas of Ward B leafleted had the highest proportion of semi-skilled and unskilled workers in the Borough. They also had a high proportion of pensioners, high unemployment and a large amount of local authority housing.

[106] See discussion in Bryman, 1988, op cit pp87-91.

[107] Dutton, Rogers and Jun, 1987(b), op cit p223, see this as a weakness of US empirical work:

" One consequence is that most of the currently available studies of computing in the home are based on nonrandom samples of respondents, which are selected on the basis of judgement, convenience, and or availability."

Murdock, Hartmann and Grey, 1988, op cit p2, criticise studies based on 'targeted sampling' because they deal with atypical people in terms of commitment to computing or access to facilities.

[108] My approach was more successful than others in generating teenage contacts. Shotton, 1989, op cit p33, for example, reports that her self-selected sample had an average age of thirty. She speculates that teenagers were unwilling to take part in the research.

[109] Haddon argues that female computer use is often hidden because of the methodologies of researchers who look for computer users in public places. Haddon himself could not generate women contacts during his empirical work with clubs and instead had to rely on personal contacts in order to find female interviewees. Shotton also found it difficult to contact 'dependent' women users - 100 out of her 106 respondents were male.

[110] Both Leslie Haddon and Sue Bains had to adopt similar tactics to address gender and home computing.

[111] I say parents rather than households because a number of my young computer club interviewees came from working class families. Working class respondents are also underrepresented in other qualitative studies of home computing. If anything the imbalance is greater in Shotton's study (see chapter four) and Wheelock's work (see Table 3). Although Murdock et al criticise targeted sampling, the class of their qualitative respondents is not made explicit. For a discussion of the class terminology and classification see G Marshall, D Rose, H Newby, C Vogler, Social Class in Modern Britain, London, Unwin Hyman, 1988.

[112] For example, Wheelock, 1990, op cit.

[113] Silverman, 1985, op cit p18, for example, sees this as a defining characteristic of qualitative methodologies.

[114] I was able to refer to studies with a longitudinal element by Murdock et al and Shapiro.

[115] Estimates of the proportion of machines which are sold to households which already have a micro vary considerably. GMS, 1984, op cit estimated that 14% of sales were 'replacements'. Keynote, 1985, op cit, estimated the same figure at 25%. Shotton, 1989, op cit p73 found that 37% of her dependent users and 21% of non-dependent users had more than one computer. Given this propensity to 'replace' machines, as the market develops the proportion of households with more than one micro will inevitably increase.

[116] This has been a recurrent theme of Murdock et al's work. They argue that cost barriers hinder successful computing on more powerful machines particularly for working class households.

[117] Ownership figures of different kinds of machines are discussed in chapter five.

[118] Mintel, 1990, op cit pp17-20 point to this and an apparent trend away from games playing towards 'educational' and 'business' uses.

[119] I asked many respondents why they had decided to take part in the research.

[120] For discussion of 'ethnographic conversations' see R G Burgess, 'Conversations with a purpose: the ethnographic interview in education research', Studies in Qualitative Methodology, Vol1, 1988, pp137-155. My work could be seen as what Hammersley and Atkinson, 1983, op cit pp112-126, term an 'ethnographic interview' although I am sure most ethnographers would dispute this claim.

[121] In common with other problems of access this is also data for research - see chapter eight, pp306-308. This issue is discussed in general terms in Hammersley and Atkinson, 1983, op cit pp55-56.

[122] The merits and limitations of gatekeepers are discussed *ibid*, pp63-76. See also a general discussion of access in Burgess, 1984, op cit chapter two.

[123] See Silverman, 1985, op cit p22; Hammersley and Atkinson, 1983, op cit p175; and Burgess, 1984, op cit p31.

[124] The decision to stop fieldwork is always a difficult one. The main constraint was time. I felt I had generated more than enough material. I also reached a natural break in that I would have had to generate more household contacts.

[125] This was confirmed by the early work of Silverstone et al. Their 'ethnographic' study of the ways ICTs are integrated in family life both produced very rich data and highlighted the complexity of the issues. For summary of approach see R Silverstone, Beneath the Bottom Line: Households and Information and Communication Technologies in an Age of the Consumer, PICT Policy Research Papers No.17., 1991. For account of methods see D Morley and R Silverstone, 'Communication and context: ethnographic perspectives on the media audience' in Jensen and Jankowski (eds), 1991, op cit, pp149-162.

[126] Bryman, 1988, op cit p115, cites similar variations in other studies.

[127] See Hammersley and Atkinson, 1983, op cit pp78-88.

[128] For a general discussion of this issue see Burgess, 1984, op cit pp88-91. For discussion of gender and research see, for example, C Warren, Gender Issues in Field Research, London, Sage, 1988.

[129] Reports of the Murdock research are impressionistic and details of the qualitative methodology are unclear. See Wheelock, 1990, op cit. Shapiro, 1988, op cit. Note, all Shapiro's interviewees had become involved in computing before 1982.

[130] There is also a special emphasis on gender in her work. See Bains, 1991(a), op cit and S Bains, Living with Information Technology: Women, Men and the Adoption of Home Computing in Distance Education report for CTI Ltd

London, 1991(b).

[131] Shotton, 1989, op cit especially chapter three.

[132] See Shapiro, 1988, op cit; Paul, 1991, op cit; Nissen, 1989, op cit.

[133] Silverman, 1985, op cit p157.

[134] ibid, p22.

[135] For a critique of 'naturalism' see Hammersley and Atkinson, 1983, op cit chapter one.

[136] See Silverman, 1985, op cit chapter seven, for justification of use of simple counting procedures in qualitative research.

[137] For discussion of 'triangulation' using different kinds of data see Jankowski and Wester, 1991, op cit pp62-63.

[138] For examples and discussion see Bryman, 1988, op cit pp131-140.

Chapter Five

[1] The nature and limitations of statistical sources are discussed in chapter four pp124-126.

Estimates of the percentage of British households owning home computers

Source	1982	1983	1984	1985	1986
GMS		5	11	19	
Murdock et al			10		24
General Household Survey			9	13	
Family Expenditure Survey				13	15
Wood McKenzie	5	11	18	24	

Figures in this table are drawn from the following sources:

a) National market research for Gowling Marketing Services see Gowling Marketing Services, The Home Computer and Software Market, Liverpool, GMS, 1985; Gowling Marketing Services, The UK Computer and Software Market, Liverpool, GMS, 1984; Gowling Marketing Services, The UK Home Computer Market, Liverpool, GMS, 1983.

b) A longitudinal survey of East Midlands households reported in Murdock, Hartmann and Grey, Interim Report of 1985/86 Sample, 1986(b), pp10-17 and G Murdock, P Hartmann and P Grey, Interim Report of 1983/1984 Sample, 1984, pp59-61. The figures are probably high because of a middle class bias in the sample.

c) Office of Population and Surveys, General Household Survey, London, HMSO, various years.

d) Market Surveys include Wood McKenzie, Home Computers, London, Wood McKenzie, 1985.

(e) See also L Haddon, The Origins and Nature of Statistics on Household ICTs, Centre for Information and Communication Technologies Working Paper No 8, SPRU, 1990, especially table nine.

[2] Discussed in chapter four, pp132-133.

[3] This is an area worthy of further investigation. If we consider the early history of home computing it is possible to identify national variations in the quantity, timing and pace of sales of machines, the type of machines purchased and the ways they were marketed and understood. Contrasts between the British and US experience will be made later in this chapter. Ownership figures vary from nation to nation but its clear that interest in home computing took off later and was less widespread in the rest of Europe than it was in Britain. At a time when millions of home computers had been sold in Britain, Euromonitor, Consumer Electronics in Western Europe, London, 1984, reported the following estimates of the number of micros in European countries:

W Germany	420,000
France	250,000
Spain	80,000
Italy	60,000

Differences between European markets at that time are also discussed in M

Lockett, Microcomputers: A Survey of Research on Social Science Aspects of Design, Production and Marketing, Oxford, Institute of Information Management, 1985, p14. The expansion of European demand was later and less dramatic but levels of ownership had risen by the end of the 1980s. Computer Trade Weekly 22/5/89 reported the following estimates from Mintel, European Lifestyle, 1989, of households with microcomputers:

UK	23%
Holland	17%
Italy	14%
Germany	13%
Spain	13%
Belgium	10%
France	7%

[4] See chapter three p95.

[5] The diffusion of innovations approach is criticised precisely on these grounds in chapter four pp116-118.

[6] L Haddon, 'The home computer: the making of a consumer electronic', Science as Culture, 2, 1988(a), pp7-51. Another useful summary of the early history of the micro is in Lockett, 1985, op cit pp2-7.

[7] M Batty, The Spatial Impact of the Computer Culture, UWIST Department of Town Planning Papers in Planning Research No 91, 1985, p10. Debates about the feasibility of the micro are discussed in detail in L Haddon, The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro, PhD, Imperial College University of London, 1988(b), see especially pp132-133.

[8] For example, L Haddon, 'Electronic and computer games: the history of an interactive medium', Screen, Vol 29 No 2, 1988(c), pp52-73, argues that the roots of computer games playing can be traced back to the informal development of games by Mainframe programmers and then in the 1970s the establishment of arcade games machines and home video games consoles as highly profitable world-wide industries.

[9] See A R Kaplan, 'Home computers versus hobby computers', Datamation, Vol23 No7, 1977, pp72-75, for insight into this period in USA. Haddon, 1988(a), op cit pp11-16 discusses the early history of hobby computing in Britain and the USA. See also Haddon, 1988(b), op cit pp88-89 and pp122-123 for detailed chronologies.

[10] Haddon, 1988(b), op cit p107, points to the active role taken by electronics hobbyists in encouraging the development of British kits.

[11] R Dale, The Sinclair Story, London, Duckworth, 1985, p93.

[12] This is outlined in *ibid*, chapters three and four, and I Adamson and R Kennedy, Sinclair and the 'Sunrise' Technology, Harmondsworth, Penguin, 1986, chapters one and two.

[13] Dale, 1985, op cit p95.

[14] *ibid*, p26.

[15] *ibid*, p96.

[16] Haddon, 1988(a), op cit p37.

[17] A *Cawson*, L Haddon and I Miles, The Shape of Things to Consume, Sage, Forthcoming, p87, refs from draft, see this as a general problem faced by producers of IT products.

[18] Purchasers of a RAM pack, designed to expand the computer memory, for example, soon learnt to keep it in place with blu-tack or else risk losing data which they had spent much time typing in!

[19] L Haddon, 'Researching gender and home computers', paper given at the workshop on 'Technology and Everyday Life', University of Trondheim, May 1990(c), p8.

[20] I Adamson and R Kennedy, 'The decline of Uncle Clive', New Scientist, 12/6/86, 1986(b) p33.

[21] Quoted Haddon, 1988(a), op cit p32. Haddon writes of the marketing of the ZX80:

" Since the design of the Sinclair machine had distanced the product entirely from the office model, the chief role for advertising was to persuade the public that this was still, in essence, a computer."

[22] The notion of computerness will be developed in later chapters. The issue of what constitutes a real computer is further complicated by the fact that other programmable consumer electronics used microchip technology often arguably with superior capabilities but were not considered computers. Video games consoles, music keyboards and intelligent telephones all became popular in the 1980s without gaining the title of computer.

[23] The distinctiveness of the British market must in part explain the failure of Sinclair and other producers such as Acorn to successfully market their micros in the USA. For accounts which contrast the markets for and adoption of computers in Britain and the US see W Dutton, E M Rogers and S Jun, 'The diffusion and impacts of information technology in households' Oxford Surveys in Information Technology, Vol 4, 1987(a), pp 145-147; W Dutton, E M Rogers and S H Jun, 'Diffusion and social impacts of personal computers', Communication Research, Vol 14 No2, 1987(b), pp225-226; Haddon, 1988(a), op cit pp25-27.

[24] Significantly early attempts to market machines which strayed too far from this conception were commercial failures. Texas Instruments produced 'software players' aimed at all the family but these were not popular.

[25] In a sample which may have over-represented more expensive computers, Murdock, Hartmann and Grey, 1986(b), op cit, reported that 90% of home computing households had a cassette player but only 20% had a disc-drive and 22% a printer.

[26] This can be seen even by the terminology used by US researchers - the term 'home computer' is much less often used than personal computer. Also in US histories of the micro, domestic and work machines are inseparable. See, for example, The Boston Computer Museum, 'Catalogue of personal computers', The Computer Museum Report, Vol 17, Fall 1986, and G Williams and M Welch, 'A microcomputing timeline', Byte, September 1985, pp198-208.

[27] Haddon, 1988(a), op cit p27.

[28] For example, P Large, 'Micro famine in shops', Guardian, 14/12/83, p15, reported:

" A member of the Guardian's Manchester staff tried all the main retail outlets in the North without success."

See chapter four, p135, footnote 72, for discussion of concentration of sales in the pre-Christmas period.

[29] See GMS, 1985, op cit. Keynote, Home Computers and Software, London, Keynote, 1985, p14, and Keynote, Computers, London, Keynote, 1986, p48 estimate market share as follows:

	1984	1985
Sinclair	28%	31%
Commodore	32%	20%
Acorn	21%	16%

They also produce 1985 cumulative volume estimates:

Sinclair	39%
Commodore	26%
Acorn	15%
Amstrad	4%
Atari	4%
Others	12%

[30] The popular Vic 20 and Commodore 64 were not mainstream micros in America. Instead Commodore concentrated on selling more powerful machines in the US market.

[31] The thinking behind the Acorn machines is discussed in L Haddon, 'The cultural production and consumption of IT' in H Mackay, M Young and J Beynon (eds), Understanding Technology in Education, London, Falmer, 1991, pp157-175.

[32] *ibid*, pp162-164.

[33] These kind of categories were used, for example, in market research on home computer use.

[34] Haddon, 1990(c), op cit pp14-15.

[35] This difficulty^{is} shared by consumers and commentators - a key theme of L Haddon and D Skinner, 'The enigma of the micro: lessons from the British home computer boom', Social Science Computer Review, Vol 9 No3, 1991, pp437-450.

[36] See Haddon, 1988(b), chapter nine. There are, for example, debates about the viability of development in home informatics. Many of the possible future developments could make the computer invisible. Microelectronics could be hidden within programmable home management systems or entertainment centres. In a sense, the home computer has already started to become invisible as the line between home and work computers has blurred.

[37] Market Intelligence, Home Computers, London, Mintel, 1990, pp6-7, discusses market segmentation. It gives the following volume market share estimate (%).

	1986	1990
Commodore	27	25
Amstrad	23	23
Sinclair	33	18
Atari	6	12
Acorn	9	4
Others	2	18

It should be noted that Amstrad sales grew very rapidly in 1986. They include the sale of a wide range of machines not just their PCs.

[38] Haddon and Skinner, 1991, op cit p442.

[39] B Murphy, The World Wired Up: Unscrambling the New Communications Puzzle, London, Comedia, 1983, chapter six, contains a discussion of early developments in the domestic application of communications related information technology in Britain. R Hammond, The On-Line Handbook, London, Fontanna, 1984, outlines the wide range of information and communication service available via modem by the mid 1980s. R L Davis and E B Howard, 'Wither tele-shopping?', ESRC Newsletter, 55, 1985, pp19-21, provides an assessment of early 'tele-shopping' experiments. Home banking via Prestel was available through the Royal Bank of Scotland and Nottingham Building Society as early as November 1982. For a visionary discussion of Videotext and the home see M Aldrich, Videotex: Key to the Wired City, London, Quiller, 1982. For data on the low domestic take-up of Prestel see I Abbot and N Manuel, Home Electronics: the UK Market, London, Economist Intelligence Unit Special Report No217, 1985, especially p55 and British Radio and Electronic Equipment Manufacturers Association, Annual Report, BREMA, 1986, p16. For a discussion of the future prospects of 'useful' home IT based on a) communications and b) as a resource to aid the management of the households see G Thomas and I Miles, Telematics in Transition, Harlow, Longman, 1989, and I Miles, Home Infomatics, London, Pinter, 1988.

[40] Estimates quoted from Keynote, op cit, 1985, p9, and C Davis, 'Did advertising cause the home computer boom?', ADMAPP, November 1984, p548. For discussion of more recent trends see Market Intelligence, 1990, op cit pp11-12.

[41] In 1982 the Advertising Standards Authority upheld complaints against Acorn, Sinclair and Atari because of questionable claims about the ease of use, technical capabilities and educational benefits of their machines. See report in Marketing, 8/4/82, p9. In January 1984 alone the ASA upheld nine complaints regarding home computer advertising. See report in Guardian, 14/3/84, p24. Market Intelligence, 1990, op cit, p11, reports that in 1987 home computer advertisements were the third largest source of complaints to ASA after holidays and cars.

[42] Adamson and Kennedy, 1986, op cit, see this as part of the Sinclair 'myth'. For clues to the thinking of marketing people see Davis, 1984, op cit, and W Danko and J MacLachlan, 'Research to accelerate the diffusion of innovation: the case of home computers', Journal of Advertising Research, Vol 23 No3, 1983, pp39-43.

[43] Something which will be touched on later in this chapter and the ones that follow.

[44] Journalist David Ahl in Personal Computer World, October 1985, quoted by

Adamson and Kennedy, 1986, op cit p83. This is also a theme of Haddon's work. See especially Haddon, 1988, op cit p28.

[45] See Davis, 1984, op cit p548. Gowling Marketing Services, 1983, op cit, estimated that 39% of machines in 1980, 34% in 1981 and 13% in 1982 were purchased by mail order.

[46] See Abbot and Manuel, 1985, op cit p70, for an estimate of market share of various retailers in 1984. They see W H Smiths as the leading retailer.

[47] This was a complaint evident in computer magazines, media coverage and recognised in a number of market surveys. It was also an issue that came up a number of times during fieldwork.

[48] This was not always an easy task because of the diversity of experience and expectations home computer owners had. This was apparent from discussions with people who worked in a computer shop where Club C was based and from fieldwork interviews. The shop workers felt they had to serve a number of different computer identities. So, for example, they employed teenager F14 S as a 'computer games consultant' while other members of the staff dealt with 'serious' computer users. One difficulty the shop workers had is that it is not easy to juggle these computer identities. Also, some respondents found specialist shops alienating precisely because of the closeness of the assistants to computer cultures. This problem was acknowledged by one of the owners of the shop I visited - he feared that the presence of teenage games players and computer hobbyists might put off 'ordinary' potential purchasers from using the shop.

[49] Dale, 1985, op cit p108.

[50] These would include hobbyist conventions, games playing contests and also the participation of computer users and promoters at more general events such as school fetes and toy fairs.

[51] Haddon, op cit, 1991, especially p166, goes as far as to argue that software and magazine producers helped turn computing in the direction of games playing, against the better judgement of manufacturers.

[52] Quoted Haddon, 1988(c), op cit p53.

[53] See Haddon, 1988(b), op cit pp249-262 for a detailed discussion of the development of the software industry.

[54] For a discussion of the development of computer games see Haddon, 1988(c), op cit. Figures on ownership of commercially produced software during the boom show the popularity of games. Gowling Management Services, 1985, op cit, estimated that by January 1985 78% of households with computers had at least five games. The average figure of games owned per household was 22.

[55] This is a point frequently made by Haddon.

[56] A large proportion of those interviewed during fieldwork had at one time or another been regular readers of computer magazines.

[57] See Haddon, 1988(b), op cit pp171-173 and p262. Computer publications were at one point the largest sector of the magazine market - out selling women's magazines. Market research and my own empirical work shows that often people were buying and reading magazines before they purchased computers. It would be a mistake to assume that all readers were actual or future home computer owners.

[58] See for example L Haddon, 'Forming the world of the hobbyist: a case study of a home computer magazine', unpublished paper, 1984. This is a study of the particularly influential Personal Computer World and its role in the construction rules and values of computer hobbyism.

[59] Another interesting development in computer publishing was the production of 'fanzines' by groups of home computer users. It is hard to measure how widespread a phenomenon this was but I came across two examples during empirical work. As part of my initial research a group of boys aged between fourteen and sixteen who ran a successful and highly publicised fanzine were interviewed. The production of a magazine was seen as one of the early objectives of Club A. The issue which I saw was largely produced by teenager club members. Although sometimes critical of the opinions and practices of the commercially produced magazines, fanzines shared a similar content and format. Most significantly they utilized similar criteria for judging between products.

[60] R Kling and S Iacono, 'Computerization as the product of social movements', in R Gordon (ed) Microelectronics in Transition, Norwood, NJ, Ablex, 1985. They give four other examples of CBSMs concerned with Urban Information Systems, Artificial Intelligence, Office Automation and Instructional Computing.

[61] This emerged from interviews with members of the early clubs. One interviewee claimed that some hobbyists had tired of clubs and were now interested in amateur radio, building televisions or designing satellite TV. This tradition of technology hobbyism is discussed in chapter one pp26-27.

[62] Murdock, Hartmann and Grey, 1986(b), op cit p17, reported that in 10% of the households with micros they surveyed somebody had attended a computer club.

[63] This was something I came across during fieldwork. A number of interviewees had attended such clubs. Haddon, 1988(b), op cit, studied members of a school club in detail.

[64] There were contrasts in this respect between the three organizations studied during fieldwork.

[65] This was a theme which emerged from interviews with club members. It will be developed further in chapter eight. Haddon found that when clubs ended as formal organizations they were replaced by informal meetings at ex-members' houses.

[66] During the early stages of fieldwork I contacted members of a club in North London. This was precisely how one of its founders described its objectives. The club had now ground to a halt because people had stopped coming along to be taught computing.

[67] The draft constitution of CompuTown listed the following objectives:

- " i) To allow members of the public free access and use of personal computers.
- ii) To give members of the public free guidance in the theory, operation and application of computers. "

[68] See later in this chapter and in chapter eight for further discussion of this.

[69] Haddon, 1988(b), op cit, studies two other types - an early hobbyist club and a school club.

[70] Fieldwork with clubs is discussed in detail in chapter four pp142-144.

[71] During fieldwork I discovered five different clubs that had existed in the Hillingdon area. This does not include school clubs.

[72] This is confirmed by the accounts of a number of club members interviewed. Photographs also exist of the first meeting showing that it was well attended. I counted 56 people in the photos with more out of the picture. The library is packed with people standing at the back with all chairs filled. There are four women and one young girl. About half of those in the picture are teenage or younger boys. Other photographs show boys clustered around demonstration computers after the talk had finished.

[73] Minutes of the inaugural committee meeting report that the 'Technical Adviser' said he envisaged his role to include:

" a) Answering general technical queries. b) Teaching programming in Basic and other languages and structured programming. c) Uses of flowcharting. d) File Handling e) Games Construction f) Hardware and software queries."

[74] 'Members' evenings' without a guest speaker were initially segregated with a games playing room and a 'non games room'.

[75] Members I talked to suggested on a number of occasions that I read prophetic works on IT like those featured in chapter two. Haddon, 1988(b), op cit chapter three, and T Roszak, The Cult of Information, Cambridge, Lutterworth, 1986, both discuss the influence of counter-culture ideas on early producers and consumers of micros.

[76] Haddon, 1988(b), op cit pp291-292, tells a similar story.

[77] Despite its informal nature the people who ran the club were still frustrated in their stated aims of teaching teenagers more about 'serious' computing.

[78] A wide range of national and EC initiatives on IT were implemented between 1975 and 1985. See summary in H Connor and R Pearson, Information Technology Manpower into the 1990s, London, Institute of Manpower Studies, 1986, pp3-4. See D Lyon, The Information Society: Issues and Illusions, Oxford, Polity, 1988, pp35-40, for examples of government initiatives around the world.

[79] In the 1980s, for example, historians Martin Wiener and Correlli Barnett both produced extremely well received and publicised works which attributed Britain's problems to a lack of prestige given to industrial production, commercial enterprise and technological endeavour. See C Barnett, The Audit of War, London, Macmillan, 1986; M Weiner, English Culture and the Decline of the Industrial Spirit, Cambridge, Cambridge University Press, 1981. Part of the expressed project of Thatcherism was to effect a transformation to this pathological culture.

[80] D Guest, 'Truth dawns in the sunrise sector', The Listener, 31/7/86, p9 quotes a 1983 government policy statement:

" Without doubt [information Technology] will be the engine of economic growth for at least the rest of the century. Britain's economic prosperity depends on the success with which we manufacture its products and provide and exploit its services."

[81] M McNeil, 'The old and new worlds of information technology' in J Corner

and S Harvey (eds), Enterprise and Heritage: Crosscurrents of National Culture, London, Routledge, 1991, pp118-119. A similar argument is offered in K Robins and F Webster, The Technical Fix, London, Macmillan, 1989, especially chapter five. McNeil makes the link between Thatcherism as an ideological project and IT but as Webster and Robins write (p73):

" The bipartisan character of responses to recession, and the identification of IT as central to its resolution, ought to be stressed."

[82] The quote is from M Thatcher, 'Keynote address', PITCOM, Vol 1 No2, 1983 p93. By privatizing the communications industry and selling off shares in new technology industries the government appeared to some to be abdicating responsibility for the development of information technology industry. McNeil, 1991, op cit pp116-117, cites a number of researchers who argue that Britain lacked any coherent policy attempting to provide IT infrastructure.

[83] For further discussion of IT Year see F Webster and K Robins, 'The selling of the new technology' in Mackay, Young and Beynon(eds), 1991, op cit, pp72-74.

[84] K Robins and F Webster, 'Higher education, high tech, high rhetoric' in T Solomonides and L Levidow (eds), Compulsive Technology, London, Free Association, 1985, pp44-45.

[85] McNeil, 1991, op cit p133.

[86] Quoted Lyon, 1988, op cit p19.

[87] See Webster and Robins, 1989, op cit pp179-200.

[88] See, for examples, Guest, 1986, op cit p9.

[89] Research indicates that union opposition to technological change was twice as likely in France or Germany than it was in Britain. Nor could unions be said to out of step with their members. There have been remarkably few instances of industrial action associated with the introduction of new technology. See I Benson and J Lloyd, New Technology and Industrial Change, London, Kogan Page, 1983 for discussion of the labour movement's positive approach to new technology in the period before the various 'awareness' initiatives. See J Northcott, M Fogarty and M Trevor, Chips and Jobs: Acceptance of New Technology at Work, London, PSI, 1985, chapter three, for general discussion of union approaches to new technology.

[90] W W Daniel, 'The myth of the British disease', New Society, 5/12/86, p11.

[91] Northcott, Fogarty and Trevor, 1985, op cit p1. For more details see *ibid*, chapter two.

[92] As well as national initiatives to promote awareness of information technology, many small scale projects took place at the local level. In the Hillingdon area these included programming courses and evening classes run by local authorities, colleges and computer shops. A number of people interviewed ran or attended such courses. The library service was also active - setting up a special section for computer books and facilitating Club A.

[93] ITV and the Post Office also had plans for similar projects. See 'Computer Project Dropped by ITV', Guardian, 14/12/83, p16.

[94] See BBC Broadcasting research, The BBC's Computer Referral Service - An Evaluation, 1985.

[95] See BBC Broadcasting Research, BBC's Computer Literacy Project - An Evaluation (Summary), 1983, and BBC Broadcasting Research, Micro Live, 1986.

[96] Although it should be noted that by 1986 audience research suggests that 'social impact' items were amongst the least popular type of programme content.

[97] My own contact with computers in school can be traced back to 1970! Haddon, 1988(c), op cit p6, remarks that teachers made up an important part of the market for the early hobbyist micros. For a critical discussion of government policies and computing in education see P Linn, 'Microcomputers in education: dead and living labour' in T Solomonides and L Levidow (eds), 1985, op cit pp58-101.

[98] K Baker, 'Closing address', PITCOM, Vol 1 No2, 1983, pp111-115. This was from a speech made at a conference to mark conclusion of IT year 9/12/82.

[99] A detailed analysis of education policy 1976-83 is provided in Linn, 1985, op cit pp68-78.

[100] This was affirmed by parents interviewed during fieldwork. Mr and Mrs F5, for example, helped to raise money for school computers. A number of interviewees were teachers caught up in initiatives. Mrs F13, a primary school teacher, talked of genuine parental enthusiasm.

[101] Figures from J Lamb, 'Programming the first generation', New Scientist, 28/3/85, pp34-37 and Parliamentary answer 14/12/84 reported in Information Technology and Public Policy, Vol3 No2, 1985, p170.

[102] This is discussed in Lamb, 1985, op cit.

[103] Educational computing initiatives were not confined to Britain. See Roszak, 1986, op cit, chapter three, for a critical discussion of the US experience. Roszak sees school computers as 'a solution in search of problems'.

[104] See M Young, 'Technology as an educational issue: why is it so difficult and why is it so important' in Mackay, Young and Beynon (eds), 1991, op cit pp234-243, for an outline of the 'vocalionalization' of the curriculum. Webster and Robins, 1989, op cit especially chapter four, write of the 'industrialization of education'.

[105] McNeil, 1991, op cit p128, argues that IT had an ideological role to play in closing arguments about vocationalism.

" What was distinctive about IT's role in this general reorientation of the British education system around industry was that it gave a sense of urgency and national mission to this transformation, whilst proclaiming it as inevitable, or, at least, value-neutral."

The shift towards vocationalism in higher education is discussed in Robins and Webster, 1985, op cit, and Robins and Webster, 1989, op cit pp129-135. For its impact on the Open University see S Bains, 'Personal computing, gender and distance education', unpublished paper, 1991. Bains argues that the use of PCs in distance education "... draws upon a diverse range of ideals and assumptions about computers - now and in the future - in education, work and the household."(p2)

[106] BBC Audience Research, 1986, op cit.

[107] See chapter one, pp24-27.

[108] See chapter one, p26 on the role of the media in presenting and promoting earlier new technologies.

[109] This follows a pattern identified in chapter one, p28 of new technology prompting utopian and dystopian hopes and fears particularly about family life. See M Shotton, Computer Addiction?, London, Taylor Francis, 1989, chapters one and two for a discussion of the influence of the notion of computer addiction. Chapter eleven in Shotton argues that addiction is only one of a series of fears about the impact of computing. See also Haddon, 1988(c), op cit pp60-61, for discussion of international 'moral panic' about computer games. Similar fears expressed recently in E F Provenzo, Video Kids, London, Harvard University Press, 1991.

[110] The research effort put into the study of the social impact of information technology in the home described in chapter four is itself part of this phenomenon.

[111] As L Winner, 'Mythinformation in the high-tech era', IEEE Spectrum, Vol21 No6, 1984, pp90-96, points out one of the key assumptions behind prophecies of the IT Revolution is that widespread access to computers would inevitably bring with it 'revolutionary' consequences.

[112] See Dale, 1985, op cit; *Adamson and Kennedy, 1986, op cit*; Report on seminar held at Lancaster Gate in Guardian, 13/9/83, p18.

[113] For a discussion of the mythology of the lone inventor see T P Hughes, American Genesis: A Century of Invention and Technological Enthusiasm, New York, Viking Penguin, 1989, chapters one, two and three.

[114] Quoted in Adamson and Kennedy, 1986(b), op cit p36.

[115] McNeil, 1991, op cit 126-127.

[116] Thatcher, 1983, op cit p94. Report of a speech on 8/12/82 at the conference held to mark the end of IT Year.

[117] Quoted in T Blackwell and J Seabrook, 'Mrs Thatcher's religious pilgrimage', Granta, 6, 1983, p47.

[118] Robins and Webster, 1989, op cit p92.

[119] A trade deficit in IT products continued to grow and, far from expanding in line with optimistic predictions, employment in production actually declined. A series of reports predicted that Britain would soon cease to have an independent information technology sector. See for examples, Information Technology Economic Development Committee, A Policy for the UK Information Technology Industry, London, NEDC, 1983; London Information Technology Economic Development Committee, The Crisis Facing UK Information Technology, London, NEDC, 1984. These argued that the future of the British computer industry was perilous. In the 1984 report (p9) it was predicted that:

" On present trends the UK will not have an independent broad-based IT industry by the end of the decade."

The only difference between the conclusions of the 1984 report and one produced a year earlier "is that we are one year nearer the precipice." (p17) In 1985 one of the authors of the reports wrote:

"... I now have to admit that the figure in the EDC report are wrong: they

are too optimistic."

See J Ashworth, 'The crisis facing the UK information technology industry', Information Technology and Public Policy, Vol3 No2, 1985, p96. For discussion of skill shortages see Connor and Pearson, 1986, op cit.

[120] See, for example, the interview with Sinclair in Dale, 1985, op cit pp125-132 where he describes his intention to "prepare the world for universal computer ownership in easy stages." Sinclair talks of a future society where criminals go free wearing tracking transmitters and where intelligent computers will act as advisers like the Roman's Greek slaves. By the twenty first century wealth will be created by robot slaves. The computer "will deal with each person in the family as an individual." It will replace or supplement "the doctor, the solicitor, the teacher."

[121] Quoted and discussed in Robins and Webster, 1991, op cit pp77-78.

[122] Davis, 1984, op cit p550.

[123] Quoted Lockett, 1985, op cit p13.

[124] *ibid*, pp18-20, describes 'an industry in crisis'. See also Abbot and Manual, op cit, p69.

[125] See estimates by Romtec quoted in New Society, 10/10/86, p48.

[126] See for example the following articles all of which appeared in the space of eight days in 1985: 'Sinclair denies market collapse', Financial Times, 29/5/85, p48; 'Chips down for computer firms', Telegraph, 5/6/85, p2; 'Crisis times for home computing', Electronics Weekly, 5/6/85, p6; 'Microcomputers take a nose-dive', New Scientist, 6/6/85, p6.

[127] D Rowntree, Who Needs a Home Computer?, London, Methuen, 1985.

[128] Dale, 1985, op cit p113.

[129] Market Intelligence, 1990, p4, for example, estimate that while home computer sales have run at 70% of the volume of pre1985 levels, there has been a consistent increase in the value of sales.

Chapter Six

[1] As chapter four, p119 argued, this has been a neglected area in the study of home computing.

[2] See discussion of the development of the home computer as a product category in chapter five, pp165-174.

[3] As a later section of the chapter will note, this was more common in discussions of later purchases.

[4] See chapter three, p102 for a discussion of this concept.

[5] The following notation is used to identify respondents. This can be cross referenced with the table in appendix two. Interviewees contacted via clubs are given the prefix 'C' followed by a number. Members of families interviewed for the study are given the prefix F followed by a number. Household members are distinguished in the following way:

Mr = father

Mrs = mother

S = Son

D = Daughter

If more than one son or daughter has been interviewed then they are numbered in order of age. So that 'S1' is the eldest son and so on.

[6] Mr F9 dates his first interest in computing from the time of the appearance of the early Sinclair advertisements. F8 D saw the advertisements for the ZX80 and thought "I must have one." Mr F19 did the same and thought "marvellous - better get into this."

[7] G Murdock, P Hartmann and P Grey, 'Home truths', Times Education Supplement, 7/3/87, also highlight the informal role of schools as a site for the promotion of computing.

[8] An interesting variation on this occurred in F16 where the father, who is a school teacher, used to borrow BBC computers from his workplace.

[9] Chapter five, pp174-175.

[10] Even in the case of F15 other factors influenced the purchase decision. The parents had been considering getting a micro for sometime and mentioned (unfulfilled) hopes of using the computer for word processing.

[11] A theme returned to in later chapters.

[12] Even adults with what seemed a good deal of computing expertise often believed that children knew more about computers than they did or that learning about computers came more naturally to children or that somehow children were more at ease with computers.

[13] L Haddon The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro, PhD Imperial College University of London, 1988(b), pp279-285 charts the rise of what Haddon calls 'computer talk' in schools.

[14] Names changed.

[15] C6, C7 and C9.

[16] This is highlighted in a US context by R S Shapiro, Analytic Portraits of Home Computer Users: The Negotiation of Innovation, PhD University of California San Fransisco, 1988, p256.

[17] This theme will be returned to later in the thesis. It is worth noting here that the position of computer 'expert' in a particular social setting can be both a pleasurable and a frustrating one. People such as Mr F11 Mr and Mr F13, for example, clearly enjoyed a role as promoter of computing not only at home but in their respective workplaces. Often, however, they felt frustrated at not being able to generate enthusiasm among colleagues for computerization. The role of the expert is also discussed in Haddon, 1988(b), op cit p281.

[18] This will be developed further when the thesis goes on to consider how people make sense of their experience of the home computer.

[19] Chapter three, pp108-110 on the peculiarities of novel goods and of novel technological goods in particular.

[20] See chapter five, pp169-170.

[21] C5 was not alone in linking his early awareness of interest in computers with the fictional computers of cinema and television.

[22] Chapter five, pp199-201 shows how producers also made just such a connection in their marketing.

[23] The power and limits of this conception of home computing is discussed in the next chapter.

[24] This view was shared by people who no longer used their home computers and members of families who had never used the home micro.

[25] This will be explored further in a later chapter.

[26] All interviews touched on people's general views about information technology.

[27] In this there are parallels with the way prophets of the IT Revolution discussed computing. See chapter two, p65.

[28] See chapter one, pp17-19.

[29] Similar links were made by producers and commentators during the boom. See chapter five, pp195-199.

[30] This is confirmed by other studies. See for example S Bains, 'Personal computing, gender and distance education' unpublished paper, 1991(a), p7:

" The men and women who had children almost with exception gave their children's future needs for computer competence and skills as an important reason for buying or wishing to buy a PC - even when the children in question are babies or toddlers."

[31] This is confirmed from other sources. See for example Gowling Management Services, The Home Computer and Software Market, Liverpool, GMS, 1985, p30. Their survey found that 64% of computer owners thought the micro was important

for their future career.

[32] See chapter two, pp57-58 which points to the same features to help explain the appeal of prophecies of the Information Technology Revolution.

[33] This issue will be addressed in later chapters.

[34] This became more common later in the boom. See discussion on page 20 below.

[35] J Wheelock, 'Personal computers, gender and an institutional model of the household', paper presented at PICT workshop on domestic consumption and ICTs, May 1990, especially pp17-19.

[36] Many of the same themes are touched on, in a US context, in Shapiro, 1988, op cit chapter one.

[37] Chapter four, pp134-136.

[38] See F2, F4, F9, F10, F11, F13, F17, F19, F22, F26.

[39] These kind of shortages and delay were not confined to the early 1980s. Similar problems were being experienced in 1986/87 by those wishing to buy the new Amstrad PC.

[40] Sherry Turkle, The Second Self: Computers and the Human Spirit, London, Granada, 1984, p189, writing about US buyers of micros in the early 1980s says:

" It is unusual for people to come to a major purchase with so little prior knowledge. It is unusual for people to come to a major purchase with so little confidence in their own taste."

[41] There are exceptions to this. F27 got their machine for £40 second-hand. F18 Mr purchased a machine for £25. A number of others had obtained additional machines cheap second hand.

[42] For example, Murdock, Hartmann and Grey, 'Family failing?', Times Educational Supplement, 19/6/87, p68, highlight financial obstacles to successful computing. They also cite examples of people who aspired to a BBC machine but could not afford it.

[43] Mr F22 with a Sinclair QL and F8 D with a Dragon both had unpopular, discontinued machines but showed these problems were not insurmountable.

[44] Continued from quote on page 6.

[45] Until the 1980s only the most powerful and expensive computers had memories of 128k or more.

[46] Additional machines are not always 'newer' or 'better'. Some owners would buy cheap second-hand computers simply to add to their collections.

[47] This will be discussed in greater detail in chapter eight.

Chapter Seven

[1] See chapter five, especially pp165-174 and pp201-202.

[2] Chapter three, pp96-100.

[3] This is further complicated by the fact that there was not a simple relationship between the amount and intensity of home computer use and the length and precision of descriptions of that use. A number of long discussions about computing were conducted with people who had only had a brief or cursory contact with the machine.

[4] The term computer career is also used in R S Shapiro, Analytic Portraits of Home Computer Users: The Negotiation of Innovation, PhD University of California San Francisco, 1988. From an interactionist perspective, Shapiro utilizes the notion of career in a slightly different way - to understand the socialization of new users into the world of computing. Because her study focuses on successful users she has a rather limited view of the factors shaping a career. That use is best understood as a trajectory is implicitly recognised in some other qualitative work. D Sudnow, Pilgrim in the Microworld, London, Heinemann, 1983, could be read as an extended account of a single computer career.

[5] One of the themes of the next chapter.

[6] The early history of home computer use was one of the themes addressed in all interviews.

[7] The notion of heavy use is relative to later use rather than an absolute measure.

[8] This can be explained in part by the changing circumstances of purchase. There is not the same urgency to buy and experience a micro as there was at the height of the boom. Another factor is the emergence of firmer conceptions of computing (described in the next chapter). This means that users are likely to have a clearer set of intentions at time of purchase.

[9] Chapter four, pp134-136.

[10] It was not always clear whether such descriptions could always be taken literally but they express families' own conceptions of ownership of and involvement with the micro.

[11] This is confirmed by other studies. See for example J Wheelock, 'Personal computers, gender and an institutional model of the household', paper presented at PICT workshop on domestic consumption and ICTs, May 1990, especially table 15.

[12] As the next chapter will show, this does not necessarily mean that people's use then became isolated.

[13] Mr F4 says computers " must have monopolized half my waking life" since he first obtained one. He reported that he would only go away on holiday if he took computer manuals with him! F8 D told how she used the computer "every moment I can." F14 S says that computing takes up "roughly every minute of every day."

[14] This level of interest was confirmed by my experience when I went to interview him. I called at his house at the appointed time to find him not yet back from work. When I returned ten minutes later he had already sat down in

front of his computer. F3 S also had a portable television set up next to his computer monitor so that he could watch TV and use the computer at the same time.

[15] Mr F17 did not start computing until midnight in order to placate his wife. It was only after she went to bed that he sat down at the keyboard.

[16] M Shotton, Computer Addiction?, London, Taylor and Francis, London, 1989, pp206-210 also found that the 'dependent users' she studies felt positive about their 'addiction'. It is worth noting that the level of commitment to computing among the very keenest of my interviewees pales in comparison with the 'addicts' studied by Shotton.

[17] Two households had only recently acquired a computer and so were excluded from this calculation.

[18] This suggests problems with purely psychological explanations of absorption with the micro.

[19] See chapter four, p122 for discussion of other data on machines falling into disuse.

[20] We should not assume this necessarily marks the end of their computer careers.

[21] Shapiro, 1989, op cit, especially chapter four, emphasises the role of changing personal circumstances in her rather different use of the concept of computer careers.

[22] See chapter five, especially pp168-169. This was confirmed by interviews with those who had purchased the early machines:

" It was a difficult machine to use [Sinclair ZX81] but it taught us what computers do and how they work." (Mr F3)

[23] See chapter six, especially pp220-221.

[24] For example W Dutton, E M Rogers and S H Jun, 'Diffusion and social impact of personal computers', Communication Research, Vol14 No2, 1987(b), p242.

[25] The development of use classifications and the 'computer identities' to which they relate, will be one of the themes of the next chapter.

[26] Initially, at least, my own perception of 'programming' was influenced by my past experience working in the computer industry.

[27] The interview was not the only avenue by which I was able to explore people's programming. A number of respondents showed me programs they had produced.

[28] Although it is worth noting that in the cases I came across teenagers often did not appear to manage to finish their school projects.

[29] The educational sector of the software industry has had a troubled history. Uncertainties about what form computer education in school should take are discussed in chapter five, pp193-194. A number of interviewees were involved in education. Mrs F13 and Mr F16 are teachers, Mr F19 works on the Technical and Vocational Education Initiative, Mr F15 is a school governor. All discussed the doubts which beset schools about how to utilize computing resources. They support the argument made in chapter five that while computing

in schools has wide support, their exact role within schools was contested and developed post hoc.

[30] Quantitative data on types of use is discussed in chapter four, pp124-126. For an example of survey data see Gowling Marketing Services, The Home Computer and Software Market, Liverpool, GMS, 1985, p29, which argues that games are the most popular use of the computer for both sexes and all ages. Wheelock, 1990, op cit table 10 shows that all but one of the households she surveyed owned games and twenty seven out of thirty nine had more than twenty five games.

[31] L Haddon, The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro, PhD Imperial College University of London, 1988(b), pp295-297, reports similar findings from his empirical work with teenagers who attended a school computer club.

[32] This has implications for the way we interpret macro statistical data on use. See discussion chapter four, pp124-126.

[33] L Haddon, 'Electronic and computer games: the history of an interactive medium', Screen, Vol29 No2, 1988(c), pp52-73.

[34] This was an activity shared, for example, by three of the teenage club goers interviewed.

[35] Mr F18, for example, who has a Texas Instruments machine informed me that his primary use of the micro was playing games. All these games had, however, first to be keyed into the machine, copied from listings in magazines.

[36] One of the key themes of S Turkle, The Second Self: Computers and the Human Spirit, London, Granada, 1984, chapter two, is the link between games playing and other forms of computing. For example on p62 she writes:

" Working out your game strategy involves a process of deciphering the logic of the game, of understanding the intent of the games designer, of achieving a "meeting of minds" with the programmer."

[37] At this point it is enlightening to consider briefly the roots of computer games. As, Haddon, 1988(c), op cit pp55-57, argues, early games creators and players were students and researchers of mini computing at places such as MIT. They saw them as a way of exploring and demonstrating the potential of these machines. Haddon's own empirical work with hobbyists confirms that this perspective on games continued during the early years of the boom. See Haddon, 1988(b), op cit p269.

[38] For example at Club C I spent considerable time with members and saw them 'use' games without actually playing them - setting up the various options, showing the capacities of the games while never actually playing a proper game. Another illustration of this came when I spent time with F3 S as he used a Multi-User Game via a modem. Most of his time on-line was spent discussing the game with other participants rather than actually playing it.

[39] Similar findings were generated in Presvelou's 1986 study of Dutch home computer users. This is reported in, amongst other places, I Miles, Home Informatics, London, Pinter, 1988, p98. S Bains, 'Research on home computers', unpublished draft paper, 1990, p7 points to a key implication of Presvelou's work:

" So called 'informatization' of domestic tasks, where it occurs, is not a case of technology applied to a perceived need but of users deliberately looking for applications for their 'fascinating tool'."

[40] Discussed further in the next section.

[41] I am not alone in noting this. S Bains Living with Information Technology: Women, Men and the Adoption of Home Computing in Distance Education, Report for CTI Ltd London, 1991(b), found some kind of work connection with 30% of computer user interviewed but this was not substitution for work outside of the home. She highlights the complexity of work-home relationship. Shotton, 1988, op cit pp184-189 found that some of the 'addicts' she studied were actually doing work related tasks.

[42] Mr F10 and Mr F12. Mr F12 is not actually being paid for the work he does on his micro which is additional to his day-time job as a doctor. Very few of the interviewees could be classified as IT homeworkers like those studied in U Huws, The New Homeworkers, London, Low Pay Unit, 1984.

[43] See chapter six, pp228-229.

[44] This is discussed in detail in chapter six, pp234-237.

[45] Mr F4 told an apocryphal story of a business friend who became so obsessed with his computer that he neglected the business that the computer was meant to make more efficient. It did cross my mind that he could have been talking about himself.

[46] For Mr F11 this enthusiasm is also evident in the attempts he made to promote computing at all his previous workplaces.

[47] Another dimension of this is the pleasure some respondents got from 'playing around with' computers in the workplace. Mr F15, Mr F26 and Mr F27 all talked of the enjoyment they got from using computers at work. Again this is hard to place under an entirely utilitarian rubric. Turkle, 1984, op cit, blurs the line between home and work use suggesting a strong element of play in both. She along with Haddon, 1988(b) op cit points out that many of the early computer hobbyists also worked with computers outside of the home.

[48] It should be also noted that he uses games and programmes in Basic on this machine as well as utilizing it for his work.

[49] This argument gained greater feasibility in Britain than in the US because of the lower capacity of popular machines. It is worth noting, however, that the American Hobbyists studied in Turkle, 1984, op cit and Shapiro, 1988, op cit were using machines of similar power to the PCs now being held up as benchmarks of 'useful' computers.

[50] This is reflected in the high 'churn' in subscriptions to communications services. The 'self-referential' nature of much interest in communications troubled some members of Club B. They were frustrated that most users of computer communications seemed most interested in the technology itself than the possibilities of information exchange offered by it. While the rationale of the organization was to promote the use of computer communication to bring about personal growth and social change, a large proportion of time both at face to face meetings and on computer networks was spent discussing the technology itself.

[51] Chapter four, pp127-137.

[52] This is how Turkle, 1984, op cit, chapter six understands 'hacking'.

[53] See chapter three, pp103-107.

[54] This distinguishes them from early hobbyists studied by Turkle, Haddon or Shotton.

[55] Sometimes this was based on contact with other users. Take Mr F11's evaluation of Club A which, for a short time, he had been an active member.

" People were like lost sheep all looking for something they couldn't find.... We were all using machines that couldn't cope with what we wanted to do with them. But we weren't sure what we wanted to do with them either."

[56] Their work is discussed in detail in chapter four. See, for example, G Murdock, P Hartmann and P Grey, 'Home computers: the social construction of a complex commodity', mimeo, 1988.

[57] This theme will be developed further in the next chapter.

[58] Other explanations will be offered in the next chapter.

[59] Both Mr F2 and Mr F5, for example, during interviews suggested that obtaining a disc drive would enable them to get a use out of their machines and also that they did not feel they could justify the financial outlay involved because their computers were not used enough.

[60] This is most pronounced among heavy users such as Mr F4, F8 D, Mr F11, and Mr F17.

[61] Both Mr F11 and Mrs F13 expressed similar sentiments about their own efforts to computerize their personal finances.

" Much better on the back of a fag packet."(Mr F11)

Chapter Eight

[1] A recent market survey Market Intelligence, Home Computers, London, Mintel, 1990, pp6-7, sees the home micro market as segmented into three parts; 'games machines', 'business machines' and 'general purpose machines' such as the Atari ST and the Commodore Amiga.

[2] G Murdock, P Hartman and P Grey, 'Home computers: the social construction of a complex commodity', mimeo, 1988 which is published in a different form as 'Contextualizing home computing: resources and practices' in R Silverstone and E Hirsch (eds), Consuming Technologies: Media and Information in Domestic Spaces, London, Routledge, 1992, discusses how users select one of a number of 'user identities' but does not develop this idea very far. The identities are seen as largely shaped by promotional discourses.

[3] See chapter five, pp175-176. It should also be noted that a number of models of computing such as those based around family computing and servicing the home promoted by producers failed to take-off. Any notion of producers creating models of computing is further complicated by the range of interests at work in the sphere of production. The development of software, peripherals, magazines and user organizations, for example, all contribute to a mutually reinforcing cycle which strengthens associations of machine and model.

[4] This is discussed in L Haddon and D Skinner, 'The enigma of the micro: lessons from the British home computer boom', Social Science Computer Review, Vol 9 No3, 1991, pp13-14. The development of games is discussed in detail in L Haddon, The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro, PhD Imperial College University of London, 1988(b), chapter seven.

[5] L Haddon, 'Researching gender and home computers', paper given at the workshop on technology and everyday life, University of Trondheim, Norway, May 28th-29th, 1990(c), p3.

[6] For a discussion of innovation as a process of institutional and cultural debate involving consumption as well as production see chapter one, pp21-31. For a general discussion of the relationship between the spheres of production and consumption, including the concept of circuits of cultural production see chapter three, pp93-96. This is also a theme of other writing on home computing, see L Haddon, 'The cultural production and consumption of IT', in H Mackay, M Young and J Beynon (eds), Understanding Technology in Education, London, Falmer, pp157-175. R S Shapiro, Analytic Portraits of Home Computer Users: The Negotiation of Innovation, PhD University of California San Francisco, 1988, develops a similar argument in her US study:

" The role of the user in the present study is viewed as an active participant in the shaping of the innovation, and the industry." (p234)

[7] M McNeil, 'Turing's men, cyborgs and wise women: information technology, gender and culture', Paper given at PICT conference on Gender and IT, Eastbourne, May 1989, p12. The particular relationship between production and consumption in this case marks it out from, for example, the history of other ICTs such as broadcasting.

[8] Haddon, 1988(b), op cit.

[9] *ibid*, pp249-260, discusses the example of software.

[10] A favourite media story of the boom was one in which programmers made large amounts of money through writing popular computer games. Within specialist publications games programmers were given prominence. L Haddon, 'Making a business a pleasure', mimeo, 1984(b), pp9-12 argues that magazines foster hobbyist's dreams of crossing the line into production. S Turkle, The

Second Self: Computers and the Human Spirit, London, Granada, 1984, pp126-129, also found dreams of writing and selling software among US games players.

[11] The high media profile of the computer industry during the boom has been noted in chapter five. The specialist magazine sector continues to report the activities of producers in detail.

[12] Computer magazines sell in far larger numbers than those dealing with more popular interests such as cars, photography or hi-fi.

[13] All those interviewed were asked about television programmes aimed at computer users. While early in the boom almost all users had watched them, by the time of fieldwork they elicited a wide range of responses. For teenagers they had little to offer. F6 S argued that the programmes "didn't have anything to do with computers or games." F14 S described them as "useless" "waffling on about BBCs and building robots." Some adults were overawed but interested. Mr F7 said it "just showed me how little I knew." Others felt they were not technical enough. F17 Mr complained that they "give no technical stuff" and were "biased towards the BBC micro".

Similar problems faced producers of magazines. They have become increasingly specialized - aimed at (and reinforcing) particular models of computing. Teenage games players continued to buy magazines which served their interest in new software. A number of enthusiasts said that magazines no longer interested them. They were seen as catering for games or PC markets.

The shop I had contact^wduring fieldwork also had difficulties dealing with the range of actual and potential micro owners. F14 S is employed as a 'computer games consultant' to foster a relationship with members of the teenage computer culture. At the same time staff had to deal with another group of users keen to buy PCs and easily alienated by those who they saw as games playing teenagers or 'boffins'.

[14] New entrants in the market, especially parents buying machines for their children, could still experience problems.

[15] The public arenas of computing, the places where it is visible, are often places of consumption such as the shop or exhibition. The shop can act as a meeting place for members of the computing culture. Friends interested in computing go to the shop together. The one occasion when thousands of home computer owners are to be found under the same roof is at a computer exhibition. It is common for teenagers to visit these events, often in the company of friends. One teenager I met during piloting enthused about the opportunity a crowded show afforded for theft!

[16] The display of new products is one of the most popular features of activities in computer clubs.

[17] See chapter six, p232.

[18] In all cases among my respondents, BBC use had involved some games playing. This is backed up by quantitative data on use and ownership of software. See, for example, Gowling Marketing Services, The Home Computer and Software Market, Liverpool, GMS, 1985, pp22-26.

[19] For an example of this approach see G Murdock, P Hartmann and P Grey, 'Home truths', Times Educational Supplement, 7/3/86, and 'Family failing?', Times Educational Supplement, 19/6/87, p68. These portray the BBC micro as a proper computer which facilitates 'creative' computing.

[20] Chapter seven, pp279-283.

[21] C Marvin, When Old Technologies Were New, Oxford, Oxford University Press, 1988, pp15-32, examining the early history of electricity, argues that stories of 'others' who are not competent or whose use is not appropriate is part of a process of establishing boundaries of expertise.

[22] See chapter seven, pp259-261.

[23] Chapter seven, pp248-250.

[24] In some cases heavy use was a source of pride. Was F8 D a computer addict? She does not reply directly:

" I think people admire you and look up to you because you know what you are talking about.... They come to you for advice."

Mrs F3 was the only interviewee to express serious concern about a family members' computer 'addiction'. She worried about her son's use of a modem.

" I reckoned, and I still reckon, that he was a computeroholic ... totally taken over. How can you be spending all that money with a modem, knowing how much it cost per minute, if you were not doing it compulsively like compulsive gambling."

When the computer was taken away the son went "into what were almost withdrawal symptoms."

" Thinking of the drug addicts that I've dealt with [she works in social services] for two bits I would have said 'what's he on that's been taken away.'"

Interestingly, Mr F3 did not share the same level of concern.

[25] Chapter seven, p249.

[26] Chapter six, pp223-225.

[27] Chapter three, pp82-89 contains a general discussion on goods as cultural resources.

[28] See chapter four, pp134-136, chapter six, pp230-231 and chapter seven, pp247-249.

[29] In the case of F24, for example, Mr arranged for the rest of his family (including his son aged 21 and daughter aged 16) to be present but they were clearly there on sufferance and were largely spectators.

[30] Mrs F16 was out the evening of the interview.

[31] This was a theme addressed in all interviews.

[32] See chapter seven, pp270-283. Mr and Mrs F1 (as quotes in previous chapters have shown) express, for example, disappointment with their micro and their children's use of it and, indeed computing in general. Their thirteen year old son takes a very different view - mounting a sustained defense of his computer, the use he put it to and computing per se.

[33] These are discussed in chapter five, pp182-186. Leslie Haddon also identified splits within clubs.

[34] One of the major sources of conflict within clubs was software piracy. Club officers resented clubs being used as swop shops for pirated software. The minutes of Club A, for example, show this to be recurring concern. At one committee meeting it was decided that a notice should go in the next issue of the club magazine warning of the dangers and penalties of illegal copying of software and that the Chairman should "speak to all members on the consequences to the club of illegal copying of software." The extent to which this reflects a concern over supposed 'law breaking' and how much it was an expression of generational divisions about the purpose of the club is open to question.

[35] See chapter four, pp133-134.

[36] Haddon, 1988(b), op cit pp288-294, identifies a range of social activities of the teenage users he studied. These included playing and exchanging games within school, visiting friends at home, attending clubs and visiting other public sites such as computer shops and shows.

[37] Chapter four, p134.

[38] Shapiro, 1988, op cit p133, looks at the computer as 'social connector' - offering both new relationships and new lines for social interaction via facilities such as bulletin boards.

[39] I spent an evening with him while he used his computer.

[40] This phenomenon has been documented in relation to Micronet. See A Caws n, I Miles and L Haddon, The Shape of Things to Consume, London, Sage, forthcoming.

[41] For a discussion of 'computer talk' in one such domain - that of teenage boys - see L Haddon, 'Explaining ICT consumption: the case of the home computer', paper presented at PICT conference, Brunel University, May 1990(b), pp8-10.

[42] In this there are parallels with Bourdieu's discussion of high culture and the cultural strategies of the socialite. See P Bourdieu, Distinction, London, Routledge & Kegan Paul, 1984, p89:

" ... the lack of deep, methodical, systematic knowledge in a particular area of legitimate culture in no way prevents him from satisfying the cultural demands entailed by most social situations, even in the quasi-scholastic situation of a survey."

[43] Chapter six, pp217-219.

[44] See chapter four, p149.

[45] Mintel, 1990, op cit p19, reports that people from social groups A and B are more likely to see a business use for the micro.

[46] See chapter seven, pp267-268.

[47] This suggests a different angle on the difficulties of drawing a hard and fast line between leisure and economic activity highlighted by the household resources approach. See chapter three, pp80-82.

[48] Chapter seven, p250.

[49] See chapter four, pp131-132 and chapter seven, pp246-247.

[50] Mrs F17 was one of the women who were 'just leaving' as I arrived to conduct an interview.

[51] See for example, R Deem, All Work and No Play: The Sociology of Work and Leisure, Milton Keynes, Open University Press, 1986; J Pahl, 'Household spending, personal spending and the control of money in marriage', Sociology, Vol24 No1, 1990, pp119-138. This kind of material is related to the discussion of women and home computing in Haddon, 1988(b), op cit pp176-186.

[52] See Haddon, 1988(b), op cit chapter ten and Haddon, 1990(c), op cit. J Wheelock, 'Personal computers, gender and an institutional model of the household', paper presented at PICT workshop on domestic consumption and ICTs, May 1990, p22, also concentrates on the social nature of computing to help explain gender differences.

[53] This theme is also developed in Haddon, 1990(b), op cit pp11-12.

[54] This helps explain some of the contradictions in the statistics on female computing. Teenage girls are often shown as the second highest using group after boys. They spend a higher proportion of their time on the computer playing games than boys. This is itself, however, a function of their marginal position. L Haddon, The Origins and Nature of Statistics on Household ICTs, Centre for Information and Communication Technologies Working Paper No8, SPRU, 1990, p24, discusses data on gender and home computer use.

[55] Haddon, 1988(b), op cit p187, argues that women are less attracted to clubs and more attracted by classes in computing. On p267 he quotes figures showing up to 90% of magazine readers are male.

[56] Mr F12, for example, describes the Dragon as a "toy". F14 S says of Dragon owners that "you feel like giving them a Spectrum."

[57] Chapter six, p218.

[58] S Bains, 'Personal computing, gender and distance education', unpublished paper, 1991(a), p11.

[59] Haddon, 1988(b), op cit pp176-186, argues that women have to work harder to justify their computing although exceptions are attracted by hobbyism. M Shotton, Computer Addiction, London, Taylor and Francis, London, 1989, chapter five, discusses gender differences among school children. She argues that girls are less likely to find computing intrinsically interesting than boys.

" When females did use computers their modes of working appeared to differ from many of their male counterparts and their need for practical applications appeared to inhibit them from wishing to own a machine of their own."(p62)

[60] The same contradiction is present in some writing on gender and computing. See chapter four, pp131-132.

[61] Similar things could be said about the micro as a product category. Haddon, 1988(b), op cit p336, argues against the view that the home computer has stabilized as a product category.

[62] For example, Murdock, Hartmann and Grey, 1987, op cit. See chapter four, p122 and footnote 26.

[63] This is supported from other quantitative sources. See, for example W Dutton, E M Rogers and S H Jun, 'Diffusion and social impacts of personal

computers', Communication Research, Vol14 No2, 1987(b), p243, who find evidence of difficulties but high satisfaction. Market Intelligence, 1990, op cit p17, cites data showing very few people have at one time obtained a micro and now no longer own one. Gowling Marketing Services, 1985, op cit:

Attitudes towards computers amongst computer households is high despite disillusionment about the failure of computers to deliver short term educational benefits."

Chapter Nine

- [1] The age, class and gender differences in the appeal of home computing catalogued in the thesis could be seen as indicating variations in the credence given to such ideas. This would, however, be over-simplistic. Belief in prophecies of the IT Revolution was shared by users and non users alike. It is more appropriate to see class, age and gender affecting how people respond to predictions.
- [2] This kind of approach is, at times, evident in, for example, K Robins and F Webster, The Technical Fix, London, Macmillan, 1989; D Lyon, 'The information society: ideology or utopia?' in H MacKay, M Young and J Beynon (eds), Understanding Technology in Education, London, Falmer, 1991, pp93-108; J D Slack, 'The information revolution as ideology', Media, Culture and Society, 6, 1984, pp247-256.
- [3] C Campbell, The Romantic Ethic and the Spirit of Modern Consumerism, Oxford, Basil Blackwell, 1987.
- [4] This argument is discussed in detail in M Featherstone, Consumer Culture and Postmodernism, London, Sage, 1991.
- [5] I use the term 'novel' carefully to mean unfamiliar, following the distinction made in C Campbell 'The desire for the new', paper presented at ESRC/PICT Workshop on Domestic Consumption and ICTs, Brunel, May 1990, between new, innovative and novel goods.
- [6] This has been a recurring theme of Haddon's work. See, for example, L Haddon, 'Researching gender and home computers', paper given at workshop on technology and everyday life, University of Trondheim, Norway, May 28th-29th, 1990(c).
- [7] For an example of work which looks at this relationship and, in particular, the ways producers attempt to read the sphere of consumption see A Dawson, L Haddon and I Miles, The Shape of Things to Consume, London, Sage, forthcoming.
- [8] R Silverstone, E Hirsch and D Morley, 'Information and Communication technologies and the Moral Economy of the Household', paper presented at ESRC workshop on Domestic Consumption and ICT, May 1990, pp7-14.
- [9] This vindicates the approaches to use value put forward in M Sahlins, Culture and Practical Reason, Chicago, University of Chicago Press, 1976 and A Appadurai (ed), The Social Life of Things, Cambridge, Cambridge University Press, 1986.
- [10] Although it is a little unfair to single them out, both these assumptions inform the work of G Murdock, P Hartmann and P Grey on home computing. See for example 'Home computers: the social construction of a complex commodity', mimeo, 1988 which is published in a different form as 'Contextualizing home computing: resources and practices' in R Silverstone and E Hirsch (eds), Consuming Technologies: Media and Information in Domestic Spaces, London, Routledge, 1992.
- [11] For a discussion of the 'drugs panic' in Britain during the mid 1980s see M Kohn, Narcomania: On Heroin, London, Faber and Faber, 1987.
- [12] Haddon makes a similar point from the vantage point of a production-based study of the micro. See L Haddon, The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro, PhD Imperial College University of London, 1988(b), conclusion.
- [13] In doing so it confirms and builds on the insights contained in L Haddon, The Origins and Nature of Statistics on Household ICTs, SPRU Centre for Information and Communication Technologies Working Paper No8, 1990(a).

[14] Confirms empirically argument made *ibid*, p27.

[15] Haddon, 1990(c), *op cit* p8.

[16] Research found a decline in 'programming' as a use classification. But as chapter seven argued, exploration continues even if it is classified differently.

[17] Haddon, 1988(b), *op cit* argues that producer strategies were influenced by a number of different 'underlying conceptions' from the very start of the development of the micro.

[18] This is already being undertaken. See, for example, Sue Bains work on home computing and distance learning with the Open University discussed in S Bains, 'Personal computing, gender and distance education', unpublished paper, 1991(b).

[19] This argument is discussed in Haddon, 1988(b), *op cit* pp332-334.

[20] For a discussion of developments in this area see I Miles, Home Infomatics, London, Pinter, 1988.

[21] For discussion of goods as links to the past see M Czikszenmihalyi and E Rochberg-Holton, The Meaning of Things: Domestic Symbols and Self, Cambridge, Cambridge University Press, 1981 and G McCracken, Culture and Consumption: New Approaches to the Symbolic Character of Consumer Goods, Bloomington, Indiana University Press, 1988.

Bibliography

ABBOT, I and MANUEL, N, Home Electronics: The UK Market, London, Economist Intelligence Unit Special Report No217, 1985.

ADAMSON, I and KENNEDY, R, Sinclair and the 'Sunrise' Technology, Harmondsworth, Penguin, 1986(a).

ADAMSON, I and KENNEDY, R, 'The decline of Uncle Clive', New Scientist, 12/6/86, 1986(b), pp33-36.

AGNEW, J C, 'A house of fiction: domestic interiors and the commodity aesthetic' in S J Bronner (ed), Consuming Visions, New York, Norton, 1989.

ALBURY, D and SCHWARTZ, J, Partial Progress: The Politics of Science and Technology, London, Pluto, 1982.

ALDRICH, M, Videotex: Key to the Wired City, London, Quiller, 1982.

ANDERSON, P, 'Modernity and revolution', New Left Review, 144, 1984, pp96-113.

APPADURAI, A (ed), The Social Life of Things: Commodities in Cultural Perspective, Cambridge, Cambridge University Press, 1986.

APEX OFFICE TECHNOLOGY WORKING PARTY, Automation and the Office Worker, London, Apex, 1980.

ARMYTAGE, W H G, Yesterday's Tomorrows, London, Routledge, 1968.

ARONSON, S H, 'Bell's electrical toy: what's the use? The sociology of early telephone usage' in I de Sola Pool (ed) The Social Impact of the Telephone, London, MIT Press, 1977, pp15-39.

ASHWORTH, J, 'The Crisis Facing the UK Information Technology Industry', Information Technology and Public Policy, Vol3 No2, 1985, pp95-99.

ASIMOV, I, WARRICK, P S and GREENBERG, M H (eds), Machines That Think, Harmondsworth, Penguin, 1983.

ATHANASIOU, T, 'High-tech alternativism: the case of the community memory project' in Radical Science Collective (ed), Making Waves: The Politics of Communication, London, Radical Science, 1985.

ATTALI, J and STOURIDGE, Y, 'The birth of the telephone and economic crisis: the slow death of the monologue in French society' in I de Sola Pool (ed) The Social Impact of the Telephone, London, MIT Press, 1977, pp 97-111.

BAINS, S, 'Research on home computers', unpublished draft paper, 1990.

- BAINS, S, Living with Information Technology: Women, Men and the Adoption of Home Computing in Distance Education, report for CTI Ltd London, 1991(a).
- BAINS, S, 'Personal computing, gender and distance education', unpublished paper, 1991(b).
- BAKER, K, 'Closing address', PITCOM, Vol 1 No2, 1983, pp111-115.
- BARKUN, M, Disaster and the Millenium, New Haven, Yale University Press, 1974.
- BARNETT, C, The Audit of War, London, Macmillan, 1986.
- BARTON, M, 'The Victorian jeremiad: critics of accumulation and display' in S J Bronner (ed), Consuming Visions, New York, Norton, 1989, pp55-72.
- BATTY, M, The Spatial Impact of the Computer Culture, UWIST Department of Town Planning Papers in Planning Research No.91, July 1985.
- BAUDRILLARD, J, The Mirror of Production, St Louis, Telos, 1975.
- BAUDRILLARD, J, For a Critique of the Political Economy of the Sign, St Louis, Telos, 1981.
- BAUDRILLARD, J, Selected Writings, Cambridge, Polity, 1988.
- BAUMAN, Z, 'Industrialism, consumerism and power', Theory, Culture and Society, Vol 1 No3, 1983, pp32-41.
- BELL, D, The Coming of Post-Industrial Society, London, Heinemann, 1974.
- BELL, D, 'The social framework of the information society' in T Forester (ed), The Microelectronics Revolution, Oxford, Basil Blackwell, 1980, pp500-549.
- BENSON, I and LLOYD, J, New Technology and Industrial Change, London, Kogan Page, 1983.
- BLACKWELL, T and SEABROOK, S, 'Mrs Thatcher's religious pilgrimage', Granta, 6, 1983, pp39-51.
- BODDY W, "'The shining centre of the home': ontologies of television in the 'golden age'" in P Drummand and R Paterson (eds) Television in Transition, London, BFI, 1986, pp125-134.
- BOLTER, J D, Turing's Man, Harmondsworth, Penguin, 1986.
- THE BOSTON COMPUTER MUSEUM, 'Catalogue of personal computers', The Computer Museum Report, Vol 17, 1986.
- BOURDIEU, P, Distinction, London, Routledge and Kegan Paul, 1984.
- BRATTON, J and WADDINGTON, J, New Technology and Employment, London, Workers Educational Association, 1981.

BERMAN, M, All That is Solid Melts into Air, London, Verso, 1983.

BREZEZINSKI, Z, Between Two Ages: America's Role in the Technetronic Era, USA, Viking, 1976.

BRIGGS, A, The Birth of Broadcasting, London, Oxford University Press, 1961.

BRIGGS, A, 'The pleasure telephone: a chapter in the prehistory of the media' in I de Sola Pool (ed) The Social Impact of the Telephone, London, MIT Press, 1977, pp40-65.

BBC BROADCASTING RESEARCH, BBC's Computer Literacy Project - An Evaluation (Summary), 1983.

BBC BROADCASTING RESEARCH, The BBC's Computer Referral Service - An Evaluation, 1985.

BBC BROADCASTING RESEARCH, Micro Live, 1986.

BRITISH RADIO AND ELECTRONIC EQUIPMENT MANUFACTURERS ASSOCIATION, Annual Report, BREMA, Various years.

BRONNER, S J (ed), Consuming Visions, New York, Norton, 1989.

BROOKS, H, 'Technology-related catastrophes myth and reality' in S Fiedlaner, G Holton, L Marx and E Skolnikoff (eds) Visions of Apocalypse: End or Rebirth, London, Holmes and Meier, 1985, pp109-136.

BRYMAN, A, Quantity and Quality in Social Research, London, Unwin Hyman, 1988.

BURGESS, R G (ed), Field Research: A Sourcebook and Field Manual, London, Allen & Unwin, 1982.

BURGESS, R G, In the Field, London, Routledge, 1984.

BURGESS, R G, 'Conversations with a purpose: the ethnographic interview in education research', Studies in Qualitative Methodology, Vol 1, 1988, pp137-155.

BURNHAM, D, The Rise of the Computer State, London, Wiedenfield and Nicolson, 1983.

CAMPBELL, C, The Romantic Ethic and the Spirit of Modern Consumerism, Oxford, Basil Blackwell, 1987.

CAMPBELL, C, 'The desire for the new', paper presented at ESRC/PICT Workshop on Domestic Consumption and ICTs, Brunel University, May 1990.

CENTRE FOR URBAN AND REGIONAL DEVELOPMENT STUDIES, Fact Pack, February 1988.

CERTEAU, M de, The Practice of Everyday Life, Berkeley, University of California Press, 1984.

- CERUZZI, P, 'An unforeseen revolution: computers and expectations, 1935-1985' in J Corn (ed), Imagining Tomorrow, London, MIT Press, 1986, pp188-201.
- CHANEY, D, 'The department store as cultural form', Theory, Culture and Society, Vol 1 No 3, 1983, pp22-31.
- CIPOLLA, C, Clocks and Culture 1300-1700, London, Collins, 1967.
- COHEN, J, Human Robots in Myth and Science, London, Allen and Unwin, 1966.
- COHN, N, The Pursuit of the Millenium, New York, OUP, 1970.
- COLLETTIVO STRATEGIE, 'The 'technetronic society' according to Brezezinski' in T Solomonides and L Levidow (eds) Compulsive Technology: Computer as Culture, London, Free Association Books, 1985.
- COMPAINE, B M, 'Information gaps: myth or reality', Telecommunications Policy, March 1986, pp5-12.
- CONFERENCE OF SOCIALIST ECONOMISTS MICROELECTRONICS GROUP, Microelectronics, London, CSE Books, 1980.
- CONNOR, H and PEARSON, R, Information Technology Manpower into the 1990s, London, Institute of Manpower Studies, 1986.
- CORN, J (ed), Imagining Tomorrow, London, MIT Press, 1986.
- CRAWSON, A, HADDON, L and MILES, I, The Shape of Things to Consume, London, Sage, Forthcoming.
- COUNCIL FOR SCIENCE AND SOCIETY WORKING PARTY, New Technology: Society, Employment and Skill, London, CSS, 1981.
- COUNTER INFORMATION SERVICES, The New Technology, London, CIS, 1979.
- COWAN, R Schwartz, 'How the refrigerator got its hum' in D MacKenzie and J Wajcman (eds), The Social Shaping of Technology, Milton Keynes, Open University Press, 1985, pp202-218.
- COWAN, R Schwartz, More Work for Mother, London, Free Association Books, 1989.
- CURNOW, R, 'The growth and pattern of the unfolding debate' in T Jones (ed), Microelectronics and Society, Milton Keynes, Open University Press, 1980, pp53-71.
- CZIKSZENTMIHALYI, M and ROCHBERG-HOLTON, E, The Meaning of Things: Domestic Symbols and Self, Cambridge, Cambridge University Press, 1981.
- DALE, R, The Sinclair Story, London, Duckworth, 1985.
- DANIEL, W W, 'The myth of the British disease', New Society, 5/12/86, pp9-11.

- DANKO, W and MACLACHLAN, J, 'Research to accelerate the diffusion of a new innovation: the case of home computers', Journal of Advertising Research, Vol 23 No 3, 1983, pp39-43.
- DAVIS, C, 'Did advertising cause the home computer boom?', ADMAP, November 1984, pp546-550.
- DAVIS, R L and HOWARD, E B, 'Wither tele-shopping?', ESRC Newsletter, 55, 1985, pp19-21.
- DEEM, R, All Work and No Play: The Sociology of Women and Leisure, Milton Keynes, Open University Press, 1986.
- DICKERSON, M and GENTRY, J, 'Characteristics of adopters and non-adopters of home computers', Journal of Consumer Research, Vol 10, 1983, pp225-235.
- DOUGLAS, M and ISHERWOOD, B, The World of Goods: Towards an Anthropology of Consumption, Harmondsworth, Penguin, 1980.
- DOUGLAS, S J, 'Amateur operators and American broadcasting: shaping the future of radio' in J Corn (ed), Imagining Tomorrow, London, MIT Press, 1986, pp35-57.
- DUTTON, W, KOVARIC, P and STEINFELD, C, 'Computing in the home: a research paradigm', Computers and Social Sciences, 1, 1985, pp5-18.
- DUTTON, W, ROGERS, E M and JUN, S, 'Diffusion and impacts of information technology in households', Oxford Surveys in Information Technology, Vol 4, 1987(a), pp133-193.
- DUTTON, W, ROGERS E M and JUN, S, 'Diffusion and social impacts of personal computers', Communication Research, Vol 14 No 2, 1987(b), pp219-250.
- ECO, U, Faith in Fakes, London, Secker and Warburg, 1986.
- ELLUL, J, The Technological Society, London, Cape, 1965.
- EUROMONITOR, Consumer Electronics in Western Europe, London, 1984.
- EVANS, C, The Mighty Micro, London, Victor Gollanz, 1979.
- EWEN, S and EWEN, E, Channels of Desire, New York, McGraw-Hill, 1982.
- FAULKNER, W and ARNOLD, E (eds), Smothered By Invention: Technology in Women's Lives, Pluto, London, 1985.
- FEATHERSTONE, M, 'Consumer culture: an introduction', Theory, Culture and Society, Vol 1 No 3, 1983, pp4-9.
- FEATHERSTONE, M, 'Perspectives on consumer culture', Sociology, Vol 24 No 1, 1990, pp5-22.
- FEATHERSTONE, M, Consumer Culture and Postmodernism, London, Sage, 1991.

FEATHERSTONE, M and HEPWORTH, M, 'The midlifestyle of George and Lyn: notes on a popular strip', Theory, Culture and Society, Vol 1 No 3, 1983, pp85-92.

FEIGENBAUM, E A and McCORDUCK, P, The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge to the World, London, Pan, 1984.

FESTINGER, L, RIECKER, H W and SCHACHTER, S, When Prophecy Fails, Minneapolis, University of Minnesota Press, 1956.

FINANCIAL TIMES MEDIA INTELLIGENCE UNIT, Home Computers in the UK and USA, FT, 1984.

FORESTER, T (ed), The Microelectronics Revolution, Oxford, Basil Blackwell, 1980.

FORESTER, T (ed), The Information Technology Revolution, Oxford, Basil Blackwell, 1985.

FORESTER, T, High-Tech Society, Oxford, Basil Blackwell, 1987.

FORTY, A, Objects of Desire, London, Thames and Hudson, 1986.

FREEMAN, C, 'Unemployment and the government' in T Forester (ed), The Microelectronics Revolution, Oxford, Basil Blackwell, 1980, pp308-317.

GANE, M, Baudrillard: Critical and Fatal Theory, London, Routledge, 1991.

GARDINER, S, Le Corbusier, London, Fontana, 1974.

GELL, A, 'Technology and magic', Anthropology Today, Vol 4 No 2, 1988, pp6-9.

GERSHUNY, J, Social Innovation and the Division of Labour, Oxford, Oxford University Press, 1983.

GOFFMAN, E, The Presentation of Self in Everyday Life, Harmondsworth, Penguin, 1969.

GOLDWYN, E, 'Now the chips are down' in T Forester (ed), The Microelectronics Revolution, Oxford, Basil Blackwell, 1980, pp297-302.

GORZ, A (ed), The Division of Labour: the Labour Process and Class Struggle in Modern Capitalism, Brighton, Harvester, 1976.

GORZ, A, Ecology and Politics, Boston, South End Press, 1980.

GORZ, A, Farewell to the Working Class, London, Pluto, 1982.

GORZ, A, Paths to Paradise: On the Liberation from Work, London, Pluto, 1985.

GOWLING MARKETING SERVICES, The UK Home Computer Market, Liverpool, GMS, 1983.

GOWLING MARKETING SERVICES, The UK Computer and Software Market, Liverpool, GMS, 1984.

GOWLING MARKETING SERVICES, The Home Computer and Software Market, Liverpool, GMS, 1985.

GRAY, A, 'Behind closed doors: women and video' in H Baehr and G Dyer (eds), Boxed in: Women on and in TV, London, Routledge, pp38-54.

GUEST, D, 'Truth dawns in the sunrise sector', The Listener, 31/7/86, pp8-9.

HABERMAS, J, Towards a Rational Society, London, Heinemann, 1971.

HADDON, L, 'Forming the world of the hobbyist: a case study of a home computer magazine',

HADDON, L, 'Making a business a pleasure', unpublished paper, 1984(b).

HADDON, L, 'The home computer: the making of a consumer electronic', Science as Culture, 2, 1988(a), pp7-51.

HADDON, L, The Roots and Early History of the British Home Computer Market: Origins of the Masculine Micro, PhD, Imperial College University of London, 1988(b).

HADDON, L, 'Electronic and computer games: the history of an interactive medium', Screen, Vol 29 No 2, 1988(c), pp52-73.

HADDON, L, 'Teleworking: literature review' in A Lewis (ed), Attitudes to Homeworking: the Views of TMS Personnel, University of Bath Centre for Economic Psychology Report, 1989.

HADDON, L, The Origins and Nature of Statistics on Household ICTs, SPRU Centre for Information and Communication Technologies Working Paper No 8, 1990(a).

HADDON, L, 'Explaining ICT consumption: the case of the home computer', paper presented at PICT conference, Brunel University, May 1990(b).

HADDON, L, 'Researching gender and home computers', paper given at the workshop on technology and everyday life, University of Trondheim, Norway, May 28th-29th, 1990(c).

HADDON, L, 'The cultural production and consumption of IT' in H Mackay, M Young and J Beynon (eds), Understanding Technology in Education, London, Falmer, 1991, pp157-175.

HADDON, L and SKINNER, D, 'The enigma of the micro: lessons from the British home computer boom', Social Science Computer Review, Vol 9 No 3, 1991, pp437-450.

HALL, P, NIGHTINGALE, J and MACAULAY, T, 'A survey of microcomputer ownership and usage', Prometheus, Vol 3 no 1, 1985, pp156-173.

HALSALL, P, Director of Planning Hillingdon Memo to Chief Executive on Unemployment Statistics, December 1987.

- HALTTUNEN, K, 'From parlour to living room: domestic space, interior decoration, and the culture of personality' in S J Bronner (ed), Consuming Visions, New York, Norton, 1989, pp157-190.
- HAMMERSLEY, M and ATKINSON, P, Ethnography: Principles in Practice, London, Tavistock, 1983.
- HAMMOND, R, The On-Line Handbook, London, Fontanna, 1984.
- HARVEY, D, The Condition of Postmodernity, Oxford, Basil Blackwell, 1990.
- HEARMAN, C, Uxbridge: a concise history, London, Hillingdon Libraries, 1982.
- HEBDIGE, D, Subculture: the Meaning of Style, London, Routledge, 1979.
- HEILBRONER, R L, 'Do machines make history' in M Kranzberg and W H Davenport (eds), Technology and Culture, Meridian, London, 1972.
- HELD, D, Introduction to Critical Theory, London, Hutchinson, 1980.
- HEPWORTH, M, GREEN, A and GILLESPIE, A, 'The spatial division of information labour in Great Britain', Environment and Planning A, Vol 19, 1987, pp793-806.
- HEPWORTH, M and ROBBINS, K, 'Information versus the regions', Intermedia, Vol 16 No 1, January 1988, pp40-44.
- HILL, S, The Tragedy of Technology, London, Pluto, 1988.
- HILLINGDON LIBRARY SERVICE, Local Information Data Base
- HOBSBAWM, E J, Industry and Empire, Harmondsworth, Penguin, 1969.
- HODGES, A, Alan Turing: The Enigma of Intelligence, London, Unwin, 1985.
- HORRIGAN, B, 'The home of tomorrow, 1927-1945' in J Corn (ed), Imagining Tomorrow, London, MIT Press, 1986, pp137-163.
- HOWELLS, J, 'Developments in the location, technology and industrial organization of computer services: some trends and research issues', Regional Studies, Vol 21 No 6, 1987, pp493-503.
- HUGHES, M, MACLEOD, H, POTTS, C and ROGERS, J, 'Are computers only for boys', New Society, 11/10/85, pp75-76.
- HUGHES, T P, American Genesis: A Century of Invention and Technological Enthusiasm, New York, Viking Penguin, 1989.
- HUWS, U, Your Job in the Eighties, London, Pluto, 1982.

HUWS, U, The New Homeworkers, London, Low Pay Unit, 1984.

HUWS, U, 'Terminal isolation' in Radical Science Collective (eds), Making Waves: the Politics of Communications, London, Free Association Books, 1985, pp9-26.

HUWS, U, 'Telework: projections', Futures, Jan/Feb 1991, pp19-31.

INFORMATION TECHNOLOGY ECONOMIC DEVELOPMENT COMMITTEE, A Policy for the UK Information Technology Industry, London, NEDC, 1983.

INFORMATION TECHNOLOGY ECONOMIC DEVELOPMENT COMMITTEE, The Crisis Facing UK Information Technology, London, NEDC, 1984.

INOSE, H and PIERCE, J R, Information Technology and Civilization, New York, W H Freeman and Co, 1984.

JANKOWSKI, N W and WESTER, F, 'The qualitative tradition in social science inquiry: contributions to mass communications research' in K B Jensen and N W Jankowski (eds), A Handbook of Qualitative Methodologies for Mass Communications Research, London, Routledge, 1991, pp44-74.

JENKINS, C and SHERMAN, B, The Collapse of Work, London, Eyre Methuen, 1979.

JENKINS, C and SHERMAN, B, The Leisure Shock London, Eyre Methuen, London, 1981.

JENNINGS, H, Pandaemonium, London, Andre Deutsch, 1985.

JENSEN, K B and JANKOWSKI, N W (eds), A Handbook of Qualitative Methodologies for Mass Communications Research, London, Routledge, 1991.

JONES, T (ed), Microelectronics and Society, Milton Keynes, Open University Press, 1981.

KAPLAN, A R, 'Home computers versus hobby computers', Datamation, Vol 23 No 7, 1977, pp72-75.

KEEN, B, 'Play it again, Sony': the double life of home video technology', Science as Culture, No 1, 1987, pp7-43.

KELLNER, D, 'Critical theory, commodities and the consumer society', Theory, Culture and Society, Vol1 No3, 1983 pp66-83.

KEYNOTE, Home Computers and Software, London, Keynote, 1985.

KEYNOTE, Computers, London, Keynote, 1986.

KHAN, R N, 'Science, scientists and society: public attitudes towards science and technology', Impact of Science and Society, Vol 38, No2, 1988, pp257-272.

KIHLSTEDT, F T, 'Utopia realized: the world's fairs of the 1930s', in J Corn (ed) Imagining Tomorrow, London, MIT Press, 1986, pp97-118.

KIRK, J and MILLER, M L, Reliability and Validity in Qualitative Research, London, Sage, 1986.

KLING, R and IACONO, S, 'Computerization as the product of social movements', in R Gordon (ed) Microelectronics in Transition, Norwood, NJ, Ablex, 1985.

KNIGHT, T O, Robots and People: the Age of the Personal Robot, USA, McGraw Hill, 1984.

KOHN, M, Narcomania, London, Faber and Faber, 1987.

KOPYTOFF, I, 'The cultural biography of things: commoditization as process', in A Appadurai (ed), The Social Life of Things: Commodities in Cultural Perspective, Cambridge, Cambridge University Press, 1986, pp64-93.

KUMAR, K, Prophecy and Progress, Harmondsworth, Penguin, 1978.

KUMAR, K, Utopia and Anti-Utopia, Oxford, Basil Blackwell, 1987.

LAMB, J, 'Programming the first generation', New Scientist, 28/3/85, pp34-37.

LEACH, W, 'Strategists of display and the production of desire' in S J Bronner (ed), Consuming Visions, New York, Norton, 1989, pp99-132.

LEARS, J, 'Beyond Veblen: rethinking consumer culture in America' in S J Bronner (ed), Consuming Visions, New York, Norton, 1989, pp73-97.

LEISS, W, 'Icons of the market place', Theory, Culture and Society, Vol 1 No 3, 1983, pp10-21.

LINDLOF, T R, 'New communications media and the family: practices, functions and effects', in B Dervin (ed), Progress in Communication Sciences Vol 10, Norwood, NJ, Ablex, 1989.

LINN, P, 'Microcomputers in education: dead and living labour' in T Solomonides and L Levidow (eds), Compulsive Technology: Computers as Culture, London, Free Association, 1985, pp58-101.

LISTER, R, The Exclusive Society: Citizenship and the Poor, London, CPAG, 1990.

LLOYD, T, 'A one man band? If it is, its a big one', Financial Weekly, 1/10/87, pp32-38.

LOCKETT, M, Microcomputers: A Survey of Research on Social Science Aspects of Design, Production and Marketing, Oxford, Institute of Information Management, 1985.

LOCKSLEY, G, 'Information technology and capitalist technology' Capital and Class, No 27, 1986, pp81-105.

LONDON BOROUGH OF HILLINGDON ECONOMIC DEVELOPMENT UNIT, Register of Industrial and Commercial Companies, 1988.

LYON, D, 'From "post-industrialism" to "information society": a new social transformation?', Sociology, Vol 20 No 4, 1986, pp577-588.

LYON, D, The Information Society: Issues and Illusions, Oxford, Polity, 1988.

LYON, D, 'The information society: ideology or utopia?' in H MacKay, M Young and J Beynon (eds), Understanding Technology in Education, London, Falmer, 1991, pp93-108.

LYOTARD, J F, The Postmodern Condition, Manchester, Manchester University Press, 1984.

McCRACKEN, G, Culture and Consumption: New Approaches to the Symbolic Character of Consumer Goods, Bloomington, Indiana University Press, 1988.

MacKAY, H, YOUNG, M and BEYNON, J (eds), Understanding Technology in Education, London, Falmer, 1991.

McKENDRICK, N, BREWER, J and PLUMB J H, The Birth of Consumer Society: The Commercialization of Eighteenth Century England, London, Europa, 1982.

MacKENZIE, D and WAJCMAN, J (eds), The Social Shaping of Technology, Milton Keynes, Open University Press, 1985.

McLUHAN, M, Understanding Media, Routledge Kegan Paul, London, 1964.

MCNEIL, M, 'Turing's men, cyborgs and wise women: information technology gender and culture', Paper given at PICT workshop on Gender and IT, Eastbourne, May 1989.

McNEIL, M, 'The old and new worlds of information technology in Britain' in J Corner and S Harvey (eds), Enterprise and Heritage: Crosscurrents of National Culture, London, Routledge, 1991, pp116-136.

McNEIL, M, 'Heritage computing', Marxism Today, July 1991(b), pp40-41.

MACRAE, N, The 2024 Report: A Concise History of the Future 1974-2024, London, Sidgwick and Jackson, 1984.

MACK, J and LANSLEY, S, Poor Britain, London, Allen and Unwin, 1984.

MANUEL, F E and MANUEL, F P, 'Sketch for a natural history of paradise' in C Gertz (ed) Myth, Symbol and Culture, New York, W W Norton and Co, 1971, pp83-138.

MANUEL, F E and MANUEL, F P, Utopian Thought in the Western World, Oxford, Blackwell, 1979.

MARCUSE, H, One Dimensional Man, Routledge Kegan and Paul, London, 1964.

MARKET INTELLIGENCE, European Lifestyle, London, Mintel, 1989.

- MARKET INTELLIGENCE, Home Computers, London, Mintel, 1990.
- MARSHALL, G, In Praise of Sociology, London, Unwin and Hyman, 1990.
- MARSHALL, G, ROSE D, NEWBY, H and VOGLER, C, Social Class in Modern Britain, London, Unwin Hyman, 1988.
- MARTIN, J, The Wired Society, Englewood Cliffs, Prentice Hall, 1978.
- MARTIN, B, 'Review of All That is Solid Melts Into Air', Theory, Culture and Society, Vol 2 No 3, 1985, pp162-165.
- MARVIN, C, When Old Technologies Were New, Oxford, Oxford University Press, 1988.
- MASON, R and JENNINGS, L, 'The Computer home: will tomorrow's housing come alive?', The Futurist, Vol 16 No 1, Feb 1982, pp35-42.
- MASSEY, D, 'A new class of geography', Marxism Today, May 1988, pp12-17.
- MASSEY, D, Spatial Divisions of Labour, London, MacMillan, 1984.
- MASUDA, Y, The Information Society as Post-Industrial Society, Washington DC, World Future Society, 1981.
- MEAKIN, D, Man and Work, London, Methuen, 1976.
- MEIKLE, J L, 'Plastic, the material of a thousand uses' in J Corn (ed), Imagining Tomorrow, London, MIT Press, 1986, pp77-96.
- MILES, I, Home Infomatics, London, Pinter, 1988.
- MILLER, D, Material Culture and Mass Consumption, Oxford, Blackwell, 1987.
- MILLER, D, 'Appropriating the state on the council estate' in J Putnam and C Newton (eds), Household Choices, London, Futures, 1990, pp43-55.
- MILLER, J, McLuhan, London, Fontana, 1971.
- MILLS, S, 'British attitudes to new technology', ESRC Newsletter 55, June 1985 pp 23-26
- MONTELONE, T F (ed), Microworlds, London, Hamlyn, 1984.
- MOORES, S, ''The box on the dresser': memories of early radio and everyday life', Media, Culture and Society, Vol 10, 1988, pp23-40.
- MORLEY, D, Family Television: Cultural Power and Domestic Leisure, London, Comedia, 1986.

MORELY, D and SILVERSTONE, R, 'Domestic communication - technologies and meanings', Paper presented to the 1988 International Television Studies Conference.

MORLEY, D and SILVERSTONE, R, 'Communication and context: ethnographic perspectives on the media audience' in K B Jensen and N W Jankowski (eds), A Handbook of Qualitative Methodologies for Mass Communications Research, London, Routledge, 1991, pp149-162.

MOWSHOWITZ, A, Inside Information: Computers in Fiction, USA, Addison-Wesley, 1977.

MURDOCK, G, HARTMAN, P and GRAY, P, Interim Report of 1983/1984 Sample, unpublished, 1984.

MURDOCK, G, HARTMAN, P and GRAY, P, 'Home truths', Times Educational Supplement, 7/3/86.

MURDOCK, G, HARTMAN, P, and GREY P, Interim Report of 1985/86 Sample, unpublished, 1986(b).

MURDOCK, G, HARTMAN, P, and GREY P, 'Family failing?', Times Education Supplement, 19/6/87, p68.

MURDOCK, G, HARTMAN, P and GRAY, P, 'Home Computers: The Social Construction of a Complex Commodity', mimeo, 1988.

MURDOCK, G, HARTMAN, P and GREY, P, 'Contextualizing home computing: resources and practices' in R Silverstone and E Hirsch (eds), Consuming Technologies: Media and Information in Domestic Spaces, London, Routledge, 1992.

MURPHY, B, The World Wired Up: Unscrambling the New Communications Puzzle, London, Comedia, 1983.

NAISBITT, J, Megatrends: Ten New Directions Transforming Our Lives, London, MacDonal & Co, 1984.

NISBET, R, History of the Idea of Progress, London, Heinemann, 1980.

NISSEN, J, 'Computer captivated youth: a Swedish picture', Paper presented at 'Children in the Information Age' Sofia Bulgaria, May 1989.

NORA, S and MINC, A, The Computerization of Society, London, MIT Press, 1980.

NORTHCOTT, J, FOGARTY, M and TREVOR, M, Chips and Jobs: Acceptance of New Technology at Work, London, PSI, 1985.

OFFICE OF POPULATION CENSUSES AND SURVEYS, National Report Great Britain Part One, London, HMSO, 1983.

OFFICE OF POPULATION CENSUSES AND SURVEYS, General Household Survey, London, HMSO, various years.

OLSON, T, Millennialism, Utopianism, and Progress, Toronto, University of Toronto Press, 1982.

ONG, W J, Orality and Literacy, Methuen, London, 1982.

- PAHL, J, 'Household spending, personal spending and the control of money in marriage', Sociology, Vol 24 No 1, 1990, pp119-138.
- PAHL, R E, Divisions of Labour, Blackwell, 1984, Oxford.
- PARRINDER, P, Science Fiction, London, Methuen, 1980.
- PAUL, G, 'Selfimages and approaches towards life among young computer fans in Germany', mimeo, 1991.
- PERRY, C, 'The British experience 1876-1912: the impact of the telephone during the years of delay' in I de Sola Pool (ed) The Social Impact of the Telephone, London, MIT Press, 1977, pp69-96.
- PROVENZO, E F, Video Kids, London, Harvard University Press, 1991.
- POOL, I de Sola (ed), The Social Impact of the Telephone, London, MIT Press, 1977.
- RADA, J, The Impact of Microelectronics, Geneva, International Labour Organization, 1980.
- RAKOW, L, 'Women and the telephone: the gendering of a communications technology' in C Kramarae (ed) Technology and Women's Voices, London, Routledge, 1988, pp207-228.
- REICHARDT, J (ed), Cybernetis, Art and Ideas, London, Studio Vista, 1971.
- REICHARDT, J, Robots: Facts, Fiction and Prediction, London, Thames and Hudson, 1978.
- RHIND, D (ed), A Census Users Handbook, London, Methuen, 1983.
- ROBINS, K and WEBSTER, F, 'Higher education, high tech, high rhetoric' in T Solomonides and L Levidow (eds), Compulsive Technology, London, Free Association, 1985, pp36-57.
- ROBINS, K and WEBSTER, F, The Technical Fix, London, Macmillan, 1989.
- ROBINS, K and WEBSTER, F, 'The selling of new technology' in H Mackay, M Young and J Beynon (eds), Understanding Technology in Education, London, Falmer, 1991, pp66-92.
- ROSS, 'The second coming of Daniel Bell', Socialist Register, 1974.
- ROSZAK, T, 'The technocracy' in N Cross, D Elliot and R Roy (eds) Man-Made Futures, London, Hutchinson, 1974.
- ROSZAK, T, The Cult of Information, Cambridge, Lutterworth, 1986.
- ROTHERY, B, The Myth of the Computer, London, Business Books, 1971.

- ROWNTREE, D, Who Needs a Home Computer?, London, Methuen, 1985.
- RYDELL, R W, 'The culture of imperial abundance: world's fairs in the making of American culture' in S J Bronner (ed), Consuming Visions, New York, Norton, 1989, pp191-216.
- SADLER P, 'Welcome back to the "automation" debate' in T Forester (ed), The Microelectronics Revolution, Oxford, Basil Blackwell, 1980, pp290-296.
- SAHLINS, M, Culture and Practical Reason, Chicago, University of Chicago Press, 1976.
- SCIENCE POLICY RESEARCH UNIT WOMEN AND TECHNOLOGY STUDIES, Microelectronics and Women's Employment in Britain, SPRU Occasional Paper No17, University of Sussex, 1982.
- SEGAL, H P, Technological Utopianism in American Culture, Chicago, Chicago University Press, 1984.
- SEGAL, H P, 'The technological utopians' in J Corn (ed) Imagining Tomorrow, London, MIT Press, 1986, pp119-136.
- SESTO, S L Del, 'Wasn't the future of nuclear engineering wonderful?' in J Corn (ed) Imagining Tomorrow, London, MIT Press, 1986, pp58-76.
- SHALLIS, M, The Silicon Idol, Oxford, Oxford University Press, 1984.
- SHAPIRO, R S, Analytic Portraits of Home Computer Users: The Negotiation of Innovation, PhD University of California San Fransisco, 1988.
- SHOTTON, M, Computer Addiction? A Study of Computer Dependency, London, Taylor and Francis, 1989.
- SIEGHART, P (ed), Microchips with Everything, London, Comedia, 1982.
- SILVERMAN, D, Qualitative Methodology and Sociology, Aldershot, Gower, 1985.
- SILVERSTONE, R, Beneath the Bottom Line: Households and Information and Communication Technologies in an Age of the Consumer, PICT Policy Research Papers No 17, 1991.
- SILVERSTONE, R, MORLEY, D, DAHLBERG and LIVINGSTONE, S, 'Families, technologies and consumption: the household and information and communication technologies', paper presented at PICT Conference, May 1989.
- SILVERSTONE, R, HIRSCH, E AND MORLEY, D, 'Information and Communication technologies and the Moral Economy of the Household', paper presented at ESRC workshop on Domestic Consumption and ICT, May 1990.
- SIMONS, G, Silicon Shock: The Menace of the Computer Invasion, Oxford, Basil Blackwell, 1985.

SKINNER, D, Microelectronics and British Society, Unpublished undergraduate dissertation Bedford College University of London, 1984.

SLACK, J D, 'The information revolution as ideology', Media, Culture and Society, 6, 1984, pp247-256.

SMITH, A, The Shadow in the Cave, London, Allen and Unwin, 1973.

SMITH, J and BALKA, E, 'Chatting on a feminist computer network' in C Kramarae (ed), Technology and Women's Voices, London, Routledge, 1988, pp82-97.

STONIER, T, The Wealth of Information, Thames Methuen, London, 1983.

SUDNOW, D, Pilgrim in the Microworld, London, Heinemann, 1983.

SUZUKI, T Morris, 'Robots and capitalism', New Left Review, 147, 1984, pp109-121.

SWINGWOOD, A, The Myth of Mass Culture, London, Macmillan, 1977.

TAYLOR, W R, 'The evolution of public space in New York City: the commercial showcase of America', in S J Bronner (ed), Consuming Visions, New York, Norton, 1989, pp287-310.

THATCHER, M, 'Keynote address', PITCOM, Vol 1 No 2, 1983, pp91-100.

THOMAS, G and MILES, I, Telematics in Transition, Harlow, Longman, 1989.

TODD, I and WHEELER, M, Utopia, London, Orbis, 1978.

TOFFLER, A, The Third Wave, London, Collins, 1980.

TOWNSEND, P, Poverty in the United Kingdom, Harmondsworth, Penguin, 1979.

TRADES UNION CONGRESS, Employment and Technology, London, TUC, 1979.

TURKLE, S, The Second Self: Computers and the Human Spirit, London, Granada, 1984.

VAIL, H, 'The home computer terminal: transforming the household of tomorrow', The Futurist, Vol 14 No 6, 1980, pp52-58.

VENKATESH, A, and VITALARI, N, 'Households and technology: the case of home computers - some theoretical and conceptual issues', in M L Roberts and L Wortzel (eds), Marketing to the changing household, Cambridge Mass, Ballinger Press, 1984, pp187-203.

VIRILIO, P and LOTRINGER, S, Pure War, New York, Semiotext(e), 1983.

VITALARI, N, VENKATESH, A and GRONHAUG, K, 'Computing in the home: shifts in the time allocation patterns of households', Communications of the ACM, Vol 28, No 5, May 1985, pp512-522.

WAJCMAN, J, 'Domestic technologies', paper presented at PICT gender and IT conference, Eastbourne, May 1989.

WALLMAN, S, Eight London Households, London, Tavistock, 1984.

WARDELL, J D, Hillingdon Census Monitor 1981 Census, London Borough of Hillingdon Planning Department, September 1982.

WARDELL, J D, Hillingdon Employment Monitor 1981 Census 10 Per Cent Statistics, London Borough of Hillingdon Planning Department, December 1983.

WARDELL, J D, Hillingdon Census Atlas, London Borough of Hillingdon Planning Department, May 1984.

WARREN, C, Gender Issues in Field Research, London, Sage, 1988.

WATSON, A P, Annual Position Statement 1987, London Borough of Hillingdon Planning Department, September 1987.

WEBSTER, F and ROBINS, K, 'Information technology: futurism, corporations and the state', Socialist Register, 1981, pp247-266.

WEIZENBAUM, J, Computer Power and Human Reason, Harmondsworth, Penguin, 1984.

WHEELOCK, J, 'Personal computers, gender and an institutional model of the household', paper presented at PICT workshop on domestic consumption and ICTs, May 1990.

WIENER, M, English Culture and the Decline of the Industrial Spirit, Cambridge, Cambridge University Press, 1981.

WILKINSON, B, The Shopfloor Politics of the New Technology, London, Heinemann, 1983.

WILLIAMS, F, RICE, R E, and ROGERS, E M, Research Methods and the New Media, New York, Free Press, 1988.

WILLIAMS, G and WELCH, M, 'A microcomputing timeline', Byte, September 1985, pp198-208.

WILLIAMS, R, Culture and Society 1880-1950, Harmondsworth, Penguin, 1958.

WILLIAMS, R, The Country and the City, London, Chatto & Windus, 1973.

WILLIAMS, R, Television, Technology and Cultural Form, London, Fontana, 1974.

WILLIAMS, R, Towards 2000, London, Chatto and Windus, 1983.

WILLIAMS, S, A Job to Live, Harmondsworth, Penguin, 1985.

WINNER, L, Autonomous Technology: Technics-Out-of-Control as a Theme in Political Thought, Cambridge Mass, MIT Press, 1977.

WINNER, L, 'Mythinformation in the high-tech era', IEEE Spectrum, Vol 21 No 6, 1984, pp90-96.

WINNER, L, 'Do artifacts have politics?' in D MacKenzie and J Wajcman (eds), The Social Shaping of Technology, Milton Keynes, Open University Press, 1985, pp26-37.

WINSHIP, J, "'Options' - for the way you want to live now, or a magazine for superwoman", Theory, Culture and Society, Vol 1 No 3, pp44-65.

WOOD, MACKENZIE & CO, Home Computers, London, Wood McKenzie, 1985.

WOOLGAR, S, 'Why not a sociology of machines? The case of sociology and artificial intelligence', Sociology, Vol 14, No 4, 1985, pp557-572.

WORSLEY, P, The Trumpet Shall Sound: A Study of 'Cargo' Cults in Melanesia, New York, Schocken Books, 1968.

WRIGHT, P, On Living in an Old Country, London, Verso, 1985.

YOUNG, M, 'Technology as an educational issue: why is it so difficult and why is it so important' in H Mackay, M Young and J Beynon (eds), Understanding Technology in Education, London, Falmer, 1991, pp234-243.

ZUKIN, S, 'Socio-spatial prototypes of a new organization of consumption: the role of real cultural capital', Sociology, Vol 24 No 1, 1990, pp37-56.

APPENDICES

Appendix One

Letters Used to Contact Interviewees

Department of Human Sciences
Professor Adam Kuper, Head of Department
Professor Liam Hudson

Uxbridge, Middlesex UB8 3PH
United Kingdom
Telephone Uxbridge (0895) 56461
Telex 261173 G

June 1987

Dear householder

Is there a computer in your home?

There are millions of home computers in Britain but little is known about what they are used for. We are told that computers will be an important part of the future, but what have we made of our first contacts with them? A research project based at Brunel University in Uxbridge aims to answer these questions.

As part of this project I am contacting people in this area to ask if they would be prepared to participate in this important research. Over the next few months we shall be conducting interviews with households with home computers in the Uxbridge area asking them about their experience of computers.

Whether your home computer is in constant use or if it is now gathering dust in a cupboard we would like to talk to you. We are particularly keen to meet people who have got rid of their computers. Interviews are fairly informal and generally last around an hour. Ideally we would like to interview all the people you live with, not just the computer users.

This research will only succeed with your assistance. If you are willing to take part, or would simply like to know more about the project, please return the slip below. No stamp is required. Any help you can give will greatly appreciated.

Yours faithfully



David Skinner

Please return this slip to: Mr David Skinner
Department of Human Sciences
Brunel University
FREEPOST
Uxbridge
Middx UB8 3BR

(NO STAMP REQUIRED)

I/we may be interested in taking part in your project. Please let me/us know more.

Name(s)

Address

Telephone

LEAF/6/87

Department of Human Sciences
Professor Adam Kuper, Head of Department
Professor Liam Hudson

Uxbridge, Middlesex UB8 3PH
United Kingdom
Telephone Uxbridge (0895) 56461
Telex 261173 G

Dear householder

Is there a computer in your home?

There are millions of home computers in Britain but little is known about what they are used for. We are told that computers will be an important part of the future, but what have we made of our first contacts with them? A research project based at Brunel University in Uxbridge aims to answer these questions.

Over the next few months I shall be interviewing households with home computers in this area. I would like to talk to you if you or your children own a computer. It does not matter whether your home computer is in constant use or if it is now gathering dust in a cupboard. I am particularly keen to meet people who have got rid of their computers.

This important research will only succeed with your assistance. If you are interested in taking part please return the slip below. No stamp is required. Any help you can give will be greatly appreciated.

Yours faithfully



David Skinner

Please return this slip to: Mr David Skinner
Department of Human Sciences
Brunel University
FREEPOST
Uxbridge
Middx UB8 3BR

(NO STAMP REQUIRED)

If we may be interested in taking part in your project. Please let us know more.

Name(s)

Address

Telephone

Department of Human Sciences
Professor Adam Kuper, Head of Department
Professor Liam Hudson

Uxbridge, Middlesex UB8 3PH
United Kingdom
Telephone Uxbridge (0895) 56461
Telex 261173 G

Dear householder

Have your children got a computer?

There are millions of home computers in Britain. Many of them were bought for children by their parents. What have these families made of their first contacts with computers? A research project based at Brunel University in Uxbridge aims to answer this question.

Over the next few months I shall be interviewing households with home computers in this area. I would like to talk to you if your children have a computer. It does not matter whether it is in constant use or if it is gathering dust in a cupboard. I am particularly keen to meet people who have got rid of their computers.

This important research will only succeed with your assistance. If you may be interested in taking part please return the slip below. No stamp is required. Any help you can give will be greatly appreciated.

Yours faithfully,



David Skinner

Please return this slip to:

(NO STAMP REQUIRED)

David Skinner
Department of Human Sciences
Brunel University
FREEPOST
Uxbridge
Middx UB8 3BR

I/we may be interested in taking part in your project. Please let me/us know more.

Name(s)

Address

Telephone

L/11C/87

Appendix Two

Data on Household Composition and Computer Ownership

Table One: Details of Households Interviewed

	Household Composition	Parents' Ages	Children's Ages	Adults' Occupations
F1	Mr, Mrs, S1, S2	Forties	Thirteen(11) Eleven(9)	Mr - Self-employed Mrs - Social worker
F2	Mr, Mrs, D1, D2	Thirties	Two Ten months	Mr - Self-employed Mrs - Clerical
F3	Mr, Mrs, S1, S2	Fifties	Twenty(15) Eighteen(12)	Mr - Administrator Mrs - Social worker S2 - Shop worker
F4	Mr, Mrs	Sixties(Mr) Fifties(Mrs)		Mr - Semi-retired ex-Chairman
F5	Mr, Mrs	Forties	Nineteen(14) Seventeen(12)	Mr - Designer Mrs - Teacher
F6	Mr, Mrs, S1, S2, D, S3	Forties	Nineteen(14) Eighteen(13) Sixteen(11) Fourteen(9)	Mr - Supervisor S1 - Shop worker S2 - Shop worker
F7	Mr, Mrs, D	Forties	Twelve(8)	Mr - FE Lecturer Mrs - Clerical
F8	Mr, Mrs, D1, D2	Forties Twelve(7)	Seventeen(12)	Mr - TV Cameraman Mrs - Social worker
F9	Mr, Mrs	Thirties	Three One	Mr - Roofing contractor
F10	Mr, Mrs, S	Thirties	One	Mr - Technical author
F11	Mr, Mrs, S	Twenties	One	Mr - Self-employed architect Mrs - Clerical
F12	Mr, Mrs, S, D	Thirties	Three(1) One	Mr - Doctor
F13	Mr, Mrs, S, D	Forties	Sixteen(11) Fourteen(9)	Mr - Self-employed Mrs - Teacher
F14	Mr, S, D	Forties	Eighteen(14) Fifteen(10)	Mr - Wine merchant S - Shop worker
F15	Mr, Mrs, D, S	Fifties	Sixteen(14)	Mr - Computer manager

Table One: Details of Households Interviewed (Continued)

Household Composition	Parents' Ages	Children's Ages	Adults' Occupations
F16 Mr, Mrs, S1, S2	Thirties	Eleven(9) Eight(5)	Mr - Teacher Mrs - School nurse
F17 Mr, Mrs	Fifties		Mr - Manager of small engineering firm
F18 Mr, Mrs, D	Thirties	Six(2)	Mr - Computer manager
F19 Mr	Thirties		Mr - Education administrator
F20 Mr, Mrs, D1, D2	Forties	Eighteen(13) Seventeen(12)	Mr - Estimator Mrs - Clerical
F21 Mr, Mrs, S, D	Thirties	Thirteen(13) Ten(10)	Mr - Foreman Mrs - Clerical
F22 Mr	Thirties		Transport manager
F23 Mr, Mrs, S1, S2, D	Thirties	Ten(10) Seven(7) Two(2)	Mr - Youth worker
F24 Mr, Mrs, S, D	Forties	Twenty One(16) Sixteen(11)	Mr - Fitter Mrs - Diner lady S - Computer operator
F25 Mr, Mrs, S1, S2, D	Forties	Sixteen(12) Fourteen(10) Eleven(7)	Mr - Supervisor Mrs - Shop worker
F26 Mr, Mrs	Sixties		Mr - Retired statistician
F27 Mr, Mrs, D, S	Thirties	Six(2) Three	Mr - Programmer Mrs - Clerical

Notes

Household composition: This is the make up of the household at the time of interview. In some cases children have left home during the period of computer ownership.

Children's ages: The figures in brackets are the ages of children at the time of initial computer purchase. Those without brackets were not born at the time of purchase.

Occupations: Where no occupation is given for adult women this is because they are currently full time housewives.

Table Two: Data on Computer Ownership in Households Interviewed

	Year First Micro	No of Micros Now/Ever	Machines Owned (Current Micros First)	Peripherals
F1	1985	One	Amstrad CPC 664	D/D
F2	1982	One/Two	Commodore 128 Commodore 64	Printer
F3	1983	Three	Sinclair ZX81 BBC B Commodore 64	D/D, printer D/D, modem
F4	1984	Two/Three	Apricot PC Apricot PC Commodore 64	Hard-Disc, printer Hard-Disc
F5	1982	One	BBC B	
F6	1982	Three	BBC B Atari 800 XL Commodore 64	
F7	1983	Two	BBC B Sinclair Spectrum	D/D, printer
F8	1982	One	Dragon	D/D, printer
F9	1982	One/Two	Amstrad PC Sinclair Spectrum	D/D, printer, modem
F10	1986	One	Amstard PC	D/D, printer
F11	1981	One/Nine	Amstrad PC Sinclair ZX81 Sinclair Spectrum Sinclair QL BBC B Commodore 64 Dragon Memtec 512	D/D, printer
F12	1986	One	PC	D/D, printer
F13	1983	One	BBC B	Hard-Disc, printer
F14	1982	Six	Commodore Amiga Commodore 64 Commodore Vic 20 Sinclair Spectrum Sinclair Spectrum 128 Atari ST	D/D D/D
F15	1985	One	Acorn Electron	
F16	1985	One	Sinclair Spectrum	

Table Two: Data on Computer Ownership in Households Interviewed
(Continued)

F17	1983	One	Sinclair Spectrum	D/D, printer Microdrives
F18	1984	One	TI 9940	
F19	1983	One	Acorn Electron	
F20	1983	One	Commodore 64	Printer
F21	1987	One	Sinclair Spectrum 128	
F22	1984	One	Sinclair QL	Microdrives
F23	1987	One	Acorn Electron	
F24	1982	One/Two	Commodore 64 Commodore 64	
F25	1983	One/Two	BBC Master BBC B	D/D, printer
F26	1983	One/two	Sinclair ZX80 Sinclair Spectrum Plus	
F27	1983	One	Acorn Electron	

Notes

Machines owned: This is a list of all machines owned by members of the household. In cases where some machines are no longer owned the current machines are listed first. There are a number of ambiguities about what to list here. For example, both Mr F27 and Mrs F8 borrow portable PCs from work to use at home.

Peripherals: This notes whether people own disc-drives (D/D), printers or modems. Other pieces of common equipment such as monitors, cassette players or joy-sticks are not registered.

Appendix Three

Examples of Early Interview Schedules

Pilot Interview Schedule

Background

Household size.

Age, sex, occupations and education of members.

Ownership of other consumer electronics.

Buying a Home Computer

Types of machine and services used.

A history of purchases.

Who bought the computer?

Who did they buy it for?

Why did they buy it? (Children's future, own job prospects?)

What did they expect?

The spread of home computing. Did you know friend/neighbour with a computer. Who did you go to for advice?

The Experience of Home Computing

Contacts with computers outside of the home - at school, work, friends. Both before and after purchase.

History of home computer usage.

Who uses/used the home computer.

How much time do members of the household spend using the machine?

What activities, if any, have it replaced?

What is the home computer used for?

Did you try any of the following uses

- helping to run the home
- education
- teaching yourself programming?

Place in dynamic of home life

Is the home computer a source of conflict.

- Over TV use?
- Fighting over who will use the machine?
- An impediment to children's homework?

Looking Back

What do you think of the home computer?

Do you think it is a good product easy to understand did you receive good service?

How do feel about Sinclair/Sugar/BBC Micro Project?

Has the home computer helped parents at work or enhanced their job prospects?

Has the home computer helped children's educational and/or job prospects?

How has owning a home computer altered ideas about computers?

Computers and the Future

o you think it is important to know about computers?

How might computers change the way that we live?

Working from home?

Helping around the house?

Do you think computers are important for the future of this country?

Failure (If people no longer use their computer or express disappointment with it)

Why do you think this is?

Who do you blame? - the machine - yourself - your children

Appendix Four

List of Taped Interviews

Early Contacts

- 1) Interview with C1 a middle aged computer enthusiast and co-founder of Club B.
- 2) Interview with a group of teenage computer users who run a computer fanzine.
- 3) Interview with middle aged computer enthusiast active in early computer clubs.
- 4) Interview with C4 a pensioner who attended Club C.
- 5) Interview with C5 a teenager who used to attend Club A.
- 6) Interview with C6 a teenager who used to attend Club A.
- 7) Interview with C7 a teenager who used to attend Club A.
- 8) Interview with C8 a teenager who attended Club C.
- 9) Interview with C9 a teenager who used to attend Club A.

Household Interviews

- 10) Interview with Mr and Mrs F1.
- 11) Interview with S1 and S2 F1.
- 12) Interview with Mr F2.
- 13) Interview with Mr F3.
- 14) Interview with Mrs F3.
- 15) Interview with S2 F3.
- 16) Interview with Mr F4.
- 17) Interview with Mr, Mrs and D2 F5.
- 18) Interview with S2 F6.
- 19) Interview with Mr F7.
- 20) Interview with D F7.
- 21) Interview with Mrs F7.
- 22) Interview with D F8.
- 23) Interview with Mr F9.
- 24) Interview with Mrs F9.
- 25) Interview with Mr F10.
- 26) Interview with Mr F11.

- 27) Interview with Mrs F11.
- 28) Interview with Mr F12*.
- 29) Interview with Mrs F13.
- 30) Interview with Mr, S, D F14.
- 31) Interview with Mr, Mrs, D F15.
- 32) Interview with S1, S2 F16.
- 33) Interview with Mr F16.
- 34) Interview with Mr F17.
- 35) Interview with Mr F18*.
- 36) Interview with Mr F19.
- 37) Interview with Mr, Mrs and D2 F20.
- 38) Interview with Mr, Mrs, S, D F21.
- 39) Interview with Mr F22.
- 40) Interview with Mr, Mrs, S1 F23.
- 41) Interview with Mr, Mrs, S, D F24.
- 42) Interview with Mr F25.
- 43) Interview with Mr F26*.
- 44) Interview with Mr and Mrs F27.

* In these three cases adult women were present for all or part of the interview but only made an occasional contribution.