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The mobile telephone: The transportation of social relationships

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The Mobile Telephone: The Transportation of Social Relationships.

**K. C. Staples
Faculty of Arts (Media)
1996**

Abstract

In the studies of contemporary electronic media artifacts and their effects on society, television, satellites, and computers have been extensively investigated and their various impacts well documented. With regards to telecommunication technologies, academic scholarship is somewhat less, with most comment being restricted to either historic evolution, or technical description. Exceptions to this are, Marvin's reference to the telephone in her publication, *When Old Technologies Were New: Thinking About Electronic Communication in the Late Nineteenth Century* (1988), and Umble's *The Amish and the telephone: resistance and reconstruction* (1992). Both of these publications are used for supporting arguments in my thesis investigating the societal and cultural effects associated with the use of the mobile telephone. I have selected this subject for my thesis, as I can find no previous significant scholarship relating to this particular field, and my research will redress this imbalance.

In my thesis I present a contextual overview of the mobile telephone dealing with its historical evolution and technological change, and how its convergence with other technologies is reshaping future expectations in personal electronic communication strategies. Also within the overview I look at what conditions determine the access to becoming a mobile telephone user, the service expectations of the users against what is provided by the service suppliers, and how the service suppliers' advertising strategies are driving a burgeoning market in mobile communications.

The main thrust of my research is contained within arguments concerning the three major research questions. My primary focus is on the relationships between place, time, and space with the mobile telephone. In past research, Meyrowitz (1985) and Giddens (1990) and (1991) have categorically stated that place is no longer important, as electronic media have permeated the confines of encapsulated areas, and transported social relationships away from the necessity for face to face interaction. I argue that the mobile telephone has re-instated the importance of place by its capacity to intrude into any place, at the will of its user, invading personal privacy of non-users within both private and public arenas. Further I argue that place is assuming importance through its exposure to environmental degradation, with the building of transmission towers to supply the mobile telephone service.

My secondary focus is on how the mobile telephone is affecting the workplace. To investigate this problem I have researched the phenomenon of telecommuting, and used the findings as a base for my investigations into the mobile office. Many of the problems relate to control, where extreme difficulties arise for authorities to manage effectively their charges when determining workers' welfare, health regulations, and supervisory duties. In the case of the employees, the freedom from direct supervision, and the flexibility to organise work times to suit their personal requirements are stated advantages. The growth of mobile office working has the potential to change the traditional values of encapsulated workplaces, and as such will

require different rules and strategies to be negotiated between employers and employees to adequately safeguard each others' interests.

Prior to my final major focus, the mobile telephone and "monopolies of knowledge" (Innis, 1949, p.5), I look at technological convergence, and change. I examine the convergence of media technologies to show that the phenomenon is not new, but historically, a driving force behind the development of new communication systems. In the section titled 'change', I document how the mobile telephone has been accepted into many different societies and sub-cultures, bringing change to their communication habits and expectations. The sections on technological convergence, and change lead my research into the final major focus, where I examine the link between the mobile telephone and the creation of new "monopolies of knowledge" (*ibid*), forming elite groups or sub-cultures which weaken the structure of community-based societies. To underpin my research focus I have used Umble (1992) to illustrate what happens when a new technology is introduced into a community-based lifestyle, creating elite groups or sub-cultures, which then challenge the basic values which support that community.

Finally, in seeking information for my thesis I conducted a survey of 100 households, where I sought replies from both mobile telephone users and non-users. The response to my survey was better than most returns predicted in the literature which I read describing strategies for mail surveys. However, due to my research being original in its field, my questions were

general for the thesis subject matter, and so did not supply an abundance of information which could be used within the narrowed structure of the research questions. Nevertheless the aggregated results are included in the appendices of this thesis.

Declaration

"I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or a diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text."

Signature_____

Date 8 . 1 . 97

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

The Mobile Telephone: The Transportation of Social Relationships.

By

Kenneth C. Staples, B. Arts (Psych), Grad. Cert. Bus. (Asian)

**A Thesis Submitted in Partial Fulfillment of the
Requirements for the Award of**

Master of Arts

at the School of Media Studies, Edith Cowan University

Date of Submission: June 1996

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Glossary of Terms

<u>Term</u>	<u>Definition</u>
Automatic Call Forwarding	The facility for a call to be passed on to another telephone without the aid of a telephone operator
Analogue	A term denoting a technology for the transmission of information based on the modulation of electrical pulses
Cellular System	A radio telecommunications system where an area is divided into transmission zones or 'cells', and each cell is served exclusively by its own low power transmitter. Calls can be passed between cells for mobile use which allows for the same frequency to be re-used in different cells simultaneously.
Demodulation	The restoration of a transmission mode to its original format
Digital	A term denoting a technology for the transmission of information based on the encoding of the information into a binary digital form, which after reception has to be decoded in order for it to become humanly intelligible
Frequency Scanning	The monitoring of radio frequencies, generally audibly, for the purposes of listening-in
LEOS	Low Earth Orbiting Satellites which will be placed at lower orbiting heights than conventional satellites, enabling them to consume less power, so making them cheaper to build and operate.
Modulation	The changing of one transmission mode to another

Multi-location Ringing

The facility for a call to be signaled simultaneously in multiple locations holding different telephone numbers

Personal Communication Service

This is a future communication device which will be hand-held, and be able to act as a normal telephone, a cordless telephone, a mobile telephone, and a pager. It will also only require the one telephone number to cover all facilities.

Wireless Spectrum

A range of radio frequencies which are allocated to a specific use

Preface

My selection of the mobile telephone as a subject for my thesis is not completely without prior knowledge. I was employed in the telecommunications industry for thirty-three years, working for both government and private concerns. The last eighteen years of my career was spent in Hong Kong where I first saw the mobile telephone. It was a bulky instrument with approximate dimensions of 400mm x 150mm x 150mm, weighing approximately 1.5kg, which was supported by a strap and carried over the shoulder. Initially the very rich were the only subscribers, and the possession of a mobile telephone was definitely a sign of wealth and status. The first instance of the mobile telephone's intrusiveness came to my notice quite quickly, when the golf club of which I was a member, banned them from the premises, and instructed members that if they brought a mobile telephone to the club they should leave it in their car.

It was some time later, when doing the coursework in preparation for writing this thesis, that communications and privacy were discussed. This led my thoughts to the British Royal Family's unfortunate experiences with mobile telephones, and rekindled the memory of the banning of mobile telephones from premises of the Royal Hong Kong Golf Club. I consulted Dr. Brian Shoesmith my lecturer, and outlined my idea to use the mobile telephone as the subject for my thesis. Dr. Shoesmith gave me encouragement to pursue this research saying that my background in telecommunications coupled with

my university studies in media presented a good level of expertise to take on this project.

In my ensuing research, I have found that the mobile telephone has already changed people's lives, and that the prognosis for the future of communications is very much tied in with the conquest of mobility. This will ultimately create the situation where everybody communicationally will have 'no place to hide'. Under these circumstances I consider my research as being important, and hope that it will generate further research within this field.

I would like to thank my supervisor Dr. Brian Shoesmith for all his advice and assistance, as without his encouragement I would probably have researched another area of less importance. Also I wish to thank Professor John Hartley for filling the supervisory position when Dr. Shoesmith was unavoidably away, and the librarians at the Edith Cowan University for their help. Finally my thanks to my wife Agnes, Paul Halfpenny, Post-graduate Resources Officer, and Ann, and Dennis, fellow Masters students, for engaging in stimulating discourse when I ran out of ideas.

Chapter One:

Introduction to the Thesis: The Problem, the Methodology, and Parameters for its Investigation

Introduction

Most communication technologies have been thoroughly investigated, and their various impacts on the world's populations have been well documented, but this is not the case with the mobile telephone technology. The low level of research and information available on the mobile telephone in comparison with other technologies such as computers and satellites, suggests that its level of importance with regards to its societal and cultural influence has been normalised. My research redresses this imbalance.

I regard the mobile telephone as a signpost to the future in communication strategies, where, communicational access will not be confined to particular sites, but ultimately will be available everywhere. Recently the former Australian Minister for Communications Mr. Michael Lee who was reported as saying,

Most Australians will never be beyond the reach of a telephone wherever they are. With the steady spread of digital exchanges through city and rural areas, the 'phone call that finds you at work, home or the beach will become a reality through the personal communications system (PCS). Your 'phone number will follow you all around Australia. It will behave like a cordless phone at home or in the office and like a mobile when your (sic) wandering. (Cribb, 1995, p.2).

It is also possible that in the future the mobile telephone will be superseded by some other technology enhancing the scope of mobile communications,

and that this may serve to attract a greater body of scholarly research into the technology's societal and cultural impact. In these circumstances I see my research as being highly significant in setting a base for future research, not only for the mobile telephone, but also for future technologies advancing this field.

Although in service since 1945 in the United States of America, the mobile telephone in its present form is one of the most recent technologies to be brought into widespread use. Lightweight construction together with miniaturised electronic circuitry makes the contemporary mobile telephone an easy to carry, easy to use, global-wide communication device. With all its promoted advantages, extending from its ability to make users communicationally available almost everywhere, it is also an instrument of intrusion. Indiscriminate use of the mobile telephone can result in the contraction of personal space in public areas, and delimit the geographical barriers to personal privacy.

The introduction of digital transmission as a mobile telephone delivery system, presents further intrusion problems. Digital technology in the mobile telephone incorporates a facility called 'seamless roaming', which allows the device to be used internationally on an unrestricted basis. This means that the mobile telephone can transcend national boundaries, which increases the chance of cultural, economic, security, and personal trespass through the difficulty of censoring transmitted data content from an unlocatable source.

With digital technology also being used for the operation of computers and all other modern forms of data transmission media, the latest models of mobile telephones can be used as transmission carriers for data emanating from laptop computers, portable FAX machines, and portable printers. This facility allows the mobile telephone to be used as a channel for the transmission, reception, and dissemination of all kinds of electronic information from anywhere and at any time, which maximises its intrusive value.

In this thesis, I consider the contemporary mobile telephone both in isolation, and in conjunction with parallel media technologies, arguing that convergence has brought a major change to the field of communications. This change has established that dedicated encapsulated environments are no longer a prerequisite for telecommunicational contact between persons. Some of the possible outcomes of this change will be researched and discussed as the subject material of my thesis.

In this chapter I will be addressing the following criteria:

- (a) explaining the significance and purpose for the need to carry out this research
- (b) present the research questions
- (c) the theoretical framework for the study
- (d) a description of the instrument and methodology for the data collection

(e) the delimitations and limitations which may affect the outcome of the research.

Significance of the Study

The most important role of this study is to address the paucity of research relating to the introduction of the mobile telephone and its impact on society. The indications are that, as a stand-alone technology, and through convergences with other technologies, the mobile telephone can bring significant changes to both the public and private social arenas, and to the workplace. The technological progress which has been made in increasing the operational efficiency of the mobile telephone has also escalated the potential problems, but little public debate has been initiated to address these issues. It is also significant that the use of digital technology as a transmission medium has now converged the mobile telephone with all other important media technologies, and as such increases the opportunity for the centralised surveillance and storage of personal data from all communication sources.

Purpose of the Study

It is expected that on completion of this research project the following issues will be brought to the foreground:

- significant factors relating to the possible infringement of personal privacy, both of users and non-users of the mobile telephone:
- the possibilities of trespass in existing norms of social interaction in public places:

- the viability of using the mobile telephone to create the mobile workplace, and the associated problems of supervising regulations which may be implemented to ensure the good health, safety, and the non-exploitation of the persons working in that environment:
- the level of security of information transmitted by the mobile telephone:
- the empowerment of threatened and disadvantaged persons being able to increase their level of personal security through their use of the mobile telephone.

The exposition of the research, and its resultant conclusions and recommendations, is aimed to elicit public response and to generate public debate. This public debate will hopefully influence the future implementation of mobile communication technologies, and any consequent legislation which may be enacted.

Research Questions

The research questions will address particular selected criteria, and will be constrained within a design which will allow them to be properly discussed within the size limit of this thesis.

The first issue to be formulated into a question will deal with the transportation of social relations across the spans of time and space as a singular unit, through use of the mobile telephone. This will be considered through the application of Anthony Giddens' "disembedding" theory , "the 'lifting out' of social relations from local contexts of interaction and their

restructuring across indefinite spans of time-space" (*Giddens, 1990, p.21*). The question will also address the "disembedding" criterion to synonymously include the potentially uninhibited re-location of 'place', as can be exercised by the use of the mobile telephone.

My primary research focus then is:

- how does the use of the mobile telephone, with its ability to constantly relocate 'place', affect the "restructuring" of transported "social relations...across indefinite spans of time-space"? (*Giddens, 1990, p.21*)

Next I will examine the phenomenon of media technology convergence, and how the mobile telephone as part of this phenomenon impacts on current workplace practices. The convergence of the mobile telephone as a communication channel with other portable media technologies has resulted in the concept of the 'mobile office'.

This leads to my second research focus of:

- The new unconstrained working environment which breaks free from the traditional highly regulated encapsulated workplace, and as such presents problems in the reduction of influence of trade unions, health authorities, and supervisory controls presently charged with the responsibility of formulating and policing existing set conditions.

The rapid spread of mobile telephone usage throughout the globe has infiltrated many different groups of people. Manufacturers have continued to

change both technical and aesthetic specifications of the mobile telephone, backed by a high level of advertising, in order to capture as large a market segment as possible. These strategies are based on the prospects of a change in public telecommunication culture from a static encapsulated form with limited access, to a mobile open form with unlimited access.

Within this changing concept in personal communication is my third research focus which aims:

- To look at the way in which the mobile telephone challenges established "monopolies of knowledge" (*Innis, 1949, P.5*), to create new ones, and thereby change social structures and cultures.

To illustrate this phenomenon, I will use a case study involving the impact of the telephone on an Amish community in (*Umble, 1992*).

Arising from the three principle research questions are a number of other issues that are significant in their own right, but are incidental to my primary focus. Two secondary questions in particular inform my research, namely;

- Will controls be introduced to restrict unsociable usage in public areas, and if so, in what form?
- Can the mobile telephone empower persons who in other circumstances would be reliant on other social infrastructures?

Theoretical Framework

The theoretical framework of this thesis will engage theories from more than one source. The first research question will use Anthony Giddens'

'disembedding' theory as a basis for the argument concerning the transportation of, "social relations from local contexts of interaction and their restructuring across indefinite spans of time-space" (Giddens, 1990, p.21) by use of the mobile telephone. Within this research I will consider the mobile telephone as a "disembedding mechanism" (1990, p.22), and as one of the expert systems, [meaning] "systems of technical accomplishment or professional expertise that organise large areas of the material and social environments in which we live today" (1990 p.27).

Anthony Giddens' 'disembedding' theory combines the elements of time and space into a singular unit, 'time-space'. I consider that this is an important factor in addressing electronic communication devices like the mobile telephone, where the immediacy of the transmitted data contracts both time and space together into infinitesimal humanly recognised values. Within this research, the inclusion of the theoretical factors of time, space and place, in relationship to the study of the mobile telephone and its social impact, is essential. Anthony Giddens, as one of the foremost contemporary exponents in his field has placed time and space at the very core of his research into social theory, where he argues that, "excluding time and space from social analysis, or privileging a *priori*, one above the other, seriously distorts our understanding of the way social reality is constituted" (Cassell, 1993, p.17).

In the case of place, or locale, the operator of the mobile telephone can choose this at will. Its importance can be understood once again in Giddens' reasoning, where he says that,

"'locales' enter into the very fabric of interaction in a multiplicity of ways. They figure in the normative basis of action, implicit rules cover what one might do and not do in a given place; and they serve as a source of meaning, aspects of the setting are routinely incorporated, usually implicitly in conversation".
(Cassell, 1993, P.19.).

Anthony Giddens' 'disembedding' theory will be applied rigorously to my primary research focus.

Giddens also theorises on 'locales' in their relationship to power, citing cities and nation-states as, "'locales' where power is generated and concentrated. These 'power containers' permit an organisation, such as a state administrative apparatus, to maintain the capacity to control subordinates who are far away", (Cassell, 1993, p.20). The mobile telephone, and its convergence with other media technologies, may challenge this relationship of concentrated power and dependent subordinates, in providing answers to my research focus relating to the dismantling of the centralised workplace, and the subsidiary question addressing the possible empowerment of disadvantaged persons.

Also Harold Innis' work on 'centres and margins', relating to the centralisation of economic and communicative power of the colonial system, and its relationship to its dependent margins will be included in the

theoretical framework. Using this application, a researcher can assess whether the mobile telephone has a role to play in the transfer of power relationships away from the centres, and into the control of the margins. However, Innis' theory may be problematic when applied to modern mobile communication values, as it was formulated when communication systems were mainly static and relatively slow in transmission speed. Today's systems produce a global communication immediacy, which reduces time-space coordinates to negligible values, and so eradicates distance as a form of restriction.

For my analysis of the impact of telephones within a closed community, I will refer to Harold Innis' theory of communications, *The Press: A Neglected Factor in the Economic History of the Twentieth Century* (1949). Innis states unequivocally

that civilisation has been dominated at different stages by various media of communication such as clay, papyrus, parchment, and paper produced first from rags and then from wood. Each medium has its significance for the type of monopoly of knowledge which will be built and which will destroy the conditions suited to creative thought and be displaced by a new medium with its peculiar type of *monopoly of knowledge*, [emphasis added] (Innis, 1949, p.5).

The implication of Innis' theory is that successive new media will continuously override, or destroy the conditions for creative thought. I interpret this as, new media bringing new or different ideas which will encourage change. To illustrate my interpretation, I will examine Dianne Umble's "The Amish and the telephone: Resistance and reconstruction"

(Umble 1992), as an exemplary case of new media artifacts introduced to non-technological societies, creating new *monopolies of knowledge*.

Umble's paper describes the difficulties which the oldest Amish settlement in North America faced when their culture was challenged by the infiltration of the telephone into their communal way of life. After a complete ban on the ownership of telephones, the society allowed a form of restricted access through community telephones, and later the inclusion of telephones in business premises. Umble saw this as a "negotiated solution" (Umble, 1992, p.191). I see it as a change to the Amish social structure, brought about by the formation of new *monopolies of knowledge* within the membership of their own community, but created by an artifact introduced by people from outside the Amish community.

The possibilities of personal surveillance being carried out through the digitalisation of the mobile telephone network can be said to be theoretically addressed by Giddens. In his text, *A Contemporary Critique of Historical Materialism*, he talks of "the retention and control of information and knowledge" (Giddens, 1981, p.94), "which is identified as providing the basis for surveillance...which encompasses the idea, that coded information can be used as a resource in the supervision of subordinates and collectives, even when the subordinate authority is distant in time-space" (Cassell, 1993, p.21). A secondary reference may be used to support this theory in James Beniger's text, *The Control Revolution: Technological and Economic Origins of the Information Society* (1986), which pursues the theory that some

aspects of technological progress are innovated in order to control imbalances in the social structure shaped by the introduction of previous technologies. This text links the "importance of information technology; the parallel growth of an information economy and its control by business and the state; [and] the organisational basis of this control, and its implications for social structure" (*Beniger, 1986, p.436*).

Data Collection Instrument, Methodology, and Returns

The data collection instrument is a questionnaire which was designed to maximise its use by making it dual purpose (see Appendices 1, and 2). The information which I collected was from two sources, mobile telephone users, and non-users. Because of this, the form was constructed as a two sided questionnaire with side 1 applicable to mobile telephone users (see Appendix 1), and side 2 applicable to non-users (see Appendix 2). This ensured that the questionnaire was appropriate to any household to which it was delivered. Enclosed with the questionnaire was a letter (see Appendix 3) explaining who I am, and why I require the information. It also stated that all participants will remain anonymous, and that the individual information they may give will be confidential only to myself, and if required, to the adjudicators of my thesis.

The questionnaire was distributed randomly in a selected area within the northern suburbs of Perth, Western Australia. In order that the data collection method had a good chance of returning information from an adequate number of mobile telephone users, the distribution strategy

targeted an area which showed signs of opulence. The area, North Shore, Kallaroo, was selected on the basis of the types of dwellings, in which their size and construction suggested that the residents were probably in a financial position to be able to afford the cost of purchasing and operating a mobile telephone. The questionnaires were distributed randomly, odd and even house numbers alternately, five per street first come first served, with the street names selected alphabetically, in a format similar to A first, Z second, B third, Y fourth etc. until all of the 100 questionnaires had been delivered.

The return of the completed questionnaires was made by the participants' use of an enclosed stamped addressed envelope. It was hoped that the presentation of the questionnaire and the accompanying letter indicating my dedication to this project, along with the no cost to the participant for making a return, would generate a good response. This strategy modeled the suggestions of Raj, "a post-paid envelope is enclosed, confidentiality of returns is assured, or an appeal is made explaining the purpose of the survey and the importance of the enquiry" (*Raj, 1972, p.117*). My number of returns in comparison to the previously stated expectations "that a typical return rate for a mail survey is around thirty percent" (*Shaughnessy & Zechmeister, 1990, p.90*), was good.

• Total Forms Distributed	100
• Total Number of Forms Returned	57
• Total Number of Returns from Users	33

Note: Double-sided forms used, hence a total of 67 returns for 57 forms returned

The returned information from the questionnaires has been collated and presented in Appendices 4, 5, 6, and 7. Any significant outcomes from the analysed information appertaining to the research and/or subsidiary questions will be identified and discussed within their appropriate chapters. Other findings considered important, but which apply to matters outside the designated parameters of this thesis, will be commented on within the thesis conclusions discussed in the final chapter.

Delimitations and Limitations of the Study

The delimitations set for this thesis mostly relate to controlling the size of the research to enable the work to be completed in the specified time-frame. The first delimitation is the restriction of the subject content addressed within the research and subsidiary questions. There are potential problem areas such as the effects of advertising strategies, and alleged health risks, which will not be addressed by the questions to be researched. This can be seen as a flaw in the research design when the research is intended to produce final results. However, because of the lack of previous work carried out within this field, a major thrust of this study is to promote ongoing research, and therefore at this stage I do not regard the delimited research areas as detrimental to the outcome of this particular project.

Another area of the research where delimitations will be set is in the design and dissemination of the data collection process. It is intended to collect information by the random distribution of questionnaires within a specified residential area. The questionnaires have been designed to cater for both users, and non-users of mobile telephones. This design is to maximise the number of completed returns, by making the questionnaire applicable to all recipients. It is understood that this design of a singular questionnaire being used for a dual purpose will limit the space available, and hence reduce the number of questions. This may also be an advantage, as a less taxing questionnaire might attract a better response in completed returns.

The restriction imposed by the selection of a particular residential area in which to distribute the questionnaires could appear as a delimitation on the research, by rendering the sample as not being truly representative of the whole user and non-user populations. Taking into consideration the specified time-frame of the research project, it was considered necessary that the distribution of the questionnaires need to have a reasonable chance to produce a meaningful number of responses from mobile telephone users. The only possibility seen to achieve this was to poll an area where the residents are economically positioned to afford the costs relating to the purchase and usage of a mobile telephone.

Another delimitation in the data collection process is the size of the poll, in which the sample limit was set at a maximum of 100 residences. The sample size was determined by the available finance of a \$100 Masters' research

allowance, which covered the expenditure for the preparation, distribution and collection of the questionnaires. Also a time estimate of two weeks work to produce the questionnaire, collate the information, and produce the results, based on an assumption of a 50% return of correctly administered questionnaires.

Other limitations liable to influence the study may arise through circumstances outside of the control of the researcher. At this stage it is not possible to foresee exactly what limitations will be imposed, or what the magnitude of their effect will be. If limitations do arise during the course of completing this thesis, then they will be identified and examined to ascertain the extent of any bias which they may cause to be reflected in the results of the study.

Chapter Two:

A Contextual Overview of the Mobile Telephone

Introduction

The purpose of this chapter is to provide an overview of the mobile telephone's perceived place within our contemporary society. Following the introductory paragraphs will be a brief history describing the evolution of the communication systems which were converged and developed to form the present day mobile telephone networks. I will also discuss the access criteria necessary to become a mobile telephone user, and demonstrate the important link between the technical development of the mobile telephone, and other technologies, in its contemporary use and future possibilities. Finally, I will address the subject of service problems for users, and the advertising techniques and strategies driving the mobile telephone marketing force.

In 1985 Duane Huff wrote an article entitled "The Magic of Cellular Radio". His opening sentences were a prediction as to what is in store for us twenty years hence. He said:

most of us regard the telephone on the dashboard, or the walkie-talkie radio in the hand as a luxury or a status symbol rather than a necessity. But a new technology called cellular radio is now emerging to make high quality, full-service mobile telephones and radio receivers much more widely available. Mobile communications...will become commonplace, and soon enough a necessity for many....Projections for the use of hand-held, portable radio-telephones based on cellular technology...are optimistic. The result is likely to be one of the greatest changes in

communications patterns since the invention of the telephone. (*Huff, 1985, p.137*)

In 1995 the hand-held/mobile telephone and cellular technology referred to by Huff has indeed resulted in great changes in communication patterns. The need to be resident in a fixed location to communicate telephonically is no longer a pre-requisite condition, "a definite place, as a component of a telephone call is now no longer certain. The telephone call as a connection of sites, as a bridge between two places where two persons exist, is being replaced by a connection of people whose space is irrelevant" (*Gumpert, 1987, p.132*). Also, with the miniaturisation of other technologies such as computers, the mobile telephone can be used as a channel to disseminate other forms of data as well as voice communication. The President of Bell Laboratories, Mr. Ian M. Ross stated that the new telecommunications technologies would make it possible "for many people to work, shop, learn, vote or be entertained...at a point most convenient to them" (*Gumpert, 1987, p.123*). These technological changes in communication hard-ware impact on user and non-user populations, and will possibly present both positive and negative outcomes when applied in particular environments. This research is directed to examine these particular environments in relationship to the use of the mobile telephone and its impact upon them, and to address the issues raised through the application of pre-determined research questions.

History

In March 1876 Alexandra Graham Bell constructed the first telephone, and during the same month, "he filed his patent claim, later to be a matter of legal dispute" (*Fischer, 1992, p.35*). One year later the Bell Telephone Company was formed which initiated "seriously marketing the device" (*Fischer, 1992*). In 1878 the Bell Telephone Company opened its first telephone exchange in New Haven which expanded the service from dedicated "two-point communications" (*Fischer, 1992*), to a service where "any subscriber could now be connected to any other" (*Fischer, 1992*).

The Bell Telephone Company's business strategy "as the exclusive builder of telephones", [was to monopolise the telephone service, by leasing instruments, and licensing] "local providers of telephone service....In this way...franchisees...used their own capital to rent telephones, string wires, build switchboards, and sell interconnections" (*Fischer, 1992, p.35*). Within two years of the telephone being invented the Bell Telephone Company had about 10,000 instruments installed throughout America, but the thriving business attracted competition from Western Union, the main telegraph operating company. Western Union was sued by the Bell Telephone Company for the infringement of patent rights and a settlement was agreed on in late 1879 which saw Western Union concede all telephone service patent rights and instruments, and Bell Telephone Company renouncing all rights to the telegraph service. The resolution to the dispute boosted Bell's subscriber's base to around 60,000 throughout the country, and gave them a monopoly in America's telephone business. "Bell's American patents expired

in 1893, and 1894. Within a decade literally thousands of new telephone ventures emerged across the United States" (*Fischer, 1992, p.42-43*).

The invention of radio in 1899 brought a new spectrum into the mass media. "In 1920 the United States Department of Commerce licensed the first radio station KDKA of Pittsburgh" (*Beniger, 1986, p.364*), and by 1922, around 60,000 American households had radio receivers. The number of licensed radio stations grew to over 800 by the end of the 1930s, with 27.5 million (79.5 percent) American householders owning radio receivers. "Unlike newspapers and magazines, [radio] could reach people engaged in any kind of waking activity....Because it carried the human voice, broadcasting could seem more interpersonal, more intimate, more pervasive than other forms of mass communication" (*Beniger, 1986, p.367-368*).

Although radio was mostly used as a one-way reception technology in its broadcast form, the desirability for mass two-way radio communications developed alongside the potential market of communicating with moving environments. "The first major use of this potential...was employed to communicate with moving vessels at sea for navigation and safety" (*Huff, 1985, p.141*). Later radio technology became completely mobile when its use was extended to land vehicles, and airplanes.

In the United States of America after World War II, the growth of the economy established the automobile as a public icon, and brought it within the financial reach of much of the population, when "by 1951...saturation of

households exceeded 95 percent" (*Beniger, 1986, p.367*). The popularity of the automobile extended people's control over time, space, and distance, but it also restricted interpersonal communication for people while being incarcerated inside the shell of their automobile. The need to communicate while enjoying the advantages of the automobile, created a demand for a public mobile telephone system. This "demand for public mobile telephone service induced the Bell System [in 1945] to test-market the service in St. Louis" (*Huff, 1985, p.141*).

The market test showed up several technical problems, one of which, cross channel interference, resulted in a fifty per cent reduction in the number of radio frequencies which were able to be used. However, this did not deter the Bell Telephone Company's efforts wherein later they tested another public mobile telephone system along the highway between New York and Boston. The highway test, similar to the St. Louis test was also problematic, where erratic radio signal propagation caused reception to be blanked out in some areas, and cross-talk between overlapping radio frequencies caused "interfering conversations [to be] carried long distances" (*Huff, 1985, p.141*).

Even with the persistence of technical problems, the Bell Telephone Company continued to extend their mobile service throughout the metropolitan areas, and by the late 1940s there were long lists of would-be subscribers eagerly awaiting connection. The demand for service did not abate even with its limitations, which frequently caused difficulties in making and receiving calls during peak usage periods.

The solutions to the main technical problems inherent in the early mobile telephone system were recognised around 1947. It was not however until the early 1970s that "advances in electronic switching, low-cost frequency synthesizers, and high-capacity microprocessors stimulated the Bell System to suggest...how a cellular system might be developed and operated" (*Huff, 1985, p.142*). The new components enabled the management of the rapid changing of frequencies between a network of transmission cells, which brought into being the principle of the cellular system on which the mobile telephone networks of today are configured.

In 1978, the communications company AT&T commissioned a cellular mobile telephone service in Chicago. The system provided the first market test of this new technology. There were 136 voice channels spread across 10 cells making possible for a "full duplex service, with few busy signals, to a 2100-square mile metropolitan area" (*Huff, 1985, p.142*). A duplex service supports a two-way communication system, where a traditional radio service only allows transmission in one direction at a time. The new service was well received by its customers who cited that time saved and convenience were the main benefits. Transportation companies reported savings in reduced fuel consumption through drivers not having to return to headquarters for new orders after each job, "and a real estate executive claim[ed] a 50 per cent increase in productivity....[as] many executives said that they extended their working day by using the telephones while commuting or traveling" (*Huff, 1985, p.142*).

By 1982 the widespread use of cellular technology was underway in America. In June of that year, 196 applications from conventional telephone and radio communication companies were submitted to the Federal Communications Commission to operate cellular systems. These applications covered the top thirty telecommunications marketing areas in the USA which were also the thirty most populated cities. By 1984 all thirty licensed cellular systems were operating, and the Federal Communications Commission (FCC) "was faced with over 1000 applications to operate cellular services in the thirty-first to ninetieth cities, (the top 90 cities in the USA contain 74 percent of the US population)" (*Forester, 1987, p.118*). The FCC announced that the successful applicants would be chosen by lottery, however this situation "provoked enough alliances and deals between applicants to obviate the need for a lottery" (*Forester, 1987, p.118*). At this time the FCC had to consider a further 5200 applications for licenses to operate cellular mobile telephone systems "in the ninety-first to one-hundred-and-twentieth cities, which will come into operation in about 1995" (*Forester, 1987, p.118*). Market researchers forecast "that the 120,000 mobile phone users in the USA in 1984 would leap to over 2 million by 1989...and that there could be as many as 4.2 million by 1992. That puts the market for mobile phones on par with other consumer goods" (*Forester, 1987, p.118*).

During the 1980s the mobile telephone service concept spread throughout the world, firstly to the main industrial nations in Europe, and Japan, and then on to other smaller nations as their economic wealth grew. In 1995 the

mobile telephone service is common in most countries, even the poorer ones of the third world.

Access

The extent of population coverage per country of the mobile telephone is determined by the personal wealth level of individuals within each particular country. In other words, the mobile telephone is not a service to the public, but a service to the appropriately financed customer. To enter this technological environment is to have financial resources to purchase one's own telephone, even before connection to the service. There is no widespread rental of subscribers' equipment by the service providers, or free subscribers' instrument maintenance as with the conventional telephone service. This situation suggests that the mobile telephone service is primarily designed to cater for the business, and high income communities. As Forester's states, "the desire for personal conversation is not the main test of the prospective significance of mobile telephones. Their role in increasing business productivity is likely to be far more important than their role in casual conversations" (*Forester, 1985, p. 145*).

Technological Change

During the period of time, from the 1980s to 1995, the pace of technological change of the mobile telephone and its peripheral equipment has endeavoured to keep up with the pace of demand. One of the major changes in technology has been the introduction of the digitalised transmission concept. This new technology reduces the volume of radio

spectrum required for a single call, and hence increases the number of calls which can be handled by each individual transmission cell.

Although digital technology at present works side-by-side with the conventional analogue system, it is, however, a completely different operational system. Apart from the more economical use of the radio spectrum, the advantages of the digital system over the analogue system are cited in terms of the greater number of additional facilities which the system can offer to the connected customers. However, these operational advantages, some of which are described in the following paragraphs, are much more appropriate to the business user than the private user.

The development of miniaturised parallel technologies, and satellite communications has converged with the digitalised transmission system to extend the facilities of the mobile telephone. The digital mobile telephone can now act as a transmission device for the connection of portable computers, and FAX machines, and provide sophisticated on-line services like alphanumeric message services, and voicemail. In the future, Personal Communication Services (PCS) will be provided, where, "with PCS, a person will require only one telephone number and Optus will route any message to that number. The message will transmit [to]...the mobile network to reach the customer regardless of their location and type of terminal" (*Optus Communications, 1993, p.28*).

At this point in time the development of the mobile telephone is endeavouring to keep up with the frenetic pace of technological invention and discovery. The "burgeoning developments in the hardware of delivery systems have outpaced the formulation of public policy, and the understanding of the problems in society that those systems might create" (*Fleming, 1983, p.xii*). The proliferation of new facilities, such as automatic call forwarding according to customers' instructions, multi-location ringing, and telephone/pager linkage, which enables pager calls to be automatically connected to the mobile telephone by dialing an access number, are being offered to customers by the service providers. These extensions to the basic mobile communication service are being provided to secure customers accounts in a competitive environment, driven by an ever expanding market, where "all too often, an emphasis on technology seems to take precedence over concerns about quality, substance, and content" (*Fleming, 1983, p.xii*). The world telecommunications services market which was "worth US\$329 billion in 1985-86, almost doubled to US\$544 billion in 1990. Estimates suggest it will grow further to be worth US\$1280 billion in 1995" (*Optus Communications, 1993, p.9*.)

Convergence and the Future

It appears there will be no foreseeable let-up to the massive sales exploitation of the mobile telephone. The extension of facilities attained by converging the mobile telephone with other technologies, the most important one being the computer, has enabled it to become a contributory link for the dissemination of all types of media. In a conference on "Mobile Business

Solutions" held in Sydney during April 1995, Dr. Mark Donohoe, President of the Comprehensive Medicine Association, addressing future trends in telecommunications, stated that, "mobile computing solutions will be the primary means of information exchange by the first few years of the new millennium" (*Donohoe, 1995, p.2*). He also said that, "although exact figures are fuzzy, mobile computing seems to be growing at around 30% per year, around triple the industry standard. The crossover year, where portable devices become the dominant computing vehicle, will be around 1999" (*Donohoe, 1995*).

The future scope of the dissemination of information employing converging technologies with the mobile telephone was the subject of a presentation given at the "IIR Mobiles '95 Conference" in Sydney on the 24th February 1995. Chris Deacon, Senior Consultant, of the Strategic Development Unit Telstra delivered a paper entitled, "Mobile Satellite Services: An Update". Deacon outlined how future satellite constellations would be used to provide world-wide communications. He said that, "future Mobile Satellite Systems with hand-held capacity", [i.e. satellite systems to support the transmission of data for hand-held terminals such as mobile telephones], would be made up of, "Low Earth Orbit constellations for world-wide mobile data collection/distribution...i.e. 'Little LEOS'; [and] Low to Medium Earth Orbit constellations for world-wide voice and real-time data...i.e. 'Big LEOS'" (*Deacon, 1995, p.6*).

The future development of support technologies for the mobile telephone is clearly aimed at establishing a complete global system for the transmission and reception of all types of media to any place at any time. Joshua Meyrowitz in his book *No Sense of Place* gives the following description of the intrusiveness of the electronic media, which also applies to the mobile telephone:

Traditionally, neighbourhoods, buildings, and rooms have confined people, not only physically, but emotionally and psychologically as well. Now physically bounded spaces are less significant as information is able to flow through walls and rush across great distances. As a result *where* one is, has less and less to do with what one knows and experiences. Electronic media have altered the significance of time and space for social interaction. Certainly, physical presence and direct sensory contact remain primary forms of experience. But the social spheres defined by walls and gates are now only one type of interactional environment. The walls of the mightiest fortresses no longer define a truly segregated social setting...if a telephone is present. (Meyrowitz, 1985, p.viii).

This comment by Meyrowitz argues that the traditional barriers to unwanted communication have been breached by electronic media. However, the mobile telephone extends the intrusion, reaching outside the sphere of encapsulated environments, to places, which previous to this technology, could only be accessed communicationally by physical presence.

Service

The present day quality of service is still not without its problems in spite of the massive strides in technological achievement since the mobile telephone first came into service. At the Mobile Business Solutions Conference April 1995 in Sydney, the Deputy Ombudsman, Mr. Wally Rothwell for the Australian Telecommunications Industry Ombudsman's office said that, "mobiles comprise over 7% of our cases and we have one investigating officer dedicated to mobile matters. Obviously, as the growth of mobile services use continues unabated this percentage will grow" (Rothwell, 1995, p.3). When addressing the nature of complaints, Mr. Rothwell listed the type of complaints his office received, like, faults with telephones both analogue and digital; coverage problems with the digital networks; the remote and outlying rural analogue access; blackspots (non-reception) within serviced areas. It is interesting to note, that since 1945, when Bell Telephone Company tried out its original system in St. Louis to the present day, coverage problems are still evident, and that service providers still seem reluctant to extend the service beyond the main metropolitan areas. Other complaints received by the TIO are, suspect practices by sales representatives to procure customers; concerns about the disbandment of the analogue network and customers' forced migration to the digital network; and environmental complaints in relation to the erection and placement of mobile transmission towers (Rothwell, 1995). Rothwell's comments indicate the problems affecting both the mobile telephone user, and non-user populations, and gives weight to my reasons for conducting this research.

The environmental issue was recently raised in the City of Wanneroo Western Australia, where Optus, a mobile telephone service provider in Australia, plans to erect a series of transmission towers along a part of the city's coastline. The residents in the affected area raised objections to the City Council. A councillor who "believes the height [of the towers] is excessive, [also said that she] was shocked...to hear...that these towers may be needed every three to five kilometres...[and that it is] outrageous. Our skyline up the coast could be nothing more than these telecommunication towers" (*Wanneroo Times*, 1995a, p.5).

The City Council passed the Optus plan with four conditions which included upgrading the landscape, and painting the towers with graffiti resistant paint. The other two conditions were about letting other carriers use the towers. It does not appear that the residents of Wanneroo, or the City Council had any significant input into the matter, as the Wanneroo City Planner Mr. Oscar Drescher said, "under the Telecommunications Act, Optus activities were exempt and did not require approvals under the Town Planning and Development Act, or the Local Government Act, nor any other state or local law or regulation" (*Wanneroo Times*, 1995a, p.5).

Another aspect in the quality of service of mobile telephones is security. Recent highly publicised incidents regarding the interception of calls on mobile telephones, like those concerning the British royal family, where a "Mr. Reenan...[was] electronic[ally] eavesdropping in the hope of picking up

something interesting...[on] calls made on mobile telephones,...heard a...telephone call between a woman whom he was sure was the Princess of Wales, and [an] unknown man friend" (Katz, Henry, Jackson, & Freeman, 1993, p.4). At a later date it was alleged in the English newspaper *The Guardian*, that "a person...had innocently picked...up on a home scanning device Prince Charles talking to Camilla Parker-Bowles" (Katz, Henry, Jackson & Freeman, 1993, p.4). These incidents demonstrate how fragile the security of wireless transmitted information can be. The interceptions were allegedly carried out by scanning the wireless spectrum frequency range used by the mobile telephone system.

It also appears that the system in use must have been an analogue system, as the technology experts inform us that with airwave frequency scanning, to receive intelligible information from a digital system is impossible. "The Digital System [gives]...high security, [and] eavesdropping [is] impossible" (AUSTEL, *The Benefits at a Glance*, 1994b, p.6). However, it should be noted that at any time digitally transmitted information is demodulated to the analogue format, such as entering an analogue system telephone exchange, or entering a cabling system which does not technically support the digital system, then the information is susceptible to intelligible interception. "Telecom Finland's Mr. Marttinen [said]...a security agency could still eavesdrop by tapping into the phone lines or switches; only the radio-wave portion of the call is encrypted. There are so many ways to eavesdrop" (Hudson, 1994, p.R14).

Another more recent report said that "the Indian Government has asked cellular service operators in New Delhi, Bombay, Calcutta and Madras to install equipment that would allow security agencies to tap calls made on mobile telephones" (*Zubrzycki, 1996, p.23*). The right of the Indian Government to insist on this action is covered by law in India's 'Post and Telegraph Act', which can also demand the suspension of all services in event of a threat to national security. Cellular services in neighbouring Pakistan were suspended in January 1995, after "gunmen in...Karachi used mobile phones to coordinate terrorist attacks...[and] security agencies complained they did not have the requisite technology to monitor the calls" (*Zubrzycki, 1996, p.23*). This report opens up questions as to how many other countries have monitoring systems in place for mobile communications, and when, and on whom, and by whom are they used.

It should also be realised that most countries, including Australia, still have numerous analogue telephone exchanges working within their national communication systems. As such, the purchase of a digital system mobile telephone, and connection to a service-provider's digital network will not guarantee complete information security, although it will probably reduce the possibility of illegal airwave scanning interception.

Closely linked with call security is the issue of privacy. According to the Australian Telecommunications Industry Ombudsman office, "some 9.5% of complaints and enquires relate to privacy" (*Rothwell, 1995, p.6*). The complaints about privacy are in most cases similar to those for the fixed

telephone service, except for one circumstance, that is in the case of the non-user, where the mobile telephone can constitute a privacy invasion by its indiscriminate use in public places. The Telecommunications Industry Ombudsman has recognised this situation, and has published the *Mobile Phone Etiquette Guide* which highlights "the do's and don'ts of using a mobile telephone in a world where privacy and personal space are all-important" (Rothwell, 1995, p.6). The issues relating to service and the mobile telephone are problematic because of the ability of the user to encroach upon almost any environment, and threaten the privacy and personal space of other individuals. The Ombudsman has tried to rectify this situation through education and cooperation, but if this approach is not successful will some kind of legislation be necessary to protect the rights of the non-users?

Advertising

The mobile telephone is the subject of a massive sales drive, where service providers seek to entice potential subscribers to be connected to their particular network. The enticements are lavish, promising all sorts of advantages and concessions. Some of the advertising has been suspect in its content, such as when advertisements "bundle the sale of mobile phone handsets with long term carrier contracts, [the dealers know] first-time buyers have no idea what the component costs of the bundle are" (Fist, 1995a, p.31). This was demonstrated when "dealers...advertised [digital] handsets worth well over \$1000 at around \$399...but only on the condition that the customer signed up with a particular carrier" (Levy, 1995, p.53).

After being inundated with complaints, the Trades Practices Commission "issued a media release...stating that the [offending] company had breached the...*Trade Practices Act* dealing with misleading and deceptive conduct...about price (Levy, 1995, p.53). The Trade Practices Commission also ordered that the practice had to cease, and that remedial action had to be taken by the release of "a series of corrective press and radio advertisements...highlighting the full cost of the connection" (Levy, 1995, p.53). Other advertisements offer free calls at weekends, and price reductions. The ironic part of the advertising strategy is that there are still many advertisements for analogue telephones, where as in Australia we are told that "the Government has decided to replace the analogue system with digital by 1 January 2000" (Austel, 1994a, *There is a mobile phone system that's right for you*, p.2).

One advertisement which has been shown on television in Australia, and also displayed in a national newspaper, is the story of Mr. Arden the senior business executive who left his office shortly before Christmas 1994 with his digital mobile telephone, and whose whereabouts is still unknown. The advertisement tells us that he is still calling his office and his clients regularly. Accompanying graphics have shown a man on a golf course, in a big-game fishing boat, and in other luxurious settings using a mobile telephone. The advertisement leads the viewer or reader to believe that with a digital mobile telephone one can carry on business while travelling to exotic places enjoying life to the full. Although this situation is possible it is also improbable for most employees, as these conditions would normally

only be available to the very top echelon of the business community. With regards to not knowing where Mr. Arden is, all mobile telephones while switched on are constantly sending out a signal to indicate their location for the reception of incoming calls. The relevant server can pin-point the location of any mobile telephone within the radius of the transmission cell receiving its signal. This can range from radius of 2km to 12km depending on the density of coverage in the particular area where the telephone is located.

Another advertising strategy is the targeting of niche markets. *Melba* reported in the Australian newspaper recently that, "Telstra has launched the biggest gay and lesbian-specific advertising campaign by an Australian corporation....gay and lesbian consumers are among the greatest users of telecommunication products...16 per cent of the gay community own mobile telephones and another 15 per cent intend to purchase one within six months" (*Melba*, 1995, p.19). It is evident from these advertising examples that the mobile telephone is recognised as a financially lucrative utility, for which the service providers will engage the most innovative methods of enticement to ensure that they capture their perceived share of the available consumer market.

Summary

In this contextual overview of the mobile telephone I have presented areas of importance relative to its impact on user and non-user populations. The historical element will be used in the succeeding chapters to define the

driving forces responsible for the technology's evolution, and to examine the possible reasons for these forces. Also the historical section will be used as a knowledge base, which may help through its evolutionary path, to identify the contemporary forces motivating technological progress.

Access to the mobile telephone service is important because of the additional communicational facilities presented to the user, which are less restricted by location than the fixed telephone service. The presence of a communication device on one's person, which can be used at any time in most places, will not only have possible efficiency values for employment, but also increase the individual's safety prospects. This situation also works in reverse, in that people who are denied mobile telephone access are in comparison deprived of a valuable employment tool, and may also be liable to reduced personal safety within circumstances which may demand a communicational device to summon assistance.

Technological changes to the mobile telephone have increased its communicative power, and widened its scope of usage. Its international 'roaming' facility, linked with its convergence to other technologies like the lap-top computer, portable facsimile, and other hard copy devices makes it a powerful global disseminator of all forms of media. These facilities make possible new forms of privacy invasion and cultural trespass, for which at present there appear to be no designed control mechanisms in place. Also the convergence of the mobile telephone with the other contemporary technologies opens up new employment environments. These new

opportunities may challenge our present ideas and established working procedures. The issues of gains and losses engendered in these new working environments are to be addressed in later chapters of this thesis.

The "Telecommunications Industry Ombudsman", has highlighted a considerable range of service problems existing within the Australian mobile telephone networks. Some of these problems appear to be fundamental, like the lack of adequate coverage in some parts of the metropolitan areas, and large expanses of the country with no coverage at all for the hand-held mobile telephone. Regardless of these shortcomings to the service, it would seem, from the statistics offered by the industry, that they have little affect on the public's willingness to become mobile telephone users.

Chapter Three:

Review of Literature

Introduction

This chapter will review the literature which I have used in my research, and which has shaped my research methods. Because of the small amount of academic work previously carried out in this field, the number of publications addressing social and cultural issues and use of the mobile telephone is limited. The main body of text which I have found in university libraries only recounts the historical evolution of the service. Under these circumstances, the review will also mention literature from non-academic sources which has provided information vital to the completion of this project. These sources will include, newspaper articles and technical magazines which deal with the issues of, service, access, advertising, and technological problems and development.

Academic Literature

The telephone is a major component of communication systems in today's society. Joseph Pelton in his text *Life in the Information Society* said,

there is little doubt that modern society cannot function without the extensive telecommunication systems that tie societies together. If the telecommunication systems of an information society were suddenly turned off, that society and others...would come to a standstill. (Pelton, 1983, p.63)

Pelton's statement projects the importance of the telephone and its subsidiary equipment to a level where societies could not function without it. Stephen Kern argues that the telephone had a broader impact than radio, as it "made it possible, in a sense, to be in two places at the same time" (Kern, 1983, p.69). According to Colin Cherry the telephone has been a major contributor to democracy. He posited that "a highly developed, two-way communication service is an essential pre-requisite to any form of 'democratic' state....The introduction of the telephone...[has] contributed greatly to our changing concept of both central and local government" (Cherry, 1977, p.125). The alteration of social relationships is discussed in Sydney Aronson's text *The Sociology of the Telephone* where he remarks that "with the spread of the telephone, a person's network of social relationships was no longer confined to his physical area of residence....one could develop intimate social networks based on personal attraction and shared interests that transcended the boundaries of residence areas" (Aronson, 1986, p.303).

The aforementioned authors saw the sociological changes made by the introduction of the telephone as changes on a large scale, where others, such as Gary Gumpert see a more personal involvement, where "today there is nothing mysterious or alien about establishing two-way communication with someone separated from us by distance....Yet for some the ease of transcending the limitations of space can be disconcerting" (Gumpert, 1987, p.122). Marshall McLuhan has pointed out that the telephone eliminated the prostitute in the red-light district, and created the call-girl. He considered

that this situation produced a de-skilling effect, where "the prostitute was a specialist, and the call-girl is not" (McLuhan, 1987, p.266). Both Gumpert and McLuhan's comments could be read to mean that the changes brought by the introduction of the telephone may not be to everyone's liking.

The disadvantages of the telephone were also taken up by Carolyn Marvin who wrote that, "the telephone was the first electric medium to enter the home and unsettle customary ways of dividing the private person and family from the more public setting of the community" (Marvin, 1988, p.6). Joshua Meyrowitz also cites a similar argument in addressing the subject of the electronic media where he says, "the walls of the family home, for example, are no longer effective barriers that wholly isolate the family from the larger community and society" (Meyrowitz, 1985, p.vii). These statements imply that the privacy of the home is no longer completely protected from intrusion by the physical barriers of walls and doors, and that users of electronic media such as the telephone do not require invitation, or permit access, to cross thresholds which were once the subject of negotiated transactions. It is probable that Marvin's text is directed at the fixed location telephone, and not the mobile telephone, although her statement would be relevant to both technologies. However, a different approach is required to expand the argument to include the phenomenon of unstructured environmental change as with the case of the mobile telephone user.

The study of the social and cultural effects of mobile telephone use is conducive to theorising communications free of specific location, or, "a

'situational approach' to the study of media and behaviour" (Meyrowitz, 1985, p.viii). In his book *No Sense of Place*, Meyrowitz expands the 'situational approach' to give a "situational analysis...[of] how electronic media affect social behaviour...by reorganising the social settings in which people interact and by weakening the...relationship between physical place and social 'place'" (1985, p.ix). As an example he cites prison as a place, prior to the era of electronic media, that "led to both physical and informational separation from society" (1985, p.117). Since the inception of electronic media, "many prisoners share with the larger society the privileges of radio, television, and telephone" (*ibid*). His example shows a change in the definition of imprisonment, where prisoner's social place can no longer be regarded as an almost total "physical isolation from the larger world" (1985, p.118). The mobile telephone accentuates this situation where "'relationships' with others [using the mobile telephone] are accessible to virtually everyone without regard to physical location and social 'position'" (*ibid*).

Another issue to be considered is the theoretical reference point of the mobile telephone. As Anthony Giddens argues in his publication *The Consequences of Modernity*, "today in the late twentieth century; it is argued by many, [that] we stand at the opening of a new era...[and] to the emergence of a new type of social system (such as the 'information society' or the 'consumer society')" (1990, p.1). The mobile telephone as a new media technology should also be included as a part of the 'information society', sometimes also termed the post-modern society. The term post-

modern suggests that a "preceding state of affairs [has drawn] to a close" (Giddens, 1990, p.2), which would be the era of modernity. However, as the mobile telephone is an extension of two other inventions, radio, and the telephone, which were inventions within modernity, I consider that the mobile telephone is also a technology of modernity. Giddens' terminology for this extension of modernity is "'Radicalised Modernity' [of which one of the concepts is defining] post-modernity as possible transformations moving 'beyond' the institutions of modernity" (1990, p.150).

The Consequences of Modernity (1990) addresses time and space in relationship to 'disembedding', which Giddens interprets as, "the 'lifting out' of social relations from local contexts of interaction and their restructuring across indefinite spans of time-space" (1990, p.21). Giddens' "bracketing of time and space" (1990, p.21-22) enables them to be transported as a single unit, which can be likened to the transportability of the mobile telephone, where with every movement, the shifting of time, space, and social relationship is done as one. Giddens also describes two types of 'disembedding' systems, *symbolic tokens*, and *expert systems* in which *expert systems*, are "systems of technical accomplishment or professional expertise that organise large areas of the...social environments in which we live today" (1990, p.27). The *expert system* seems applicable to the mobile telephone, in that it is a technical accomplishment, and contains professional expertise, and will be considered within this thesis as influential in re-organising today's social environments.

Giddens refers to "surveillance being the supervisory control of subject populations...[and that this control can take the form of] the use of information to coordinate social activities" (Cassell, 1993, p.289). This reference could apply to when the mobile telephone is converged with other media technologies and the information used to intrude into people's personal lives. Another text which is appropriate to theorising surveillance and control is James Beniger's *The Control Revolution: Technological and Economic Origins of the Information Society*, (1986). This text follows a path from the Industrial Revolution to the early 1980s, with descriptions of how progressive technological innovation has overtaken the existing societal control mechanisms, which has required further technological innovation to re-establish control. The mobile telephone appears to be another technical innovation which has the power to overtake existing societal control mechanisms, because it is a technological response required to re-establish societal "control by business and the state", [and] "the organisational basis of this control and its implications for social structure" (Beniger, 1986, p.436).

The power of the mobile telephone in its convergence with other media technologies like the laptop computer, could be regarded as an instrument which enables an individual to set their own centralised workplace in almost any chosen location. Angus & Shoesmith suggest centre and margin relationships expressed in terms of cultural marginalisation, "reproduc[e] metropolitan forms that den[y] the specificity of location" (Angus & Shoesmith, 1993, p.9). This theory relates to the power of teleworking, where workstations can become independent, through the ridding of direct

supervision and other controls, by being mobile and multi-locationary. One of the possible consequences of teleworking referred to by Nigel Hawkes in *The Australian*, (1995), drawing upon the research of Professor Ian Angell, London School of Economics, says, "information technology with 'teleworking' and 'video conferencing' could make the office largely redundant, except for social events for the employees to cement their loyalties to the company" (Hawkes, 9th March 1995, p.17).

To assist in understanding the reasons for a technology affecting a society, it can be helpful to have knowledge of how and why the technology developed. Huff, (see above), provides the historical background from the growth of cellular radio technology in the United States, to the evolution of the mobile telephone system, and its spread to other countries during the late 1980s. The information in this article, highlights the interaction between public demand for the mobile telephone, and engineering tenacity to provide a workable system, and then improve it to meet the increasing demand generated by each technological improvement. According to Edward Constant technological innovation may not always need public demand to generate improvement. Constant sees technology as self-perpetuating, describing it as a phenomenon with a presumptive anomaly, which is, "an occurrence in technology, not when the conventional system fails in any absolute or objective sense, but when assumptions derived from science indicate either that, under some future conditions the conventional system will fail (or function badly) or that a radically different system will do a much better job" (Constant, 1980, p.15). This can also apply to the mobile

telephone where new technical designs and new inventions are constantly increasing its operational scope and facilities.

Data Gathering Methodology Literature

To augment the existing literature on the mobile telephone, which is not plentiful, I considered it necessary to collect information from both users and non-users of mobile telephones. The type of information sought was, "the nature of peoples thoughts, opinions, and feelings, and the method is called *survey research*" (Shaughnessy, & Zechmeister, 1990, p.77). In deciding upon my methodology of data collection, I consulted various texts to ascertain the advantages and disadvantages of the face to face interviewer administered questionnaire, against other methods such as mail, or telephone surveys.

All survey methods of data collection have their strong and weak points, for instance the personal interview is considered to have a high response rate. Shaughnessy, and Zechmeister say that, "the commonly accepted response rate is 80 to 85 percent" (1990, p.92), where they assess, "that a typical return rate for a mail survey is around 30 percent" (1990, p.90). Des Raj also comments on the generally low response rate of mail surveys where he says , "the initial response rate may be barely 40 percent if you are lucky" (Raj, 1972, p.117). He also cites that ignoring the non-returns and basing ones results on the returned data alone can raise problems, as "experience in data collection...shows that the non-respondents often differ from the

respondents in many respects. Their exclusion will introduce systematic errors in the results" (*ibid*).

Another suggested advantage of the personal interview over the mail survey is the "greater flexibility in asking questions...[where] the respondent can obtain clarification on unclear questions, and the trained interviewer can pursue incomplete or ambiguous answers to open-ended questions" (Shaughnessy & Zechmeister, 1990, p.91). Perhaps the strongest point in favour of the personal interview is that the interviewer is in charge of the proceedings. This situation is important in the correct administration of the questionnaire, where "the interviewer controls the sequencing of questions, and can ensure that all respondents complete the questionnaire in the same order" (1990, p. 92).

Shaughnessy, and Zechmeister cite that there are two main disadvantages of the personal interview method in the collection of data. "The first disadvantage [is the] high cost, because the use of trained interviewers is expensive in terms of both money and time" (1990, p.92). The second disadvantage can be interviewer bias, which is when the interviewer introduces "wording...[or] ideas that may then become part of the respondents subsequent answer" (*ibid*). This situation is also recognised by Raj who cites that "a combination of methods may be the best solution in some situations...[where] the questionnaire may be left with the respondent for self-enumeration...to avoid the biases introduced by interviewers" (Raj, 1972, p.119).

Another possible disadvantage of the personal interview method is the acquisition of skilled interviewers who are able to, "operate comfortably in a climate in which strangers are viewed with distrust, and [who can] successfully counter respondents' objections to being interviewed" (*Dillman, 1978, p.4*). Dillman also cites that interviewers are increasingly having to work unsociable hours, that is they "must be willing to work at nights to contact residents in many households" (*1978, p.4*). There are also other issues associated with nightwork such as protection "for interviewers working in areas...in which a definite threat to the safety of individuals exists" (*ibid*). All of these problems can make data collection using the personal interviewing method both "demanding and costly" (*ibid*).

The method of data collection termed as ethnographic investigation is described by Hammersley and Atkinson where,

the ethnographer participates overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions; in fact collecting whatever data are available to throw light on the issues which he or she is concerned (*Hammersley & Atkinson, 1983, p.2*)

was also considered. One of the key strengths of ethnography is that the researcher or data collector becomes an integral part of the subject under study, which negates the circumstances which can result in biased observations, similar to interviewer bias which can occur in personal interviewing within the survey method of data collection. Hammersley and Atkinson's description of this phenomenon is:

By including our own role within the research focus and systematically exploiting our participation in the world under study as researchers, we can develop and test theory without placing reliance on futile appeals to empiricism. (Hammersley & Atkinson, 1983, p.25)

The ethnographic method of data collection can be likened to participant observation. The observer's role can be "*undisguised* participant observation, [where] the individuals who are being observed know that the observer is present for the purpose of collecting information...or *disguised* when the observer's role is not known to those who are being observed" (Shaughnessy & Zechmeister, 1990, p.41). Although the ethnographic method has many strengths, it is not suitable for collecting data quickly, as can be done with the mail and telephone survey methods. Therefore, where severe time limitations are placed on research projects, the ethnographic method of data collection will not be the most suitable option.

Another possible data collection method is where the interviewer administers a questionnaire by the use of the telephone. According to Shaughnessy and Zechmeister this method has several advantages over face to face personal interviewing such as, the provision of "access to dangerous neighbourhoods, [without the need for protection], locked buildings, and respondents available only during evening hours" (1990, p.92). Also telephone interviews can be completed quickly, Dillman cites an example of "a statewide survey of the general public on a tax policy issue...[in which] the results would have to be available in only 15 days....The results of the first night's interviewing were fed into the computer less than half an hour after the last interview was

completed, and...[the] results from some 150 interviews were phoned to the sponsors of the survey the same evening" (Dillman, 1978, p.232-233).

One of the major criticisms of telephone surveys in the past, according to Dillman, "was that many people did not have telephones, [and] those who did tended to have higher than average incomes and education" (Dillman, 1978, p.2). Regarding this situation, Dillman gives the example of where the downfall of the *Literary Digest*, in wrongly predicting a landslide victory for Landon in the 1936 presidential race,..."was traced in part to the use of telephone listings as a sampling frame and the clear social class bias associated with having a telephone" (1978, p.9). Sydney Aronson in *The Sociology of the Telephone* also refers to this phenomenon citing "the possession of a telephone may have served both to define and enhance the social status of individuals" (Aronson, 1986, p.304). This class bias phenomenon could restrict a survey, similar to having a sample selected by means of the "purposive sampling [technique where] the investigator handpicks...the individuals...judged to have certain special characteristics" (Shaughnessy & Zechmeister, 1990, p.84). However, the mass distribution of telephones in developed countries has probably negated the once elitist situation of telephone possession, and made this type of class bias a thing of the past. In support of this notion, Shaughnessy and Zechmeister stated that, [in the United States of America] "by 1979...more than 95 percent of all households had telephones" (1990, p.93).

The telephone survey method does have limitations such as the problem of interviewer bias, as with the face to face interview. The use of the telephone instrument, according to Shaughnessy and Zechmeister, "may influence how people respond...[where] responses are being given to a 'faceless voice' " (1990, p.93). Regardless of these limitations telephone surveys have increased in popularity especially for brief surveys. As Dillman states, "the glamour of doing surveys...to report on events that are undergoing dramatic change...has given the telephone an irresistible appeal. Thus it is not surprising that most major research organisations are now doing some research by telephone" (1978, p.11).

A very popular method of data collection is by mail survey, where questionnaires are sent out to respondents with a request that they complete the questionnaire and return it to the researcher. This method is generally favoured by researchers carrying out small surveys, or researchers who have limited time and/or economic resources. From the economic point of view, Raj says that, "the major cost is postage stamps which should be quite small" (Raj, 1972, p116). Dillman estimated that "the costs for mail surveys done when [American] first class postage was 8 cents per ounce or less ranged from \$1.60 to \$2.84 per completed questionnaire....If the surveys had been done by telephone...the cost would have been about \$7.00 per interview, well over half of which would have been for telephone toll charges" (Dillman, 1978, p.69). Dillman also points out that the size of the survey affects the cost per questionnaire. He says that "the costs for doing mail surveys become smaller as size increases [due to] lower printing costs for

producing questionnaires and correspondence in large quantities" (1978, p.70).

Shaughnessy and Zechmeister list other advantages of mail surveys saying that "because they are self-administered, mail surveys avoid the problems of interviewer bias...and...mail surveys are the best for dealing with highly personal or embarrassing topics, especially when the anonymity of respondents is preserved" (1990, p.90). I refer again to Shaughnessy and Zechmeister, 1990, p.90, and Raj, 1972, p.117, where both texts cite the greatest drawback to the mail survey as the low response rate. The texts also suggest methods of increasing the response rate, for example, Raj suggests, "a gift may be offered, a post-paid envelope is enclosed, confidentiality of returns is assured, or an appeal is made explaining the purpose of the survey and the importance of the enquiry" (1972, p.117). Shaughnessy and Zechmeister include the same inducements as Raj to increase the response rate, with the addition of "a letter...explaining the basis on which the respondents were selected" (1990, p.90)

The mail survey, along with the telephone survey are the specific subjects of Don A. Dillman's text, *Mail and Telephone Surveys: The Total Design Method* (1978). Dillman sets out to tackle the problem of low response in these survey methods by hypothesising that, "the problems of response quantity and quality are solved in part by a procedure called 'the total design method'. This is nothing more than the identification of each aspect of the survey process...that may affect response quantity or quality, and shaping

them in a way that will encourage good response" (1978, p.2). In focusing only on mail and telephone surveys, Dillman has produced a comprehensive study of these subject areas, which can probably be of great assistance to "the would-be user [who] needs a methodological 'recipe' that includes all the ingredients, and directions for combining them...to conduct successful surveys" (1978, p.5).

Technical and Services Literature

Some of this literature is produced by the main Australian mobile telephone carrier and service suppliers, Telstra, and Optus. Both of these companies produce advertising literature which displays their mobile telephone facilities, and services offered. Telstra produce publications such as *Direct Line*, and the *Telecom Australia MobileNet Users Guide* (1994). *Direct line* is a publication issued to Telstra agents and their approved telecommunications equipment retailers. This publication provides retail operatives with news on Telstra's most up to date mobile telephone services, and advice on advertising techniques on how best to market these products. An example of this strategy was an article headed *Call Privacy Campaign* where the article gave information of "a campaign promoting Telecom MobileNet digital service...to get the attention of chief executives, politicians, security companies, accountants and others who require complete call secrecy" (*Direct Line*, August 1994, p.10). Other Telstra texts like the *Telecom Australia MobileNet User Guide* are also advertisements for their services but are distributed directly to the retail customers. Similar to Telstra, Optus also produce advertising literature for their agents and customers, such as

the publications, *The Power of Choice*, and *Optus Mobilesat*. Advertising literature is important to this thesis as it gives information on the current situation (and future predictions) regarding the type of services and facilities on offer to users and potential users. This type of literature can also serve as a source for examining the importance of mobile telephone products to the marketplace, by looking at the advertising strategy in relationship to the service and financial concessions offered to attract customers.

There is also literature produced by Austel, and the Telecommunications Industry Ombudsman's office, as organisations which hold various watching briefs over the telecommunication industry's participants. Austel is a Federal Government organisation which deals mainly with the technical and regulatory side of the industry in deciding if technologies and pricing structures are appropriate to the Australian government's laid down communications strategy. It also oversees, and can enforce 'fair play' in the competitive environment of communications, including mobile telecommunications. The literature which Austel produces is mainly appropriate to particular circumstances, like advice on which mobile telephone, analogue or digital, is most suitable for one's particular needs. The Austel pamphlet entitled, *One of these phones is Digital, and the other is Analogue, which one is right for you? (no date)*, explains the advantages and disadvantages of both systems in order that the potential user can make an informed choice when purchasing a mobile telephone. Other Austel publications are normally addressed to particular individuals or organisations in the form of reports or instructions. Public access to this information in

some cases may be obtained by application to Austel, or it may appear as a press statement.

The Telephone Industry Ombudsman's (TIO) office has been set-up by the industry's service carriers and suppliers like Telstra, Optus, and Vodaphone. TIO produces a regular publication called *TIO Talks* which provides data on its operations. Issue 5 declares unambiguously that TIO

is an office of last resort to be involved once all other avenues for dispute resolution with a telecommunications carrier have been explored. It is only at this stage that the TIO can participate in negotiation, resolution, or arbitration. (*TIO Talks*, 5, 1995, p.1)

The same publication also states that the TIO exists for, "providing independent, just, informal, speedy resolution of complaints" (*TIO Talks*, 5, 1995, p.1). *TIO Talks* participates regularly in dialogue on the main issues in which the organisation is currently engaged, and the issues to be tackled in the near future. Another publication which the TIO has produced is called *The Etiquette of Mobile Telephones* (1994) which gives a guide on how a mobile telephone should be used to minimise interference to others. The need for this was recognised after "the TIO drafted...a few basic 'dos' and 'don'ts' for mobile phone users...[and they] were inundated with requests for this little guide" (*Smith, TIO*, 1994, p.3). Although the TIO can not enforce their decisions by law, they can play an important role in opinion formation, by keeping the industry aware of consumers' problems, and so act as a stabilizing influence between the customer and the service carriers and

providers. This literature is important to my thesis in revealing some of the problems experienced both by users and non-users of mobile telephones.

Other literature is published by government departments, and committees, such as an issues paper entitled *Telecommunications Developments to the Year 2000 and Beyond* (1995). This paper was produced by the Senate Economic References Committee to "stimulate public debate...about Australia's future communications requirements", (Ferguson, March 1995, p.viii). Literature of this type, which discusses governmental telecommunication policies, and future strategies can be useful to this thesis.

Newspaper articles are a good source of information especially in a publication like *The Australian*, which supports a weekly section on communications. From this source, up to date information can be obtained, and because of the nature of the newspaper industry, issues which are problematic generally get an in-depth coverage. It is realised that the commercial nature and the editorial position of newspapers can result in biased comment, but this is no different to any other text which takes a position when offering opinions, even texts with selected back-up references.

Moreover, newspapers frequently foreground issues such as health that government departments try to obscure. For example, Fist in *The Australian* wrote an article on the health risks of using technologies which transmit radio frequencies. Fist commented that, "surprisingly little work has been done with the cellular radio frequencies around 900MHz, [frequencies used by

mobile telephones]...but there are numerous laboratory studies showing that cell-changes occur at the low power levels you'd expect from a 0.6 watt phone" (*Fist, 1995b, p.34*). *Fist* also said in his article that a report which addressed this issue was "sat on [by a government minister]...for nearly a year, then 'officially' released without printing any copies, and without telling anyone it existed" (*Fist, 1995b, p.34*). In the same article *Fist* said that "the [telecommunications] industry would prefer that the public not notice this document" (*Fist, 1995b, p.34*).

Another source for accessing mobile telephone information is from magazines. The magazine *MOBILE>>>com* is a semi-technical publication that presents articles by various contributors, which although addressing technical matters, is written in a form that can readily be understood by the users of the equipment, as well as the technical experts. Some of the subjects addressed are: the arguments surrounding the comparison between the analogue and digital mobile telephone delivery systems; whether all mobile telephones can be used globally; the mobile office, which involves the use of a mobile telephone as a transmission medium for laptop computers, portable fax, and printing machines; how mobile technologies will impact on peoples lives. I find that this type of magazine is a valuable source of information, because it helps one understand the 'elite' language associated with the technologies' operating functions and procedures, which is a pre-requisite to becoming a proficient operator of modern-day technologies.

The *IEEE international conference papers* are excerpts from a series of technical papers given at a conference in New York in 1992. Although this information was directed at a technologically competent audience, there was enough data in 'layman's' language to understand certain important points at issue. A submission entitled *Cryptographic security techniques for digital mobile telephones* (Cook & Brewster, 1992, p.1), addresses problems of security in mobile telephone systems. It argues that "to prevent the possibility of fraud, or the general impersonation of other subscribers, that a positive authentication of subscriber identity must be achieved, [and that] the only robust method of achieving...[this] in a public system is with the aid of cryptography" (1992, p.1). This paper gives information on existing technological problems associated with mobile telephones, and then goes on to provide new technological solutions to these problems. In Telstra's advertising text *Call privacy campaign*, it was said that the "Telecom MobileNet digital service...[gave] complete call secrecy" (*Direct line, August 1994, p.10*), with no mention of the additional requirement of cryptography. In these circumstances it seems necessary to read technical literature to become properly acquainted with the operational properties of modern technologies, and to acquaint oneself with possible technical limitations which may not be revealed as general public knowledge.

Summary

In this chapter three types of literature have been reviewed, the academic, the data gathering methodology, and the technical and services literature. The academic literature dealing specifically with the mobile telephone is

sparse, so other literature dealing with electronic media and the fixed telephone have been used to provide a framework for this research investigation.

Due to the lack of information available on the sociological and cultural effects of mobile telephone use, it was necessary for data to be collected from mobile telephone users and non-users. To arrive at the best data collection method to suit this research project, the section of this chapter on data gathering methodologies determined that the survey research method was the most suitable. Also, due to limited financial resources, and severe time restrictions in place on this research project, it was decided to use the *mail survey* method of data collection.

The final section of this review has dealt with other literature which is not academic by definition, but is necessary for the fulfillment of this research project. The mobile telephone being an ongoing consumer product is subject to technological change and continuing service adjustments which need to be known and understood to ensure the factual correctness of this research. This information is available from a number of sources, such as the service carriers and providers, government and private sector organisations within the communication industry, technical conferences, media publications, and the service carriers' retail agents.

Chapter Four:

The Relationship of Place, Time, Space, and Control of the Mobile Telephone, and Their Affect in Restructuring Social Relationships

Introduction

The mobile telephone is an electronic media artifact, which like other technologies of this group, reforms the meanings of place, time, and space in respect to their influences on social relationships. Most former references to this phenomena have only mentioned telephone equipment as an appendage to the more popularly discussed artifacts such as television, and later satellites. However, I argue that the mobile telephone is worthy of researching in its own right, especially with reference to place, time, and space.

In this chapter I will refer to Meyrowitz, (1985) and Anthony Giddens, (1990), (1991) who both argue that the importance of place has been diminished through being permeated by electronic media. In contrast, I will show that the mobile telephone is re-establishing place as a valuable social commodity. I will also discuss Giddens' theories on the separation and reconnection of time-space, disembedding, expert systems, and faith and trust, and their relationships to the mobile telephone. Finally I will address the issue of the control of use of the mobile telephone in public and semi-public places.

Place

Meyrowitz states that, "the evolution of media has decreased the significance of physical presence in the experience of people and events" (1985, p.vii). This statement signifies that electronic media, in some circumstances, negates the requirement of presence in a particular place to experience the happenings and the perpetrators of those happenings. The non-requirement to be present to experience the events being enacted in a particular place, tends to diminish the importance of place in those instances. However, there are other issues associated with place in which certain expectations may be required, and if those expectations are not met, then place assumes a significant position.

One of the instances where place raises certain expectations is the fixed location telephone conversation, where the caller knows where the called party is located, and the called party generally asks where the caller is calling from. Of course, the caller could give a false location, but this would generally not affect the called person, as the information would be probably be accepted as truthful. The implicit or explicit knowledge of others' place to people engaged in telephone conversations, will give either reassurance or frustration dependent on whether the place is regarded as agreeable or disagreeable to the connected parties.

The lack of territorial whereabouts can affect the social hierarchy between the connected persons in a telephone conversation. As Meyrowitz points

out, "because of the high status person's need to project only the proper image, subordinates must be kept away" (1985, p.66), with the likely effect that, "the relationship between physical isolation and social inaccessibility will support hierarchy mystifications" (1985, p.67). The telephone challenges the hierarchical system and its relationship to social status in that, "a telephone...in a ghetto tenement...is potentially as effective as a telephone...in a corporate suite" (Meyrowitz, 1985, pp.169-170). The mobile telephone accentuates these relationships, as the owner is accessible almost anywhere within the parameters of its designed operational area, and does not have to be encapsulated in a designated place to be communicationally available. This situation of being constantly available would normally be a chosen state, and as such would probably not be seen as a hierarchical change in social status. However, it could be seen as a hierarchical change designated by the importance and power of having access to an elite communication system, and of the needs for others in requiring the mobile telephone owner to be constantly accessible.

Meyrowitz stresses the problems of high status persons' inability to isolate themselves physically from the intrusions of the electronic media which he says, "leads to an inability to separate situations and the behaviours appropriate to them" (1985, p.170). He also says that, "leaders are now faced with the dilemma of having to gain and maintain high status by appearing ordinary, and yet they face criticism if they lack dynamism and power" (1985, p.171). In contrast to Meyrowitz's statement, the users of mobile telephones do not come under criticism for lacking "dynamism or

power', (*ibid*), but are criticised, for being over-powerful in commandeering others' private space when using the mobile telephone in public settings.

This change in the conception of the electronic media causing the reduction in the social situation of high status persons, against the apparent increase in social status and situational power of mobile telephone users is due to the following reasons. Most types of electronic media intrude by invading peoples' private space in their private places, such as television and radio situated in peoples homes. However, the main intrusiveness from the mobile telephone comes from invading people's private space in public or semi-public settings, where no designated area has been set aside for the use of this medium. Mass media are generally operated by some form of government institution, or commercial organisation, the mobile telephone is operated by a single individual. The situation is significant, in that with the mobile telephone a real sense of power is experienced, where the operator can legitimately take over public space, while being observed by others. This phenomenon describes a difference between the mobile telephone and most other electronic media, where the mobile telephone has control over space within the public setting. Meyrowitz comments that "one of the ironies of an electronic age is that new media have made completely centralised control technically possible yet socially unacceptable" (1985, p.172), yet within the same electronic age the mobile telephone has moved some of the information control to the peripheries, which to the people who find their private space in the public setting invaded, is also socially unacceptable.

The situation where other people are in a room, when another occupant of that room is engaged in a telephone conversation, can bring about events where the outsiders attempt to join in, or bring some influence to bear on the telephone conversationalists. Meyrowitz describes the situation as an "almost jealous response, [where the people not engaged in the telephone conversation] often ask, 'Who is it?' 'What's she saying?' 'What's so funny?' or 'Come on, get off the phone already!' Or they try to participate by throwing remarks from the background and by attempting to elicit a response from the person on the other end of the phone" (1985, p.38). This situation is not likely to happen in a public place where a person is engaged on a mobile telephone call, as this extrovert style of behaviour would appear foolish within the public environment. The difference of behaviours because of the difference of locale is significant, in that the mobile telephone user not only controls the public place, but is reasonably assured that no criticism will be directed his way, which underlines the user's powerful position to the person's self as well as to the helpless others. Meyrowitz cites that through electronic media, "the components of 'place' have been split apart....Wherever one is now...one may be in touch and tuned-in...[as] the changing relationship between physical and social place has affected...our world, [where] for the first time in modern history, it is relatively placeless, (1985, p.308).

The part of Meyrowitz's statement referring to the world being placeless suggests that 'place' has a diminishing significance with respect to its importance in the modern world. However, users of the mobile telephone

seem to be reclaiming 'place' by operating this communication medium unrestrictedly in public and semi-public arenas. Also the non-users of mobile telephones see place as important with regards to their protests of environmental degradation, such as the siting of mobile telephone transmitters. A recent petition was signed by 124 residents of Mindarie, Western Australia where a "45 metre high telecommunications tower" (*Wanneroo Times*, 1995a, p.5) is to be erected, and in Ocean Reef, Western Australia where it is proposed to erect a 15 metre high tower. "City Planner Oscar Drescher...[said that] at the close of advertising, 19 letters and one petition had been received, [he also said that] the concerns of local residents are recognised, but analysis has failed to substantiate any reason for opposing the proposal" (*Wanneroo Times*, 1995b, p.7). In these two cases the protests against the reallocation of place in order to site mobile telephone transmitters were unsuccessful, but the issue of the environment, i.e. place, and how it is used, with regards to the mobile telephone, is assuming greater importance.

Anthony Giddens describes place as phantasmagoric, because place has become, "thoroughly penetrated by disembedding mechanisms which recombine the local activities into time-space relations of ever-widening scope" (*Giddens*, 1991, p.146). According to Giddens, disembedding mechanisms relate to two categories, symbolic systems and expert systems. Symbolic systems are described as "media of interchange which can be 'passed around' without regard to the specific characteristics of individuals or groups that handle them at any particular juncture" (1990, p.22), like money.

Expert systems Giddens describes as "systems of technical accomplishment or professional expertise that organise large areas of the material and social environments in which we live today" (1990, p.27). The construction of the mobile telephone would align it with the expert systems category of disembedding mechanisms, which according to Giddens is partially responsible for making place "phantasmagoric" (1990, p.19), interpreted as "a scene of constant bewilderment and change" (*Readers Digest Illustrated Dictionary*, 1984, p.1276). Giddens also suggests that although the place where people live, "remain the source of local attachments, place does not form the parameter of experience" (1991, p.146). Like Meyrowitz, Giddens does not appear to be addressing 'public place', where the use of the mobile telephone has important implications for the public's experience within the public arena.

Claude Fischer comments on the Meyrowitz reference to place, where electronic media, "lead to a nearly total dissociation of physical place and social 'place'" (Meyrowitz, 1985, p.11). Fischer regards this statement as technologically deterministic because it sets-up a situation where "a technology enters a society from outside and 'impacts' social life...which describes a form of cultural lag, during which sets of adaptive problems arise because we, by nature or by historical experience are unable to use a new technology to meet our needs and instead are used by it" (Fischer, 1992, p.12). The Meyrowitz statement may indeed be regarded by Fischer as technologically deterministic, but that does not make it invalid. The problem as I see it, is that the statement does not address the issues of which kind of

technology, and in which place. The intrusion into the private place of electronic media like radio, television, and the telephone have blurred the distinction between public and private place, and by that reduced the importance of the private place to an incumbent. However, the public place has never been an arena of privacy like one's private place, but has been a theatre for exhibition, in which generally, space is negotiated implicitly to give room for individuals' activities. This situation is upset when individuals bring behaviours or objects which are socially unacceptable to the public arena, in which case the equilibrium of the public place is unbalanced, and a realisation of the importance of private space within the public place becomes evident to its occupants.

The mobile telephone is a technology which is specifically made to operate in all arenas including the public arena, and because not everyone within the public arena has one, its operation can become a source of disequilibrium for the non-user occupants of the public place. The action of using a mobile telephone in a public place perhaps devalues 'place' in a similar way to that cited by Meyrowitz, but in the situation of the non-user the mobile telephone registers an increase in value of public place, similar to any other act which upsets the public place equilibrium.

Stephen Kern argues that, "telephones penetrate and thus profane all places; hence there are none in churches" (*Kern, 1983, p.316*). Kern's observation illustrates my argument on place and the mobile telephone, that in recognising the telephone as devaluing, or in Kern's description as

profaning place, the church authorities have put a value on the semi-public place of churches, by according to Kern, not allowing the installation of telephones in churches. The action of banning the installation of telephones in churches has singularised a specific electronic medium as not being appropriate to a particular place, and as such increased the value of that place in respect to its importance relative to that medium. In line with my argument, there are members of the mobile telephone non-user section of the community who do realise the value of public place. In my recent survey nineteen out of thirty-four mobile telephone non-user respondents gave examples of places where the use of the mobile telephone disturbed them, such as, banks, restaurants, shops, doctors' waiting rooms, post offices and shopping malls. Also, twenty-five out of the thirty-three users of mobile telephones who responded said that they switched their mobile telephones off in various places such as restaurants, meetings, and places of entertainment.

For the article *Remote mothering and the parallel shift: women meet the cellular telephone* (1993), women were surveyed as to why they possessed a mobile telephone. Some of the reasons given were for safety purposes such as, "a realtor said she got it for safety reasons....[her husband said] that something might happen, you might be out someplace and you might need a phone" (Rakow & Navarro, 1993, p.151). The husband saying "you might be out someplace" (*ibid*) highlights someplace as the important criterion for possessing a mobile telephone. It also demonstrates how place is not

devalued when associated with a media technology which has been invented specifically for being operative in any place.

If place was not important the mobile telephone would not have been invented. A text published by Austel on mobile telephones informs the reader that the mobile telephone can be used in "New Zealand, USA, Canada, Hong Kong, and Singapore" (*Austel, 1994c, p. 5*), as well as Australia. The mobile telephone and 'place' are inseparable in that it makes a user available in any place, and allows the user to initiate a call from any place. When 'place' is no longer important, the use for the mobile telephone will become obsolescent. However, with an increase in the use of the mobile telephone, 'place' will become increasingly important with the competing parties associated with the user and non-user groups, contesting for their use of the diminishing arena of public and semi-public 'place'.

The aim to extend communication to communicate with places which were not only encapsulated environments, but were also open and moving environments, has brought a new emphasis to the importance of public and semi-public place. Even with the apparent conquest of place by the mobile telephone, this conquest is only temporary, for as each telephone conversation is terminated, or with the capabilities of the mobile telephone moving from place to place in the course of a telephone call, 'place' becomes vacated and so resumes its importance by reverting to an unconquered state, being at that time unpermeated by the intrusion of electronic media.

The mobile telephone is also adaptable as shown by its capability to converge with other electronic media, as Telstra state in their publication *Advantage News*, "now you can send and receive faxes, email and computer data all via your digital mobile phone" (*Advantage News*, 1995, p.1). With regards to the mobile telephone being unobtrusive, I would not think that this would be the case when used in public or semi-public places. The feedback I received from my survey indicated that nineteen non-user respondents who were disturbed by the use of the mobile telephone in the public setting were mainly irritated by being interrupted during a conversation when a mobile telephone user had to answer an incoming call. They were also disturbed by users speaking too loudly, and felt at times that the users were not engaged in meaningful calls but were using the instrument to impress others by commandeering the space adjacent themselves.

Notwithstanding the possibility that non-users may have some personal reasons for listing these complaints, their comments are grounded in the fact that the operation of mobile telephones outside a purely private place can raise issues with others occupying a nearby, or in some cases, almost the same place. Under these circumstances place is important and does not lose its importance when permeated by the use of 'the mobile' telephone. Perhaps place does lose its importance when intruded upon by other electronic media, and as Meyrowitz considers makes the "world...senseless to many people because...it is relatively placeless" (*Meyrowitz*, 1985, p.308), but not, I argue, in the case of the mobile telephone.

Time and Space

Giddens states that "the advent of modernity increasingly tears space away from place by fostering relations between 'absent' others, locationally distant from any given situation of face-to-face interaction" (*Giddens, 1990, p.18*). This situation of 'absent' others being locationally distant from face-to-face interaction can relate to the usage of the mobile telephone, which accounts for time and space being considered separately from place in this chapter.

According to Giddens, time and space have gone through various forms of connection and disconnection as the world has moved from its pre-modern era through the developing period of modernity. In the pre-modern era, time and space were connected, where "no one could tell the time of day without reference to other socio-spatial markers: 'when' was almost universally either connected with 'where' or identified by regular natural occurrences" (*Giddens, 1990, p.16*). The first separation of time from space came with the invention of the mechanical clock, when "the uniformity of time measurement...was matched by uniformity in the social organisation of time" (*Giddens, 1990, p.18*). These social organisations of time like standardised calendars, and the standardisation of time throughout the world to a single reference point, Greenwich Mean Time, enabled time to stand alone as a measure no longer requiring the socio-spatial references to make it meaningful.

However, Giddens also points out that "the separation of time from space should not be seen as a unilinear development, in which there are no

reversals or which is all encompassing" (1990, p. 19). To illustrate this he refers to a train timetable which indicates when and where the trains arrive, which he refers to as a "time-space ordering device...[which] permits the complex coordination of trains and their passengers...across large tracts of time-space" (1990, p.20).

The separation of time and space and their resultant stand-alone conditions, severs the connections between "social activity and its 'embedding' in the particularities of contexts of presence" (Giddens, 1990, p.20). However, Giddens says that disembedded institutions "depend upon coordination across time and space...to open up manifold possibilities of change by breaking free from the restraints of local habits and practices" (*ibid*). This statement implies that the disembedding of social institutions would form a reconnection of time and space. Giddens' interpretation of disembedding is "the 'lifting out' of social relations from local contexts of interaction and their restructuring across indefinite spans of time-space" (1990, p.21). In the case of the mobile telephone I would see time and space connected, as mobile telephone usage evokes a simultaneity in the transportation of time and space as one unit.

I have argued that mobile telephones are regarded as disembedding mechanisms, within the category of "expert systems" (Giddens, 1990, p.27), and that they operate through a system of 'faith' and 'trust'. The 'faith' ingredient is that the user of the mobile telephone has 'faith' in the construction of the instrument that it will fulfill the operations for which the

user has purchased it, and 'trust' in the expertise of the manufacturers of the instrument that the quality will be to the user's expectations. In recent times the users' 'faith' in the mobile telephone has probably been put to the test when it was found that conversations could be overheard by monitoring the airwaves with a scanner. This situation was brought to light with the well publicised revelations of monitored telephone conversations of members of the British royal family using mobile telephones. An article in the *Guardian* told how a "Mr Reenan is one of the many thousands of people in Britain who enjoy electronic eavesdropping....While [operating] his...scanning machine, which can pick up radio transmissions and calls made on mobile telephones, he heard a woman's voice, which...he was sure was the Princess of Wales" (Katz, Henry, Jackson, & Freeman, 1993, p.4). A part of the 'faith' element in the mobile telephone must have been completely dismantled, when the operation which allegedly intercepted and listened to Princess Diana's call was found to be not an isolated incident, but a widespread practice. An article by Stephen Cook entitled, *Camillagate: All the fun of the phone*, (*Guardian*, 1993, p.5) related that "Martin Lynch, who sells hundreds of scanners a month...says that people make no secret of the fact that they buy them to listen to calls....There are tens of thousands of people out there listening to other people's phone calls" (Cook, 1993, p.5).

The mobile telephone user, after having his 'faith' disassembled by finding out that the privacy of the mobile telephone conversation was more public than the standard telephone conversation, (one must have expertise and access facilities to monitor telephone conversations relayed through

underground cables), is now about to have his 'trust' tested. The service carriers and providers say that the new digital delivery system for mobile telephones is secure from intrusion by airwave scanning, to which the analogue delivery system was susceptible. Telstra in their *MobileNet* publication says "when using the MobileNet Digital Network...all transmissions are encrypted to protect against electronic eavesdropping" (*MobileNet*, 1995, p.2). This new digital delivery system of the mobile telephone will become the object of 'trust' wherein according to Giddens, "trust may be defined as confidence in the reliability of a...system, regarding a given set of outcomes or events, where that confidence expresses a faith in...the correctness of abstract principles (technical knowledge)" (1990, p.34).

In Giddens' definition of disembedding expert systems, by which he "means systems of technical accomplishment or professional expertise that organise large areas of the material and social environments in which we live today" (1990, p.27), the mobile telephone is a complete fit. Also his references to 'faith' and 'trust' are probably correct in that most users would fall into his category of the lay person for whom "trust in expert systems depends neither upon a full initiation into these processes nor upon mastery of the knowledge they yield. Trust is inevitably in part an article of 'faith'" (Giddens, 1990, p.29).

In consideration of Giddens' theory that 'faith' in the construction of the instrument to fulfill its' function, and 'trust' in the quality of the instrument to

perform to expectations, are necessary for the ordinary user in absence of expertise. I consequently examined the results of my survey to three questions which needed some understanding of the mobile telephone's technical aspects to answer positively. The assumption is that, if Giddens' theory is correct, all three questions should have a negative bias in their result.

Questions

1. Do you realise a mobile telephone when switched-on can make you locatable?
2. Do you realise that digital information can be stored and easily retrieved for analysis?
3. Do you realise that mobile telephone emissions may present health risks to its users?

Results

Question	Yes Responses	No Responses	Total Responses
• 1	24	9	23
• 2	13	20	23
• 3	20	13	23

Although no positive conclusion can be drawn from these results with regards to the substantiability of Giddens' theory, the number of 'Yes' responses to these questions indicates a reasonable level of technical interest in this particular media artifact by the user population. I see this as

being supportive of my decision in researching the mobile telephone as an important technology in contemporary communications.

The separation of time and space according to Giddens is "the condition for the articulation of social relations across wide spans of time-space, up to and including global systems" (1991, p.20). Giddens also says that the separation of time and space developed the "'empty' dimension of time" (1991, p.16), meaning that time could exist meaningfully without reference to place. The separation of time and place allowed for space to be created between what was originally the combination of time and place. This phenomenon led to the 'emptying' of space and a deprivileging of place, as social relationships spread across the indefinite spans of time-space. However, Giddens does concede that in certain circumstances time and space can become recombined "in ways that coordinate social activities without necessary reference to the particularities of place" (1991, p.17).

The mobile telephone does coordinate social activities without reference to the particularities of place through its capacity to operate in almost any place, which in that sense may render place as meaningless. However, when the mobile telephone is considered in the light of its conception, that is, a communication device which, with the support of the appropriate technological network, is designed to bring, or transport social activities to selected locations which can be changed almost unrestrictedly at almost any time, then place can be seen to maintain its importance. The fact is that the mobile telephone user will use the device because the place where he is at

that time located, does not provide the facilities he requires. If Giddens' reasons for the separation of time and space are to be accepted, then the use of the mobile telephone would seem to reverse modernity back towards pre-modern days, where the significance of place was vital to the understanding of what was happening at a particular time.

Giddens sees the separation of time and space in spatially expansive terms: "the articulation of social relations across wide spans of time-space, up to and including global systems", (1991, p.20). This suggests that the instruments of modernity like electronic media, which are partially responsible for the articulation of social relations, only operate by extending the time-space boundaries of social relationships. The geographical expansion of electronic media, "including global systems" (*ibid*) has in fact spread the operative arena of social relations to universal proportions. Also the mobile telephone has been a part of this social relations expansion, and recent its technical developments have extended its operations globally.

However, the mobile telephone is not always expansive in its geographical operations, as it can also be used to diminish space between social relations by reducing the geographical distance between communicating parties. According to Giddens, modernity and expansion are inseparable, he says, "the reorganising of time and space, disembedding mechanisms, and the reflexivity of modernity all presume universalising properties that explain the expansionist, coruscating nature of modern social life in its encounters with traditionally established practices" (1991, p.21). The geographical spatial-

diminishing properties of the mobile telephone can reverse the relationship "between distancing and the chronic mutability of local circumstances and local engagements", (*ibid*) by one user proceeding towards the other user in the course of their telephone conversation. It is possible that the two protagonists can visually come face-to-face where they can experience each other's expressions and body language while conversing through modern electronic media. This situation must question Giddens statement that "the advent of modernity increasingly tears space from place by fostering relations between 'absent' others, locationally distant from any given situation of face-to-face interaction" (1990, p.18).

My point is that the mobile telephone is a modernity era media device, a device which was invented during "the period of history from about [the year] 1450 to the present day" (*Reader's Digest Illustrated Dictionary*, 1985, p.1094), but which does not conform in some instances to Giddens' theories of modernity.

Controlling the Use of the Mobile Telephone

The question of operational freedom of the mobile telephone directly relates to place. The device is primarily designed to overcome the restrictions of communication being limited to specific fixed locations, and to give users universal communicational availability, limited only by the prescribed coverage of the particular cellular system. This unrestricted control of place by mobile telephone users can be to the detriment of non-users, in that it can invade individuals' private space which is co-occupied with mobile telephone

users within public and semi-public areas. The instances of these occurrences have been recognised by the Telecommunications Industry Ombudsman's office, who have produced a booklet entitled *The etiquette of mobile phones*, "to promote awareness and encourage thoughtful use of mobile phones" (Smith, 1994, p.4). The question is, whether this instructional booklet is sufficient to ensure an equitable sharing of public and semi-public place by both users and non-users of the mobile telephone.

My survey showed that nearly fifty-five per cent of user respondents said they switched their mobile telephone off in public places like restaurants, theatres, cinemas, libraries, hospitals, concerts, and lectures. This finding suggests that well over forty per cent of the user population are unaware of, or not concerned with, the intrusive nature of the mobile telephone to others in the public and semi-public arena. I also asked non-users if they thought that there should be legislation restricting people from using mobile telephones in public places. Out of thirty-four respondents, seventeen said 'yes', stating mainly that restrictions should apply to the same locations as those in which some users indicated that they switched off their telephones.

These particular results could be read as representing a reasonable level of concern for others around them by mobile telephone users, and a reasonable level of tolerance of mobile telephone usage by non-users. It must also be recognised that both sets of replies mainly concerned semi-public environments, that is environments where behavioural etiquettes exist, and can be enforced. The public areas with which I am also

concerned are external common use areas such as, in the street, external meeting places, playgrounds, parks, beaches, shopping malls, where exercising control over one's private space in such public places is determined to a very large degree on the people sharing adjacent spaces.

My survey contained responses that around thirty percent of the users had no concern at all for non-users, and that forty-seven percent of non-users did not consider legislative measures necessary to restrict public mobile telephone use. These figures if translated into the global totals of people either using, or being exposed to mobile telephone usage, would be significant. In fact the figures are significant in Australia taking into account the recent estimates by Stewart Fist who said, "it's now apparent the AMPS analogue network will have well over two million customers by Christmas [1995], while the three GSM [digital] carriers [Telstra, Optus, and Vodafone] combined have about 300,000" (*Fist, 1995, p.30*). These indicate that nearly thirteen percent of Australia's total population of eighteen million own mobile telephones. Considering that the mobile telephone services are mostly restricted to the main populated areas, the public place in these serviced areas will increasingly become influenced by them, and "the landscape of social life [in these public places] may be largely transformed" (*Meyrowitz, 1985, p.340*). The behaviour of persons within public places needs to be respectful in consideration of others using adjacent space, and the burgeoning use of mobile telephones in these circumstances could represent an infringement of privacy to non-users sharing the same place.

To resolve the problems of mobile telephone use in public places causing inconvenience to others occupying adjacent areas is complicated. The difficulties of producing legislation prescribing fairness to both mobile telephone users and non-users is considerable, notwithstanding the added difficulties of application and enforcement which would no doubt require additional resources. Also the recognition of the non-users' rights to privacy in public places in not being molested by the use of mobile telephones, equally raises questions as to the rights of mobile telephone users being allowed to operate their communication devices in public places. Under these circumstances perhaps the best way to deter indiscriminate users will be to legislate against mobile telephone use in semi-public places such as restaurants, cinemas, theatres, hospitals, public transport, and libraries, similar to the places suggested by some of the survey respondents. From this limited restriction there may grow a self-regulated mobile telephone etiquette which will become established and subsequently transferred to the wholly public place.

Chapter Five:

The Mobile Telephone and the Workplace

Introduction

In this chapter the relationship between the mobile telephone and the workplace will be addressed to show how the resultant situational dispersion of the workforce affects existing employment conditions, and traditional working practices. The transient capabilities of the mobile telephone, when replacing static communication devices, I shall argue, undermines the function of the present controlling strategies like direct supervision, and the overseeing institutions of workers welfare, such as trade unions. Decapsulation of the centrally concentrated workplace system into a geographically unorganised array of fluid individual workstations will invalidate standardised operating and supervisory procedures.

At present there seems to be little information available relating to the mobile telephone and its creation of a dispersed and mobile workplace. There is however information available with regards to people who have elected to work from their homes using personal computers and the telephone. This work situation will form the first part of the chapter under the sub-heading 'Home Office', where the issues raised hold some similarities to the main subject of the chapter. The second part will address the concept of the 'Mobile Office' with its modifications of the static workplace environment, and extension of the problems confronting 'Home Office' working.

The Home Office

In the 1980s the convergence of computer and telecommunication technologies instigated the concept of remote-office working. The staff employed under these conditions were termed as 'telecommuters'. They operated personal computers from their homes which could be linked to their parent office via a telephone line. The telecommuting system of working gained rapid popularity, where by the mid-nineteen-eighties "in the USA...homeworkers...compris[ed] [of] 10 percent of the entire workforce....[and] in Britain....7 percent of the workforce by 1985" (*Forester, 1987, p.162*).

Both employers and employees saw immediate economic advantages in the system. For the employers a reduction of office accommodation, furniture, and energy costs, and for employees the saving of time, money and stress in avoiding the daily return journey to the office. Another advantage for employers was productivity gains, as shown in an "extensive US study - of 1200 workers by Electronic Services Unlimited (ESU) of New York, [which] found average productivity gains of between 40 and 50 percent" (*Forester, 1987, P.163*). One of the main factors influencing the increase of productivity would be the reduction in the distractions which are inherent in an office environment but not found in the home, such as the interruptions caused through interaction with other workers. However, this "isolation...from all on the job social contact" (*Nilles, 1988, p.204*) has been the subject of complaint from some 'telecommuters', where "co-workers

account for one of the major job satisfactions [as] social interaction with others" (*Lederman, 1986, p.317*).

The effects of social interaction can also be experienced in commuting, which is an area that telecommuters are initially glad to avoid. When working from home "the change of surroundings, the sense of going somewhere and doing something...[and the] sense of closure, of completeness when we leave work and head for home at the day's end" (*Renfro, 1988, p. 211*) is forfeited. In ceasing to commute, the feeling of being at home will change, as there will be no difference between the home and working environments. The one time private environment to which its incumbent had "absolute dominion...will be invaded by a boss calling to check up on [work] progress" (*Renfro, 1988, p.211*). This situation is in excess of Marvin's interpretation of the telephone "dividing the private person from the more public setting of the community" (*Marvin,1988, p.6*), in that the private abode and persons, have been traded to the public setting under a commercial agreement.

Lederman also comments on the structuring of time, and how in the office "the worker is accountable both for the use of time, and for the amounts of time spent in completing the work assignments....[where] the worker's use of time is lost when the work is done at home within a personal time frame" (*1986, p.317*). These comments suggest that the freedom of operation away from the structured discipline of the office environment may have an adverse effect on a home-worker's adherence to doing things at certain times and

within certain times. However, this flexibility in the working arrangements of the home-worker may be a part of the positive findings of the ESU, of forty to fifty percent productivity increase for home-workers above their central office counterparts. Another point raised by Lederman is the influence of the presence of co-workers as "a key element for observing and modeling office behaviour....[and] to learn...by watching others or asking questions" (Lederman, 1986, p. 317). This could be a valid criticism as home-workers could well be isolated from the learning of new technologies, new working procedures, and the knowledge of central office workers' revised benefits.

Telecommuting has brought benefits to sections of the working community such as persons who for some reason cannot hold a job down in the normal workplace, and handicapped people who find it difficult or impossible to commute.

The Lift project...in...Illinois, enables the handicapped to work at home as [computer] programmers, and American Express has a similar scheme for handicapped word processor operators....In Britain nearly 1000 women [computer] programmers are working at home for a company called F International, which was set up by a group of female executives with domestic ties who also preferred to live outside the big cities. (Forester, 1987, p.163).

Trade union organisations do not seem to have made much effort to represent the telecommuting section of the workforce. They are "ambivalent about telecommuting, primarily because few have considered the process at all, [and because] they see neither great threats nor great opportunities in the process" (Nilles, 1988, p.206). Although historically trade unions have been more representative of manual workers, since the nineteen sixties their

influence has grown among the 'white collar' section of the workforce including "clerical workers and professionals such as engineers and scientists" (*ibid*). There may indeed be logistic problems in trade unions representing the geographically dispersed telecommuting community, but it is exactly this dispersement of employees which can result in the working conditions that trade unions have been contesting globally with employers since the inception of organised labour movements. These adverse working conditions are "a return to the 'sweatshop' atmosphere through piecework payment systems, forcing some production costs on to workers, and the absence of enforced periodic rest breaks" (Nilles, 1988, p. 206). Further, "an official British study by Catherine Hakim, of the Department of Employment, found that new freelancers [telecommuters] fared less well than their office-based counterparts in terms of pay, while holiday pay, sickness benefit and pension rights were virtually non-existent" (Forester, 1987, p.164). Another British study for the Equal Opportunities Commission attributed to Ursula Huws, "uncovered widespread evidence of financial exploitation....[where nearly all of the telecommuters sampled] had pay levels...below the average for their grade in more traditional locations" (*ibid*). It is clear from these examples that employee exploitation does exist in the telecommuting community due to the lack of union representation, and that some telecommuters are without job security, and legal protection. These workers are "at the mercy of their employers who [can] pick and choose at...time[s] of high unemployment, [and present a] grim picture of high-tech homeworking, [which is] hardly in accord with some of the more utopian visions of life in the 'electronic cottage'" (Forester, 1987, p.165).

Another important area to be considered is the environmental health situation of telecommuters in their working premises. In this day and age office premises are custom designed for the type of work which will be carried out within those confines. Working conditions are specifically regulated to conform with the particular 'Occupational Health and Safety' aspects appropriate to the use of the premises. However, in the case of homeworking it is unlikely that the premises used are specifically designed to incorporate the health and safety features required in the normal workplace. In an effort to address this problem, "Ms Julie Pagonis...spent four years preparing the Australian Public Service Home Based Work Award (1994)" (Clark-Dickson, & Salwat, 1996, p.21), but the response has been disappointing. Only the Roads and Traffic Authority, and Telstra are trialing the award, in which "100 Telstra employees have taken up home based employment under the award, and the results of an 80 strong trial within the Road and Traffic Authority are as yet to be collated" (*ibid*). According to the "Director of Telecommuting Australia, Mr. Alan Schaverien...the Telecommuters Award (incorporating OH&S principles) designed for the Public Sector Union is little known, less promoted and rarely used" (Clark-Dickson, & Salwat, 1996, p.21).

The question of workers compensation for teleworkers is also problematic, the Chief Executive Officer of Comcare, the Australian Government's occupational health and safety organisation, considered that,

the legal questions of such coverage are complicated. He said the advice Comcare was giving federal departments on

the introduction of telework included the need to define the boundaries of teleworker's workplace because of the employers duty to cover employees for occupational health and safety. (Lynch, 1994c, p.28)

To give an example of the problems as to what constitutes the workplace in the home, "in the US a woman who cut her hand while preparing lunch has filed a claim" (Clark-Dickson, & Salwat, 1996, p.21), this claim has not been settled yet, but it is plain that there are many considerations to be resolved as to what health and safety aspects need to be covered for the telecommuter. In Australia it has been estimated that "only 53 per cent of employees working at home are covered by workers compensation" (Clark-Dickson, & Salwat, 1996, p.21).

It is apparent that both advantages and disadvantages are experienced through workers choosing to vacate the centralised office environment to operate from their home environment. Forester cites that "employees rarely feel isolated in the ways predicted, although this is partly because most telecommuters have been self-selected and highly motivated" (Forester, 1987, p.164). This statement suggests that the telecommuting arrangement is suitable for some people but not others. Under these circumstances it is difficult to see this form of employment expanding further than the boundaries of employees who have a vested interest in exercising an opportunity to work from their home. Another impediment to the expansion of telecommuting is the attitudes of managers, who "have tended to resist change, not wishing to relinquish their traditional intra-office power" (Forester, 1987, p. 164). Also some economic and safety issues for

equipment may be difficult to resolve, for instance, "the homemaker and the employer will have to settle questions of liability" (Nilles, 1988, p. 212) should expensive equipment get damaged or stolen. This may make it necessary for special arrangements to be put into place such as "insurance and security systems [which] will certainly add to the expense of [establishing] the home office" (Nilles, 1988, p.212).

Nilles suggests that "many of the legal and economic issues could be resolved if the home worker were not an employee but an independent subcontractor who supplied his[her] own equipment or leased it from the office or a third party" (1988, p.212). This solution suggests a reduction in the number of people willing to engage themselves as telecommuters, as apart from being "self-selected and highly motivated", (Forester, 1987, p.164) telecommuters will also have to be competent at running a business. Another aspect of workers having to become subcontractors to engage in telecommuting employment, could be, through increased financial outlay, interpreted as a return to the "sweatshop' atmosphere....[by the] forcing [of] some production costs on to workers", (Nilles, 1988, p.206).

Telecommuting has extended opportunities for the disabled and infirm to be employed, but the downside of this aspect is that it also removes them from the normalities of going to work. In fact, disabled, and other disadvantaged persons "may discover that [telecommuting] is a dubious opportunity [as] they try to overcome barriers to take part in society" (Nilles, 1988, p.212). While the disabled and infirm are isolated from the normal workplace, they,

and their special needs will not be apparent, which can result in employers not being forced to address these special needs, and society becoming amnesiac about the disabled person's plight.

Nilles also comments that the increased opportunity for people who wish to work from home maybe to the disadvantage of some people who remain in the centralised office environment. He argues that telecommuting could have "a very important social cost...[where telecommuters] will be taking jobs...that have traditionally served as entry positions for lower skilled workers, [which] could make the job market for the underprivileged and the unemployed teenager even smaller", (1988, p.213).

The technologies of computers and telephones have set up teleworking working locations as a viable alternative to the traditional centralised office environment. From the following figures telecommuting appears to be well established.

- "7 percent of the [British] workforce in 1985", (Forester, 1987, p.162),
- "15 million telecommuters in the USA by 1990", (Forester, 1987, p. 161),
- "4 percent..of the Australian workforce of 8.2 million", (Robbins, 1995, p. 4),

The question of how much telecommuting develops does not only depend on further technology advancement, but also whether working at home "is supplemental to work at the office or a substitution for it" (Lederman, 1986, p.318). This decision will rest with the employers who are no doubt analysing present telecommuting performances, advantages, and

disadvantages, to compare them against the economic opportunities which may be afforded with oncoming technological advances.

The Mobile Office

One of the most recent technological advances to be marketed concerns the possibility of remote working through the converging of the mobile telephone, as a communication channel, with other portable media technologies. This has resulted in the concept of the 'mobile office', which allows for battery powered artifacts such as laptop computers, portable fax machines, and portable printers to be set-up in an office configuration in any situation which can be accessed with a mobile telephone. On page 18 in the Autumn 1995 issue of the *Mobile>>>com* magazine, an article entitled "Hit The Road" shows a photograph of a lady sitting upon a briefcase with a laptop computer connected to a mobile telephone. A textual explanation of the meaning of the photograph states that,

armed with the right combination of computers, communication devices and peripherals, it's possible to build the electronic infrastructure of an office into a briefcase....[as] the availability of mobile data communications has added the final part to the jigsaw...[to where] you can communicate...as if you were sitting at [an] office desk...send[ing] and receiv[ing] electronic mail and faxes and transfer[ing] files. (Fairall, 1995, p.19).

This new unconstrained workplace breaks free from the traditional highly regulated encapsulated centralised workplace, and the static condition of the telecommuters home working environment, and as such presents both employers and employees with a new set of problems. For instance, the change will reduce the importance of encapsulated workplace demands

brought about through personal association. Criteria such as dress codes, designated behavioural patterns, preferred physical attributes, and personality similarities will no longer maintain the same status as desired employment requirements.

These new sets of problems will also exist for organisations like trade unions, and health authorities, who are charged with the responsibility of ensuring correct working conditions, and who will need to produce new rules to cover the different situations. In examining the phenomenon of telecommuting, I found that very little control by trade unions and health authorities had been exercised in this area, and it was assumed that logistical problems of having a geographically dispersed workforce contributed to the apparent lack of interest in regulating and policing this specialised work area. At least with the home office the static environment is capable of being monitored, but with the mobile office, and the possibility of constant change to the working environment, any sort of meaningful inspection, or supervision would appear impossible. This changing of the office landscape will increase the problems in regulating for, and policing of, the working conditions under which the operators of mobile offices perform their duties.

To examine the concept of the mobile or "floating office, [which is] a management system that allows employees to set up their mobile offices wherever convenient" (*Office Computing*, 1993, p.49), it is important to look at the advantages and disadvantages as perceived by both the employers

and employees. Some companies see the mobile office as a more suitable alternative to the home office in remote working, because the office is not stationary and can be operated within the "corporate headquarters [as well as] branch facilities" (*Office Computing, 1993, p.49*) or any other place at short notice, and without the expenditure of equipment removal costs. The advent of portable technologies coming together with the mobile telephone, allows a configuration of office equipment which can be easily transported from site to site, and linked with all other workplaces within the facilities offered by the local mobile communications server. "Computing is now changing from a desk-bound activity to a more mobile computing activity....Increasingly, organisations are giving their employees portable workstations more powerful than any desktop-bound workers, and often home PCs. Instead of taking home a half dozen word processor documents, workers are taking their entire office" (*Petty, 1994, p. 7*).

The spread of telecommuting has allegedly been constricted by management who do not wish to give up the direct supervisory control function of the centralised workplace environment. It appears that the mobile office environment, to some extent, mediates this problem in that supervisors can recall their charges to the centralised workplace at any time, along with their office equipment. In fact the mobile office worker could operate on a roster basis, moving between remote worksites and the head office, allowing his supervisor to maintain a degree of face to face control.

It is understandable why a supervisor may not want to relinquish altogether the physical presence strategy of controlling staff, as the enthusiastic comments from staff who have embarked into mobile office working possibly breeds suspicion. Comments from employees such as "I don't have anyone looking over my shoulder....its a great feeling to have the flexibility to manage your own day....if we're not busy on any given day...we don't have to make work just to look busy....it is completely acceptable for us to time shift - to work on a Sunday..and take a few hours off on Monday to tend to a personal errand" (*Office Computing, 1993, pp. 49-50*). These types of remarks can raise doubts in the minds of supervisors as to the maintenance of an equitable balance between personal and company business within these flexible working procedures which are unseen and unsupervised. Even if workers' comments include "I get more done in any given day free from the stresses of commuting and office distractions" (*Office Computing, 1993, p.50*).

The enthusiastic comments of workers in support of the mobile office concept shows preference for individual action and choice in working conditions. This can present problems for institutions like trade unions to assume control over mobile office workers, in that an apparent major attraction to this form of employment is freedom from the constrictions placed on them by the various controllers of centralised workplaces. Individuality in the workplace directly challenges the creed of trade unions, which supports the axiom that all workers follow a common path laid down through respective agreements reached between the particular unions and

particular employers. It is however probable at this time that the numbers of mobile office workers in comparison to the numbers of employees who are engaged in the traditional centralised workplace is small, and therefore has little effect on the trade union control of worksites. This may not be the situation in the future if employers become confident that the mobile office concept can be adequately controlled and supervised. The possible monetary savings through the reduction in office space and equipment, and increases in efficiency where the office can be easily transported to any arena of action will present the mobile office as a viable, and in many cases a desirable working alternative.

The apparent advantages of the mobile office for both employers and employees along with vigorous advertising and supportive rhetoric in the media would suggest that the convergence of other portable communication devices with the mobile telephone would be a widespread practice. However, in my survey of one hundred households, I received replies from thirty-four mobile telephone users all of whom answered 'No' to the question "Have you ever used your Mobile Telephone and a Modem, for use with a Laptop Computer?" (*Staples, 1995*,). One of the respondents qualified the negative reply with a comment of "not yet" suggesting that the possibility did exist. Although my survey does not indicate that the mobile office is yet a common form of working, the volume of media output on the subject, or about artifacts associated with the subject, suggests that this communication structure will be an integral part of office configuration in the future.

A recent publication on future technologies addresses the launch of the Nokia 9000 Communicator, and describes the device as "a miniature office in your hand" (Cooper, 1996, p.34). The device has the outward appearance of a mobile telephone, and operates as such, however the telephone portion can flip-up "to reveal a full key pad in the underbelly, plus a small but clear six inch by two inch LCD screen" (Cooper, 1996, p.34). According to the rhetoric, the keyboard when closed functions as a normal telephone, but when opened operates as a speaker phone giving the user a 'handsfree' option to work simultaneously with the keyboard while engaged in a telephone conversation. The device is capable of sending and receiving messages from both email and fax sources, and can be connected to a personal computer either by cable or an infra-red connection allowing information back-up, and the printing of files. The company vice president of product development said that the Nokia 9000 Communicator would be commercially available in the third quarter of 1996, and that it looked like devices of this nature would become trend items of the latter half of the 1990s.

The Nokia 9000 Communicator shows how the mobile office concept is being developed, by combining the requisite technologies of the computer and mobile telephone into a single unit. Competitively priced, this device could spread the popularity of mobile office working, to where less senior ranked members of the workforce will be equipped in this way so further straining the traditional ways of supervision by managements, trade unions, and health authorities.

Within the circumstances of supervisory functions, the mobile telephone appears to be another technical innovation which has the power to overtake existing societal control mechanisms. The subversion of the presently exercised close control methods of supervision by dispersing the workforce with the aid of information processing technologies like the mobile telephone, will alter the organisation of work practices, and change the operational responsibilities of managerial posts. Unless some replacement supervisory methods are immediately available to cater for a workforce which is geographically spread and segregated from its centralised control mechanism, work practices may become disconnected from authority and guidance, drifting into a period of inefficiency. According to Nadel:

Social existence is controlled existence....Without some constraint of individual leanings the coordination of action and regularity of conduct which turn a human aggregation into a society could not materialise....The concept of social control brings us to the focus of sociology and its perpetual problem, the relation of the social order and the individual being, the relation of the unit and the whole....Control is simply coterminous with society, and in examining the former we simply describe the latter. (*Beniger, 1986, p.61*).

I consider Nadel's statement as especially applicable to the workplace situation where we have already noted that in the case of teleworking, trade unions seem to have lost control over their remote charges. Within these circumstances some teleworkers are experiencing diminished salary rates and other benefits in comparison to their central office located counterparts.

Beniger suggests that "each new technological innovation extends the processes that sustain human social life, thereby increasing the need for control and for improved control technology" (1986, p. 434). Also Beniger states "control by business and the state [and] the organisational basis of this control and its implications for social structure" (1986, p.436) are highly significant. Thus, technology appears autonomously "to beget technology", (Beniger, 1986, p. 434). In the case of technologies begetting technologies, Beniger acknowledges their contribution to the conquest of time and space, and the removal of barriers which distance human physical contact to where only technologies are capable of maintaining a connection. It appears then that the mobile telephone converging with other information technologies to form the mobile office concept will have to rely on further technological development to furnish the requirements for supervisory control mechanisms. Also, the zero return shown in my survey from the respondents who were asked about using a computer with a mobile telephone, may indicate a reluctance on the part of employers to engage in the mobile office concept until such times as a technology has been developed to exercise supervisory control for these decentralised conditions.

In the section on telecommuting we considered the effect of the home office with regards to the employment of disadvantaged persons. It was argued that although there were distinct advantages with regards to giving employment to persons who found difficulty in commuting, that there also could be disadvantages through the effect of isolation, leading to the possible disregard by the public at large for the plight of such persons.

However, in the case of the mobile telephone and its relevance to remote employment, the situation is changed in that most advantages would result from the employee being able to commute freely to any place at any time. These circumstances will seriously restrict the opportunities for persons with mobility problems being engaged in the mobile office working environment. However, outside of persons with mobility problems, the mobile office should provide similar employment conditions for disadvantaged persons as those discussed previously in the telecommuting section of this chapter.

Chapter Six:

Technological Convergence, Change, and Monopolies of Knowledge.

Introduction

In this chapter I discuss initially the issue of technological convergence and its contribution to the production of new communication systems and media artifacts. Secondly, I focus on the mobile telephone as a new media artifact, and how, in establishing a presence within different social structures and cultures, it brings changes to existing societal and behavioural norms. In considering these changes, I argue that new technologies challenge established positions, and force the creation of new "monopolies of knowledge" (*Innis, 1949, p.5*). To illustrate my argument I examine Diane Umble's (1992) description of how "since 1909" (*Umble, 1992, p.183*) the life of an Amish community was affected by its introduction to the telephone. Through this example I argue that the mobile telephone "has its significance for the type of monopoly of knowledge which will be built" (*Innis, 1949, p.5*), and therefore will produce changes to contemporary social structures and cultures into which it is introduced.

Technological Convergence

Technological convergence in communications is not a new phenomenon, the first example being when humans became able to "embody speech in writing, to be preserved over time and transported over space" (*de Sola Pool, 1983, p.24*). As writing became a more popular means of communication, the search began for suitable materials on which to write.

According to Innis, "various media of communication such as clay, papyrus, parchment, and paper, produced first from rags and then from wood", (1949, P.5) were used. This transformation of the spoken word into written form was the most important of all convergences of media systems, because it provided the impetus for most other working combinations of media inventions. The next important convergence was that of writing and Gutenberg's printing press. This combination enabled the mass production of print, where "written texts could be disseminated in multiple copies" (*de Sola Pool, 1983, p.24*). Other new media inventions like the phonograph and photography were developed and later converged into moving images with sound. Similar to print, this medium was also circulated in multiple copies to form a popular entertainment medium, namely the film industry. In more recent times the advent of the 'electronic era' has enabled "digital electronics [to bridge the] technical separations...between the telegraph...telephone...radio...print and electrical delivery, which through these mergers, electronic technology is bringing all modes of communications into one grand system" (*de Sola Pool, 1983, p.28*).

Telegraph and Telephone

The convergence between the telegraph and the telephone came about for various reasons. Around the time of the invention of the telephone, the telegraph companies were trying to move from the "Morse code system for sending dots and dashes from operator to operator, to a teleprinter system that would provide a switched network for sending written messages from premises of the sender to the premises of the receiver" (*de Sola Pool, 1983,*

p.28). The telephone became a directly competitive form of communication to the telegraph, when in 1910 in America, the largest telephone company AT&T, and the largest telegraph company Western Union merged. This merger was described by the president of AT&T as,

"one system with a common policy, common purpose and common action; comprehensive, universal, interdependent, intercommunicating like the highway system of the country, extending from every door to every door, affording electrical communication of every kind, from everyone at every place to everyone at every place" (*de Sola Pool, 1983, pp.29-30*).

In 1913 the U.S. Federal Government forced AT&T to dismantle the merger and to relinquish the telegraph side of the business back to the restored independent operations of the Western Union company. Although the separation of telegraph and telephone operations was maintained, the introduction of the computer and the facilities for it to be connected to the public telephone network has evolved a configuration in which "the telephone system has in fact become what its creators always thought it would be, a hybrid telephonic and telegraphic system, carrying both human voice and written messages over the same lines" (*de Sola Pool, 1983, p.30*).

Radio and Telephone

In 1906, R. A. Fessenden demonstrated the phenomena of sending voice messages by radio to ships at sea, and in the same year AT&T the American telephone company "saw radio transmission as a natural extension of its communication business" (*de Sola Pool, 1983, p.34*). Although radio and telephony were combined for communications between ships and shore, and used in a limited form on land in communication with cars and taxis, no major

convergence of these two systems occurred until the introduction of communication satellites in the 1970s. The combined use of satellites for radio, telecommunications, and television transmissions "present[s] to the world a way of doing things which did not exist before...They also allow a whole range of existing activities to be performed differently...[in altering] the way television is distributed, telephone calls transmitted, and business information carried around the globe" (*Reinecke, 1983, pp.101-102*).

This "way of doing things which did not exist before" (*Reinecke, 1983, p.101*) prompted the greater use of converged radio and telecommunication systems, such as the microwave radio transmission of telephone calls within national telecommunication networks. In Australia, "70 per cent of [Australia's national telecommunications carrier's] trunk traffic is carried on radio signals between microwave dishes erected on towers located on hilltops and ridges around Australia" (*Reinecke, 1985, p.136*). The other major convergence of radio, and telephone occurred in 1983, when the "cellular [mobile] telephone service [became] available to [the] public in [the] United States" (*Crowley, & Heyer, 1991, p.245*).

Digitalisation and Convergence

The introduction of the digital communication delivery system, and its application to computer technology, is the heart of the communications' technological convergence phenomenon. As James Beniger observed, "because most modern computers process digital information, the progressive digitalisation of mass media and telecommunications content

begins to blur earlier distinctions between the communication of information and its processing" (*Beniger, 1986, p. 25*). Digitalised computers with their speed and efficiency in the processing of information are encouraging the strategy of digitalising all electronic information formats and communication systems. This common information delivery format will allow for the unimpeded flow of all forms of information, to, from, and between all types of media, or as expressed by Beniger, "digitalisation promises to transform currently diverse forms of information into a generalised medium of processing and exchange by the social system" (*ibid*). The convergence of the mobile telephone into this "generalised media of processing [can open up new strategies of communication] exchange by the social system" (*ibid*).

Change

The mobile telephone and its convergence with other technologies is bringing change to people's lives by reassembling their communication patterns and expectations. Some of these changes will concern future technologies, like the concept of "Universal Personal Telephony (UPT)" (*Fist, 1994, p.12*). The UPT is a communication system that combines all of a subscriber's telephones, including the mobile telephone, to a one contact number. This system provides for "everyone [being] contactable anywhere at any time [and] embraces...a single telephone number [which is] yours for life, [establishing] the ultimate in cradle-to-grave portability" (*ibid*).

The concept of having a lifetime personal telephone number to cover all electronic communications will be like having a national, and if connected

globally, an international identity number. It is also assumed, that having a lifetime personal telephone number will mean that changing one's number will be discouraged. These situations can impose on some people changes which will restrict their relative freedom of anonymity, and make unwanted communication a forcibly accepted part of their lifestyle. However, not everyone sees electronic identification as a bad thing, Mary Dunlop a vice-president with the Canadian telecommunications company Nortel recently said that, in relation to telecommunication identification systems, "the issue of invasion of privacy [is becoming] less and less, and more and more the value of doing business quickly...is becoming recognised" (*Tellzen, 1996, p.34,*). In apparent qualification of her views she also said that "one of the greatest invasions of privacy ever was the development of the telephone itself, but we are so used to that intrusion we do not think of it as such at all" (*ibid*).

Another encroachment on people's freedoms from electronic communication will be in future office environments. "New offices are already being designed and equipped for the next development [of] wireless telephones which will operate like mobiles, but only within a particular building. Employees will carry lightweight cordless telephones wherever they go in the office leaving no excuse for missing a telephone call" (*Brewster, 1996, p.4*). The outcome of this communication facility will have the effect of staff being permanently on call within their employer's premises, and as such will increase productivity through the reduction of non-communicable ineffective time. The change where office employees' non-communicable ineffective

time becomes effective communicable time will make the use of a modified form of "Frederick W. Taylor's scientific management [possible, where]...unit times [can be measured to establish] reconstructed jobs with composite times as a standard" (Kem, 1983, p.115-116,).

The mobile telephone has also raised the expectation of users, in that other users will always be available at any time, and in any place. This expectation will fundamentally change the time and place parameters relating to telephone communication behavioural patterns, by increasing the opportunity to "unsettle customary ways of dividing the private person and family from the more public setting of the community" (Marvin, 1988, p.6). Also, with the present rapid expansion in the numbers of subscribers taking up the service, a future scenario may see non-users branded as non-contributors to the social norm.

The situation in which the mobile telephone is making people communicably available at all times, is also extending into people's leisure time. Privacy is no longer assured as the mobile telephone can access large areas of public space, some of which were treated as sanctuaries, where people specifically went to isolate themselves from intrusive communicative contact. Also beachgoers who may take mobile telephones with them, can now cover all telephone communication eventualities within this environment. "A British company Aquaman, is doing brisk business with the Aquapac waterproof floating mobile phone

cover....mobile users can now...take their phones in the water" (*On the Edge*, 1995, P.47,).

Although the situation of having telecommunication facilities available while a person is bathing seems bizarre, the manufacturing company has established a market for the product. This suggests that mobile telephone users are desirous to maintain telephone contact at all times and under any circumstances, and do not appear concerned to protect their private time from public intrusion. A lifestyle change of consciously allowing, or even desiring interruption into one's leisure time raises the possibilities of either seeking an extension of working hours into leisure time, or that the mobile telephone in some way enhances the pleasure of one's leisure time.

In Australia, the telecommunications industry has traditionally been highly regulated, but since the deregulation of the mobile telephone market, two other service providers namely Optus, and Vodaphone have been given operational licenses. Since then the one-priced local call charge, applicable to the normal telephone service, has come under pressure to be made chargeable on a timed basis. The request for this change has been refused by the Federal Government of Australia, but it appears that a large number of local calls are actually registered as timed calls. These calls are being made through the mobile telephone networks which are not covered by the one-priced regulation.

A recent report in *The Australian* said that "up to half of all local telephone calls will be timed by [the year] 2000 despite government regulation,...[as] the unexpected explosion in growth of mobile telephones which charge callers by the minute, will see mobiles account for close to half of all calls by the end of the decade" (Brewster, 1996, p.4.). This situation seems set to expand as the same article reports that, "mobiles are expected to partly replace fixed telephones...[as] there is evidence some young people are dispensing with fixed telephones when they move house, using their mobile as their only telephone" (ibid). The increasing popularity of the mobile telephone is plainly evident, where a growing part of the population is willing to forgo the financial benefits of the fixed telephone for the convenience of mobility in their electronic communications.

Mobile telephone penetration in some places is a matter of necessity. In countries such as India, Indonesia, and China, whose "combined population amounts [to] around 2.3 billion, [the fixed line penetration] is [only] 1, 2, and 3 telephones for every 100 people" (Richardson, 1995b, p.12.). The large economic costs, and time consuming operation of installing cable networks for fixed-line telecommunication services in these countries, are being complemented by the installation of the less costly alternative of wireless telephone systems. "Hand-held cellular phone networks, which use the airwaves, not wires, are filling a big gap....[and] as handset prices, monthly access rates, and airtime charges fall, wireless is emerging as an alternative to wireline in a number of countries" (ibid). The change in the traditional telecommunication strategy of supplying services based on fixed-line

systems, to supplying services by wireless systems may have some financial benefits. "In the Philippines...wireless monthly subscriptions have fallen below comparative wireline charges, [and] in places such as India the implementation of wireless networks is expected to leapfrog landlines" (*ibid*).

In Malaysia in 1985 there were no mobile services existing, but by 1995 there were "about 1.2 million subscribers to cellular mobile services, [and] by [the year] 2000 there are likely to be 2.5 million if industry estimates are correct" (*Richardson, 1995a p.26,*). Malaysia during the past two decades has been one of Asia's rapidly growing economies: "where established state controlled telecommunication monopolies were slow to deliver fixed-line phones. [The] wireless system [has enabled] Malaysia to catch up with demand by using new technology" (*ibid*).

The introduction of mobile telephone systems in Malaysia came with a partial deregulation of the state controlled telecommunication industry to introduce competition between rival servers, and hence produce equitable subscription rates to the customers. However, the dynamic growth of the mobile telephone industry appears to be instituting changes, where both government and the industry are reassessing their original strategic thinking as to the format in which the industry should operate. Although the mobile telephone market in Malaysia is buoyant, the rival servers are now questioning the market's potential volume to provide adequate profit margins for all of the players, a sentiment which is also being expressed by the Malaysian government. A statement from the Minister in charge of

telecommunications in Malaysia said that, "while we accept the benefits of competition, we do not want to see a situation where competition comes to the point of being wasteful, unnecessary and unproductive" (*Richardson, 1995a p.26,*).

This has opened up the door to the possibility of "mergers and alliances to reduce the number of competitors, [and has drawn statements from industry executive Abdul Kadir that] you cannot be going into this market and think you want to dominate....[as] we believe that the success of this industry will depend on rational thinking and co-existing with other operators" (*ibid*). These statements indicate a change from the original free competition strategy of the mobile telephone industry, to a system of private enterprise cartels with agreed market shares and non-competitive customer subscription pricing. This strategy is unlikely to be contested by the Malaysian government, as it will gain income from taxation levies placed on the licensed operating companies, and be without the outlay of overhead expenditure for the provision and operation of the cellular networks. The only losers from this system will be the customers, who will cease to benefit from subscription reductions through the stifling of competition. It is also possible that similar situations could arise in other countries, especially those countries which are embracing policies of privatising government controlled industries.

Another area of change through the introduction of the mobile telephone is the way that young people have embraced the technology. "According to a

national survey [in Australia] conducted by Telstra...22 per cent of young people aged 20 to 24 already have a mobile telephone" (*Jinman, 1996, p.4,*). The mobile telephone once regarded by young people as a "yuppie toy [in the 1980s], has become a particularly cool item in the 90s" (*ibid*). Fashion conscious young people have alerted mobile telephone manufacturers to the demand for contemporary designs resulting in, "Motorola [an American manufacturer]...selling two-tone mobile phones, available in 11 colour combinations (*Partridge, 1995, p.30*). This line of products is called the *Flare* range, which in addition to the colours of "yellow, raspberry, aubergine, greeny-blue, and traditional black,...leopard skin cases" (*Jinman, 1996, P.4*) can also be purchased. Motorola Cellular promotions manager said that "the youth market is very conscious of aesthetics, once something becomes a necessity...it does need style" (*ibid*).

Another American company, Bell-Northern Research is working on future designs for communication devices, which their product design manager Jeff Fairless says "would need to be smaller and more personal...functional and make a statement about the person who wears it....[and] be something that they are comfortable to be seen with" (*Wheelwright, 1995, p.29*). Fairless also cites "the growing number of American teenagers buying multicoloured designer pagers to wear as fashion items as much as communication devices" (*ibid*). The desire of young people to be seen with a communication device is also experienced in other places besides America. "In Hong Kong...you can buy plastic pretend mobile phones...[which] look like the real

thing and serve no purpose save as the ultimate in portable yuppie fixtures" (Kurosawa, 1995, p.10,).

Other changes in mobile telephone styles relate to size, where portable communication devices are being designed smaller to be unobtrusive to the carrier. The Japanese electronics manufacturer Sony "has released a credit card-sized mobile phone which is 24mm thick and weighs 185gms, including batteries" (*The Australian*, 1995, p.36). The size of the communication device also matters to young people according to Nicole Fossati who said that, "the type of telephone mattered...the smaller the better scores the most style points" (*Jinman*, 1996, p.4).

The growing use of the mobile telephone by young people has been partially brought about by the reducing cost of purchasing an instrument. With the Australian analogue mobile telephone network being phased out in favour of an all digital network by the year 2000, the costs of the analogue mobile telephones have plummeted. In December 1995 analogue mobile telephones could be purchased for as little as "\$99" (*Jinman*, 1996, p.4). These low price purchases, although becoming obsolete in 4 years, are worthwhile not only for the young purchasers, but also for "concerned parents, [who may use] them as sophisticated homing devices to keep track of their offspring" (*ibid*). Young people's adoption of the technology will ensure that the expectations of mobile communications will be carried forward with them into their adult life, replacing some of the expectations

associated with the static encapsulated communication facilities of the present.

The use of mobile telephones by young people also has its downside, as described in a newspaper article relating to a riot in south London. The article said that "a rampaging mob of about 100 youths...looted shops and set cars on fire....[with the] looters us[ing] mobile telephones to coordinate their movements while pulling clothes and electrical goods from shops" (*The Australian*, 1995, p.8). From this example it would appear that the expectations of criminals will change, where the mobile telephone will serve as an aid for coordinating illegal activities. Law enforcement agencies will also have to change their strategies and maybe equipment, in order to overcome this impediment to fighting crime. It is evident from these examples that the mobile telephone is being used in distinctly different circumstances, one in bolstering security, and the other in assisting to dismantle security, and that the lowering cost of access to mobile telecommunications is liable to be accompanied with both beneficial, and detrimental social change.

Monopolies of Knowledge

Harold Innis claims that "each [communication] medium has its significance for the type of monopoly of knowledge which will be built and which will destroy the conditions suited to creative thought and be displaced by a new medium with its peculiar type of monopoly of knowledge" (*Innis*, 1949, p.5). My interpretation of Innis' theory is that, each successive media artifact is

constructed to advance preceding artifacts' potential to satisfy contemporary requirements. These new artifacts create new cells of knowledge which are contained and monopolised by their constructors, and later their users. The holders of this new knowledge can become sub-cultures which will influence communication behaviours within their dominant culture. The mobile telephone has created a users sub-culture which, as illustrated previously, has spread into many different sections of society on a global scale.

The mobile telephone user's sub-culture can be likened to other previous sub-cultures as "the exotic within the boundaries of [a] nation, [similar to] the mods and rockers,...women [and] blacks", in the 1960s (Kress, 1989, p.xi). Kress also cites that "culture is the domain of meaningful human activity and of its effects and resultant objects; [and that] communication is the domain of the intended or unintended between social/cultural agents" (Kress, 1989, p.2). According to Kress, the link between culture and communication exists through the "concept of meaning, [and that]...cultural production brings into existence meaningful objects [e.g. mobile telephones] which in turn communicate their meanings" (*ibid*), similar to the fashion and status concept exhibited by the young people's use of the mobile telephone.

As a cultural artifact the mobile telephone communicates in its own particular way, such as, that it is recognised as being portable without physical restrictions. It also communicates it's flexibility by its variable dimensions and design, to suit the differing environmental conditions associated with its use, and for the esthetic preferences of its users. The mobile telephone "is

therefore an object that carries...a complex of meanings about one particular area of culture, namely", the electronic media (Kress, 1989, p.7). The mobile telephone, as a communication artifact, is inexorably linked to culture, as "culture sets the ground entirely for communication, for what can be communicated, what is communicable, and for how it is communicated" (Kress, 1989, p.10).

To give an example of how a communication device can affect a culture by the creation of new "monopolies of knowledge" (Innis, 1949, p.5), I will refer to Diane Zimmerman Umble's, *The Amish and the telephone: Resistance and reconstruction* (1992). "Since 1909, the Amish in Pennsylvania, USA, have banned the telephone from their homes" (Umble, 1992, p.183), the telephone "figur[ing] prominently in accounts of a church split that resulted in the loss of one-fifth of their membership in 1910" (1992, p.184). The Amish lifestyle is practised in accordance with "the concept of *Gelassenheit*....demand[ing] obedience, humility, submission, thrift...simplicity [and that] one 'gives up' or 'gives in' in deference to another or for the sake of the community" (1992, p.185-186). The telephone "came from outside the Amish community and led to association with outsiders...contributed to individualism and pride rather than humility...[and when used] for gossip...disrupted social harmony" (1992, p.189).

The telephone challenged the Amish principles of separation and non-conformity by invading the home which is the "sacred space....[enveloping] the very centre of Amish faith and life" (1992, p.190). It symbolised a

connecting bridge to the outside world by which culturally foreign influences and intrusions could enter the "sacred space [of the Amish home, and remove] communication from the context of community, and [make] possible private and individual links with sources of information from outside, unmediated by the style, rhythms and rituals of community life" (*ibid*). The outcome of these threats to the *Gelassenheit* existence of the Pennsylvanian Amish community resulted in a telephone installation ban within the community confines until the mid-1930s.

After this time some Amish families requested from the church elders permission to share telephones, which would be sited in a structure outside of the living premises of the sharing families. This strategy of sharing a telephone not sited in people's living residences became known as the 'community telephone' system, which was an "Amish attempt to protect their homes from interruptions....[which] would spoil the natural rhythm of family life, and to protect the home from unwanted intrusions by outsiders and outside influences" (1992, p.190-191). The 'community telephone' arrangement is felt to provide a line of separation between the Amish community and other communities, and with the discouragement of loud bells for signifying incoming calls, and the unlisting of the 'community telephone' numbers, the telephones' usages are mainly restricted to outgoing calls.

As American economic conditions changed so has the lifestyle of the Amish community, where "a growing population and a dwindling supply of farmland

[have required] Amish families [to develop] small businesses....that often serve both the needs of the Amish community and the general public" (1992, p.191). These entrepreneurial conditions now being experienced by some members of the Amish community have increased the call for better telephone access, where it is being argued "that access to the telephone is now a necessity for running a business" (*ibid*). The response to requests for having telephones sited in shops "varies from district to district, depending on the position of the local bishop" (*ibid*). In cases where permission to site a telephone within shop premises is granted, the "mark of separation" (*ibid*) between the Amish community and the outside world begins to blur. These circumstances erode the Amish creed of, priority of community service within their order above individuals' needs, by accepting requests from business people to allow the installation of the telephone for what is mainly their personal convenience.

Umble sees the Amish response to "telephone access [as representing] a negotiated solution, [where] community telephones maintain the traditional ban on the home telephone, [and that] the compromise maintains separation from the world, while making an accommodation to economic pressures and social change" (1992, p.191). The "negotiated solution" (*ibid*) which the Amish have applied to telephone access within their community has without doubt changed their culture, as it has introduced a form of sub-culture within the parent culture. A gradual capitulation from, the total banning of telephones within the community, where at that time the Amish community were of one culture, to the inception of the community telephone, and now

telephones installed within individuals' business premises has developed new *monopolies of knowledge*.

These new *monopolies of knowledge* held by a telephone sub-culture within the Amish community, is exerting pressure for more contact with the world outside of their community. Even the installation of the "community telephones....[which were solely provided on the argument] that access to a telephone was important in times of emergency [for] calling a doctor or the fire company" (Umble, 1992, p.190), were also able to accept incoming calls. If incoming access from the outside world to the Amish community was to be maintained in its original form prior to the installation of community telephones, and the acquirement of 'new knowledge', the telephones would have been configured to completely bar incoming calls, not just to discourage incoming traffic by prohibiting the use of "loud call bells" (1992, p.191).

It is evident that with the invasion of the telephone into their community, the Amish way of life has had to accommodate changes to satisfy the demands of it's community members who have acquired new "monopolies of knowledge" (Innis, 1949, p.5). In acceding to the demand for the installation of "community telephones" (Umble, 1992, p.184), and later to telephones in business premises, the Amish community put in place changed communication patterns for it's community. These changed patterns have also meant a cultural change within the Amish community where more communication has been made with people outside of their own community,

different sets of communiqués are being used due to their changing business and economic environments, and that an alternative way of communicating has been acquired to achieve these communications. In re-iterating Kress's statement that "culture sets the ground entirely for communication, for what can be communicated, what is communicable, and for how it is communicated" (Kress, 1989, p.10), it is reasonable to assume that any change of these communication parameters will also be responsible for a change in culture. Therefore the change in the Amish communication patterns with the use of the telephone has also changed their culture.

The introduction of the mobile telephone and its impact on society can be likened to the effects of the Amish community's experience of the telephone. The creation of new "monopolies of knowledge" (Innis, 1949, p.5) and the formation of an influential sub-culture within the parent culture, is forcing change across the whole spectrum of society. As with the Amish society, the changes to communication patterns are irreversible, and the resultant widening social shifts occurring between the holders of the new "monopolies of knowledge" (Innis, 1949, p.5), and the disenfranchised, challenge the structure of community living. It is recognised that most modern societies operate in a duopoly of individualism and community living, and that a major supporting structure of community living is communication. However, with the mobile telephone changing communication patterns, and given that these new communication patterns are not available to the whole community, then the structure of community living is consequently weakened.

Summary

In this chapter I have traced the evolution of individual communication technologies, and suggested how, in converging they have widened their operations to global proportions. As an integral part of these convergences, the mobile telephone has accessed places which were previously communicationally unavailable, reassembling the communication patterns and expectations of its users. Within this new communication environment of total availability, the distinction between work and leisure times is becoming blurred as mobile telephone users choose to make the instrument their constant companion. A future extension of mobile telephone technology is Universal Personal Telephony (UPT). This system is designed to give each subscriber just one telephone number to embrace all of the individual's communication requirements. This will be similar to having an electronic identity number, which will restrict the freedom of anonymity.

Young people are making extensive use of the mobile telephone both for communication purposes and as a fashionable accoutrement to their attire. Some manufacturers of mobile telephones have recognised the commercial potential of this market segment, and are implementing design changes to cater for the contemporary fashion requirements of young people.

Another group adopting the use of mobile telephones are criminals, who frustrate law enforcement work by reporting to their counterparts police patrol movements. With the mobile telephone criminals are as communicationally flexible as the police, and can constantly relay updated

information to assist in planning felonies and avoiding detection. In these circumstances it is probable that law enforcement agencies will have to adopt some other technical solution to redress this imbalance.

The final part of the chapter dealt with the mobile telephone and the creation of new *monopolies of knowledge*. I argued that the mobile telephone creates new *monopolies of knowledge*, which weaken community values held within societies through the formation of elite sub-cultures. These sub-cultures influence and consequently change communication behaviours within their dominant cultures. To support my argument I have used a case study by Umble (1992) relating to the introduction of the telephone into a Pennsylvanian Amish community. The case study shows how the introduction of the telephone into this community developed elite groups with new *monopolies of knowledge*, which challenged the principles of separation and non-conformity which are central values to the Amish communal way of life.

Chapter Seven:

Conclusion.

In the conclusion to my thesis I will summarise the main points addressed within the body of the text, and identify the important issues that have been raised. The mobile telephone has not been selected as a major subject when reviewing the impact on society of media artifacts, hence my research has filled a gap in academic scholarship relating to electronic media. I also stress the importance of my findings, as the mobile telephone is being relentlessly driven by the telecommunications industry, supported by media organisations, and national governments, to become a main avenue for all types of electronic communication.

The release of the telephone from being a static encapsulated communication device, to a mobile personal communicator, has changed the whole concept of the value of the telephone. Many different sections of the society have embraced the mobile telephone to cater for their specific needs, such as small businesses, which have no further requirement to maintain a home office specifically for communication purposes, and professional business persons who require to be constantly communicatively available. There are also young people who see the mobile telephone as a contemporary accouterment to their attire and image, as well as parents who equip their young charges with this communication device to enhance their safety while away from the family home and parental care. Other sections of the community are converging the mobile telephone with media devices such

as portable computers, fax machines, and printers to change the concept of the traditional centralised workplace. With this new communication configuration the office becomes completely mobile, and can be easily transported to practically any environment within the coverage of the particular mobile telephone network.

The changes in societies' communication pattern brought about by the mobile telephone are fundamental, in that the boundaries between work and leisure, private and public in the public settings are becoming blurred. Places which were traditionally leisure and rest domains are being invaded by the unrestricted access of mobile communications and changed into workplaces, and private spaces in public settings are now permeated by direct telephone communication, or overheard conversations.

The implications for the future suggest that communication devices will combine fixed and mobile technologies to envelope a single number strategy for all telecommunications contact. This format will make one's telephone number similar to an identity card, which through a digital delivery system can be combined with all other personal data resident in various government and commercial archives. Apart from the collection of personal data, the mobile telephone when switched on, sends out a signal in order that it can be located to receive incoming calls. It is possible for the telecommunication authorities to physically locate a particular mobile telephone to within the radius of the cell transmitting its signal, which could be anything between two and twelve kilometres. This means that it in the future set-up of personal

communicating systems, the approximate whereabouts of particular individuals can be determined at any time while their personal communicators are switched on.

It is evident that the mobile telephone is infiltrating all sections of society, and that it is not only changing the way people communicate, but also unrestrictedly extending the areas in which telephone communications can be operated. This new communication freedom is bringing a set of different expectations between the communicators and the communicated, where mobile telephone callers expect the mobile telephone called to be available anywhere and at any time. Carriers of mobile telephones are expecting to be called, and are knowingly exposing themselves to calls from any source, maybe even receiving work based communications within their leisure time.

The changes emanating from the introduction of the mobile telephone into society are both social and cultural, and as mobile communication technologies continue to advance, so will societies' social and cultural norms change. Because the prognosis is that mobile telecommunications will continue to grow within our societies, and with that growth, social and cultural changes seem destined to occur, it is strongly suggested that further research into the mobile communication phenomenon is carried out.

In this study I have established the importance of place as a fundamental component in communication and social relationships. Both Meyrowitz (1985) and Giddens (1990) & (1991) devalue place within this context.

Meyrowitz argues that place has become permeated by the electronic media which assumes no further importance for place as a site for communication. Giddens argues that place was important when it was used as a reference point to time and communications in the pre-modern era, but in modern society with the invention of the mechanical clock, and the social organisation of time, time became a stand-alone component separated from both place and space. Within this theoretical discussion, which sees space and time separated and considered as separate entities, place became irrelevant.

My position is that place has assumed a new importance when considered in relationship to the mobile telephone, not only in the case of users' unrestricted selection of where communication can take place, but also for non-users who can have their private place within the public setting intruded upon by the use of this artifact. There is also the consideration of environment, where place has been invaded by the erection of transmission towers to relay mobile telephone radio signals. In one particular environment some residents claimed that these towers destroyed the natural beauty of the place where they lived, and demanded that they should not be erected.

Giddens also argues that although the place where people live, "remain the source of local attachments, place does not form the parameter of experience" (*Giddens, 1991, p.146*). It is probable that this statement can be appropriate to the home environment, but I would reject it in the case of the public arena where the influence of others do form parameters of

experience. My interpretation is that both Giddens and Meyrowitz are addressing their theories to the electronic media which are encapsulated within peoples' places of domicile. The mobile telephone differs to most other media in that it is specifically constructed to operate everywhere, especially in the public domain. Perhaps a previous analogy to the mobile telephone in respect to its invasion of the public place was the portable radio. However, the mobile telephone is different to the portable radio, in that it is an interactive technology which can be activated either locally or remotely, i.e. by either outgoing or incoming originated traffic.

Giddens describes the situation relating to the separation of time and space in spatially expansive terms, that is, "the articulation of social relations across wide spans of time-space, up to and including global systems" (*Giddens, 1991, p.20*). The mobile telephone has been a part of this social expansion. With recent technical developments it has extended its operations globally. However, this geographical expansion can also be reduced with the mobile telephone, as a user could, and in many instances probably does, actually reduce the physical distance between themselves and their connection within the duration of the call.

The outcome of my investigations is that the mobile telephone is a different artifact compared to other electronic communications media, and as such should be researched independently. The importance of the described differences within this thesis are that they present a whole new set of

circumstances for communication, which will have major social and cultural effects.

When we consider the concept of the mobile office through the convergence of the mobile telephone with other communication media, advantages and disadvantages become apparent for both employers and employees. One of the main issues refers to supervisory control by employers, and the institutions charged to oversee workers' welfare and safety. It appears from information gained on 'home office' working that very little has been done by trade unions or health authorities to guarantee the minimum working conditions, or health and safety standards for employees located in 'home office' worksites. One text suggested that trade unions did not bother about the welfare of home office workers because they did not see any great advantages in representing them. Also, because of the small numbers of home office workers relative to the rest of the workforce, the trade unions do not think that they risk any disadvantages in not representing them. If the trade unions or the health authorities thought that there were logistic problems in administering the needs of the home office workers, then carrying out these functions within the mobile office concept would be practically impossible.

Another problem for the overseeing authorities associated with mobile office working is the attitudes of the mobile office workers. One of the major advantages cited by these workers is the freedom from supervision and direct control, and the flexibility that they can introduce into their working

arrangements. These type of statements suggest that the freedom of the mobile office environment is much preferred by some to the rigidity of the highly supervised workplace, even if some of the supervisory controls are for the employees' own good.

The spread of the mobile office concept could have major implications for institutions such as trade unions. Their authority in determining the conditions under which people are employed will be eroded due to their inability to represent effectively this mobile, geographically dispersed, section of the workforce. Also problems can arise for health and safety authorities in being unable to properly designate the parameters of the mobile office, and consequently which health and safety precautions should be met to justify compensation should accidents occur. These situations will require that the mobile office working concept and conditions are addressed by the relative supervising bodies, and appropriate representation and minimum standards are put into place. If this is not done, then changes to the whole employment structure could result to where conditions for employees return to the former 'sweatshop cottage' type of workplace.

The subject of convergence of electric and electronic media has also been addressed in this thesis. The reason for this approach is to show that convergence may mean change, which in the case of communications is the working towards an integration of technologies to form a common global system. The president of AT&T described the merger between his company and America's main telegraph company as "one system with a common

policy, common purpose and common action; comprehensive, universal, interdependent, intercommunicating like the highway system of the country, extending from every door to every door, affording electrical communication of every kind, from everyone at every place to everyone at every place" (*de Sola Pool*, 1983, pp.29-30). Although this particular merger was comparatively short-lived, other mergers involving technologies focused on the same outcome, with the mobile telephone completing a global communications network which can reach into almost any environment.

Changes in the communication environment have brought changes to many other environments. The mobile telephone in particular has changed the working environment, and the leisure environment, increased disadvantaged persons' safety factor, and become a valuable tool for the criminal. It is also used as an aesthetic accouterment for young people, and a symbol of power for the young professional. There are probably not many environments in which the mobile telephone has not made some impact, and the indications are that this technology, or future versions of mobile communications, will continue to make social changes. With the ingress of this technology into societies, the present values with regards to personal privacy, personal space in public places, relationships between work and leisure, will be changed. It is therefore necessary that further research is carried out to provide an in-depth understanding of these changes and their future implications for the present social and cultural norms.

APPENDIX 1

QUESTIONNAIRE SIDE 1 **FOR MOBILE TELEPHONE USERS**

1. As an owner/user of a Mobile Telephone is your telephone Analogue ☐ or Digital ☐ ?
2. Do you use your Mobile Telephone mainly for Business ☐ or Private Use ☐ ?
3. Do you think your Mobile Telephone is Very Useful ☐ Useful at Times ☐ Not very Useful ☐
4. Do you mainly Make Calls ☐ or Receive Calls ☐ on your Mobile Telephone ?
5. Do you think the cost of making calls on a Mobile Telephone is expensive? YES/NO
6. Does the Mobile Telephone Extend Your Working Hours? YES/NO. If so By How Many % _____
7. Do you use your Mobile Telephone in your car? YES/NO. If Yes, is it Hands Free? YES/NO
8. Have you ever used your Mobile Telephone Outside of Australia? YES/NO
9. If Yes to Question 8, Which Other Countries? _____
10. If YES to Question 8, How Often? Many Times ☐ Occasionally ☐ Only Once ☐
11. Are you aware of others around you when using your Mobile Telephone in a Public Place? YES/NO
12. Do you try to avoid annoying others when using your Mobile Telephone in a Public Place? YES/NO
13. Do you ever Switch Your Mobile Telephone Off in a Public Place? YES/NO
14. If YES to Question 13, in which Public Place(s) _____
15. Have you used your Mobile Telephone with a Modem and a Laptop Computer? YES/NO
16. Do you ever feel that having a Mobile Telephone Intrudes on Your own Privacy? YES/NO
17. Do you realise that a Mobile Telephone Switched-On can make you locatable? YES/NO
18. Do you realise that Digital Information can be Stored and Retrieved for Analysis? YES/NO
19. Do you realise that Mobile Telephone Emissions may Present Health Risks? YES/NO
20. If you have an Analogue Telephone, will you Change it to Digital at Some Time? YES/NO
21. Will there be a Price Limit on this Change? YES/NO. If So, How Much Approx? Under \$ _____
22. Do you think that the Digital Mobile Telephone being used with other communication devices will be the way many people will communicate in the future? YES/NO
If YES, Will You Personally wish to Communicate in this Way? YES/NO

☞ Thank You very much for taking the time to complete this questionnaire ☞

APPENDIX 2.

QUESTIONNAIRE SIDE 2 **FOR NON-USERS OF MOBILE TELEPHONES**

1. Do people using Mobile Telephones in Public Places disturb you in any way? YES/NO
2. If the answer to question 1. is YES, in what ways do they disturb you?

3. Do you Think Mobile Telephones are At All Useful? YES/NO. If so in What Ways?

4. Why do you not own a Mobile Telephone?

5. Do you think that you will ever own a Mobile Telephone ? YES/NO
6. Do you think there should be legislation restricting people from using Mobile telephones in Public Places? YES/NO. If YES, in which Public Places should be Restricted?

7. Do you think the Mobile Telephone Service is Expensive? YES/NO
8. If Mobile Telephones cost the same as normal Telephones, would you have one? YES/NO
9. Do you think that TELECOM should rent out Mobile phones similar to normal phones? YES/NO
10. Do you think that the use of Mobile Telephones will Change Peoples Attitudes to Each Other? YES/NO. If YES, in which ways?

11. Do you feel Deprived Because You Do Not Own a Mobile Telephone? YES/NO
12. Do you think that eventually most people will own a Mobile Telephones? YES/NO
13. Do you Know that there may be Health Risks in using a Mobile Telephone? YES/NO
14. If YES to Question 13, does this influence your decision for not having one? YES/NO
15. Do you think that My Research Project is Important, in that it could Influence Decisions for Reducing the Annoyance Factor caused by the Use of Mobile Telephones? YES/NO
16. If your answer is NO to question 15 - was it because you consider the Commercial Interests of Big Business, and Governments are too strong to be influenced by individuals? YES/NO

Thank You very much for taking the time to complete this Questionnaire

APPENDIX 3.

Kenneth C. Staples
[REDACTED]

Tel No [REDACTED]

To: The Householder

Dear Householder

I am currently undertaking a Masters Degree in Media Studies in Edith Cowan University, and am at present conducting a study on the use of the mobile telephone and it's social and cultural effects on the community.

In my research I am trying establish how the mobile telephone is changing the communicating habits of it's users, and also to investigate what negative effects it has on non-users. In order for my thesis to be deemed creditable, I must collect some information from mobile telephone users and non-users. It is in this context that I am requesting your cooperation in completing the enclosed Questionnaire.

The Questionnaire is divided into Side 1 and Side 2. Side 1 is applicable to owners and users of mobile telephones, while side two is applicable to non-users. I will be very grateful if either Side 1 or Side 2 can be completed and returned to me. If in your household you have both a user and a non-user, I will appreciate if both Sides of the form can be completed.

I can assure you that the information which I gather from your reply will be treated with confidentiality, and will only be used in my research study, and if required, for examination by the Adjudicating Board for my thesis. All Questionnaires have been distributed randomly by a third party to ensure that your identity remains anonymous. I hope you will grant me your cooperation by completing the Questionnaire and returning it to me in the accompanying stamped addressed envelope by the 30th September 1995.

I thank you in anticipation for your kind assistance in this matter.

Yours Faithfully

Ken Staples

APPENDIX 4.

AGGREGATED RESULTS OF SURVEY

QUESTIONNAIRE SIDE 1

FOR MOBILE TELEPHONE USERS

Legend Y=YES, N=NO

1. Is your telephone (A)nalogue ☐ or (D)igital ☐ ? A=24 D=10
2. Telephone usage mainly for (B)usiness ☐ or (P)rivate Use ☐ ? B=27 P=10
3. Telephone (V)ery (U)seful ☐ (U)seful at Times ☐ (N)ot (V)ery (U)seful ☐ ?
VU=23 U=11 NVU=0
4. Do you mainly (M)ake (C)alls ☐ or (R)eceive (C)alls ☐? MC=24 RC=14
5. Is the cost of making calls on a Mobile Telephone is expensive? Y=24 N=8
6. Does the Mobile Telephone Extend Your Working Hours? Y=14 N=20:
By how Many %= 18.85% av.
7. Do you use your Mobile Telephone in your car? Y= 27 N=4:
Is it hands-free? Y=11 N=20
8. Have you ever used your Mobile Telephone Outside of Australia? Y=4 N=29
9. If Yes to Question 8, Which Other Countries? N.Z. : USA: Singapore:
United Kingdom.
10. If YES to Question 8, How Often? (M)any (T)imes, (Occ)assionally, Only
(Once). MT=0, Occ.=2, Once=2
11. Awareness of others using your Telephone in a Public Place? Y=28 N=4
12. Do you try to avoid annoying others when Telephoning in a Public Place?
Y=31, N=2
13. Do you ever Switch Your Mobile Telephone Off in a Public Place?
Y=23 N=9
14. If YES to Question 13, in which Public Place(s) Hospitals, Restaurants,
Cinemas, Shops, Meetings, Church.

APPENDIX 5.

15. Have you ever used your Telephone with a Modem and a Laptop Computer? Y=0 N=33
16. Do you feel that having a Mobile Telephone Intrudes on your own Privacy? Y=7 N=26
17. Do you realise that a Mobile Telephone Switched-On can make you locatable? Y=26 N=7
18. Do you realise Digital Information can be Stored and Retrieved for Analysis? Y=14 N=19
19. Do you realise Mobile Telephone Emissions may Present Health Risks? Y=21 N=12
20. If you have an Analogue Mobile Telephone, will you later change it to Digital? Y=20 N=4
21. Will there be a Price Limit on this Change? If So, How Much Approx? Averaged between the respondents=\$533
22. Do you think the Digital Mobile Telephone being used with other portable communication devices will be the way people will communicate in the future? Y=28 N=2
If YES, Will You Personally wish to Communicate in this Way? Y=25 N=3

APPENDIX 6

AGGREGATED RESULTS OF SURVEY **QUESTIONNAIRE SIDE 2** **FOR NON-USERS OF MOBILE TELEPHONES**

1. Do people using Mobile Telephones in Public Places disturb you in any way?
Y=20 N=14
2. If the answer to question 1. is YES, in what ways do they Disturb You?
Invasion of privacy: Pretense: Interruption: Loud talk: Intrusion at inappropriate times.
3. Do you Think Mobile Telephones are Useful? Y=34 N=0 If so in What Ways?
Contactable in any place at any time: Emergencies: Convenient to tradesmen and business people.
4. Why do you not own a Mobile Telephone?
No need for one: Expensive: Do not want to be available all of the time.
5. Do you think that you will ever own a Mobile Telephone ? Y=16 N=18
6. Do you think there should be legislation restricting people from using Mobile telephones in Public Places? Y=17 N=14.
If YES, which Public Places should be Restricted? Places of entertainment: Public transport: Hospitals: Most public places: Educational establishments: Libraries.
7. Do you think the Mobile Telephone Service is Expensive? Y= 26 N=12
8. If Mobile phones and normal phones cost the same, would you have one?
Y=22 N=10
9. Do you think that Telecom should rent out Mobile Telephones? Y=22 N=8
10. Do you think that using Mobile Telephones will change peoples attitudes?
Y=9 N=19.
If YES, in which ways? Class distinction, the haves and have-nots: Less privacy: Less consideration through attention to the immediacy required by the mobile telephone; Isolate people from personal contact.

APPENDIX 7

11. Do you feel deprived because you do not own a Mobile Telephone?
Y=2 N=32
12. Do you think that eventually most people will own a Mobile Telephone?
Y=27 N=7
13. Do you Know that there may be Health Risks in using a Mobile Telephone?
Y=23 N=11
14. If YES to Question 13, does this influence your decision for not having one?
Y=5 N=18
15. Do you think my research project is important, in that it could influence decisions for reducing the annoyance factor caused by the use of Mobile Telephones? Y=19 N=13
16. If your answer is NO to question 15, is it because you consider the commercial interests of Big Business, and Governments too strong to be influenced by individuals? Y=10 N=8

BIBLIOGRAPHY

- (1995). "Announcing MobileNet digital fax and data: bringing you more freedom to work on the move", *Advantage news, winter 1995*. Telstra Corporation Ltd.
- (1994a). "There is a mobile phone system that's right for you", *One of these phones is digital, the other is analogue. Which one is right for you?* Melbourne: Australian Telecommunications Authority.
- (1994b). "The benefits at a glance: the digital system", *One of these telephones is digital, the other is analogue. Which one is right for you?* Melbourne: Australian Telecommunications Authority.
- (no date). "The benefits at a glance: the analogue system", *One of these telephones is digital, the other is analogue. Which one is right for you?* Melbourne: Australian Telecommunications Authority.
- (1994). "Call Privacy Campaign", *Telecom mobilenet publication*, August, Issue No. 10.
- (1994). "Digital photography throws doubt on camera's authority", *The Australian Newspaper*, October 18th 1994, p.43.

- (1995). "How about a PC with the lot"? *The Australian*, 31st October 1995, p.47.
- (1993). *Personal Communications Services*. Sydney: OPTUS Communications Pty. Ltd..
- (1993). *What Next*. Sydney: OPTUS Communications Pty. Ltd.
- (1994). "Privacy on Mobile Telephone Calls", *MobileNet User Guide*, p.34.
- (1995). "Card-sized mobile", *The Australian*, 21st March 1995, p.36.
- (1995). "British mob loots shops, burns cars", *The Australian*, 15th December 1995, p.8.
- (1996). "Phone rivals cut call costs", *The Australian*, 25th January 1996, p.3.
- (1995a). "Petition fails to stop tall tower", *Wanneroo Times*, 8th August 1995, p.5.
- (1995b). "Tower approved for ocean reef", *Wanneroo Times*, 8th August 1995, p. 7.

Angus, I. & Shoesmith, B. (1993). "Dependency/Space/Policy: An Introduction to a Dialogue with Harold Innis", *Continuum: The Australian Journal of Media and Culture*, Vol. 7, No. 1, 1993.

Apple, M. (1987). *The new technology: part of the solution or part of the problem*. Canberra: The Curriculum Development Centre.

Aronson, S. H. (1986). "The Sociology of the Telephone", *Inter Media: Interpersonal Communication in a Media World, Third Edition*, Gumpert, G. and Cathcart, R. eds. Oxford: Oxford University Press.

Beniger, J. R. (1986). *The Control Revolution: Technical and Economic Origins of the Information Society*. Cambridge, Mass.: Harvard University Press.

Bijker, Wieber, E., Hughes, T. P. & Pinch, T. eds. (1993). *The Social Construction of Systems: New Directions in the Sociology and History of Technology*. Cambridge, Mass.: MIT Press.

Bolgar, H. (1965). "The Case Study Method", *Handbook of Clinical Psychology*, B. B. Wolman ed. New York: McGraw-Hill, pp.28-39.

Brewster, D. (1996). "Mobiles ring time on fixed calls", *The Australian*, 6-7th January, 1996, p.4.

Cassell I , P. ed. . (1993). *The Giddens Reader*. London: Macmillan.

Cherry, C. (1977). "On the political significance of the telephone", *The social impact of the telephone*, de Sola Pool, I. ed. Cambridge, Mass.: M.I.T. Press. p.125

Clark-Dickson, P. & Salwat, H. (1996). "Occupational Health and Safety: Homework done at touch of key", *The Australian* , 13th February, 1996, p.21.

Constant, E. W. (1980). *The Origins of the Turbojet Revolution*. Baltimore: James Hopkins University Press.

Cook, S. (1993). "Camillagate: all the fun of the phone", *The Guardian*, 14th January, 1993, G2T, P. 5.

Cooke, J. C. & Brewster, R. L. (1992). "Cryptographic Security Techniques for Digital Mobile Telephones", *IEEE International Conference Paper*. New York: IEE.

Cooper, J. (1996). "Pocket office a handy gadget", *The Australian Newspaper*, 19th March, 1996, p.34.

Crowley, D. & Heyer, P. (1991). *Communication in history: technology, culture, society*. New York: Longman Publishing Group.

Deacon, C. (1995). "Mobile satellite services: an update", *IRR Mobiles '95 Conference 24th February 1995*. Sydney: IRR Conferences.

de Sola Pool, I. (1983). *Technologies of freedom*. Cambridge, Mass.: Harvard University Press

Dillman, D. A. (1978). *Mail and Telephone Surveys: The total design method*. New York: John Wiley & Sons.

Donohoe, M. Dr. (1995). "Assessing the impact: presented by Dr. Mark Donohoe Australian Health Net Services ACMA", *Mobile Business Solutions Conference, Wednesday 26th April 1995*. Sydney: IBC Conferences Pty. Ltd.

Fairfall, J. (1994). "Cheap' satellite clusters widen range of mobiles", *The Australian Newspaper*, September 20, 1994, p.33

Fairall, J. (1995). "Hit the road", *Mobile>>>com*. Sydney: Auscom Publishing Pty. Ltd.

Ferguson, A. B. (1995). *Telecommunications developments to the year 2000 and beyond*. Canberra: Senate Economics References Committee

Fischer, C. S. (1992). *America Calling: a social history of the telephone to 1940*. Los Angeles: University of California Press.

Fist, S. (1994). "The Mobile Revolution", *Mobile>>>com*. Sydney: Auscom Publishing Pty. Ltd. pp.12-17

Fist, S. (1995a). "A deal's a deal - but what cost to the consumer", *The Australian*, February 7th 1995, p. 31.

Fist, S. (1995b). "Industry not playing fair on radiation risks", *The Australian*, July 18th 1995, p34.

Fleming, R. W. (1983). "Forward", *Telecommunications: issues and choices for society*. Salvaggio, J. L. ed. New York: Longman Inc.

Forester, T. (1987). *High-Tech Society*. Oxford: Basil Blackwell Ltd.

Franklin, U. (1990). *The Real World of Technology*. Ontario: House of Anansi Press Ltd..

Giddens, A. (1981). *A Contemporary Critique of Historical Materialism*, vol. 1, *Power, Property and the State*. London: Macmillan.

Giddens, A. (1990). *The Consequences of Modernity*. U.K.: Polity Press.

Giddens, A. (1991). *Modernity and self-identity: self and society in the late modern age*. Ca., USA: Stanford University Press.

Gottman, J. (1977). "Megapolis and antipolis: the telephone and the structure of the city", *The social impact of the telephone*. de Sola Pool, I. ed. Cambridge, Mass.: M.I.T. Press.

Gumpert, G. (1987). *Talking Tombstones, and Other Tales of the Media Age*. Oxford: Oxford University Press.

Hall, E. T. (1973). *The Silent Language*. New York: Anchor Books.

Hammersley, M. & Atkinson, P. (1983). *Ethnography: Principles in practice*. London: Tavistock Publications.

Hawkes, N. (1995). "Academic warns of bad new world", *The Australian Newspaper*, March 9 1995, p.17.

Hudson, R. L. (1994). "Snooping vs. secrecy: car-phone users wanted privacy; governments wanted to eavesdrop. Guess who won"? *The Wall Street Journal, (Eastern Edition)*, February 11th 1994. New York, p.R14.

Huff, D. L. (1985). "The Magic of Cellular Radio", *The Information Technology Revolution*, Forester, T. ed. Oxford: Basil Blackwell Ltd. pp. 137-146.

Innes, H. A. (1949). *The Press: A neglected factor in the economic history of the twentieth century*. London: Oxford University Press, 1949, p.5.

Jinman, R. (1996). "Youth heeds call to be upwardly portable", ", *The Australian Newspaper*, January 6-7th 1996, p.4.

Juddery, B. (1994). "Big Brother digitally controlling us", *The Australian Newspaper*, October 1 1994, p.34.

Katz, I., Henry, G., Jackson, H., & Freeman, S. (1993). "Camillagate: caught in the tender trap", *The Guardian Newspaper*, 14th January, 1993, G2T, P. 4.

Katsh, M. E. (1989). *The Electronic Media and the Transformation of Law*. New York: Oxford University Press.

Kern, S. (1983). *The Culture of Time and Space*. Cambridge, Mass.: Harvard University Press.

Kress, G. (1988). "Preface", *Communication and Culture*. NSW, Australia: New South Wales University Press.

Kurosawa, S. "That's life: To dial for", *The Australian Magazine* 13-14th May 1995, p.10.

Lederman, L. C. (1986). "Communication in the workplace: the impact of the information age and high technology on interpersonal communication in organisations", *Inter Media: Interpersonal Communication in a Media World*. Oxford: Oxford University Press.

Levy, B. (1995). "Beware of those mobile special deals", *Mobile>>>com*. Autumn 1995. Sydney: Auscom Publishing Pty. Ltd.

Lynch, A. (1994a). "Commission moves to set security guidelines", *The Australian*, October 18th 1994, p.33.

Lynch, A. (1994b). "Teleworking in spotlight at inaugural conference", *The Australian*, October 18th 1994, p.33.

Lynch, A. (1994c). "Jury is 'still out' on telecommuting", *The Australian*, 6th December 1994, p.28.

Marvin, C. (1988). *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century*. Oxford: Oxford University Press.

Melba. (1995). "Phone war gets sweaty", Henry, S. ed. *The Australian*, July 7th 1995, p.15.

- McLuhan, M. (1967). *The medium is the Message: An Inventory of Effects*. New York: Bantam Books.
- McLuhan, M. (1987). *Understanding Media; The Extensions of Man*. London: Ark Paperbacks.
- Meyrowitz, J. (1985). *No Sense of Place: The impact of Electronic Media on Social Behaviour*. New York: Oxford University Press
- Michaels, E. (1985). "Ask a foolish question: on the methodologies of cross cultural media research", *Australian Journal Of Cultural Studies*, vol.3, number 2, December 1985, ed. Hartley, J.
- Mokyr, J. (1990). *The Lever of Riches; Technology Creativity and Economic Progress*. Oxford: Oxford University Press.
- Nilles, J. (1988). "Teleworking from home", *The information technology revolution*, Forester, T. ed. Oxford: Basil Blackwell Ltd.
- Office Computing. (1993). "Floating offices complement portable technology", *Managing Office Technology*, Vol. 38, November 1993, p. 49.
- O'Neill, J. (1991). *Plato's Cave: Desire, Power, and the Specular Functions of the Media*. New Jersey, USA: Ablex Publishing Corporation.

Partridge, C. (1995). "Two-tone mobiles 'desirable'", *The Australian*, 6th June 1995, p.30.

Pelton, J. (1983). "Life in the Information Society", *Telecommunications: Issues and choices for society*, Ed. Salvaggio, J. L. New York: Longman Inc.

Petty, S. (1994). "Changing office needs to drive distance working", *The Australian*, 22nd November 1994, p.7.

Raj, D. (1972). *The Design of Sample Surveys*. New York: McGraw-Hill Book Company.

Rakow, L. F. & Navarro, V. (1993). "Remote mothering and the parallel shift: women meet the cellular telephone", *Critical Studies in Mass Communication*, vol. 10, pp. 144-157.

Reeves, G. (1993). *Communications and The Third World*. London: Routledge.

Reinecke, I. (1985). *Connecting You*. Victoria, Australia: McPhee Gribble Publishers Ltd.

Reinecke, I. (1982). *Micro Invaders: How the New World of Technology Works*. Australia: Penguin Books.

Reinecke, I. & Schultz, J. (1983). *The Phone Book*. Australia: Penguin Books.

Renfro, W. L. (1988). "Second thoughts on moving the office home", *The information technology revolution*. Forester, T. ed. Oxford: Basil Blackwell Ltd.

Richardson, M. (1995a). "Malaysian mobiles are on a roll, but players are running amok", *The Australian*, 23rd June 1995, p.26.

Richardson, M. (1995b). "Potential telecom giants scramble for a wireless lifeline", *The Australian*, 28th November 1995, p. 12.

Robbins, M. (1995). "Home work rates to rise", *The Australian*, 22nd May 1995, p.4.

Robinson, R. & Goodman, D. S. G. (1996). *The New Rich in Asia: Mobile Phones, McDonalds and Middle-Class Revolution*. London: Routledge.

Rothwell, W. (1995). "Answering some concerns: presented by Wally Rothwell Telecommunications Deputy Industry Ombudsman", *The Benefits Mobile Business Solutions Conference, Wednesday 26th April 1995*. Sydney: IBC Conferences Pty. Ltd. pp.1-11.

Shaughnessy, J. J. & Zechmeister, E. B. (1990). *Research Methods in Psychology, 2nd. Edition*. Singapore: McGraw-Hill.

Smith, W. (1994). *The etiquette of mobile phones*. Australia: Telecommunications Industry Ombudsman.

Stevens, M. (1994). "Embrace technology: News chief", *The Australian*, October 21 1994, p.2.

Tellzen, R. (1996). "Cost benefits will counter identification privacy fears", *The Australian*, 30th January 1996, p.34.

Umble, D. Z. (1992). "The Amish and the telephone: resistance and reconstruction", *Consuming Technologies: Media and Information Domestic Spaces*. London: Routledge.

Wemick, A. (1991). *Promotional culture: advertising, ideology and symbolic expression*. London: Sage Publications.

Wheelwright, G. (1995). "We'll be wearing a mobile future", *The Australian*, January 31st 1995, p.29.

Wilson, H. (1988). "Communication as an Industry", *Communication and culture: an introduction*. Australia: New South Wales University Press

Yao, Souchou. (1994). "The Predicament of Modernity: Mass Media and the making of the West in South East Asia", *Asian Journal of Communication*, Vol. 4, No. 1, 1994. pp. 33-51

Zubrzycki, J. (1996). "Telstra venture to tap mobile phones", *The Australian*,
28th March 1996, p.23.