THE WIRED

THE HISTORY

In the year 1982, in the United Kingdom the Wired Community took a major step forward from science fiction towards everyday reality. There will be long debates as to why it happened at this particular time but it is already possible to discern some milestones which the basic idea passed until it suddenly became an "idea whose time has arrived", to echo Victor Hugo.

An idea of the magnitude of Wired Community has to develop through a number of stages. As a generalization, these stages were Attention, Interest, Commitment and Action. The Wired Community gathered its first significant Attention in the early 1950s, following the publication in 1949 of George Orwell's "1984". In "1984" the telescreen is pervasive providing two-way audio visual communication that simultaneously allows Big Brother to propagandise the populace and permits Big Brother to spy on the home activities of everyone including the hapless Winston Smith.

Orwell wrote "1984" before television became the prime communications medium of the western world. The 1950s, 1960s and 1970s saw explosive growth in television in terms of audience, technology, choice of programmes, television arts and television industries. If the 1950s and 1960s provided a television service and multichannel colour television respectively, the 1970s provided the technology to extend the use of television. The beginning of the 1970s saw the Interest phase develop.

TELEVISION NO LONGER A SLAVE

There were four approaches to the extended television, all based upon the realization that the television receiver could be used for things other than real-time reception of public service television. In other words, the television was no longer the captive slave of the broadcasters.

Firstly, the British Post Office began researching a residential computerised information service that later in the 1970s was to become viewdata, Prestel and videotex. The idea of bringing such a service into the home through a modified television was revolutionary. It was an extension of the idea of broadcast text that became teletext. That idea has now become a world industry.

Secondly, in 1972, the then Minister of Posts and Telecommunications, Christopher Chataway, agreed to licence five experiments in local programme origination of local nature material for transmission by cable to local communities – the so called community cablevision projects. Greenwich Cablevision began in July 1972 followed by Bristol Channel, May 1973, Sheffield Cablevision, August 1973, Swindon Viewpoint, September 1973 and Cablevision Wellingborough, February 1974. A change of government in 1974, together with the establishment of the Annan enquiry into broadcasting cast a shadow over these experiments which all ceased by the mid-1970s except for Greenwich which still exists. Meantime across the Atlantic Ocean, the 1970s witnessed a massive expansion of cable television creating large new industries.

The third approach was the development of TV games. More than
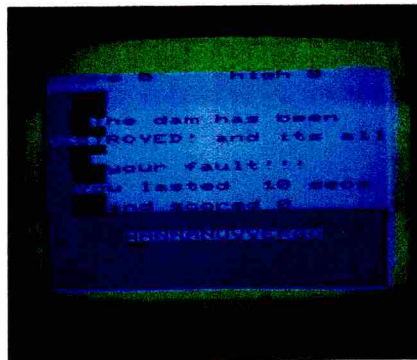
anything else, the TV game demonstrated to a mass market totally new, simple and enjoyable uses for television that had nothing to do with broadcasting.

Finally, the advent of the videocassette recorder in consumer form at the end of the 1970s destroyed the real-time imperatives of broadcasting and enabled the audience to time-shift programme material.

The intensity of these developments had not been lost on

THIS IS THE FIRST OF I
TO BE FEATURED IN IN
THAT WILL DESCRIBE I
COMMUNITY FROM A N
HISTORICAL, TECHNOL
REGULATORY, CLASSI

thinking men. Toffler published "Future Shock" in 1970 and James Martin published "The Wired Society" in 1978.

COMMITMENT PHASE

The debut of the public Prestel service in 1979 is probably the milestone for the opening of the Commitment phase of the development of the Wired Community idea. In terms of futuristic projections of the application and value of consumer videotex, the Post Office had few peers. Whatever else they did they made everyone aware of the technology. At the same time, the broadcasters demonstrated their commitment with the opening of the

teletext services – CEEFAX and ORACLE. The quality and success of these services will soon pass into legend. If consumer videotex in spite of its technological and entrepreneurial imperatives didn't quite succeed – it has become increasingly a business service – teletext hit the jackpot in 1981 to become soon a standard facility on all televisions.

And so the 1980s began with widescale commitment to the extended use of television. The personal computer revolution quickly found yet another use of television. The video camera rental business provided an alternative to still photography and amateur movies and again needed a television. The videocassette hire business provided a cinema substitute using a television. It was hardly surprising that people began to consider the television as a multifunction system and to start researching its possibilities as part of new kinds of networks.

There were two countervailing forces. The institutional view of television, so well documented in the 1977 Annan report, saw it as the captive slave of public service broadcasting. In effect, one type of user would preserve unto itself an entire technology. It was a doomed attempt to prevent the inevitable. The other view was that of the technologists with a deterministic approach – if we can do it, why shouldn't we – based upon a philosophy that argues that the main determinant of man's progress and evolution is his ability to develop, use and control technology. The technologists were not seeking to undermine public service broadcasting, they were seeking to open the technology for other uses. The logic of much of the argument that ensued was the classic defensive line of all established positions under threat, that, "if it is new, it must be inferior". Much the same line, taken by contemporary dramatists, condemned Shakespeare as a rather "low" playwright.

CABLE TV EXPERIMENTS

In the autumn of 1981, new cable TV experiments began, this time aimed at testing the climate for subscription television. Cable TV in spite of its lost battles of the past refused to lie down and die. In the same year the Home Office published a report on direct broadcast satellites (DBS) setting out the arguments and alternatives for establishing DBS services in the UK. Subscription television which was anathema to the broadcasters at the time of Annan was now respectable.

The Home Office DBS report and the ITAP Cable Systems report, published in March 1982, will probably be seen by future commentators as the beginning of the Action phase. Both reports were calls for action on technologies that were revolutionary. The time for the idea had arrived.

In October 1982, the Hunt report was published reconciling the broadcasting implications of cable TV. In December 1982, the government gave the wiring of Britain the green light.

COMMUNICATIONS AND COMPUTERS FUSE TOGETHER

There is, of course, a second major technological ingredient to the Wired Community – telecommunications, and that too had been undergoing major changes.

In the 1970s the computer revolution caught up with the telecommunications industry, or, to be unkind, vice versa. Computers and communications fused together are what we call today Information Technology. By the mid-1970s the widespread availability of cheap microcomputers had dispelled any lingering doubts that telecommunications had to be digital and worldwide the change from analogue to digital, which would take thirty years to complete, was begun.

Telecommunications can be sub-divided into Consumer and Business. In consumer telecommunications a large number of users pay relatively small amounts of money for service. In business telecommunications it is the opposite. In both the revenues are enormous.

There are three basic kinds of communications networks – telephony, broadcasting and cable. In business telecommunications, the 1970s saw widespread growth in the use of the telephony network for computer to computer communication. During the latter part of the 1970s, interest in office automation directed attention at cabling systems to connect disparate office machines. These are now known as local area networks.

Prestel's thrust with videotex was aimed initially at consumer telecommunications, although it was the broadcasters who succeeded in selling text services to the consumer through teletext. This illustrates that the networks do compete with each other for new services and this competition may well feature strongly over the next decade.

Because of the technological advances made in the basic networks and the rivalry that exists for new service provision, it may be useful to outline an overall communications network scenario. This is known as the Four Circles.

FOUR EXTERNAL CONNECTIONS

Imagine four concentric circles at the centre of which is Homo Sapiens. The first circle is called Homenet. A

home network is a cabling system that will exist in the home connecting together communications systems (voice and data), environmental controls (heating and lighting), appliances and alarm systems (fire, intrusion and medical alert). The device that will be the controller for this network will long be debated but suffice to say a television with a 16 bit microprocessor and a moderate amount of memory could, with today's technology, be that device. Tomorrow's technology is needed to get the price down to acceptable levels.

The Homenet would have up to four external connections – the telephony network, cable, a terrestrial antennae for terrestrial broadcast including CB radio, and a satellite dish for space television. The actual connections for any particular home would be dependent upon availability and economics.

If Homenets seem to be somewhat futuristic it should be noted that a Home Bus Standards Association already exists and Sony, Matsushita and Texas Instruments are founder members. Philips have published a specification for a Digital Data Bus to interconnect television, hi-fi and videocassettes. Many suppliers are already selling televisions with multiple interfaces.

LOCAL AREA NETWORKS

The second circle is the workplace or learning place. Here the requirement is to connect communication, recording and storage devices together so that they work as a cohesive system with electronic intercommunication. Data, text, voice, image/graphics and video are the media ingredients. At this time there are three kinds of network – all known as Local Area Networks – based on baseband, broadband and ring technologies. Broadband is the only technology that can handle all the different media.

The Local Area Network will have the same external interfaces as the Homenet viz telephone, cable, terrestrial antennae and satellite dish. However, the satellite dish may have up-links and down-links for telecommunications. Terrestrial antennae would include mobile radio facilities.

The third circle is the Local or District Loop known universally and inaccurately as Cable TV. This loop is a broadband cable connected to homes, workplaces and learning places which distributes multichannel television, stereo sound and digital services. It will have two-way digital communication, probably using packet-switch techniques. Other facilities may be added in due course.

The topology of a Local Loop system consists of a control station (or head-end) where terrestrial antennae, satellite dishes, connection to the national, international and intercontinental packet switch services, and computers for control and billing are located. From these control stations

TELECOMMUNICATIONS
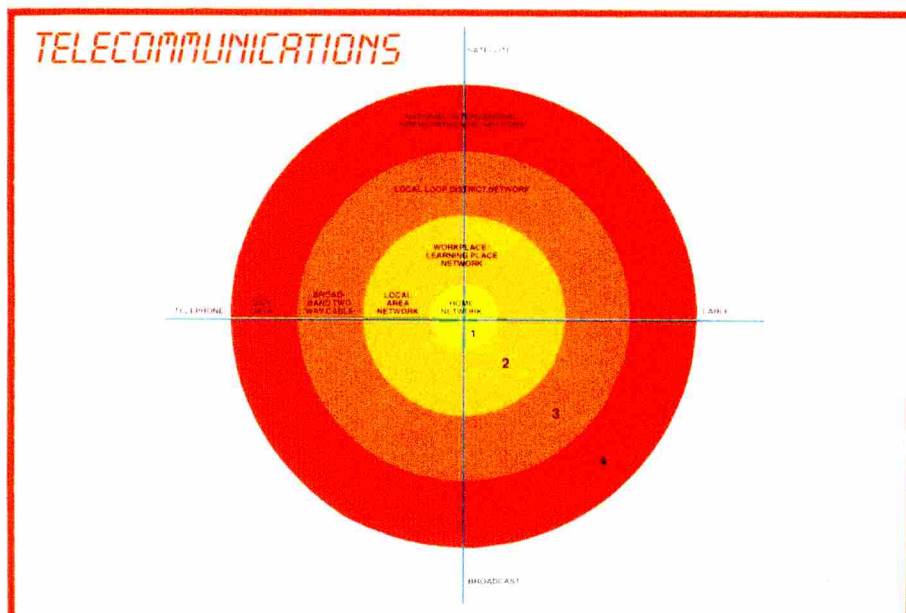
trunk cables are run to switching points generally located in the street rather like telephone distribution boxes. From the switching points cables are run directly into the home or office. For heavy traffic requirements there is no reason to prevent packet switch network connections from being made from the switching boxes or even from the premises. The system is very flexible. It can be seen that the Local Loop has the same external connections as the other circles.

The fourth circle is the national, international and intercontinental telephone network – the network that provides the total framework within which all the others operate. That network is provided by the PTTs in the main. In the UK there is now a duopoly with BT and Mercury in much the same sense that a fleet could consist of a battleship or a speedboat. That is not meant in any pejorative sense. It is hard to believe that the preeminence of BT in transmission, switching and network will ever be seriously challenged.

But it does serve to focus attention on competition within the circles as well as competition between the circles. The interconnection of the three networks – telephony, cable and broadcasting – highlights the point that in a world of new services there may be alternate distribution mechanisms. As an example a film could be distributed by videocassette or videodisk, by public service broadcast, by DBS subscription or by cable. The recipient would see the same film. Choice would rest on price and convenience. Similarly, digital data services could be delivered to the home by cable or by telephony. In the end product there would probably be little if any difference. Price convenience and availability would be the key choice criteria.

The arena for the struggle is therefore competition. A three-sided game is always difficult to control and in this case the umpire is the government and its regulatory agencies. There is a

place for each kind of network only if each network is kept in its place.

CABLE IS GIVEN THE GREEN LIGHT

Cable is in the most difficult position. Unlike telephony and broadcasting, it has no established position and no institutional might. The very nature of the proposal to build a cable network that is funded by commercial risk investment means that unless the regulatory environment is supportive the seed will not germinate. On the other hand, the other networks do not see why they should allow a new entrant. The threat is easily perceived, the opportunity is harder to define.

Initial reactions to the ITAP cable proposals from existing telephone and broadcasting networks therefore ranged from neutral to hostile.

For broadcasters cable offered a method of delivering a large DBS audience quickly which would assist the profitability of DBS. Cable also offered an alternative market for programme material. On the other hand, cable would compete for audience and programme production resources.

For telephony, cable would act as a feeder for packet switch services, building traffic over existing plant. On the other hand, the consumer telecommunication monopoly would be breached.

At this time the institutional networks are undecided whether to make war or to make love. On balance, accommodation would seem to be a better strategy than confrontation. However, efforts are being made to emasculate cable so that it becomes either an appendage or a mirror image of existing and proposed network systems. These efforts will fail.

Cable has been given the government green light as cable and the first systems will be operational in the UK in 1984. George Orwell would be very amused.

THE WIRED COMMUNITY

THIS IS THE SECOND OF A SERIES OF ARTICLES TO BE FEATURED IN INFORMATION MANAGEMENT. THIS ARTICLE COVERS SOME REGULATION, TECHNOLOGY AND SOCIETAL ISSUES.

There can be little doubt that we are in the middle of a communication revolution. Great changes are underway that are proliferating methods and media, that are identifying and serving segmented audiences — witness the growth in specialist magazines — that are changing institutions — such as the liberalization of British telephony — and that are causing us to think about the wider societal issues.

The complexity of this revolution, its wide ranging nature and its impact on so many aspects of our culture, our value systems and the fabric of society would be enough to make it important in its own right. But coming at a time when world economic growth is flat and likely to remain so for some time, when economic recession at home has created record unemployment, when the velocity of change of political fortunes has reached new heights and when serious doubts are being raised about ever returning to the old industrial order that had been created by coal, iron and steel, its importance is greatly magnified.

Communication has always been a part of the infrastructure support of civilization. For a long time it was synonymous with transportation because most messages had to be physically transported. The inventions of telegraphy, telephony and radio changed the world. The invention of computers and their subsequent micro-miniaturisation and low-cost mass production has created the means for universal usage of electronic communications.

Technology has been the driving force in this revolution. Convergences of different technologies and different industries have created new products and new services and they have obsoleted many of the control mechanisms that society, through government, had established to secure orderly progress.

We must therefore recognise that we will experience a new era of control or regulation based on the new technology rather than the old. Without a changed regulatory environment the benefits of new technology in the communications field will not be

realised either because that which is possible and beneficial would not be permitted or because that which is possible and harmful might slip through unfettered. The arbiter of benefit or harm must be Parliament.

Convergence of products, services and industries does not make definition of the regulatory issues simple and so a starting point has to be an overall definition of the information industry which

shows segmentation and strategic positioning.

The industry can be segmented by content, facilities, products and services. By using a chart with two axes and four segments, the overall industry segmentation can be simply defined. (FIG 1).

It can be then seen that the regulatory situation differs in each segment (FIG 2). Provided the segments remain separated, there is no great difficulty except that cable currently has two regulatory authorities — the first being the Home Office regulating content and the second being the Department of Industry regulating the facility. As segments converge to provide the ultimate technology — something that is a mixture of product, service, content and facility — the regulatory problems could become immense.

INFORMATION INDUSTRY		
Content	Publishing TV/Film Production Gaming Machine Mfg. Applications Software	Advertising News Libraries Contract Programming
Facilities	Computer Mfg. Office Equipment Mfg. Telecom Mfg. Consumer Electronics Mfg.	Broadcasting Cable TV Time Sharing Telephone/Telegraph Postal
	Product	**Services**

Source: Booz Allen Hamilton   FIG. 1

| REGULATORY SITUATION		
Content	Obscene Publications Act Film Censorship Via Certification TV: Tidylav "Balance" "Standards"	Press Council Advertising Council Libel Laws
Facilities	Technical Regulations: Standards — BSI Health & Safety Legislation	BBC/IBA: Home Office Cable: Home Office/ Dept. of Industry British Telecom Act Postal Monopoly
	Product	**Services**

FIG. 2

The White Paper

The White Paper on "The Development of Cable Systems and Services" (Cmnd 8866) published in April 1983, continues the duality of regulation. Franchises to permit dissemination of content are to be granted by a Cable Authority and licences to operate the dissemination channel (cable systems) are to be granted by the Office of Telecommunications (OFTEL).

Currently, two areas — Product/Content and Service/Facilities — are under scrutiny. In Product/Content, resources are infinite and regulation is a reflection of the social/political mores at any instance in time. Qualitative issues are of the essence.
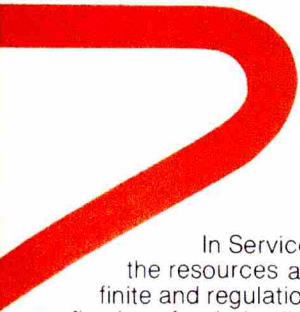
In Service/Facilities the resources are finite and regulation is mainly a reflection of orderly allocation of quantitative items — such as radio frequency allocation and cabling systems. Existing regulations, however, were not designed to deal with the organizational and technological changes now in prospect. The privatisation of BT will require a strong regulatory authority to assure fair competitive trading. This is the role of OFTEL.

Widespread cable development will require different regulations to those now in place. Because of intra-segment competition between the three basic networks of telephony, broadcasting and cable the regulatory framework needs to be wide ranging
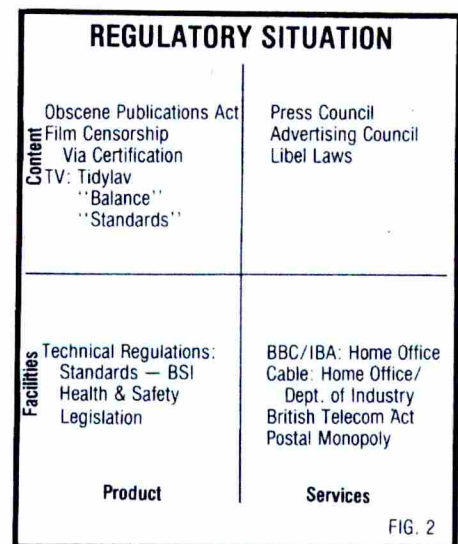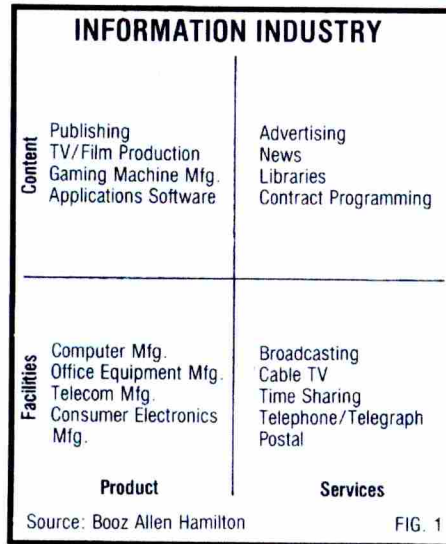
and coherent. There are no signs that this message has been received.

There are other facets to regulation. If we take cable as an example there are actually three strategic businesses encompassed by the term. They are programme origination, production or provision; cable operation which includes laying and maintaining the network, scheduling and allocating the entertainment material, together with marketing the packages of services and, thirdly, the supply and maintenance of delivery machines (television and terminals) to the subscribers. Each business has a different economic cost profile. Programme origination, production or provision have the profiles of film/TV production or perhaps publishing industries. Cable operation mixes the economics of a public utility (long life fixed asset depreciation) with theatrical impressario, sophisticated marketing and door-to-door selling. The delivery machine business will have a similar economic profile to domestic television and home computers.

Cable operation has a number of critical success factors. The ones detailed below are not necessarily ranked in order of importance but they are indicative of some of the issues. A supportive regulatory environment is a prerequisite. This would include no mandatory separation of cable ownership and operation, no mandatory separation of operation and program scheduling, channel allocation, marketing and selling. Long-term licences, reasonable qualitative guidelines, predictable and reasonable penalties for infringements and no regulation for the sake of regulation are also necessary. The White Paper referred to previously seems to recognise these needs. Fundamentally if cable is to be a commercial rather than a social service, it should be free

to find its marketplace and provide the consumer with value for money.

Regulation is now recognised as the major constraint on successful communication development. It is likely that the next few years will see more changes in regulation than we have experienced in the last twenty years. As a result we will see a quantum leap in communication services and products and a major change in our perception and use of them.

From regulation, let us now move to technology and specifically examine some of the main issues for cable.

There are three main interest groups propounding three different network approaches for cable. This definition excludes the argument about fibre optics or copper which is really a peripheral issue.

U S Cable Technology

Firstly, there are those who wish to use American cable TV technology updated to provide a two-way digital capability. American technology is known as tree and branch. Imagine a signal entering the base of the trunk of a tree and being distributed through the trunk to the branches with individual home connections being made to each branch or sub-branch. The merits of this technology are that it is available now, proven in performance (except for two-way digital) and could thus be quickly implemented. The disadvantages are that above 24 channels it becomes expensive and that incremental expansion beyond this level cannot be achieved without disturbing the final distribution link into the home.

Secondly, there are those who wish to use British cable technology to provide a local switched broadband system where the signals are

distributed from a street switch into the home. This overcomes the limitations of the tree and branch system and still provides two-way digital links.

Thirdly, there are those who want a national switched broadband system with two-way video. This would cost probably ten times as much as the local switched systems.

On a commercial basis, local switched is a little more expensive than tree and branch but both would yield commercially viable systems. National switched is not commercially viable but could be by around the middle of the next century. One of the more interesting technical issues is whether local switched could be engineered in such a way, without damaging its commercial viability, to be up-gradable at a later date to national switched without relaying the network. The likely regulatory problems so created can be imagined.

A technical committee still sitting (the Eden committee) has the unenviable task of resolving the conflicts. On the optical fibre vs copper argument, resolution is much simpler. If the networks were to be installed in 1983, it would be cheaper to use copper than optical fibre. The cost of optical fibre is falling as production expands and within the next few years it will be similar to copper. Given the Government's initiative on promoting optical fibres it is a fair guess that the new networks will use optical fibres for their trunk systems with coax for the final distribution link until the late 1980s. Then the technology will be available for optical fibre terminating equipment that will be competitive with copper. In overall terms, the industry is looking for network costs of around £150 per home passed or £300 per home connected, assuming a 50% take-up rate by subscribers. At these levels it is assumed that a reasonable commercial return can be earned. No-one believes that cable will be a licence to print money.

The societal issues that have arisen from the cable debate have to date arisen around two major areas — who owns it and who controls it? Very little consideration has been given to the potential social impact or who uses it and for what?

The 'who owns it' argument is best stated by reflecting the TUC view that says that BT should own it but there should be no concentration of ownership. The problems of separation of ownership and operation have already been indicated. If the desire is to provide a social service rather than a commercial service, these problems can be disregarded but the Government would have to be the owner. The Government has made it clear that it does not wish to invest in cable. Investment is for private risk capital.

The 'who controls it' argument comes mainly from the broadcasters. Should the TV material be subject to constraints of range and balance? Should the programme "standards" be the same as public service broadcasting? Should competition for programme material particularly sporting events, be limited? Who is going to control competition with public service broadcasting?

The Government has decided that a Cable Authority will control it and the authority will ensure that cable conforms in broad terms to broadcasting standards for video material.

One of the myths about cable perpetuated in the White Paper is that it is a local monopoly. It is not a monopoly in the sense that there is no alternative. Alternative programme material can be acquired by the consumer from DBS, videocassette, videodisk or from trips to theatre, opera or sportsground. Cable is merely one of the distribution mechanisms. Because there are alternatives the consumer can and will disconnect from the cable service if value for money is not a perceived benefit. In the narrow sense that there will only be one cable service in any single location it is of course a monopoly.

In the social impact area, discussion revolves around the effects on employment, communities, culture and life-style.

1 Billion Per Annum

The cabling of Britain will generate substantial economic activity — estimated at around £1 billion per annum for ten years. That sum includes the cabling work in its entirety to connect around 70% of households, the provision of programme material and the new generation of TV receivers that will result. That economic activity will protect existing jobs in the cable and TV industries and will generate more employment. The export potential of the new technology should also be substantial. The new British technology of star-switched systems is unique.

For communities there has been an argument that it would create two nations — poorer inner cities and rich leafy suburbs, the premis being that it would be commercially more attractive to cable the leafy suburbs. Unfortunately, unless requirements to bury cables are rescinded, that is not the case. Cabling economics are complex but household density per acre is a critical criteria and where, in inner cities, it is often at its highest it will prove to be attractive for cabling. Conversely, the very leafy suburbs may never be economic for entertainment services although they may prove attractive for non-entertainment interactive services.

Most of such arguments and much of the general discussion has revolved around extended television services. The ITAP Cable Systems report recognised that this would be the case and that the entertainment services would cost/justify the investment and allow other services to be provided at marginal cost.

These other services will impact culture and life-style and, in fulness of time, they may be recognised as the
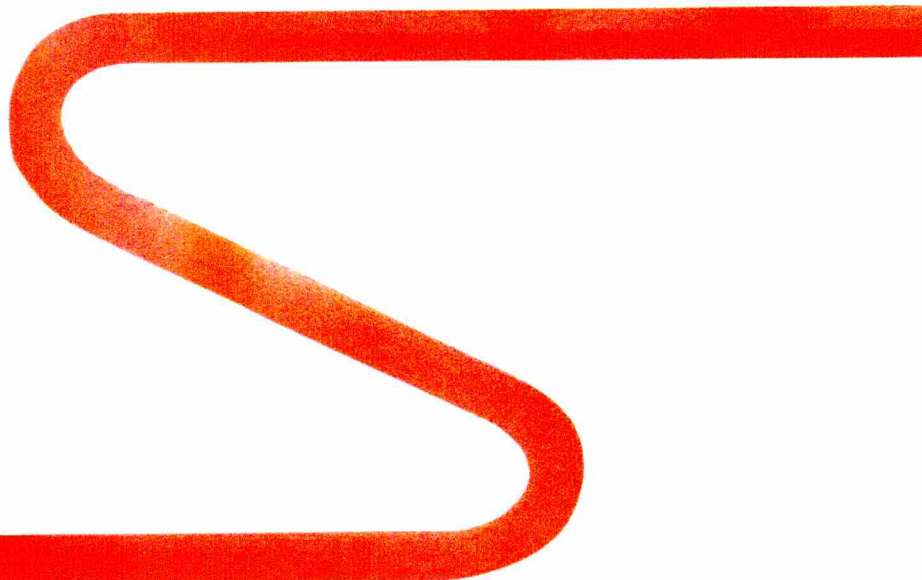
most important aspect. They will bring the Wired Community.

Much has been made of new services such as teleshopping, telebanking and electronic mail but little thought has been given to the impact of providing national, international and intercontinental packet switched data services in the home. In a society where some 50% of the workforce currently work in offices, it will be possible for many workers to work from home — thus becoming teleworkers. The organisation of office work around new generations of electronic office computers will enable the teleworker to have similar facilities at a home terminal as at a desk-top terminal in the office. Products are already available for this purpose. The workers most affected will be knowledge workers — management, professional and technical staff.

Working From Home

There will be significant growth in teleworking reversing the trend which began 200 years ago with the Industrial Revolution of forcing the workers to travel to the work. With new communications the work can be taken to the workers. Currently in the UK there are some 250,000-400,000 outworkers mainly women, who undertake unskilled work, such as envelope stuffing, electrical component assembling and doll construction at home. The new technology will enable skilled professional people to work from home. This revolution is already beginning and a British company, Rank Xerox, has already implemented such a scheme.

The ramifications of such a trend are enormous. Changes in community transportation, changes in office design and function, changes in approaches to labour organization towards more task orientation, changes in management-worker relations, changes in dormitory communities, changes in the role of the home, changes in life-style and changes in our perception of work are possible. Will society become home-centred rather than work-centred? What impact will there be on inter-personal relationships within the family and within the community? Will the electronic cottage become a reality? What impact will the velocity of transactions from teleshopping and telebanking have on our commercial and financial institutions? Will retailing have to change? Will direct sale from manufacturer to consumer eclipse traditional shopping and traditional distribution?

These issues transcend the cable TV issues. But perhaps because they are not easy to imagine or quantify they are largely ignored. The impact of these new services will be on the young who will accept and use them as today they use telephone and teletext and the personal computer. A recent survey in the US showed that 40% of personal computer users are less than 4′ 6″ high! They accept without question and without concern. They become familiar with the technology and they expect to use it. Teleworking may be a difficult idea for today's middle aged but not in ten years time for today's twelve-year-old.

For the present, we address the issues with the emotional and intellectual baggage of the past, concerned to fit new ideas into old institutions, and often concerned to control and restrict because we cannot contemplate a different future. We sometimes forget that our survival as a species is due to our ability to adapt to change.

If there is one message that shines through this appraisal of the communication revolution, it is that we must have courage; courage that we can introduce the new technologies, courage that we can adapt to use them properly and courage that we can exploit them for the greater benefit of all the people.

Then we will have confounded Orwell and, hopefully, we will have made a brave new world.

© Michael J. Aldrich 1983
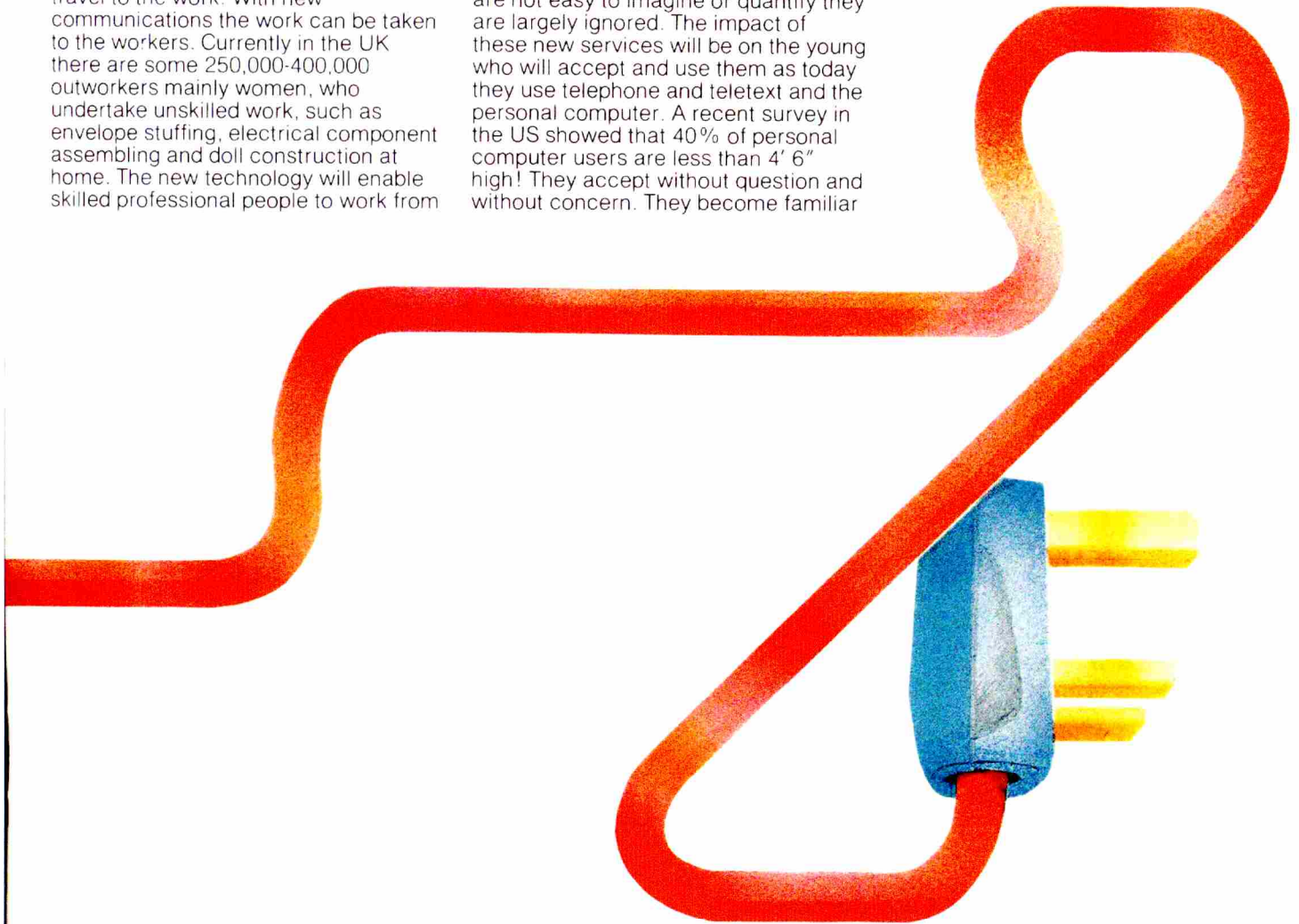
THE WIRED COMMUNITY

THIS IS THE THIRD OF A SERIES OF ARTICLES TO BE FEATURED IN INFORMATION MANAGEMENT.

THIS ARTICLE COVERS CABLE INFORMATION SYSTEMS.

The information services provided by cable systems will be far more important in the long term than the multichannel television that has caused so much comment to date. Yet these services seem to have been largely overshadowed by the focus on 20-30 channel television.

Perhaps the reason for this curious state of affairs is that people find it easier to focus on one relatively familiar aspect of an issue rather than try to come to terms with the totality of it. One finds much the same approach with inter-personal relationships. It is comparatively simple to think of one's wife as a wife but as the spectrum increases to mother, lover, companion, co-worker, friend, counsellor, cook, cleaner, gardener et al, the image blurs. 'Whole person' judgements are very difficult. Just as people are complex in roles and personalities, sophisticated systems have not dissimilar characteristics.

Cable systems could be said to be schizophrenic. They have two personalities. They bring multichannel television delivered to a passive audience. Passive is used in the sense that one only has to sit back and let the television programmes wash all over. And they bring active services — services that require action by the user.
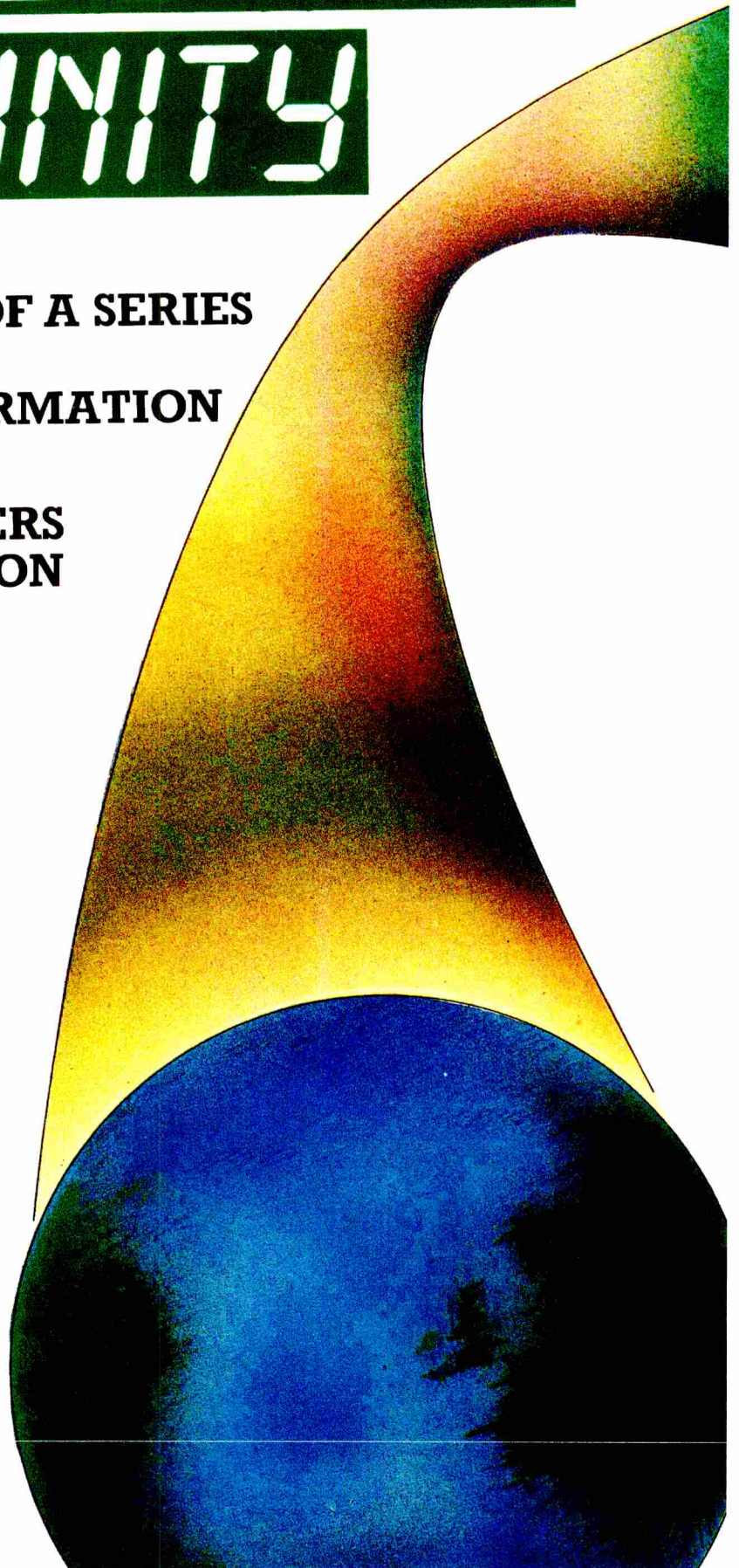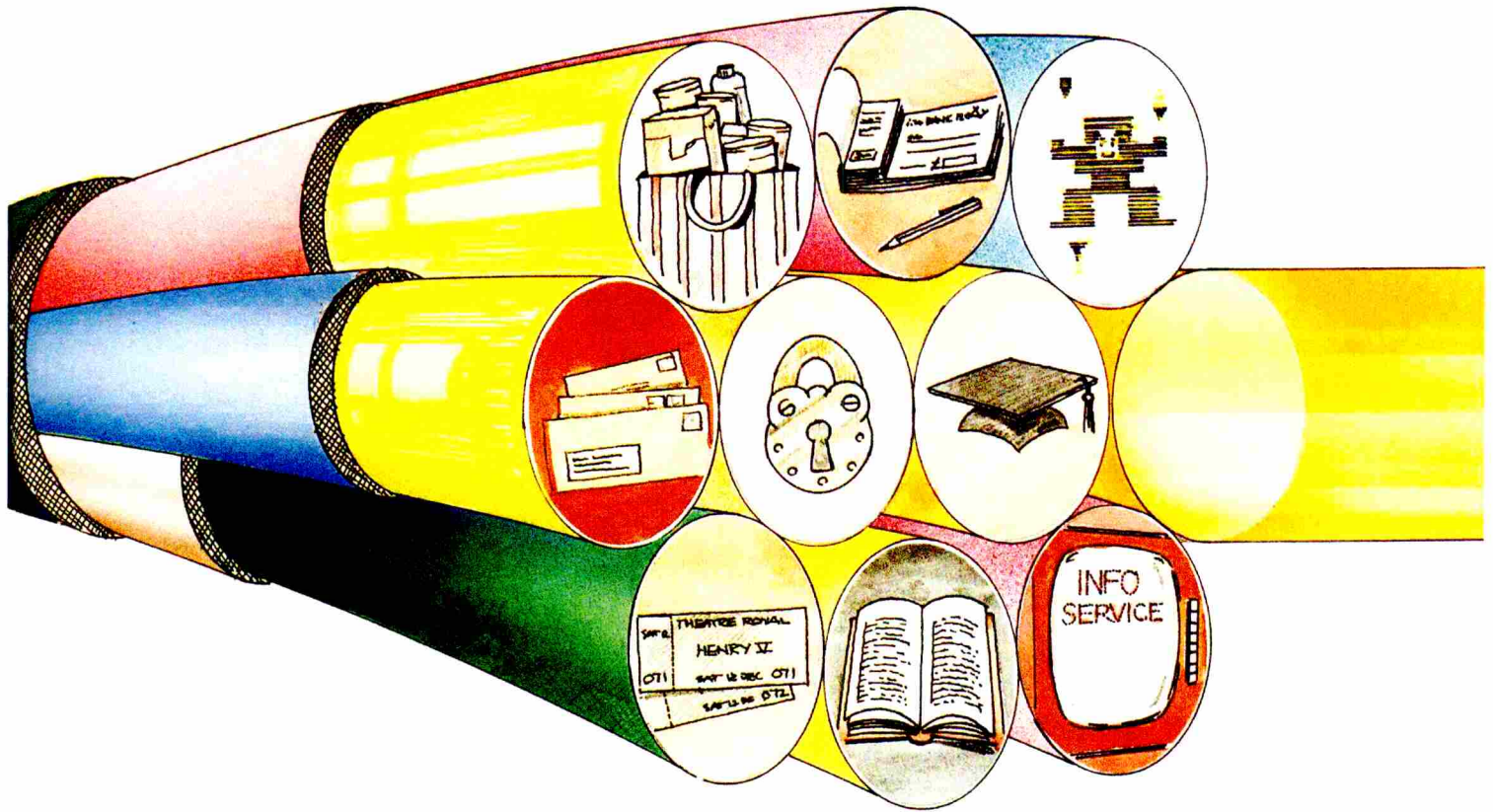
These are the so-called non-entertainment or information services. A better description might be consumer telecommunication services.

Cable is a new kind of communications medium, a medium that will form an eternal competitive and collaborative triangle with telephony and broadcast, the other two mass networks, with all the tensions inherent in such dispositions. It will be a new form of mass communication and it will cause the creation of new industries and service sectors as its infrastructure support. Cable is every bit as important as telephony and broadcast and it will sit halfway between the other two networks in terms of economic activity generated.

The first round of the battle to supply consumer information services to the home using electronic media has been won by broadcast, through the teletext technology delivered as BBC's CEEFAX and ITV's ORACLE services. It seems unlikely that telephony's Prestel videotex service delivered down a telephone line, will be successful in the home, except for specialised uses, although it has won and will continue to win many adherents in business use.

However, teletext and videotex have been the proving ground for text/graphics-based information services presented on a television set. Most of the lessons in terms of non-threatening perceptions of technology, immediacy of response

and simplicity of use as well as attitudes to the totality of the services offered, rather than just reactions to constituent elements, are there for all to see. These lessons are vital input for creating the new generation of home information systems.

There are **ten major** consumer communications services that are likely to be developed with the new cable systems. They are:

1 Information services similar to teletext delivered by a full TV channel bandwidth **teletext service** that typically would display any page of information from a 150,000 page database in less than one second. This is some twenty times faster than existing teletext. Enlarging the database would slightly extend the response time. Additional TV 'channels' could be allocated to extend the range of information.

2 **Shopping transactional** services for retail and **mail order** are obvious services. Industrial teleshopping is already taking place in the UK and valuable experience is being gained. The legal framework for consumer teleshopping will require minor legislation for clarifying credit law and

consumer protection. Text needs to be matched to full moving video for optimum results. Experimentation is likely to multiply over the next two years as existing retailers and mail order houses position themselves for electronic merchandising.

3 **Banking** is a key area. Falling interest rates have pressurised existing overhead costs in the banks while new sources of money-shop competition have appeared. Retail banking will move to provide more electronic services from cash dispensers in factories to teleservices from home or office. The aim will be to cut the unit cost of transaction processing and to win investors for deposits and services.

4 **Publishing** will be a generic service providing alternate electronic distribution for magazines, newspapers and newsletters and markets for new products.

5 **Reservation services** will cater for airline, train, theatre, hotel and car rentals.

6 Teledelivery services will deliver videogames, filmed entertainment delivered to unattended terminals, telesound (substituting for LP records and audio cassette) and computer programs for home use

7 Mail/messaging services, interfaced into the national, international and intercontinental telephony networks will send/receive messages to home or office.

8 Educational services will offer interactive video computer-aided learning probably mixing self-improvement education (how to) with formal education services (leading to public examination).

9 Gateway services will enable the home terminal to access other networks and databases including the work-place (to provide telework). Just as radio hams roam the airwaves of the world, home information buffs by the mid-90s will roam the information networks of the world.

10 Security systems based on installed home sensors will provide fire, police and medical alert and in-house surveillance (for baby-sitting et al).

New data protection legislation will protect the privacy of the individual insofar as controlling personal information held in databases.
Is it any wonder that the implications of these services are far

more interesting than multichannel TV? The ITAP report on Cable Systems, published in March 1982, envisaged entertainment-financed cable expansion as the funding mechanism for building these information society services.

As a mass communication medium cable will have far-reaching social and economic impact. The schizophrenic nature of the medium — the active and the passive — will determine the development of services around 'play' and 'work'. The single TV household will become an historical anachronism. The multi-TV household will, by the mid-90s, become the norm. In the 'play' room there will be a TV with videocassette recorder and/or videodisk, videogames, and a hi-fi. The system will receive multi-tier entertainment programmes from cable plus the teledelivery of games, music and video

In the 'work' room will be a smaller TV with a computer, printer, keyboard, data storage connected into the home cable, the homenet that runs through the household, into the metropolitan area cable and probably will be connected to the telephone as well. This multifunction machine perhaps will be called a home information system or teleputer. This system will have access to all the information services including those provided by the telephony network. It seems improbable that the telephony network will not wish to compete for consumer telecommunication services and in the interests of consumer choice and competition, it should be encouraged to do so

The practical issues of how to implement the proposed systems are important. There is a general concensus within the cable community that a cable operator is not and cannot become a 'common-carrier' in the sense that that description is applied to telecommunication franchisees. Cable is very much an integrated service and needs to be engineered and marketed as such.

But just as it is improbable that cable operators will wish to become the providers of their own entertainment programmes, so is it equally improbable that they will wish to provide the non-entertainment services

The provision of these services requires both technical proficiency and artistic flair. Neither the cable operator nor the bank or shop offering the service will have the depth of skills needed to achieve success.

We are therefore likely to see the emergence of a whole new breed of media people — not in the advertising or ink on paper style but people who can marry technological expertise in computing, telecommuinications and database handling with entrepreneurial flair in building a desirable service for a client. These people may be called Contel agencies — Contel being an acronym for consumer telecommunications — and they will be the catalysts between cable operator and communication service provider (bank, shop, airline etc). The rise of the Contel agencies is of great importance for the mass use of these new services. It is highly likely that some will develop their own brand names for packages of services and become merchandisers in their own right. This already happens to a certain degree in some types of telephone marketing and mail order activities. It is also possible that their relationships with cable operators in the early years could be more joint venture than arms length trading as risks and rewards are shared to build the new networks.

The market, of course, will evolve rather than just be created one fine morning. There is much cultural change to be assimilated and as usual it will be the younger people who dictate the pace of success. We must recognise that bringing these services into the home will make for more home-centring of activity. The nature of household accommodation, the way our family units function, our attitudes towards knowledge and particularly its electronic acquisition and use, the rate at which telework will displace deskwork in the office, particularly for 'knowledge' workers, are issues worthy of attention. What will be the impact on family life?

We can see the first evidence of the new media around us. It isn't easy to speculate on what the future holds with these new technologies but the pattern is starting to emerge. Home computers are being sold by the thousands. Videogames are a mass market.

Teletext has become an overnight standard. Videocassette sales are booming. Prestel, for long an oppressed service, has 30,000 users. And the broad support now behind cable TV would have been unthinkable a year or two ago.

The next decade will see increasing competition between telephony, broadcast and cable for subscribers and services. Many products will become media-blind such as a film delivered by broadcast, cassette or cable, or a magazine delivered by paper, cassette or cable, or a computer program/videogame delivered by broadcast, cassette or cable. The medium may no longer be the message. Who will be the typical purchaser of these services? In the beginning it will be young people, up to 35 years old, ideally with up-scale incomes and young children living in urban areas, which are likely to be cabled first.

The ultimate audience is today's primary school child in 10 years time. In this context the success of government initiatives such as microcomputers in primary and secondary schools can be seen to be vital. Cable cannot be viewed in isolation. It is part of a rich, diverse flood of new technologies born out of the microchip revolution. Its pace of evolution will depend mainly upon the evolution of its contempories, and the changing environment whether free market or government-controlled within which it operates.

Cable has been described as the Infotainment medium. Some believe that it is more the former than the latter.