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The Social Impact of Communication Technologies in
Health Care: Intervention and Patient Empowerment

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ABSTRACT

The Social Impact of Communication Technologies in Health Care: Intervention and Patient Empowerment

Geoffrey S. Gurd

The evaluation of the Sioux Lookout telemedicine experiment is assessed in terms of the authors' underlying assumptions about technology assessment and modern technological medicine. Various critiques of medicine and technology are then used to support a broader definition of health and a more comprehensive approach to the study of social impacts of a communication technology. Finally, these new assumptions are reviewed with respect to issues of patient empowerment in the Sioux Lookout region.

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Introduction

This thesis is a product of thinking about the social impact of new communication technologies in the Canadian health care system. Beginning in the early 1960's in the United States (Filep et al, 1975), and in the early 1970's in Canada (Picot, Roberts & Gurd, 1984), a number of experiments were conducted using communication technologies such as satellites, two-way video, slow-scan video and more recently videotex and computers to solve some of the problems of health care delivery to rural and remote regions. The success of some of these government-funded projects has led to permanent installations between urban and rural health facilities. Much of the innovative work that was done is gradually coming into widespread use. For reasons which will be discussed shortly, the time is ripe to critically examine this injection of yet another dose of technology into the health care system.

The application of communication technologies to solve apparent problems in health care delivery seems on one level to be a simple clinical problem and solution. In order to study the ramifications of these applications at the level of practice, a specific Canadian site is used to illustrate the clinical practice and to focus on the various problematics that are involved. In the Sioux Lookout Telehealth experiment, which connected remote native communities in

Northwestern Ontario to two Toronto hospitals, patients were enabled to stay more often in their communities to receive medical treatment, rather than having to go South away from their families (Dunn, Conrath & Higgins, 1983). Clearly from this narrow focus, on what is essentially a transportation problem, patients and health care professionals thought that the communication link was useful. Similarly, health care professionals in the remote region were able to stay more up to date on new medical treatments and procedures. The communication system helped to remove some of the geographical barriers contributing to their professional isolation. Clearly the idea behind the telehealth experiment was to maintain skilled personel in the remote areas, or at least transport the necessary medical expertise to the region.

One incident in the Sioux Lookout telehealth experiment raised a general concern about the involvement of patients in this process. A female patient was transferred from Sioux Lookout to a Toronto hospital. After being there for a week or so, she announced that she felt better and wanted to return home. However her medical condition made such a rapid recovery seem unlikely. A nurse at the Toronto hospital suggested using the telehealth system so that the patient could see and talk to her family. The patient was relieved and reassured after talking to her family. She then admitted that she was still quite sick. This incident was labelled by

the researchers as therapeutic communications (Charbonneau, 1982). This kind of communications was not anticipated by the researchers in the design of the experiment. This episode triggered a more general concern with how patient autonomy and empowerment are represented and constrained when new communication technologies are introduced into the health care system.

A review of all Canadian telehealth experiments was recently published in The Canadian Telehealth Sourcebook (Picot, Roberts & Gurd, 1984). The evaluations of the experiments were based on similar clinical considerations as the example above. Typically the experiments were designed to test the technical capabilities of the communication system to duplicate, as much as possible, the existing relations between doctors and other doctors and nurses, and between nurses and patients.

In all these experiments Shannon and Weaver's mathematical model of communications was the underlying assumption as evident in the dominant concern with distortion in the communication channels. For example, the reliability of a diagnosis based on black and white slow-scan video images of x-rays was compared to viewing them in person on a standard x-ray viewing box. Also two-way video and audio connections were used to enable doctors to examine patients or consult with other health care professionals at a distance. While examining patients at a distance

(telediagnosis) was clearly not and could never be the same as an in person examination, attempts were made using electronic thermometers and stethoscopes as well as the assistance of the attending nurse, to come as close as possible to providing the quality and quantity of information that the doctor needed to make an accurate diagnosis. Thus a typical technical/medical problem was deciding whether or not colour or black and white video provided sufficient information to diagnose a skin condition.

It also seemed that these telehealth experiments were constrained by several explicit, or more often, implicit assumptions about what is health care delivery, what is the role of technology in medicine and other assumptions. The experiments appeared to operate with an implicit acceptance of the status quo in medicine. The focus is a decidedly narrow clinical one. The evaluations failed to place the social impact of communication technologies in a broader historical and social context, and therefore left a number of important questions unanswered or irrelevant. Were there other ways to solve the perceived problem? What were the assumptions behind the choice of the technology? Who made that choice? How did these choices determine how the technology will be used? Could the communication technologies have been used to achieve different, purposes? And finally, are communication technologies just another example of the medical profession's emphasis on technological

solutions?

A concern with the broader social context within which
communication technologies and health care decisions operate
might seem quite unmanageable. Where does one draw the
boundaries around possible influences? One way to do this is
to focus on social impacts from the patients' point of view. [1]
It is evident from reading the reports of many Canadian
telehealth experiments, that it is the health professionals
who are supposed to benefit from the introduction of
sophisticated communication technologies. The assumption is
that the patient will reap the benefits of better health care
from better informed health care professionals. Why not
explore the possibilities of patients using a telehealth
system to inform themselves? Why not explore whether or not
patients could be more involved in the design and
implementation of a telehealth system which operates both as
an information channel and as a communication channel?

It is clear that the telehealth experiments were studies
of specific technologies as solutions to specific health care
delivery problems. Presumably the long-term research goals
were to discover which technologies worked well in which
situations. These series of micro analyses/experiments were
designed to discover broad principles about the social impact
of new communication technologies in the health care system.

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[1] See R. Porter's article "The patient's view: Doing
medical history from below" (1985) for a justification
for looking at the patient and away from the doctor.

However the failure of any of the telehealth reports to
seriously consider any larger social questions, criticisms or
problems weakens their generalizable principles. The
clinical model of reality is restrictive and narrow. It
seriously constrains the broad predictive powers of
generalizable principles. In fact there are a series of
problematics about the relationship between technology and
social structure, between medicine and society/social
structure, and between technology and medicine which need to
be addressed. Fundamentally, then, a broad recognition of
the economic, political and ideological assumptions
influencing the introduction of telehealth technologies in
the health care system is needed for two reasons.

First of all to show that social impacts do not freely
occur, but are instead constrained and channeled by different
pressures or forces, with varying intensities and importance
over time. For example doctors have control, along with
administrators, over the selection and purchase of medical
technologies. It seems quite fair to state that these
purchases of technology reflect not an objective statement of
need, but more complex reactions to the driving force of
technology in medicine and society, and the power of the
medical profession. Secondly, as already stated, the notion
of patient empowerment requires a broader understanding of
the macro forces which determine the possible impacts of a
specific technology. Thus, to continue with the above

example, patients have very little say in the purchase and installation of medical equipment.

There are four overlapping areas of concern which will be discussed in the next chapter: the different explanations for the relationship between society and its technology, the ideological, political and economic basis of Western scientific medicine, the relationship between technology and medicine, and the discourses on new communication technologies and the "information society".

In chapter one an approach for studying the relationship between technology and society or social structure, as well as the interplay between economic, political and ideological factors that effect the social impact will be examined with particular attention to the work of Jennifer Daryl Slack.

Some of the historical conditions for the present day dominance of modern technological medicine will be elaborated against a backdrop of broader critiques of science, medicine and technology as found in such journals as the Radical Science Journal, International Journal of Health Sciences, and Social Science and Medicine, and as evident in the work of I. Illich. Also the importance of technology in medicine will be explored. The present day use of technology in medicine seems to indicate an established readiness to experiment and innovate with technology. Thus communication technologies might be considered as simply part of a larger on-going dependency on technology to support the scientific

practice of medicine.

Next the current fascination with communication
technologies will be explored on the assumption that the
rhetoric about the uses of these technologies is misleading
and an influence on the design of telehealth experiments.
The analysis of the so-called neutrality of the technologies
and its applications is relevant to the idea of using or not
using the technologies to develop increased personal autonomy
and empowerment. Is the rhetoric of the information age a
constraint on possible interventions?

Chapter two is an analysis of the Sioux Lookout
telehealth experiment. Clearly the only way to substantiate
the macro analysis is to connect it to a specific site. The
book Evaluating Telecommunications Technology in Medicine
(Dunn, Conrath & Higgins, 1983), which details and analyses a
four year research project undertaken by the Universities of
Toronto and Waterloo, will be analysed. In addition to this
text, there are 13 journal articles on different aspects of
the study which will be consulted when necessary. In
particular, this chapter will examine the underlying notions
of technology assessment used by the authors, their tacit
assumptions about medicine, and the relationship between the
technology assessment approach and the authors assumptions
about medicine.

Finally, in chapter three, an analysis of possible
points of intervention for empowering patients will be

discussed. The analysis of chapters one and two should help
to indicate which factors are open to reinterpretation,
repositioning or change. Finding a way to intervene in the
social system in order to systematically or purposefully
change social relations and structures is recognized as a
difficult and no doubt idealistic proposition. However it is
a task worth engaging in, if only to see that change is
small, incremental and difficult.

Chapter One

The social impact of a telehealth system needs to be broadly considered, from the point of view of patient empowerment, through a multi-layered analysis of the direct and indirect economic, political and ideological influences. How is this complex analysis to be accomplished? First of all, detailing the relationship and strengths between the different forces requires an approach which can clarify the relationship between technology and society. Secondly such an evaluation needs to allow for a number of levels of analysis to interact with varying strengths and over varying periods of time. It is as de Kadt (1982) suggests 'a field of complex interactions'.

Michel Foucault's The Birth of a Clinic (1973) is one example of the kind of approach that is analytically useful. Foucault examined the interplay between economic, political and ideological factors during a critical 70 year period in the development of medical thought in France in the 18th century. He contends that "medicine made its appearance as a clinical science in conditions which define, together with its historical possibility, the domain of its experience and the structure of its rationality." (Foucault, 1973, p. XV) Foucault's multi-layered analysis does not proceed in a linear fashion, linking events together in a two-dimensional

chain, but rather relates different factors with differing strengths together in what seems more like a three-dimensional model. However, while Foucault's analysis is historically interesting and no doubt a brilliant analysis of events and structures which are still dominant today, the approach used by Jennifer Daryl Slack is both more current and more clearly structured.

Jennifer Daryl Slack, in Communication Technologies and Society (1984a) states that there are basically three types of analyses used to describe the relationship between technology and society. These are: the technology assessment approach (TA), the alternative technology approach (AT) and the Luddite response. Each kind of analysis has its strengths and weaknesses. However each one, by itself, is insufficient to describe all the complex, overlapping factors involved or to provide an adequate basis for an intervention on behalf of the patient.

TA is the most widely used type of analysis. It is accepted by governments and industry as a valid tool for predicting the impact of a technology. However TA does not assess the whole technology, but just its effects. This approach is not an open-minded evaluation of a technology for two reasons, first because it does not question the underlying assumptions and intentions integral to the development and introduction of the technology. Secondly, TA leaves out the social, political and ideological context

within which the technology is brought forth. TA limits its
analysis by emphasizing unintended, indirect or delayed
effects while ignoring or downplaying the intended and direct
effects. This approach recognizes the unintended effects
only in order to defuse resistance against the introduction
of the technology. The operational assumption is that the
planned for technology is a correct solution, subject to
ironing out a few difficulties which might hinder its
adoption. Thus the embedded assumptions about social
relations and control remain unquestioned. As Slack states
"we are not made to understand technology as part of the
social order, only as something that is used by the social
order." (Slack, 1984b, p. 86) A more balanced interpretation
of TA would, as Raymond Williams states, "restore intention
to the process of research and development." (Williams, 1974,
p. 14) Thus, it will be clear later that if one disagrees
with the underlying assumptions of Western scientific
medicine, its uses of technology and specifically
communication technologies, and its structural arrangements,
then one will probably not be content with the resulting
technology assessment.

Two concrete and typical examples of TA in medicine and
the centrality of technology in medicine are represented by
an often cited book Toward a Rational Technology in Medicine
(Banta, Beheny & Willens, 1981) and a recent article in the
Canadian Hospital Association's journal, Dimensions in Health

<u>Care</u> titled "Assessing and diffusing today's medical
technologies". The article's opening paragraph trumpets the
past two decades as a "period of triumph in medical
technology" (Hanley & Williams, 1984, p. 10) Advances in
molecular technology, microchips, drugs, and artificial
materials have all contributed to the triumph. According to
the authors, "technology assessments occur at three levels:
determining the unique and relative contributions of
technology in clinical practice, assessing longer term
effects and costs on the public served by the technology and
monitoring its use in practice to assure conformance with the
standards and criteria for high quality care." (Hanley &
Williams, 1984, p. 10) Thus clinical efficiency and cost
effectiveness represent a "linear causal model. TA, as
represented by the above article, demonstrates an emphasis on
the effect of the technology.

Since TA, as it is presently understood and applied,
cannot provide the necessary broad perspective, it needs to
be used in conjunction with other approaches. The
alternative technology (AT) approach suggests that
"technology can be made to serve a just society merely by
altering the uses to which the technology is put." (Slack,
1984a, p. 30) The danger of this position is that technology
is assumed to be neutral, if not autonomous. It is only the
uses which are deemed good or bad. For example Ivan Illich
in <u>Limit to Medicine</u> (1976), and in <u>Tools for Conviviality</u>

(1973) says that the criteria for judging a technology is whether or not it is convivial. This approach, especially as argued by Illich, is a compelling one. It suggests the possibility for real change through interventions in how technologies are used. Furthermore this approach recognizes that social structures and values effect uses. Thus the AT approach opens up the possibility of criticizing who is using technology as well as its actual uses.

However there are some limitations to this approach. AT's "focus on use tends to ignore the structure of the technologies and the extent to which those structures are integral to the social relations of productions responsible for their appearance." (Slack, 1984a, p. 38) This means that the structure of a technology might suggest certain forms of social organization because of the social relations of production which were essential to the design. An example of this approach is Mike Cooley's Architect or Bee? (1980). He examined the impact of computerized drafting equipment on the worker. He analysed computers as a means of production, but viewed in the context of the ideological, political and cultural assumptions of society and especially those of the owners of the means of production. His critique includes comments on modern 'Taylorism' in the workplace, and the underlying assumptions about how work should be organized. Cooley wisely stated that "there is a tendency, therefore, to make value judgements about given technologies based on what

they might achieve, rather than on what they have already achieved and are likely to continue to achieve within a given economic, political and social framework." (Cooley, 1980, p. 35)

Thus Cooley points to the failure of the AT approach to clearly distinguish the intentions and structures built in to the technologies. This blindspot thus weakens any arguments fashioned from the AT perspective. The AT approach can consider new uses but remains constrained by old intentions. Thus a third type of analysis is necessary which might allow for criticism of the intentions designed in to technologies. This is the Luddite approach. [2] It is suspicious of the structures of technologies, as well as the social structures within which the technologies emerge. The advantage of the Luddite approach is its broad and deep critique of contemporary society. In the health care system, for example, it would allow for the complete rejection of a technology as well as the underlying assumptions which support the introduction of the technology.

Both the TA and AT approaches do not normally consider that a technology is simply bad or harmful. And even if they did think this, their responses would be to either change the unintended effects or consider better uses. The advantage of the Luddite approach is that a technology can be rejected outright before it enters the marketplace or becomes widely

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[2] See Robins, K. & Webster, F (1983, 1985)

used. However this rarely happens in practice. It is one
thing to make a formidable analysis and another thing to
effect a positive rejection of an undesirable technology.

In terms of a critique of the health care system which
would place a greater emphasis on patient empowerment and
autonomy, the Luddite response argues against the status quo,
against more technology, and against the imbalances of the
existing doctor-patient relationship. A Luddite analysis
becomes a critique of the medicalization of society and the
priveleged position of doctors.

The problem with the Luddite approach is that it tends
to lump together the technology and society. What is good or
bad about one applies equally to the other. For example
Jacques Ellul, in <u>The Technological Society</u> (1964) and
<u>Propaganda</u> (1965), describes the homogeneous relationship
between technology and society and between propaganda and
society respectively. His all encompassing analysis does not
allow for any kind of intervention because everything is
reduced to either 'technique' or 'propaganda'. By Ellul's
definition, the social cannot be outside of or neutral from
technique or propaganda. Thus the only kind of intervention
which could occur has to be initiated by outside agents of
change. A Luddite analysis, which might reject a telehealth
technology and the supporting social structure at the same
time, suggests an analysis which does not recognize the
possibility of incremental changes or solutions. It suggests

an all or nothing attitude.

Individually the TA, AT and Luddite approaches all have positive and negative values. Taken together they form the basis for a powerful analysis of the social impact of a telehealth system. A study of a telehealth system which uses these three types and levels of analyses can lead to a variety of possible interventions. Therefore the relationship between technology and society must be seen from a point of view which incorporates all three kinds of analysis.

For example Michael Goldhaber, in writing about microelectronic networks in workers organizations, suggests two different outcomes. The first outcome is that workers' organizations can use microcomputers to organize and initiate nationwide collective bargaining but still within the existing capitalist structure. This is clearly the AT approach. Secondly Goldhaber states that capitalism might not continue as we now understand it. He thinks that there is the possibility for the birth of a new society. Although his proof of this possibility is weak if not simply wishful thinking, Goldhaber's suggestion that the social structures might change is basically a Luddite analysis. He believes that the social structure has to change in order to allow new uses to emerge. What is important here is how he sees the relationship between these two possible outcomes. "The second describes the social vision that may inform the

political tactics suggested in the first, while the first offers a means of struggle that might be necessary to make the second a reality." (Goldhaber, 1984, p. 228)

Goldhaber's statement that an AT and a Luddite response might be complementary brings up the importance of causality. He suggests a relationship between the micro and the macro levels, as well as between the structure of technologies and the structure of society. In order, then, for three different approaches to be used to construct a point or points of intervention, there needs to be a common sense of causality. For example, empowering the patient might involve using existing technologies differently or rejecting the technological fixes in medicine in favour of political or economic solutions.

Jennifer Daryl Slack (1984a, 1984b) has described how the TA, AT, and Luddite approaches operate with different ideas about causality. There are two kinds of mechanistic causality, simple and symptomatic, as well as expressive and structural causality. The mechanistic conception is defined as those "causes and effects (that) are discrete and isolated objects, events, or conditions that exercise effectivity externally. Both the cause and the effect are self-contained and distinct from their environments, as is the cause-effect event." (Slack, 1984a, p. 53) Simple causality then assumes that "communication technologies are conceived of as autonomous causes whose appearance produces inevitable

results." (Slack, 1984a, p. 56) Or as Raymond Williams
suggests, simple causality is a kind of technological
determinism.

Thus Slack argues that the Luddite approach is based on
an assumption of simple causality. Technology is neither
good or bad, to be accepted or 'smashed'. Similarly some
alternative technology writers like Ivan Illich use a value
such as conviviality to accept or reject a technology.
Illich's underlying assumption is that the technology is
neutral and autonomous. The other problem with the
mechanistic view of causality is that it cannot explain very
much. It can only really describe discrete, individual
events in an ahistorical and asocial process.

Symptomatic causality goes a little deeper than simple
causality by suggesting that the so-called autonomous
technology is acted upon by the social system once it
appears. While the technology might still be considered as
being neutral, the social system is not. Slack defines
symptomatic causality as "the effectivity of institutional
forces on the technology once it has appeared." (Slack,
1984a, p. 58) This view of causality is used by the AT and
TA proponents. Thus the AT approach would encourage
structures which would allow for new uses. While the TA
approach would examine the unintended effects of a technology
in its interaction with institutional forces. However
neither the simple nor symptomatic types of causality examine

the process of invention or innovation. How, for example, is a telehealth technology developed? How does it come to be used in certain ways and not in others? An analysis using the symptomatic causality approach limits any possible interventions, if any, to the period after many important decisions have already been made. To overcome the limitations of possible interventions requires an approach which can critique the social structure, and act before the desired effects are blocked out.

Technology can easily be seen as causal, as above, however it can also be effective as explained by the expressive and structural analyses of causality. Expressive causality "links technologies, as both cause and effect, to the society within which they emerge and exercise effectivity." (Slack, 1984a, p. 64) Technologies are not neutral, but embedded in social relationships, in the social control or context of institutions. For example, in the work of Jacques Ellul expressive causality characterizes technique as the essence of society. Technique is both cause and effect. However Ellul does not explain how technique became so dominant. Rather "the very structure of communication technologies, as well as their content, is an expression of a totality expressed by technique." (Slack, 1984a, p. 68) Positing such a totality makes any kind of intervention impossible short of, as was said before, outside intervention. It seems that some kind of intervention is

more possible if the totality represents a specific social configuration rather than an abstract essence.

Raymond Williams' work, which builds on more of a Marxist concept of causality, is less obviously in the same category of expressive causality as Ellul. Williams is in the expressive causality camp, but in a unique way. His reappraisal of the base-superstructure metaphor is a valuable addition to the understanding of the relation between technology and society. This relationship, in a Marxian analysis, is represented by the base-superstructure metaphor. Economic activity determines the totality within which technology is both cause and effect. The totality in Western industrial societies is, of course, capitalist commodity relations. Typically one of the problems with the base-superstructure relationship is its interpretation of a uniform, one-way, determined relationship between the base and the superstructure. Williams (1980) suggests a new interpretation of this relationship in an article titled "Base and superstructure in Marxist cultural theory". He states that the base is more active and less uniform than is simply suggested by the notion of 'productive forces'. He favours a wider definition of the base which refers to "the primary production of society itself, and of men themselves, material production and reproduction of real life." (Williams, 1980, p. 35) Defined this way, the base is a more active process which also implies the possibilities of

fluctuations. Williams states that the base is not reflected 100 percent in the superstructure, but is qualified by delays in time, technical complications, and indirectness. As well, reflection is more accurately a mediation between the base and superstructure. Williams' interpretation includes a reevaluation of Gramsci's concept of hegemony. He uses the term to describe another way of viewing the dominant social structures.

According to Slack, Williams understands that a "social formation is made up of practices, meanings and values that, as pointed out earlier, are dominant and effective. In and through these practices, meanings and values, individuals act in the world with intentions, interests or objectives." (Slack, 1984a, p. 74) Williams uses the term hegemony to describe the dominant social structure. He "would propose a model which allows for this kind of variation and contradiction, its set of alternatives and its process of change." (Williams, 1980, p. 38) Williams' position avoids the drawbacks of mechanical and symptomatic causality. The distinction that Williams makes between residual and emergent forms, both of alternative and oppositional culture, is a fuller attempt to explain the complexity of any culture or social formation.

Yet Williams is still in the expressive causality camp and therefore limited in his analysis because he focuses primarily on internal changes within society. Slack states

that "the essence of any social formation, or totality is what Williams calls the structure of feeling." (Slack, 1984a, p. 73) As Williams himself says "In one sense, this structure of feeling is the culture of a period: it is the particular living result of all the elements in the general organization." (Williams, 1961, p. 64) Slack argues that the 'structure of feeling' is coterminous with culture, totality and social formation. Therefore, Williams' position confirms that "any and all phenomena are mere expressions of some inner essence, be that essence an idea, ideal, social configuration or dynamic." (Slack, 1984a, p. 75)

The problem with an expressive causality position is that any real change requires changing the underlying essence of the social order. How does one change such an abstract concept as essence? It is really too all encompassing a concept as we saw with Ellul. The way out of this problem is through structural causality. It is based on Althusserian structuralism, which understands a correspondence on three levels; the economic, the political and the ideological, with the base-superstructure metaphor. Society is a social whole, but not an expressive totality. It is "constituted in the relationships in and between three levels; the economic, the political and the ideological." (Slack, 1984a, p. 83)

The economic level is composed of labourers, the means of production and the non-labourers. The political is essentially the institutionalized power of the State, that is

the legal system and the political system. Ideology, still
being considered from the Athuaserian position, is a "system
of representations endowed with an historical existence and a
role within a given society." (cited in Slack, 1984a, p. 85)
"The three levels ... coexist within a complex structural
unity in which they are both relatively autonomous and
determined in the last instance by the economic." (Slack,
1984a, p. 86) Or as Williams states the base-superstructure
metaphor should be replaced by "the more active idea of a
field of mutually if also unevenly determining forces."
(Williams, 1980, p. 20)

To summarize so far, perhaps the most important point
about the structural causality position is that "a
'technology's relationship to society, its relative autonomy,
its position in the structure of dominance and therefore its
identity as both cause and effect are all subject to
historical specificity." (Slack, 1984a, p. 90)

Applying the structural approach to the introduction of
communication technologies in medicine suggests two major
fields of arguments, that of critical health care research
and critical communication research. These two broad areas
will be fused together through their common interests in
questions of epistemology, power and interventionist
strategies, as well as their common emphasis on technology.
Thus there are two parallel analyses of the structure and
larger problematics of contemporary Western technological

medicine, and notions of a communications or information revolution.

There is another level of analysis in addition to the integration of the critiques of medicine and communications technologies which runs throughout the thesis. Harold Innis' (1951, 1952) idea of space-binding and time-binding communications is critical to an appreciation of the impacts of a communication system which in effect transports information, expertise and in a larger sense a structure of social relationships from the urban medical centres to remote communities. The distinction between whether the communications system is predominately space-binding or time-binding has an impact on possible interventions. Thus if, as it seems to be true, the telemedicine system is space-binding, then any possible intervention might need to consider how to make the system more time-binding.

Now, to understand the present day prestige of medicine, its proficient application of science and technology, its rhetoric of life-saving professionalism and the priveleged social position of doctors, requires a brief review of the social history of medicine. (Starr, 1982; Brown, 1979; Stark, 1982; Ehrenreich, 1978; Hamowy, 1984; Reverby & Rosner, 1979; Coburn, Torrancé & Kaufert, 1983)

It is generally agreed that doctors in the 19th century had poor incomes, few real skills and little public authority or credibility. This was so because scientific knowledge was

inadequately developed at the time. Or as Starr suggests
"the dream of reason" began to unfold when its rationality
could be based "on elaborate systems of specialized
knowledge, technical procedures, and rules of behavior."
(Starr, 1982, p. 3) However up to at least the mid-19th
century North American medicine was delivered by a mixture of
lay healers, quacks, and semi-professionals, and
professionals trained in Europe. During this period,

> Nineteenth century medicine took its unique
> character in America from the dialectic between
> professionalism and the nation's democratic culture.
> Physicians tried to raise their standards, dignity
> and priveledges through medical schools, societies
> and licensing, but the openness of the society and
> the ambitions of their fellows subverted their efforts.
> (Starr, 1982, p. 54)

The stalemate between the apparent complexity of
medicine and the public desire for a common sense
understanding of medicine was broken by the end of the 19th
century by the rise of the clinical methods described by
Foucault (1973).

Observation, a kind of clinical impotence, turned to
examination then finally to intervention in the body. With
this changing perspective of the body and of the cause and

effects of diseases came a gradual rise in medical instrumentalism and specialization. Starr refers to this as the 'eclipse of legitimate complexity'. "The democratic interregnum of the nineteenth centruy was a period of transition, when the traditional forms of mystification had broken down and the modern fortress of objectivity had not yet been built." (Starr, 1982, p. 59)

It was the period between 1900 and 1930 which saw the fuller development of scientific medicine, both as a technical discipline and as the basis for a movement towards political control, and especially licensing procedures. Richard Brown's Rockefeller's Medicine Men (1979) provides a broad, neo-marxist analysis of this period in this United States. Much, but not all, of what he describes applies equally to the Canadian experience. Brown's main thesis is that the development of scientific medicine was actively sought by corporate capitalism. "The complete professionalization of medicine could only come when they developed an ideology and a practice that was consistent with the ideas and interests of socially and politically dominant groups in society." (Brown, 1979, p. 71) Scientific medicine required expensive laboratory technology and full-time European trained instructors. The costs involved favoured the well-endowed schools such as John Hopkins, Harvard and McGill. Fundamentally though, what turned the tide for the medical schools that survived this period were the generous

endowments of the Rockefeller foundation and those of other
wealthy industrialist like the Carnegies and Mellons.   Less
well-endowed schools were forced to close down because they
had neither the latest technology nor the approval of the
medical societies.

Brown argues that the function of the promotion of
scientific medicine within the capitalist paradigm was to
divert attention from the evils of industrialization and
defuse the protests of radicalized immigrant workers.   "The
medical profession thus accepted the capitalists definition
of health as the capacity to work." (Brown, 1979, p. 119).
Fundamentally, then, social problems became medicalized and
placed in the hands of professional expertise and
management. [3]

Brown's basic thesis is compelling if only because he
clearly rejects the idea that technology and
industrialization act as universal determining factors.
(although he could be accused of seeing capitalism as an
universal determining factor)   Rather he uses an approach
very similar to that used by David Noble in <u>America by Design</u>
(1977).   In fact, Brown and Noble's books are parallel
interpretations of the rise of science and technology in
medicine and engineering in the United States.   What is
important about both interpretations is the idea that

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[3] See R. Numbers (1982) for a review of the development
of medical histories.   The works of Brown and others are a
recent trend.

technology and social relations are interrelated. As Noble
states, "technology is thus a social process; it does not
simply stimulate social development from outside but, rather,
constitutes fundamental social development in itself."
(Noble, 1977, p. xxii)

Canadian developments were not significantly different
from those in the United States in the early part of the 20th
century. [4] The growing control of the medical associations
over licensing, educational requirements, the development of
fee schedules and the internal conflicts with other health
care professionals were equally evident in the Canadian
experience. Ronald Hamowy's <u>Canadian Medicine: a study in</u>
<u>restrictive entry</u> (1984) provides valuable historical data on
these trends, although he fails to link up social and
political events in the same manner as Brown, Noble and
others.

The brief historical picture presented above of how.U.S.
and Canadian medical care systems developed their dominant
clinical emphasis and political power has been treated more
extensively by other authors. The historical sketch was
provided in order to place the following discussion in
perspective.

The steady growth of the medical professions' real and
imagined expertise based on science and technology and its

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[4] See Blishen (1969), Crichton (1976) Soderstrom (1978)
and Coburn, D'Arcy, New & Torrance (1981).

justification for its dominant position in the health care
industry sparked a number of radical critiques of the whole
industry in the 1970's. These criticisms are certainly still
valid today, because the roots of discontent are still there.
If anything the applied science and technology which
constitutes the practice of contemporary medicine is more
powerful than ever, both as instruments in and of themselves
and also as tools of the medical apparatus.

There is a growing body of literature which is critical
of both the technical and social aspects of medicine. Some
of the typical problems identified in this literature are:
the social construction of medical knowledge versus a
materialist science, the problematic of professional
dominance, questions of the real effectiveness and efficiency
of the health care delivery system, as well as fundamental
questions regarding what is health, who defines it and who
pays for it? All of these recent approaches attempt to deal
with the monolithic positivism (optimism) of modern
technological medicine, to show that the clinical practice is
related to larger social and economic concerns and vice
versa, and perhaps to offer concepts of health care which
might open the door to alternative practices based on notions
of patient empowerment through self-knowledge and autonomy.
These movements, while often highly polemical in tone, do not
wish to wipe out the existing preventative or curative powers
of modern medicine, but rather to rebalance the health care

professional-patient relationship, and to reassess the relationships between technology and society, and medicine and society. Therefore the proponents of a social constructionist view of medicine

Refuse to regard medicine and technical medical knowledge as pre-given entities, separate from all other human activities. Instead, it is argued that medicine·is to be seen as a highly specialized domain of social practice and discourse, the limits and contents of which are themselves set up by wider – but not separate – social practices. (Wright & Treacher, 1982, p. 10)

Many articles in the last decade (Figlio, 1979; Stark, 1982; Radical Science Journal Collective, 1981; Waitzkin, 1974, 1978; Carlson, 1975; Doyal 1979, 1984; Berliner, 1977, 1979; Young, 1977; Kelman, 1975; Navarro, 1976, 1980, 1983, 1984) have mapped out the various liberal, radical, feminist, marxist and academic sociologists' positions on the relations of medicine and society. Most of their positions recognize a connection between the clinical practice of medicine and the social structure which surrounds it. However there is a general tendency to view the interplay between the clinical and the social as somehow predetermined by the larger society (particularly capitalist commodity relations), controlled in

an overt manner by professionals (usually just doctors), and
ideologized as the medicalization of society.

The limitation of many of these criticisms is that
generally they are correct in looking at the deeper
connections between medicine and society. However their
reduction of everything to being ultimately determined by
capital's commodity relations is to use an expressive
causality approach and to be limited in one's analysis. Thus
a typical Marxist approach calls for the overthrow of
capitalism, an unlikely proposition. Yet at the same time it
seems obvious that these larger factors have some impact on
health care in general and on particular sites such as Sioux
Lookout.

Thus the Sioux Lookout zone health care and social
system is, despite its relative isolation, somehow the
product of many historical, longterm trends such as the
technological emphasis of modern medicine, the particular
role of doctors and their relative monopoly of knowledge,
state funding arrangements, and for the purpose of exploring
a communication technology in health care, the rhetoric and
promise of the new information technologies.

Most social historians and critics of medicine have
tried to explain how medicine developed its emphases: on
individual medicine over public health, on strict clinical
causality over broader notions of social causality, and on
scientific medicine over social medicine. Typically it is

stated that the development of medicine's scientific base and
thus its legitimate complexity grew in parallel to the
development of capitalism.

The critics of medicine are at the same time explicit or
implicit critics of science and technology in society. (Rose
& Rose, 1976; Hales, 1980, 1982) Thus Foucault's clinic, the
real world of medical practice, is the site where the
efficiency and effectiveness of science and technology are
brought into play. It is on this terrain that medicine
justifies its advances in terms of its reasoned use of
applied science and technology. And fundamentally, although
not exclusively, it is the doctor who is the mediator between
science and technology, and life or death at its extreme. [5]
In other words this is the 'base' of the base-superstructure
metaphor.

One could argue that the base as primary productive
forces can be analyzed in two parts. First there is the
broad, lived experience of the health care system, and
secondly there are the epistemological assumptions of
medicine which support the clinical medical practice and are
functional to the practice of medicine and to notions of the
medicalization of society.

At the clinical level, technology assessment types of
studies have evaluated the introduction of medical technology

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[5] The rhetoric of this position is well represented by
the McGill University Dept. of Medicine's slogan for its
public lectures, " From the bench to the bedside".

and procedures. This is a critical point in the critique of medicine because the justification for medicine and professional dominance of the medical profession rests on precisely this point.

Richard Taylor's <u>Medicine Out of Control</u> (1979) is one of three examples of a contemporary critique of clinical medicine. Taylor states that,

> Unfortunately, many doctors still equate 'high
> technology' with 'what is possible' and further equate
> this with what is necessary and desirable. Most of these
> new technological 'advances' have been uncritically
> accepted as efficient and superior to previously used
> methods and have not even been subjected to proper
> scientific medical scrutiny let alone to psychological,
> social and economic analysis. (Taylor, 1979, p. 106)

Taylor goes on to describe the proliferation of coronary care units as scandalizing. He states that these units are full of both specialized technology and personnel. However, these units, according to clinical studies quoted by Taylor, are no better at keeping heart attack victims alive then if they rested at home. The fact that these units are popular, and even seen as successful and therefore necessary for every hospital to have, has to be attributed to some other factor than clinical effectiveness. Taylor, while recognizing the

larger causal connections, retreats however to a call for
better-technology assessment procedures. His is a call for
more rationalization of and about technology and clinical
practice. His position is identical to that of Hanley and
Williams (1984). The underlying assumption is that there is
nothing intrinsically wrong with modern technological
medicine as long as proper clinical studies of usefulness and
effectiveness are undertaken before widespread adoption and
implementation, and followed by audits. Taylor, as a typical
liberal critic, falls into a TA position with a notion of a
neutral technology. Medical practice should be assessed
internally against an objective standard of rationalization.
Taylor would like to assume that since medicine is based on
objective science, that medical procedures and technologies
which do not meet the above criteria would be rejected.
Fundamentally Taylor implies that a TA approach contains a
moral or non-technical vantage point which would allow a
technology assessment to be judged rationally. Moral
reasoning would restrict scientific rationalizations. Moral
reasoning has to appear to be rational in order to make
judgements on technical and social problems while remaining
detached from them. Taylor's argument is an example of an
earnest criticalness which is reduced to equating technology
assessment with clinical effectiveness. And as will be seen
in chapter two, this is a common assumption in TA studies.

Thomas Mckeown's The Role of Medicine: Dream, mirage or

nemesis? (1979) is often cited in the literature. His basic theme is that "misinterpretations of the major influences, particularly personal medical care, on past and future improvements in health has led to misuse of resources and distortion of the role of medicine." (McKeown, 1979, p. 4) He cites the work of Rene Dubos (1965, 1979) and Ivan Illich to support his thesis. McKeown makes the argument that environmental factors have played a more important role in the incidence of disease than is normally recognized.

The other author who I wish to discuss is Ivan Illich. He is important for a number of reasons: as a catalyst within the critical community, as a critic of clinical medicine and most importantly as a critic of the medicalization of society.

In 1975 Illich's Medical Nemesis landed like a terrorist's bomb in the medical world. World-wide response to his searing critique of Western medicine led to Limits to Medicine in 1976. The opening line of his introduction of the latter book established Illich's prime target: "The medical establishment has become a major threat to health" (Illich, 1976, p. 11) Through the use of a type of technology assessment methodology developed in a earlier book, Tools for Conviviality (1973), Illich struck out to demystify modern medicine's effectiveness and purposes.

His intention was to "allow the layman effectively to reclaim his own control over medical perception,

classification and decision-making." (Illich, 1976, p. 12)
Illich thought that scientific, technological medicine had
reached its limits and was counterproductive to the health of
populations. "It must now be understood that what has turned
health care into a sick-making enterprise is the very
intensity of an engineering endeavor that has translated
human survival from the performance of organisms into the
result of technical manipulations." (Illich, 1976, p. 14)

In Limits to Medicine, Illich distinguished three
levels of the health care epidemic; clinical, social and
cultural iatrogenesis. Iatrogenesis means "induced
inadvertently by a physician or his treatment." (Webster's,
1980, p. 561) For the moment, though, our interest is with
Illich's critique of clinical medicine. Clinical
iatrogenesis is concerned with medicine's ability to cure
disease and also to cause disease. "Clinical iatrogenetic
disease comprises all clinical conditions for which remedies
physicians or hospitals are the pathogens or sickening
agents." (Illich, 1976, p. 36) As examples Illich refers to
the unwanted side effects of drugs, unnecessary surgery,
disabling non-diseases resulting from the treatment of non-
existent disease and medical malpractice. The common myth
that Illich wished to deflate is that more medical care
equals better health.

"The changes (in health status) are dependent variables
of political and technological transformations, which in turn

are reflected in what doctors say and do; they are not
significantly related to the activities that require the
preparation, status and costly equipment in which the health
profession takes pride." (Illich, 1976, p. 22)

Illich argues that the situation is clearest when the
argument is pushed to its extreme. For him the litmus test
of technology's role in health is in the large, urban
university hospitals. These tertiary care facilities are the
most expensive to operate and equip, have equally specialized
and expensive professional staff. Statistically most people
now die in hospitals. It is within these facilities that the
denial of death is waged with the tools of technology and the
expertise of science. "In a complex technological hospital,
negligence becomes 'random human error' or 'system
breakdown', callousness becomes 'scientific detachment', and
incompetence becomes a 'lack of equipment'."(Illich, 1976, p.
39)

That is the basic sense of Illich's argument about
clinical medicine. Most of the critics of Illich quibble
over specific examples of effective or ineffective
techniques, while missing his broader points. And while he
quotes from reputable sources such as the New England Journal
of Medicine, his argument is more powerful than just a
critique of clinical medicine. His two other levels of
iatrogenesis, social and cultural, will be examined shortly,
but first the other half of the clinical dilemma,

epistemology, will be explored.

"Identification of medicine or medical knowledge posed no difficulties, indeed it was self-evident: medicine was what doctors and their ancillary workers did; medical knowledge.... was simply what was transmitted through medical schools or diffused by the professional journals and textbooks." (Wright & Treacher, 1982, p. 3)

This is the public's general understanding of medical assumptions and epistemology. And this benign definition or situation rest on a number of less explicit asumptions. "Medical knowledge was distinctive because it was characterized by two particular features: it was built upon the findings of science; and it was effective. Its scientific foundation was important because medicine drew from it the same priveledged epistemological status that was usually accorded science." (Wright & Treacher, 1982, p. 4) Thus medicine is assumed to be a science. Its determinants are primarily biological. It operates with a biomechanical, materialist view of man. "Diseases ... were natural objects which existed prior to and independent of their isolation or designation by doctors." (Wright & Treacher, 1982, p. 4)

Thus science and medicine involved the systematic uncovering of the mechanisms of life. It is systematic because it is based on techniques of scientific method and rationality. All that this suggests is that in the final analysis, the social context is generally rendered irrelevent

to the practice of medicine. As Treacher and Wright have
suggested "it is that the social forces - whether much
attention was given to them or not - were assumed to be self-
evidently distinct from medicine." (Wright & Treacher, 1982,
p. 4-5)

Continuing for the moment with the dichotomy between
objective, instrumental scientific rationality and the social
world, William Leiss has argued, in The Domination of Nature
(1974), that to trace this division between science and the
social we must begin with Francis Bacon. Leiss thought that
Bacon was the initiator of the idea of organized scientific
research. Bacon believed that "religion and science were
engaged in a mutual effort to compensate for the damage
incurring as a result of the explusion from paradise."
(Leiss, 1974, p. 49) Religion was to deal with the loss of
moral innocence and science with the loss of domination.
Thus Leiss states that Bacon's clear separation of natural
knowledge and moral knowledge became an essential connection
in modern thought. The importance of this separation became
apparent when the moral authority of religion withered away,
leaving only science as man's salvation on earth. Therefore
Leiss argues that natural knowledge and its methodological
corpus are dominate undercurrents to not only modern science,
but also to modern life. Impartiality, objectivity,
detachment, analytical rigour and so forth are both the
desired qualities and the ground rules for conducting

scientific research.

The linear progress of man's scientific discoveries, whether real or imagined, gradually came to rely on technological instruments for probing the world. Stanley Reiser's Medicine and the Reign of Technology (1978) is an example of the history of medical technology told as the unfolding rationalization of science and medicine. Reiser traced the development of major diagnostic technology, such as the microscope, thermometer, increased knowledge of bacteriology and biological chemistry, x-ray devices and microchip technologies. The author concluded "that modern medicine has evolved to a point where diagnostic judgements based on 'subjective' evidence - the patient's sensations and the physician's own observation of the patient - are being supplanted by judgement based on 'objective' evidence, produced by laboratory procedures and by mechanical electronic devices." (Reiser, 1978, p. IX)

Leiss' basic argument is thus supported by Reiser's well-known, typical history of medical technology. Leiss' argument goes on to state that the domination of nature is really the domination of man. Scientific rationality is used explicitly by some interests in society against other parts of society or acts as an implicit foundation for modern society's position of dominance. That is, there is a dialectical relationship between instrumental rationalism, science and technology and the social life-world. The

relationship between these two dynamic forces is evident in
the practice of medicine. The application of science and
technology in the real world is the production, distribution
and consumption of medicine, knowledge and expertise.

"Information provided by the strictly empirical sciences
can be incorporated in the social life-world only through its
technical utilization, as technical knowledge, serving the
expansion of our power of technical control." (Habermas,
1970, p. 52) Habermas' statement points to the importance of
studying the application of technical knowledge in medicine
in relation to larger notions of social control.

What Leiss and others have described is not only
operative at the clinical level but also interacts with, and
is substantive to Illich's two other levels: social and
cultural iatrogenesis.

"On the second level, medical practice sponsors sickness
by reinforcing a morbid society that encourages people to
become consumers of curative, preventative, industrial and
environmental medicine...Second level iatrogenesis finds its
expression in various symptoms of social over-medicalization
that amount to what I shall call the expropriation of
health." (Illich, 1976, p. 41-42)

Illich calls for political change as a solution to
technological medicine's epidemics. Yet the development of
modern medicine is based on scientific knowledge and
instrumental technologies. The legitimacy for the existing

social relations between health care providers and health
consumers is based on the supposed advances of science and
technology. Therefore, the substance of clinical medicine as
'dream, mirage or nemesis' is critical to the working of the
cultural and social levels and the reverse as well.

"When the intensity of biomedical intervention crosses a
critical threshold, clinical iatrogenesis turns from error,
accident or fault into an incurable perversion of medical
practice. In the same way when professional autonomy
degenerates into a radical autonomy and people are rendered
impotent to cope with their milieu, social iatrogenesis
becomes the main product of the medical organization."
(Illich, 1976, p. 50)

Other authors are in general agreement with Illich.
Elliot Krause in Power and Illness (1977) states that the
medicalization of life "arises from two sources: the growth
of technology in medicine and the continuing power, status
and profit motives of physicians." (Krause, 1977, p. 117-118)
Marc Renaud sees medicine as a microcosm of capitalist
society. "The general argument has been that capitalist
industrial growth both creates health needs and
institutionalizes solutions to those needs that are
compatible with capital accumulation. The key mechanism in
this institutionalization is the medical engineering model
which transforms health needs into commodities for a specific
economic market." (Renaud, 1978, p. 118)

The medicalization of society is achieved through a
variety of technical, economic, organizational and social
factors. Since there is a complex interplay of factors, it
is not easy for Illich or other authors to pinpoint a role
for technology in isolation, let alone prescribe limits to
the use of technology that does not also suggest limits in
other areas as well. Yet it is clear that the medicalization
of society revolves around doctors, hospitals, and technology
in both a metaphoric and geographic sense.

On one level Illich is concerned with the industrial
base of Western industrial medicine. On another level, he is
concerned with basic definitions of man, health, illness and
disease. Thus social iatrogenesis designates "all
impairments of health that are due precisely to those socio-
economic transformations which have been made attractive,
possible or necessary by the industrial shape health care has
taken." (Illich, 1976, p. 49) On the second level, Illich,
like Leiss, states that medicine presents itself as value-
free. "The divorce between medicine and morality has been
defended on the ground that medical categories .. rest on
scientific foundations exempt from moral evaluations." .
(Illich, 1976, p. 55)

These two apparently different levels of analysis are
connected for Illich because the basis for a limit to
scientific medicine and a limit to rampant industrialization
are moral ones. It seems that for Illich and many other

writers concerned with the ethical vacuum brought about by rampant technological expansion, that a moral counter-movement needs to be asserted in order to establish limits and reestablish mans' control over his inventions. Thus the AT and Luddite approaches reveal the existence of alternative visions of reality. In a similar way an emphasis on patient autonomy provides a new direction for research and action.

Here are two other quotes which further illustrate that Illich's concern for values and constraints is now part of a much larger debate.

"The contemporary movement in medical ethics in part asks physicians who control a powerful technological store of therapy to consider, as the ancient Greeks did, the limits imposed on therapeutic undertakings by the biological makeup of man and the moral and therapeutic consequences of accepting these limits." (Reiser, 1978, p. 53)

"Today science is under attack because it has lusted after means and been blind to ends. If health had been the objective we would be healthier. But health has not been the objective. The objective has been technique. Jacques Ellul described the dichotomy in The Technological Society when he pointed out that the elaboration of technique and man's inability to control the technology he has created is due to our failure to understand how to change the underlying assumptions from which we work." (Carlson, 1975, p. 156-57)

Another reason given by Illich for the medicalization of

life is economic. Illich is interested in how much money is
annually spent under doctors' orders, and how the cost
increases are due to bad planning, technology and prepayment
services. The "reason why these costly medical bureaucracies
are health-denying, lies not in their instrumental but in
their symbolic function: they all stress delivery of repair
and maintenance services for the human component of the mega-
machine." (Illich, 1976, p. 69)

The symbolic function would not stand up if there was
not some basis to the argument. However, for Illich the
greater danger is in creating ever growing expectations for
more and better health care, as if 'health' was a commodity
rather than man's adaptation to his environment.

Social iatrogenesis is clearly more than just physicians
controlling spending or drug companies profiting by over-
consumption. The medicalization of life is the ability of
health bureaucracies to label behavior as a medical problem.
Doctors have been accused of labelling the natural process of
birth as a medical problem and thus incurred the wrath of
various women's groups. Thomas Szaz's Myth of Mental Illnes
broke similar ground in denouncing the medical establishments
power to label homosexuality as mental deviation Thus there
is a growing body of literature which demonstrates the role
which doctors have played in subordinating women, minority
groups and other powerless segments of society. (Freund,
1982; Illich et al, 1977)

The unrelenting treatment of any medicalized group in society is what Victor Fuchs calls the 'technological imperative', namely "the desire of physicians to do everything that he has been trained to do regardless of the benefit-cost ratio." (Fuchs, 1974, p 60) Or as Illich says, "the escalation of terminal treatment removes from the physician all need to prove the technical effectiveness of those resources he commands." (Illich, 1976, p. 107)

"The place of technology in medicine - and the place of technology more generally in contemporary life - provides the most significant obstacle to the development of a reasonable and limited concept of health... In short, the more involved one becomes in making calculations and comparisons, the more problematic the venture." (Callaghan, 1977, p. 27)

To summarize so far, it was stated that the application of science and technology, and the perceived success of its clinical applications gave rise to social beliefs which were generally supportive of man's domination of nature. The critics of Western industrial medicine have suggested that the basis for medicine's claims are suspect on clinical and social grounds, and also that the medical profession and/or the ruling elite of capitalism have conspired to use medicine and its cloak of expertise to control the population. At a minimum, the critics of medicine have suggested that the broader social events and environmental factors have been underemphasized and at the extreme perhaps deliberately

downplayed.

In terms of the Sioux Lookout experiment which is examined in the next chapter, it is clear that the medical assumptions of mainstream medical practice are operational at the macro and the micro level. Similarly notions of social control and the transportation of expertise, while perhaps not explicitly displayed, form the basis of the assumptions used in selecting telehealth technologies for a narrow range of applications.

The purpose of examining the critical approaches to health care was to reassess the medical system and to seek out critiques which would support a new interpretation of health production, distribution and consumption more in line with a broader realization of structural factors and notions of patient autonomy.

When medical and communication technologies are compared as to their forms of social organization, it seems that medical technology is more specific to the social organization of the health care system, than would be communication technologies to the same system. When one thinks about medical technology, it is clear that most of the technology was specifically designed for use in medical care. CAT scanners are an example of a specialized and expensive technology for imaging the body. Its design function is to provide computer-generated images of tissue densities.

However communication technologies would seem to be more

generically useful. This is because the notions of
'information' or 'communication' apply to medicine and many
other endeavors as well. They are not restricted to a
particular industry or profession. This, then, makes
communication technologies more pervasive and perhaps more
dangerous because of their wider possible uses. The
telephone, which reflects a design intended for person-to-
person calls, can be used for many different purposes from
telemarketing to emergency calls. Thus most of the
communication technologies used in the health care system had
their invention and innovation outside of the system. This,
then, suggests that the social structure of communication
technologies and their design intentions are different from
medical technologies, while their use values are similar
within the health care system.

In the previous section the medicalization of society
was the direct and indirect effect of medicine's place in
society. In a similar way the 1980's are characterized as
the 'information age', the 'communications revolution' and
other inspired phrases. The discourse on new communication
and information technologies informs us that we are
connecting to the 'electronic highway' and in the process
gaining greater access to information that will inform and
improve our political and leisure lives.

The idea of an information society (Masuda, 1980; Bell,
1973) is an ideology supported and promoted by the major

communication conglomerants, to reinforce the continued use
and acquisition of technology and software. (Finlay-Pelinski,
1983; Slack, 1983, 1984c) The rhetoric of the computer-
communications revolution is disguised by expectations for
participatory democracy and new electronic communities
spanning time and space. Innis' valuable distinction between
space-binding and time-binding communications is ignored in
this discourse.   The individual is presumed to be in
control, while the corporations market their information
technology and commodities. The individual is free to
operate within the largely undiscussed and almost invisible
structure of capital's control over information. Thus any
critique of this situation is often reduced to lamenting the
gaps between the information-rich and the information-poor.
Nobody argues that the market economy is Wrong, but only that
they don't have the money to participate in it. In a similar
way the idea of the individual being in control is the basis
for blaming the victim of an illness for not having taken
better care of himself, while clearly ignoring larger social
factors such as environmental pollution, and manmade
carcinogenics.

    The new communication technologies are embraced by both
corporations and community groups, all seeking their uses of
the technology. (Cartier, 1984) There already exists a
substantial history of using communication technologies in
health care and social service. (Filep et al, 1975; Picot,

Roberts & Gurd, 1984) Computers are an especially practical
and powerful technology for alternative practices. (Haight &
Rubinyi, 1983; Athanasiou, 1985) However computers, as part
of the larger changes in the information society, are not
without their problems. (Solomonides & Levidow, 1985)

Most writings about communication technologies assume
that the technology is neutral and can be applied to do
established activities faster and more efficiently. Since
this is the primary reason for introducing communication
technologies, it isn't surprising that the Sioux Lookout
project reflects this emphasis on duplication. What is
duplicated and transported is, at the micro level diagnostic
information, and at the macro level the social structure and
relationships of medicine. So while the technology is used
to assess a new way to change the distribution of health
care, the production and consumption practices remain the
same. Therefore the distribution of health care in a new way
has the possibility of altering the quality of care but is
always constained by the unchanged production and consumption
relationships. Thus the centralizing tendencies of medicine
are reinforced through the use of telecommunications
technologies.

There are important parallels between the use of
information technologies in the home or at work, and their
use in medicine. Fundamentally it seems that any technology
can be assigned to the medical system if it can function as a

tool within the medical discourse and its assumptions as discussed above. Thus the instrumental rationality practiced in a material medicine requires instruments that abstract lived social processes and as an unintended side-effect remove them from social criticism.

Medicine is an information-intensive discipline, as, are all the hard sciences in light of the rapid expansion of their respective knowledge bases. It follows almost logically that the hard sciences have embraced and will continue to embrace information technologies, and their extensions, artificial intelligence, expert systems and computer culture.

As was discussed above, the medical apparatus justifies its existence through its clinical practice and its ideological presentation of its benevolent domination of nature for man. The information revolution has a similar discourse which concerns the personal and political advantages of having more information. (Katzman, 1974; De Pool, 1983; Science Council of Canada, 1982; Cordell, 1985). The error here is the emphasis on the individual at the expense of social structures and relationships.

Up to this point the clinical, social and cultural levels of medicine have been outlined, along with the rhetoric of the information revolution. These two parallel streams are both thought to have an influence on the conception, design, implementation and evaluation of a

specific telehealth project.

The next chapter explores how the underlying assumptions of medicine and the communication revolution impact on the authors' definition of the problem in Sioux Lookout and their evaluation of the telehealth system. The emphasis on the transportation of medical information, a biomechanical view of man, and professional expertise falls within the simple casuality of an uncritical medical world view. It is obvious that the transportation function is only part of a larger process of production and consumption of medical knowledge. By recognizing this larger connection, it can be shown that interventions on behalf of the patient must include a space for criticizing the production, distribution and consumption of medical knowledge as a whole. Thus the purpose of this chapter was to lay the ground work for a broader critique which could support some kind of intervention. The next chapter places the possibility for intervention strategies within the perspective of the actual use of the telecommunication technology in Sioux Lookout.

Chapter two

The Sioux Lookout Telemedicine project is a key project
in the history of Canadian experiments which used
communication technologies to provide social services. This
chapter will be a reevaluation of the project bearing in mind
the criticisms of the health care industry and the new
communication technologies described in chapter one. The
first section will explore the assumptions underlying the
authors' technology assessment approach and its constraints.
The next section will describe the tacit assumptions about
medicine within which the authors operate. Finally the
relationship between the technology assessment assumptions
and the medical assumptions will be explored for any deeper
connections between them.

The authors' underlying assumptions about technology
assessment are evident in both explicit and implicit
statements concerning the role of a communication technology
for the delivery of health care to remote regions. However
before indicating these statements it is necessary to clarify
the difference between a technology assessment approach and
the research methodology which seems inseparable from it. Is
is clearly the TA approach which determines the methodology
and not the opposite case. The methodology and the design of
the experiment were chosen to capture the data which is

necessary to answer the questions posed by the authors.
Therefore any criticism of the project needs to take account
of, not only the possible methodological errors, but also the
larger TA assumptions which underlie the conception of the
initial problem.

The authors evaluated "the potential of a technology to
support a social system. ... in relation to the environment
in which the technology will be used " (Dunn, Conrath &
Higgins, 1983, p. 1). Specifically they examined the social
impact of slow-scan video on the delivery of medical care to
remote communities in Northern Ontario between 1976 and 1979.
The 'social system' is the context within which the
technology will be judged effective or not. The social
system is in effect the health care delivery system. The
environment is a specific location within the larger health
care system. These definitions suggest that the authors can
not interpret the social impact of a communications
technology outside of the determining influence of the health
care delivery system. This attempt at containing the
experiment to a social system which does not operate in
isolation from the rest of society restricts the authors'
final analysis while also illustrating the dominance of the
medical model. The narrow context of a social system is
further compromised by the micro analysis of the Sioux
Lookout health care delivery system.

The authors' TA approach does not, then, allow for any

evaluation of the larger social system although it is
admitted that the impact of the slow-scan system may change
the social system, meaning the health care delivery system,
later. Fundamentally, then, the health care delivery system
is not subject to any criticism nor do the authors'
assumptions allow for any criticism. The health care
delivery system is also not seen as having any influence or
impact on the implementation of the communication technology.

Thus the new technology is seen by the authors to have a
minimal effect on the larger health care system. The reverse
is also true. Thus the sole context for studying the social
impact becomes the Sioux Lookout site. Again not the total
social system within which the Indians live, but only the
locations where health care is delivered: the Sioux Lookout
zone hospital, the nursing stations and to a lesser extent
the nurses-aides stations. Furthermore, the evaluation of
the effect of a technology is within a narrow workplace
context. This effectively cuts off any mention of outside
influences or factors and at the same time ignores the
structural constraints within the workplace.

Jennifer Daryl Slack (1984a) argues that technology
assessment approaches tend to emphasize the indirect and
unintended effects of a technology. The assumption is that
the direct and intended effects on the workplace are
justifiable, rational or obvious. Since the authors do not
critique the concept of a health care delivery system itself,

but only selected portions of its practices, they put
themselves in the position of supporting the direct and
intended effects of health care delivery. The sole purpose
of undergoing a technology assessment, then, is to uncover
the problems which might holdback or delay the implementation
of the technology and the elimination of problems. This is
clearly evident in the hypotheses which the authors developed
to guide their study. Yet these methodological beacons are
derived at a deeper level from the underlying assumptions of
the technology assessment approach. It can even be argued
that the essential optimism of the technology assessment
approach has some relationship with the perceived
evolutionary growth of science and technology.

The main purpose of using a technology assessment
approach is not only to remove or reduce the barriers
effecting the successful implementation of the technology,
but also to justify whatever is being delivered by the
technology. Thus office automation technologies can only be
intended to support the basic notion of the office and its
structural relationships. Similarly a telecommunication
technology can be understood as supportive of the dominant
medical paradigm. The technology assessment approach can
only operate with an explicit or implied vision of what it is
that needs to be changed, supported or evaluated. To an
extent, then, the desired impact is symptomatic of the
oganizational structure and of the dominant ideological

structure.

So far, then, the assumptions about technology assessment which the authors use reflect a concern with instrumental solutions and simple causality. The evaluation is in terms of a narrow work place focus. It is only the unintended and indirect effects which are problematic. Basic social, political and ideological problems are reduced to technological problems. Only a 'well defined problem' is necessary to discover the instrumental solutions. Thus the authors' statement of the problem in chapter two indicates the desirability of technological solutions. It also suggests how evaluating a technological solution to a well defined problem helps in itself to structure the methodology needed to determine the effectiveness of the intervention.

In chapter two the problem is as follows.

The provision of health care to rural and remote regions has long been fraught with problems. Residents of these areas have difficulty accessing the medical services and facilities which are commonplace in large urban centers. Consequently, there is concern that the level of care which they obtain is substandard. (Dunn, Conrath & Higgins, 1983, p. 13)

The authors then go on to identify three broad categories of barriers to the delivery of medical care to

remote regions: sociocultural, economic/demographic, and
professional and organizational. They do not discuss any
notions of causality between these three kinds of barriers
and the larger concerns of the critiques of medicine, and
science and technology which were raised by Illich (1976),
and others in the previous chapter.

The social and cultural barriers to physicians
practicing in remote regions are explained in terms of the
isolation from the cultural advantages of urban life. The
reasons why physicians might prefer city life is not
explored. It is taken for granted that the majority of
physicians would prefer to live in larger centres. In any
case it is unlikely that a communications technology can do
much to alleviate this problem. It is a cultural and
ideological problem, a matter of upbringing and expectations,
and not a technical problem.

The economic and demographic barriers are based on U.S.
studies. However in Canada, the provincial health plans
provide a generous fee structure for doctors working in rural
areas. There is little uncertainty about not getting paid.
This only becomes an issue when the authors mention the
physicians concerns about payments for remote diagnoses.

It is the third barrier which is the most problematic
and the one most susceptible to a technological intervention.
The authors state that four approaches were tried to
alleviate the maldistribution of physicians: attracting them

to rural areas, transportation systems, the use of non-physician providers and telemedicine. Compulsory medical service, higher fees and internship programmes have all been tried with limited success. The authors' conclusions are that these attempts will never really succeed. While this might well be true, the authors can't explain why. What the authors fail to analyse are the political and structural factors which might make rural service always unattainable, despite all the well-intentioned incentives. Thus the authors can only then, ask "What is the best way to use and support the few physicians who do locate in remote areas?" (Dunn, Conrath & Higgins, 1983, p. 19). The overall problem of encouraging physicians to work in remote areas applies to all other health care professionals as well, although the authors focus primarily on doctors.

The problem for the authors is how to bring the appropriate level of care and supporting technology to the patient. The critics of modern technological medicine argue that the efficiency and effectiveness of technology in medicine is questionable and that the continued emphasis on health care delivery is suspect. Furthermore the idea of an appropriate level of care is socially constructed and not a given scientific fact.

There are two components to the transportation system which sustain remote health care delivery, "transportation of the patient to the medical facilities and transportation of

the medical facilities to the patient". (Dunn, Conrath &
Higgins, 1983, p. 19) Patients have to be transported to the
medical centres because the hospital has become the dominant
location for the delivery of health care. In the case of the
Sioux Lookout zone, patients are transported to the
appropriate facility depending on the level of care which
they need. Thus the most serious cases follow a path from
the nurses-aides stations to the Sioux Lookout zone hospital
and finally to specialized centres in Toronto.

The other component of the health delivery system
involves the transportation of the medical facilities to the
patient. The authors basically mean doctors when they
discuss medical facilities. Medical facilities is an acronym
for medical expertise, embodied in doctors, and supported by
technology.

Clearly the professional and organizational barriers to
the delivery of health care to remote regions are more than
simply transportation issues. However it is in precisely
these terms that the authors have raised the problem of
delivery. The delivery of health care is a transportation
problem. This ignores the possibility that health care
delivery is a political problem. It is within these terms
that the authors' basic research question emphasizes the
unidirectional flow of medical information and expertise from
the urban medical centres to the remote nursing stations.
What is not mentioned here are the problematics involved in

the production and content of the expertise which is
delivered. As well, the receipt of the medical care by the
patient is barely acknowledged.

The use of non-physician providers is recognized by the
authors as another way to solve the maldistribution of health
services in the North. The literature sources that are cited
appear to value non-physician providers while recognizing
that they would, naturally, step aside when a doctor was
present. (Dunn, Conrath & Higgins, 1983, p. 22) It is
convenient for doctors to accept non-physician providers in
rural areas but not in urban ones. Doctors choose not to
provide a service and at the same time maintain the right to
approve their partial replacement by non-physician providers.
The authors think that the use of non-physician providers is
a limited solution to the need to delivery health care to
remote areas. The major reason given against this solution
is that of physician and patient attitudes towards the non-
physician providers. What is particularly strange and at the
same time revealing here, is that this is the only place
where the authors discuss patient attitudes towards one of
the four possible solutions to the maldistribution of
physicians. The authors note that "acceptance was often
dependent on the personal endorsement of the family
physician". (Dunn, Conrath & Higgins, 1983, p. 22) It is
likely that this endorsement is as much a structural one as a
personal one.

Physician reaction to non-physician providers reflects a built-in logic of professional dominance. Encroachments on the decision-making authority of physicians is tolerated at the best of times. So it is not surprising that "physician acceptance of non-physician providers has been mixed".(Dunn, Conrath & Higgins, 1983, p. 23) It is clear from the authors statements that they expect that patients have ambivalent attitudes towards non-physician providers conditioned on one hand by their deference towards doctors and their opinions, and on the other hand their immediate need for any kind of medical care.

Finally, telemedicine is the fourth approach proposed. In particular it is seen as "one way to supply some of the consultation and educational needs without overly burdensome expenditures." (Dunn, Conrath & Higgins, 1983, p. 23). Since the experiment concerns telecommunication technologies in its final stage, it is this aspect which will be criticized. It is enough to suggest that there is probably a relationship between communication technologies and other technologies in medicine. For example, a recent article in Dimensions in Health Service, the journal of the Canadian Hospital Association, discussed the assessment and diffusion of medical technology. The technologies were divided into six categories; diagnostic, survival, illness management, cure, prevention and system management.(Hanley & Williams, 1984) The last category included medical information systems and

telemedicine.

Putting telemedicine in the category of systems
management along with other information systems lumps
together two components of the 'communications revolution'.
Although the experiment in Sioux Lookout does not directly
include computer technologies, they form part of the
background within which telecommunications are considered.
The current fascination with information technologies,
informatics, etc. continues to fuel an interest in finding
new applications for the new technologies. As the authors
state, the feasibility studies have been shown. However, as
the authors do not state, the project is another example of a
technology-driven study which thus requires a technology
assessment to study the impact.

Furthermore the new communication technologies are
actively encouraged by Provincial and Federal levels of
government. For example the Hermes experiment in the 1970's
explored the social uses of satellite technology. New
applications of communication technologies have also been
supported in more ways than just financially. The Federal
government established a telehealth consultative group in the
late 1970's. (Martin, 1979, 1984) The Ontario government
established a telehealth branch in its Department of
Communication. It seems clear that governments are anxious
to promote the application of new communication technologies
for a variety of reasons. This is evident in the Telidon

development program undertaken by the Communication Research
Centre near Ottawa, and more recently in the work being done
at the Canadian Workplace Automation Research Centre in
Laval. No doubt the Federal Departments of Health and
Welfare and of Communications share similar philosophies
about using the new technologies to increase communication,
reduce costs in health care, while improving service.

The authors make two good points when they state that
the desirability for the use of telecommunication
technologies in the delivery of health care has not been
shown and that the different technologies have not been
compared to each other. The question of desirability brings
up the question of who might see the technology as desirable
or not. The assumptions of chapter two suggest that the
judgement of desirability rests with the physician and not
with the patient. One purpose of this thesis is to emphasize
patient needs and expectations towards the delivery of health
care in general, and specifically as it concerns the
application of new technologies in medicine.

The assumption that telemedicine might provide some
relief to the inadequate delivery of health care is not in
itself an incorrect position for the authors to have taken.
What does need to be explained, though, is how the authors'
definition of the typical doctor-patient encounter reveals
the instrumental role envisioned for the communication
technology, even just at the level of examining the effects

of the technology, let alone the broader critiques of chapter
two of this thesis.

In chapters three to five the authors reviewed the three
stages in their research, which led up to the major field
study at Sioux Lookout. Thus in preparation for examining
the effectiveness of a communications technology to
supplement existing health care facilities and relationships,
the authors explored what they considered was important about
the doctor-patient relationship. Their initial concern was
with the physical-presence encounter between the doctor and
the patient. In chapter three they asked "What is the
communication content of the doctor-patient primary care
consultation?". (Dunn, Conrath & Higgins, 1983, p. 29) By
communication content, the authors refer to the sensory clues
which are needed to make a diagnosis. This is a key
assumption, which is both ahistorical and asocial, and which
links technology assessment and the scientific method. The
diagnostic process is made the central focus of health care
delivery and at another level becomes the basis for comparing
technologies. Thus the most desirable technologies must
embody the epistemological stance of the diagnostic process.

The authors concern here is only with how physicians
receive the sensory information that represents the signs and
symptoms of a specific illness. The patient's perception of
his illness is at best assumed under the notion of auditory
signals, that is, the patient's responses to the doctor's

questions. This narrow approach fails to address the problems of medical epistemology, the problems raised by the social constructivist theorists or of the doctor's processing of the sensory data. Nor is the relationship between the data collected, the diagnosis and the outcome of the treatment seen as a larger whole. The authors concern with sensory clues, whether transmitted by a mediating technology or received in person, reveals a way of looking at the communication process which sees the illness before the person.

In chapter three the authors observed family physicians in practice and interviewed them to discern what kinds of information were important for making a diagnosis. Sight, touch, colour, the patient's verbal explanation and laboratory tests were all tested for their relative importance. This small study of 73 useable consultations became the basis for the hypotheses in chapters four and five.

The authors abstracted the doctor-patient encounter so that all that remained were different information channels. Thus the diagnostic process is seen as the combination of different channels of information to form a composite image of a patient's health status. This is evident in chapter four when the conceptual framework for the overall study is explained. "The research most relevant for the development of our conceptual framework was that concerned with human

senses as information channels." (Dunn, Conrath & Higgins, 1983, p. 44-45) Thus three hypotheses follow directly from this narrow emphasis on multi-channel information processing: diagnostic accuracy will be higher for the more sensory-rich modes, the greater the number of cue systems then the more rapidly one should be able to reach a diagnosis, and all subjects will prefer the sensory-rich modes. The laboratory experiment discussed in chapter four was used to compare four different modes of diagnosis: physical presence, colour television, black and white television and hands-free telephone.

Once again the authors reveal their notion of technology assessment. "We decided that it would be more appropriate to examine the effects of alternative modes of telecommunications under highly controlled conditions." (Dunn, Conrath & Higgins, 1983, p. 43) It is only effects occurring after the introduction of the technology which. interest the authors.

In chapter four the authors concluded that,

> No significant differences were found that
> distinguished the three modes of telecommunications in
> terms of efficiency, measured by the time taken to
> complete the diagnostic processes, and effectiveness,
> measured by the proportion of medical problems that
> were detected by the consulting physician." (Dunn,

Conrath & Higgins, 1983, p. 54)

In chapter five the authors reworked the above
hypotheses in order to test them under different conditions.
The new hypotheses become: a rank ordering of cue systems
based on sensory richness, physician perception of the
sufficiency of use to reach a diagnosis related to the
sensory rich modes, and physician perception of sufficiency
of use related to the presence of a nurse during the remote
diagnosis. The participating physicians were asked to make a
diagnosis based only on a brief description of the patient's
medical problem, and to suggest which telecommunication
systems might have been adequate for making the diagnosis.

Once again the perceptions of the relative effectiveness
of the various modes by the physicians indicated that the
more cue systems that are available, then the more adequate a
communication technology is perceived to be. This conclusion
contradicted the finding that clinical effectiveness didn't
vary very much among the three modes tested.

The authors' basic assumptions about cue system
effectiveness and efficiency tend to emphasize information
channels and sensory-rich modes. The central focus is on the
diagnostic process. In fact the narrow focus of the study
allows the authors to examine only the effects of different
communications systems on the diagnostic process.
Fundamentally the authors suggest that technology assessment

is the study of diagnostic accuracy. Technology assessment
measures the degree of correspondence between the desired
effects of the technology and the medical and social
assumptions underlying them. The technology will be useful,
desirable and unopposed by physicians or patients if it is
effective and efficient at the diagnosis stage. The
processes which might lead up to the diagnosis, such as the
process of educating doctors, the publics' perceptions about
health and illness and other factors, are not deemed
important. This suggests that the authors are incapable of
seeing how the medical apparatus might overdetermine the
introduction of a communication technology. Furthermore the
processes which follow from the initial diagnosis, such as
patient management, prevention and counselling take second
place to the need to define the medical problem.

Or put another way, the emphasis on the diagnostic
process eliminates the much larger process; of how science
and technology are applied, of how they are perceived by both
the medical and health professions and the society at large,
of how science, technology and medicine interact, of how the
biomedical approach fails to account for the social and
cultural basis of diseases, and of how the interpersonal,
physical-presence consultation relates to larger social
issues.

The basic assumptions underlying chapters three to five
emphasize diagnostic accuracy. This can be seen as the

process of applying medical knowledge. This process includes the idea of an appropriate level of expert expertise. Thus the importance of the telemedicine experiment is not only to duplicate the diagnostic accuracy of the physical-presence consultation, but also to ensure the correct distribution of this expertise. In chapters one and two the authors placed the idea of transportation as being central to the delivery of health care in the North. When these two underlying assumptions are joined, it then appears that the authors are concerned with the transportation of the appropriate level of medical expertise. Since it is difficult to get physicians to practice in the North, the best available option to the authors is to transport the expertise of the specialized urban medical centres to the rural areas. Thus there is the physical transportation of health care professionals to the North and patients to the South. As well, though, there is the electronic distribution of the medical apparatus. In Foucault terms, there is the delivery of medical power and knowledge. Yet as will be seen in the next section, this power is implied, but certainly never openly stated, in the authors field experiment and the assumptions which underlie its conception.

Chapters six to eleven describe the final stages in the clinical experiment in the Sioux Lookout zone. Phase three of the Sioux Lookout telehealth experiment extends many of the underlying assumptions of the first two phases. The

emphasis, although on a clinical experiment, is nonetheless
focused on sensory data and a transportation perspective.
The emphasis is still on senses and cue summation concerns at
the expense of larger concerns. The transportation bias
evident in the discussion of both the communication
technology and diagnostic process ignore the social context
of the transactions. The authors justified the final phase
by summarizing the first two phases.

The authors state that "for medical diagnosis we did not
find any cue summation effects." (Dunn, Conrath & Higgins,
1983, p. 72) Their search for the basic principles
underlying the transportation of information returns to the
concept of a single, important, communication channel. This
kind of thinking clearly has a parallel relationship with the
germ theory basis of much of modern medicine. One organism
or cause can be identified which begins the chain of events.
A notion of simple causality is evoked in both cases.

Furthermore, since, as the authors state, performance
data and attitudes do not correlate, they are forced by the
limits of their scientific thinking to favour performance
over attitudes and to ignore their interaction in the
diagnostic process. Clearly the authors are operating on the
assumption that attitudes are complex while behavior speaks
for itself. This emphasis on performance functions at two
levels, one at the level of the success of the information
transportation process, the other at the level of the

effectiveness of the health care provided by the communication channel. Either way the authors' reduction of sensory data to the minimum necessary to perform the diagnosis denies the complexity of both human disease and human relations.

The authors developed, in chapter six, seven hypotheses to probe the relationship between the communication technology and the diagnostic process. Once again the focus is on the diagnostic process and the doctor's role in defining the diagnosis and naming the disease. The hypotheses emphasized: diagnostic accuracy, the doctor's confidence level, the number of investigations ordered by the doctor, the time taken to complete the consultation and the attitudes of both doctors and patients to the technology. There is no mention of the receipt of all this care by the patient.

The authors found that many of the hypotheses concerning the diagnostic process are independent of the communication mode or their dependency is not supported. For example the data supports the hypothesis that "diagnostic accuracy will be independent of the telecommunication mode used for consultation". (Dunn, Conrath & Higgins, 1983, p. 73) This would seem to represent the ability to diagnose the patient in his absence as was done in phase two of the experiment. This finding also confirms the authors' emphasis on a single communication channel. The common link is the audio channel. Futhermore since the differences between the different modes

is not statistically significant, then the preferred mode
also becomes the cheapest one.

On the surface then the four telecommunications modes
appear to have had little impact on the diagnostic process.
Perhaps then the impact of the different modes is to maintain
the status quo, or if not that, then perhaps the social
impacts exist somewhere else. For example, at one point the
authors suggest that the patients' favourable attitude
towards the more sensory-rich modes may be a product of a
social norm, watching television. However the authors
dismiss the significance of the patient preference as simply
the contrast between attitudes and performance, between
expectations and effects, without stopping to consider how
they might be related. The opportunity to explore the impact
of the sensory-rich modes on the patients is ignored. Why
this is so, would seem to be the result of a number of
factors. First of all the design of the experiment
emphasizes the transportation of information rather than the
transformative capabilities of information. The real
emphasis is towards space-binding communications, despite the
appearance of an emphasis favouring time-binding
communications. Secondly economic costs are an obvious
constraint against the use of two-way video. While there are
clearly pressures within and without the health
care industry to design, purchase and implement the latest
technologies, this is tempered by the need to rationalize

their costs and use. Thirdly the professional training of
doctors, and nurses to a lesser degree, frame how they deal
with patients as less than whole persons. The patient is the
unfortunate carrier of the disease which is the real focus of
the physician's attention.

It follows from the results of phase three that since
the four telecommunications modes are essentially the same in
their effect on the diagnostic process, that the least
expensive modes are chosen for the final field experiment.
In chapter seven the authors state what they now consider to
be obvious. The various telecommunications modes have proven
their feasibility to provide health care services remotely.
This statement is justified with reference to the many U.S.
and Canadian experiments. Furthermore the desirability of
the different modes was established in the first chapter.
The telecommunication technologies are considered as
instrumental solutions to practical problems. Since the
large majority of doctors do not wish to practice in remote
regions, then the alternatives are to move people or
expertise. From this perspective the desirability and
feasibility of using the telecommunication technologies is
assumed. Success is only a question of eliminating unwanted
and unexpected effects. This approach represents the typical
assumptions behind the technology assessment approach to
evaluating the social impact of a new technology.

The final phase of the telemedicine experiment embodies

the assumptions brought forward from the first three steps.
The authors view communication and health care delivery as
transportation problems. The medical apparatus is extended
to remote regions essentially unchanged. Any anticipated
changes are designed to conform to the underlying assumptions
of the health care delivery system. Within the framework of
the authors' technology assessment approach, there is a
recognition of the constraints operating on the introduction
of the telecommunication technologies.

However this notion of constraints is restricted to "the
diagnostic and management aspects of the physician-patient
primary care consultation. ... The experiments were not
conducted in the context of the total health care system."
(Dunn, Conrath & Higgins, 1983, p. 98) The instrumental
approach to problem-solving evident throughout the experiment
dictates a narrow approach. It is more scientific to
concentrate on a solvable problem without the baggage of many
other determining factors. The authors' focus here is really
limited to "a complex network of relationships". Table 3.4,
which is referred to, is a doctor-patient check list. It
refers to the network of personnel which a physician contacts
in the process of diagnosing the patient. Thus the complex
network of relationships is really a map of who the doctor
contacts and where they are. This network of relationships
is described as if it is a constraint on the introduction of
the telecommunications technology. Yet it really only

describes the centrality of doctors in the health care
deliver system.

Another assumption for conducting the field experiment
is "the restricted use of the communication technologies in
the experiments conducted to date." (Dunn, Conrath & Higgins,
1983, p. 98) This first of all implies that other uses of
technologies are possible. However this is not the same
thing as an alternative technology approach. What the
authors mean is only that the applications in medicine have
been restricted so far. What is possible for the authors
remains constrained by what is considered necessary to the
diagnostic and management aspects of patient care. Therefore
the other uses consist of x-rays and laboratory test results.
These are both regular procedures in the practice of
medicine. The investigators' desire to include many of the
frequent procedures of the health care delivery system only
serves to lessen the importance of patients while reaffirming
the central importance of confirming technologies like x-rays
and lab tests. The openness to other uses is biased against
patient uses of the system.

Once again the idea of what is desirable is conditioned
by what is already practiced and how it is normally
practiced. The technology is therefore seen to be neutral,
if not entirely transparent, in the process of duplicating
existing procedures and relationships. The TA approach which
is used here draws the authors attention towards minimizing

the unintended effects of the technology on the practice of medicine. The technology is intended to solve problems not create them. It seems then that the authors believe that the technology will not be problematic if it is used to duplicate existing procedures. This then reduces any problem to a technical level.

The final reason for extending the experiment into the field is based on the hope that additional factors would help to distinguish between the four modes of telecommunication other than diagnostic effectiveness. As the authors suggested more than once, many researchers felt strong attachments to full-motion colour television. Thus the problem was to explain how their preference for colour TV failed to correlate with clinical effectiveness.

The many reasons for continuing the research into the field are certainly justifiable, since there is the real possibility for better health care. The field experiment was designed to go beyond feasibility to deal with real needs, costs and benefits. How is it then that mostly economic costs were considered and not social costs? One reason might be the fact that governments and not individual consumers have to pay for the technology. Therefore cost-benefits need to assume a form that assures governments that the technology is worth what it costs, both by itself and in competition with the other demands for technologies.

The authors are certainly correct in pointing out the

problem of rising costs in relation to technologies in
medicine. It is not simply that more technology is being
purchased, but also the documented fact that some of these
new technologies often encourage their greater use. For
example, computerized laboratory testing equipment which can
do 30 different tests on a blood sample has contributed to an
abuse of testing and therefore rising costs. Because the
machine can do so many tests every sample is tested this way,
even though not all the tests are necessary.

It can be recognized, then, that the authors view cost-
benefits as a condition of introducing the technology into
the Sioux Lookout region. These benefits are the effect of
measuring the success of the technology in solving the
problem of health care delivery versus its costs. What is
important, though, is that this illustrates once again the
authors' concern with effects resulting from the introduction
of the technology. The investigators simply do not mention
how the medical system might effect which technologies are
chosen and for what purpose. All intentions are either
ignored or viewed as benevolent.

Thus the authors decide in the final phase to test slow-
scan video and speaker telephones. Slow-scan was never
tested in the first phases of the experiment. It was chosen
though because no one technology seemed to dominate in terms
of its effectiveness. The only thing which they all had in
common was audio. However since the authors wished to

include x-rays and lab results, while still keeping costs
down, slow-scan video was chosen. The intention here was to
duplicate as much as possible the communication needs of the
normal delivery system. And as was seen before this does not
present itself as a problem to the authors. It is only
unintended effects which need to be measured and adjusted
for.

The constraints built in to the health care delivery
system will be discussed more later, but perhaps one example
here might clarify what the authors missed in their analysis.
The Sioux Lookout health care system is organized in a
pyramid fashion, with many health aid stations at the bottom,
a few nursing stations, one regional facility and at the top
the urban, specialized tertiary care centre in Toronto. The
more serious the medical problem, the more the patient moves
(physically) towards what is called the appropriate level of
care. The different supporting structures of the health care
delivery system can then be seen to be based on the
application of different quantities of medical knowledge
(different qualities as well). Medical knowledge, however,
is not something entirely by itself since much of medical
knowledge is the product of technologies which detect or
measure that which the specialists claim to know. Thus
medical knowledge can not be treated separately from the
technology which supports it, nor from the knowledge of how
to use the machines and interpret their readings.

These constraints impact then on where the slow-scan
technology was placed and on who used the equipment. The
authors suggest that the health aids limited familiarity with
communication technologies led to the slow-scan units being
installed at the nursing stations. Similarly, since the
slow-scan video was believed to be useful for transmitting
x-rays, this required placing the equipment in proximity to
x-ray machines. Thus something as simple as the placement of
the telecommunication technology was limited by structural
divisions within the health care system which are based on a
hierarchy of medical knowledge and authority, and the need
for proximity to associated equipment. The need for
proximity to associated technologies represents another
example in itself of the centralizing tendencies of modern
technological medicine.

We have seen, then, the major reasons given for
extending the experiment in the field. This next section
will examine the environment of the final phase of the Sioux
Lookout project, the actual uses of the telecommunications
system, its evaluation, the attitudes of the providers, and
the authors summary. This analysis corresponds with the
authors final series of chapters. Generally speaking this
phase of the experiment is described in terms of: the
environment or context within which the telecommunication
technology operates, the constraints of materials and
technology, the limits of professional training and

attitudes, and the more abstract discourses which justify the above constraints.

The notion of environment takes on slightly different meanings in each of the final chapters. In chapter eight, the emphasis is on the geographic remoteness of the Sioux Lookout region, on the Native social system and the health care delivery system in the region. Each of these is implicitly compared to the urban environment, the White man's social system and the rest of society.

In the first two cases the rural environment with its marginal status is compared to the ideal of health care which is available in the large central urban centres. This is not simply just because the study itself was developed in one such urban medical centre, but because the farthest extension of science and technology in the mastery of the human body occurs in these centres. It is fundamentally this desire for medical domination as well as the desire for control over illness which is one discourse which helps to define what is marginal health care.

In the second case, that of the Native social system, the assumption is made that the White man's social system and its benefits are more desirable than the Native social system. It goes without saying that the White man's culture is more powerful and therefore dominate. Thus the difference between the two social systems is problematic. The main examples used to illustrate the differences are the economic

and educational ones. The authors recognize these
disparities but have little else to suggest in the way of
remedies or more importantly how these cultural and economic
differences might impact on the telemedicine project.

Similarly, the authors acknowledge that the health care
system operates within the larger social system, but they are
content to leave that relationship unanalyzed. Yet the
relationship between the health care system and the larger
social system is analytically rich terrain. For example from
the point of view of a Marxist health care theoretician like
Vincent Navarro, the relationship between the underpriveleged
state of the Native social system and the larger social
system is explainable in terms of the economic constraints of
capitalism. Leslie Duxbury, whose doctoral thesis is cited
by the authors on page 122, states that "our analysis
indicates that the fundamental key to improved native health
care ... appears to be economic conditions and enhanced
levels of education, interaction and activity." (Duxbury,
1984, p. 265-266) Other authors have said essentially the
same thing. In particular the proponents of social medicine,
like George Rosen (1974), John Powles (1973) and others, view
health within a larger context which allows them to recognize
the physical and mental damage of Western industrial society
on individuals.

The basic view of the medical profession is that they
are trained to treat disorders, cure illnesses or at least

slow down the processes of diseases. In parallel to that, the basic discourse of Western scientific medicine is founded on its curative emphasis, and not so much on its preventative function. Health care professionals, for the most part, only want to treat medical problems. The social problems or fallout of capitalist society are not considered as their profesional problems. Yet, at the same time social problems which could be explained as resulting from living a life of inequality in modern capitalist society, like alcoholism, are defined as medical problems. Once a problem can be shown to have a biological basis then it is eligible for medical treatment and control.

The geographic environment and the social context of the Sioux Lookout region act as constraints on other factors as well. Thus the resources available to the region are a product of the higher costs needed to support outlying areas. Physical distances and isolation influence who will work in remote regions and how long they will stay. This is always in implicit contrast to what is available in urban centres. There are more jobs available, better chances for promotion, greater medical challenges and of course the amenities of city life. Most of the training of health care professionals is done in large urban centres. This fact suggests that there is some relationship between educational advancement, specialization and attachment to urban centres.

So one can recognize that geography and the isolated

social context form barriers to certain kinds of practices
through the problems which they create, ie. the problem of
staff turnover, the reliability of the communication systems,
the training of Native workers and the cost of
transportation.

These four problems have an impact on the actual use of
the telecommunication technology as described in chapter
nine. For example, the project's system coordinator's job
was to train and persuade health care workers about the use
and value of the technology. This practice emphasizes that
the intended effects of the telemedicine system are
satisfactory and that resistance can be reduced by more or
better training. This position is a typical technology
assessment approach.

The problems of geography are what led initially to the
telemedicine project. Thus the problem of health care
delivery in the field is based on the same hypotheses dealing
with transportation. Six of the eight hypotheses dealt with
transportation questions and the other two with x-rays. Only
two of the transportation hypotheses were slightly supported
by the authors' data. The lack of strong supporting data for
the hypotheses based on the transportation of expertise calls
into question the authors' initial assumptions. The
hypotheses about the transportability of x-rays were more
strongly supported by the results.

So far then the final chapters of the telemedicine

project have been examined in terms of geographic isolation
and transportation issues. This next section will retrace
the same chapters but from the perspective of other
constraints and relationships. The data in chapter eight
concerning patient loads, common diagnoses and patient
management suggests that there is a conflict between the
authors' initial assumption about the importance of the
doctor-patient encounter and the reality of Sioux Lookout.
While this disparity is recognized as an omission in chapter
12, it remains to explain how it came about in the first
place.

In the large urban centres, the usual patient encounter
is with a doctor in the emergency department or in his
office. Patient encounters in the Sioux Lookout zone tend to
begin with nurses and health aides. The hierachical
management structure which is the authors model is alluded to
in the following quote. "The management of patients is
another way to differentiate the roles of doctors, nurses and
health aides." (Dunn, Conrath & Higgins, 1983, p. 132)
Clearly then the management of patients in the Sioux Lookout
zone is different from the process involved in urban
medicine. It is this difference in management which was not
anticipated by the authors because the common view of the
medical process is that the doctor maintain strict control
over the management of patients. Thus one of the constraints
of the study is also a major constraint on the process of

delivering health care.

This becomes even more clear when the authors state that the biggest difference between the doctors and the nurses management roles was that the doctor emphasized reassurance and approval. The nurse had usually already set up the patient management process, therefore the doctor had little else to do after the initial diagnosis. Yet the authors state that patients expect and require the doctor's reassurance. It is a knowledgeable reassurance that the patient seeks. This pattern is an example of what Talcott Parson's called the sick role. Thus the patient's dependency on the doctor, whether real or imagined, manifests itself in a desire for reassurance.

Thus the discourse about the role of doctors in both the training and control of all health care professionals, as well as their authoritative position over patients, becomes self-perpetuating through the practice of medicine. The hierarchy of medical knowledge, expertise, prestige and the like has been cultivated since the turn of the century by the medical profession and predicated upon their manipulation of science and technology. Their success in placing themselves at the top of the hierarchy is only superseded by their success in establishing an elaborate structure of political and ideological control.

Although the authors did state that certain uses for the telecommunications technology existed prior to the study,

they failed to consider how this discourse about uses is a determining constraint on which system was adopted and for what sort of activities. Simply put, slow-scan video was chosen to duplicate existing experiences and relationships. Slow-scan video is not immediately interactive like a telephone conversation. Thus from the beginning the technology itself represented an unequal relationship. It just so happens that this technology fits in rather well with the process of doctors exerting their authority over a distance. The communication process was never intended to be one between equals, except perhaps in the case of doctors communicating among themselves. Therefore even if patients were allowed to use the system more, or the health care system decided to find ways to meet patient education needs, the chosen technology is a constraint.

Since the direct and intended effects of the technology seems self-evident from the medical profession's point of view, then the explanation for the limited uses of the telemedicine system must also be explained in terms of the dominant perceptions of the doctors. Thus medical consultations and continuing education are described by the authors as obvious uses of the technology.

However, it is the area of social therapy which becomes problematic for the medical profession. It is simply not something which they have a lot of training for or experience with. It is primarily nurses and other health care personnel

who spend time with patients and who are therefore more aware of the need for and the benefits of social therapy. Social therapy refers, among other things, to letting patients use the communication technology to communicate with family members in other locations. Social therapy is a similar term to therapeutic communication. (Rossiter, 1975)

The failure of the project investigators to anticipate the ability of the telehealth system to help patients overcome the separation from their family reflects an approach to implementing new communication technologies, which is not fully objective in the sense of considering all the possible uses, implications, and effects. This process suggests that the objectivity of the technology assessment approach is biased by both those who initiate the system and by those who control it. This bias is not necessarily deliberate, but instead more often than not represents structural blindspots.

It has already been stated by a number of critics of medicine that the dominance of the curative discourse acts as a major constraint on the broader introduction and acceptance of the wholistic medicine discourse. It is, of course, this latter discourse which considers notions of therapeutic communication. A broader view of what is health and what affects one's health might easily account for a broader use of the telehealth system, although not without conflicts with economic and other factors.

In the chapter on the attitudes of the providers, the
authors once again displayed their bias towards the
deliverers of health care and less so on the receivers. Not
only that, but the health care emphasis is on end results
rather than the process. The communication process, when it
is mentioned, is primarily between doctors, or between
doctors and other health care professionals. Thus the
professionals communicate about the patient's condition, on
behalf of his body. The additional communications which the
telehealth system allows are considered to be for the benefit
of the patient, but not for his use. Meanwhile the patient
is constrained by his medical condition from complaining or
protesting about his isolation from the consultative process.

The final chapter of the authors telemedicine book,
which summarizes the research approach in hindsight, can be
read as if the authors have recognized their blindspots, that
is, they acknowledge that their narrow approach yielded some
unexpected results. This recognition might be understood to
further imply that the authors would develop an approach
which could account for the many different factors which
might impact on the implementation of a telehealth project.
This does not seem to be the case. Each acknowledgement of
an omission, such as the difference between the rural and
urban environments, the unanticipated demand for social
therapeutic uses of the technology, the emphasis on first the
physician-patient, then the physician-provider relationship

rather than the provider-patient relationship, and even the
doctors' concerns about the legal ramifications of giving
remote advice help to bring into focus a structure of
practices and discourses which determine in many ways the
intended and actual impacts of a new communication technology
for the delivery of health care to the North.

The tacit assumptions about medicine which the authors
use have been mentioned already, such as the emphasis that
centralized, urban, technological medicine is the ideal, that
science, technology and the physician's specialized knowledge
are all effective against disease, and that the diagnosis
process is the proving ground for epistemological
assumptions. Furthermore specialization of knowledge is
necessary and beneficial. And as well, the professional
dominance of doctors and the hierarchy of expertise which
they control, are essential to an adequate health care
delivery system.

There are, of course, many other assumptions about
medicine which have been raised by various critics of
medicine, as evident in the last chapter. Whether the
authors of the telemedicine project believe these criticisms
or not, they are still problematic. For example Lesley
Doyal, in The Political Economy of Health (1979), suggests
that there are three key medical assumptions: the
determinants of health are predominately biological, medicine
is assumed to be a science, and only scientific medicine can

mediate between people and disease.

The first assumption is based on the germ theory of medicine which assumes a relationship of simple causality between an organism and its disease. If the determinants of diseases are predominately biological and not, for example, social then it follows that the authors of the telemedicine study would emphasize the diagnostic process and the search for biological causes. Similarily their methodology was designed to uncover the effects of a technology.

The idea that medicine is strictly a science is counter-acted by theories of the social construction of reality or in this case the social construction of health and medicine. (Young, 1977; Kelman, 1975) It is not that medicine is not based on science or even not often right, but rather that medicine because it is mostly based on science is made to seem scientific. The ever increasing use of technology in medicine gives an impression of ever greater accuracy, and thus an implied greater success. Thus the discourse on medicine claims a greater objectivity than really exists. Yet many social histories of medicine and as well critiques of mental health by people like Thomas Szasz, demonstrate that what was once considered as a disease can change over time.

Finally, there are certain parallels between the basic assumptions of the technology assessment approach and those of medicine. Both technology assessment and the diagnostic

process measure effects. The former measures the effects of
a technology and the latter measures the effects of an
organism. Furthermore, as we have already seen, both of
these measurement devices have a narrow emphasis. Both of
them imply a simple notion of causality. This restricts in
many ways the ability of either measurement to deal with
complex phenomena. The direct result of such a narrow
emphasis is evident in the methodologies used to measure the
effects. Technology assessment does not exist as anything
other than a tool of analysis outside of its specific
application. It seems that when this approach is applied
within the domain of health care, that it takes on the
concerns and assumptions of medicine.

Thus in the project under study, technology assessment
as an approach is easily translated into a methodology which
measures the diagnostic accuracy of different
telecommunications devices. It conforms on one hand to the
narrow vision of the medical assumptions, and on the other
hand restrains any possibility of the medical assumption
being a broad and more complex one. Therefore one can state
that both the assumptions of technology assessment and of
medicine restrict each other to the narrowest common base.
And if one were to privelege one over the other,
then it would probably be medicine because it is both the
specific site of the technology and because technology
assessment is a tool in aid of medicine rather than the other

way around.   Thus any possible interventions would seem to be
most likely in terms of the specificity of the health care
delivery system.

Chapter Three

In the introduction, an incident involving what was later called therapeutic communication lead to a series of questions about the social impact of a telehealth system on patients. It was seen that the narrow biomedical model was related to the technology assessment approach used by the authors to study the social impact. The whole telehealth study was thus constrained from the beginning from paying adequate attention to the patient.

The alternative to the technology assessment and the biomedical models were described as, respectively, the structural approach of Jennifer Daryl Slack and a more wholistic view of health which provided a broader social definition of health and its environmental causes. What, then, does the broader definition of health allow one to state in light of the structural factors influencing the selection and assessment of the telehealth technology and the emphasis on the transportation of medical information over that of therapeutic communication? How does one proceed from a theoretical assessment of the problem to an intervention in favour of increased patient autonomy in an overdetermined arena?

It was seen that many of the health problems of the Native population can be attributed to substandard living

conditions, poor sanitation, high unemployment and a harsh climate. The doctoral thesis of Leslie Duxbury that was referred to by the authors of the telehealth study is proof enough of these conditions. Certainly in the short run there are no easy solutions to these broad problems. And even in the long run the political solutions to these problems probably do not favour the Native population.

While it should be admitted that the Sioux Lookout population was never asked if they find these conditions restrict their personal autonomy, that is not necessarily the issue here. One of the purposes of this study is to test the operationalization of the structural approach in order to measure its effectiveness as a tool for interventions into the social impacts of new communication technologies. Thus knowledge about the macro conditions influencing the health of the Native population is not superfluous information, but helps to form the social vision of what is desireable which in turn might inform the political or other action needed to arrive at the desired end. This view was well stated by Micheal Goldhaber in chapter two. Another way of saying essentially the same thing is the World Futures Society slogan of thinking globally, acting locally.

While it is important to know about the larger issues interventions are accomplished at the micro level. The social structure and practices of the Sioux Lookout zone have the advantage of being rather marginal in comparison to the

centres of power and medical expertise. It is precisely this
remoteness which gives Sioux Lookout the chance to conceive
of and try put new arrangements.

Therefore the Native people would need to recognize the
larger social and political forces which are limiting their
lives. When this awareness is connected to a definition of
health which places more emphasis, control and responsibility
on the patient, then a vision can be formulated which can
lead to local action. What this calls for, initially, is a
new definition of health. The World Health Organization
(WHO) in 1946 defined health as "a state of complete
physical, mental and social well-being and not merely the
absence of disease or infirmity." (cited in Rossiter, 1975,
p. 127)

Thomas McKeown (1979) and others have criticized the WHO
definition for its abstractness. McKeown stated that,

> Positive health cannot be measured accurately, so
> that success or failure in achieving it can only be
> judged subjectively... that since many influences,
> person, religious, educational, and economic as well as
> medical contribute to a state of well-being, the concept
> goes far beyond the responsibility of health services.
> (McKeown, 1979, p. 190)

Rick Carlson (1975) has similar reservations about the

WHO definition. "First, health is too frequently measured against some objective and extrinsic standard such as the absence of pathology, the capacity to function in a given social role, or the freedom from disability. Second, health is erroneously conceived of as a state or property of an organism rather than as a dynamic condition, a constantly evolving source of energy." (Carlson, 1975, p. 181)

There is another danger to wholistic definitions of health and that is the conceptual assimilation of health and medicine into one category which favours medicine. This assimilation is usually called the medicalization of life. It is based on the assumption that medical care equals health. Therefore health and disease become interdefinable. Health is the absence of disease, therefore, the promotion of health is the eradication of disease.

Those who choose to define health in terms of disease generally suppose that if health is defined in this way, it will be possible to clarify health issues by translating them into the more objective and scientific language of medicine. ... On the other hand, those who choose to define disease in terms of health are generally interested in stressing the connection between problems of disease and wider social and value questions. (Ladd, 1978, p. 25-26)

I would like to argue that the WHO definition, despite its obvious optimism, is a useful goal to pursue. The WHO's definition of health subsumes medicine and disease within itself. Thus instead of the medicalization of life, which has resulted in dehumanizing techniques and behavior, there exists the possibility to balance that perspective with a humanist viewpoint which would favour the person over the technique.

The use of the WHO definition, as well as a broader conception of the determining forces affecting a particular implementation of a communication technology, are necessary in order to reconceptualize the possibility for a social critique and plan of intervention.

The underlying assumptions of a transportation theory of medical practice clearly needs to be undermined and replaced by a non-transmission model of communication. If, as Innis suggested, time-binding communications is necessary to balance the forces of space-binding communications, then a transformation model of communication might be relevant to this task. For it is precisely Innis' notion of community, despite its romantic looking back at the Greek city State, that is necessary for a marginal, remote community to assert its idea of what is health communication and for whom. Therefore once the dominant assumptions of the medical practice and its uses of medical and communication technologies are undermined, then any interventions follow

from this critical base.

Robert Rushmer, in <u>Humanizing Health care</u> (1975) deals
with the idea of creating a desireable future in medical care,
by turning the current objections to the dehumanization of
medicine into future objectives. From this perspective it
could be argued that the dehumanization of the sick role in
medical care is partly to blame on concepts and practices
which follow from too much emphasis on the biomechanical
model of medicine. Therefore any attempt to humanize medical
care requires a rebalancing of physiological needs with
psychological needs.

A broad definition of health based on a wholistic notion
of health is the minimun needed if patients, both potential
and actual, are to gain increased autonomy and empowerment in
the face of the monopoly of knowledge built into the
production, distribution and consumption of the medical
system. The telehealth system was used to link the remote
communities to better health care opportunities. In reality
this meant that the monopoly of knowledge held by doctors was
also a geographic monopoly. The space-binding effects of the
telecommunications technology bound the Sioux Lookout region
to the expertise of Toronto. In effect the telehealth
technology is a two-edged sword. It does help patients to
remain in their communities through improved monitoring and
communication system, but at the expense of maintaining a
dependency relationship. It seems that the ideal situation

would be to improve the opportunities for patients to be treated in their communities, yet with a greater emphasis on community and/or personnel self-help through increased knowledge about health matters.

Interventions on behalf of or by the patient or community need not be directed only at the existing technology and the possibility for other uses of it. One advantage of the structural causality position is that it does not privelege technology over anything else. It was already seen that the AT approach was limited by its insistence on alternative uses while ignoring larger structural constraints. Similarly a Luddite rejection of the technology would only forfeit what little local control the community has over the transportation of patients.

If, as Talcott Parson's suggests, the patient accepts their sick role at the same time that they give up their control to doctors, then perhaps the solution is either to stay healthy or to ask questions and make connections. It was seen that the Sioux Lookout nurses liked the telehealth system because they could ask questions and expect to get answers from the remote physician. This arrangement gave the nurses a greater sense of equality with the doctors. It no doubt explains the nurses strong support for the system. At the same time the system was not as appreciated by the doctor for the reason that their professional control was lessened.

It is interesting that one of the effects of a remote

diagnosis was to make the physician dependent on the nurse attending the patient during a telehealth session. The mediated communication gave the nurse an advantage which would be unlikely in a large urban hospital. In a similar way perhaps the telehealth technology could be used to equalize the relationship between the patient and other health care professionals. Although this could never occur in the same manner as the nurses asking questions of the doctors, patients could be invited to ask about health care prevention or medical procedures. This could happen using the existing system for educational programs or through some other activities unrelated to the technology. Clearly the use or nonuse of the telehealth system need not effect any self-help process. Any educational practices would be quite limited if they were bound by the existing relations and dependencies of the medical apparatus. To move beyond these dependencies requires a rearticulation of the medical apparatus in terms of the broader definitions of health outlined above. And in a parallel effort the rhetoric of interactivity and access to information needs to be concretized in practice. Fundamentally then a activist practice such as Freire's notion of "education for critical consciousness" might be a useful tool for integrating a different vision of health and medicine with a different set of social practices and by implication a different view of the value of technology in the whole process. (Minkler & Cox,

(1980)

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