A THIRD GENERATION MASS COMMUNICATIONS SYSTEM:

ITS POSSIBLE IMPACT ON SOCIAL STRUCTURES AND PROCESSES

A Preliminary Draft

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During the next four to five years, the PLATO

(Programmed Logic for Automatic Teaching Operations)

system at the University of Illinois is scheduled to expand from

the simultaneous operation of 20 terminals to the simultaneous

operation of 4000 terminals. Although the PLATO system has

been designed primarily as an educational device to be utilized

by existing educational institutions, the PLATO IV system might

also be viewed as a new kind of mass communications system--

a mass communications system with feedback. If radio and television

are thought of as first and second generation mass communications

systems, then perhaps the PLATO system can be thought of as a

forerunner of a "third generation mass communications system."

Assuming that these metaphors do not too badly overstate

the case, but rather are useful in prodding us to imagine new

possibilities, then it would seem that such a system could have

many uses beyond conventional classroom activities. This

paper will discuss some of the changes which the PLATO IV

system could produce in the University of Illinois, the

Champaign-Urbana community, and the state of Illinois. New

social arrangements designed to ensure its use in the best

interests of the public will be suggested, and some pitfalls

of particular applications will be pointed out. The paper

makes no claim to completeness; however, it is hoped that

the ideas mentioned here will initiate further discussion and

possibly experiments which could be made both on new applications

and on the impact of a new communications medium on social

systems at various levels.

THE RANGE OF POSSIBILITIES

Listed below are several ideas related to the effects
which this new communications technology may have on social
structures and procedures. Each idea is based upon the following
assumption: Social institutions can be thought of as social
technologies which utilize the available physical technologies
of communication. A major transformation in communications
technology will bring about a profound change in the social
order. (A "technology" is here defined as an object or sequence
of operations created by men to assist in achieving some goal,
whether it is acquiring food or maintaining "domestic tranquility.")
A few of the possible applications of the system, which go well
beyond its use in the classroom, are as follows:

1. The Computer as a Mediator. Several years ago a group
of people at the University of Illinois began developing programs
on the PLATO system which enable people to explore the effects
of investments made in various possible future developments on
the probable occurrence of other developments. After such
an exercise, a person may change his mind about what investments
he should make, especially if some developments have consequences
which he had not expected and which he would consider undesirable.

However, it is unlikely that a thoughtful person will
change his beliefs about the world simply because a television
screen and a complex adding machine told him that some undesirable
X would happen if he were to invest in Y. He may not agree
that the world in fact works that way. It is far more likely

that his attitudes could be changed by having a better understanding of the judgments and opinions of people about whom he knew at least a little. Consequently an effort has now been undertaken to write   programs which will allow the teaching computer to be used as a mediator between groups with different viewpoints.

Students, faculty members, and administrators are the groups being used in the first exercise. Student activists frequently talk about their inability to communicate with administrators or faculty members. Administrators, on the other hand say that students do not use the proper channels. Students then begin to wonder where these mysterious channels are, how they operate, and why they are not seen. It seems possible to develop a method to find out how people think the University operates.

This method would be based on the assumption that human interactions in a social system are self-intimating, i.e. the existence of a channel of communication implies that it is known. To put it slightly differently, if students do not know that a channel of communications is theoretically possible, then they will not use it and consequently, for all practical purposes, that channel of communication does not exist. Administrators can quite sincerely say that students are not using possible channels if they refer to channels which they are aware of but students are not. A simulation of the University as a changing system can point out the importance of different perceptions of how the system operates.[1]

Thus the PLATO system could be used by students, faculty members, and administrators as a medium for discussing University policy in addition to its use in the classroom. At present there is a need for finding new ways to involve students in thinking about the University's goals and policies, and the social consequences of its operations. The probable spread of PLATO-like systems to additional universities during the 1970's implies that others will look to the University of Illinois as an example of how to use this new educational technology. The uses made of the equipment at the UI could thus have an important impact on the direction which higher education will take in coming decades.

2. <u>A New Form of "Industrial Democracy"</u>. PLATO terminals installed in a manufacturing firm could be used for at least three purposes.

    a. Job training of new employees and retraining of existing employees in new jobs at roughly the same level of skill.

    b. Educating present workers for corporate advancement. Expansion of this activity could provide an alternative to university certification as the almost exclusive route between blue collar and white collar positions and professional and management positions.

    c. Exploring alternative long-range policies and their possible consequences, for example whether to manufacture war material or whether to hire more blacks.

3.   Involving the Public in Community Planning.

PLATO-like systems could be used, beginning within the next

five years, to involve the public in a local community in

discussing the goals which the community should pursue during

the next few years.   Time delays involved in programming and in

analyzing results would make it infeasible to use a computer-

based communications system for short-term, day-to-day

decision-making.   Thus, the process suggested here is not

direct democracy.   In recent years the planning function of govern-

ment has been increasing.   If the democratic ideal is to be main-

tained, new ways must be found to involve as large a proportion

of the body politic as is possible in the consideration of

long-range goals.   A teaching computer appears to offer great

potential for becoming a communications medium between

planning personnel and the public.[2]

4.   A National Communications Network.   The maximum size of

a single computer-based communications network will depend upon

the technology available at a particular time.   Facilities similar

to PLATO in cities across the country could be linked within two

decades by a later version of the ARPA net now being constructed

by that agency of the Defense Department.

A small number of radio or television channels tends to

unite people, thus helping the rise of nationalism.   The large

number of channels, which cable TV makes possible, will tend to

"atomize" society.   A mass communications system with feedback,

which could be used to compare and contrast the different

viewpoints developed on the special audience channels, might
help to hold society together.

5. Communications Networks Linking Scholars and Planners.
Remote computer terminals are already being used by a variety of
corporations and professional societies. These time-sharing
networks are essentially limited audience communications networks.
Such a communications network could be set up among people interested
in alternative futures. The present communications technologies
used by people engaged in futures research are the print medium--
books, articles, and letters--and conferences. However, the
Institute for the Future is giving some thought to a "D-net".
Once such a system is set up and equipped with a variety of
programs which explore and project into the future, this set of
programs could be used not only as a communications medium among
people interested in future research but also by local planning
personnel across the country. After reading into the computer
a set of social indicators on his community, a planner could
receive simulated estimates of the probable consequences of
alternative actions.

Such a system would help to bridge the gap between the quality
of advice available to the national government and that available
to local and state governments. At present only the national
government has immediate access to the best minds of the country
for consultation. A national computer-based communications
network linking academic specialists and planners could bring
the accumulated social wisdom of the nation more easily and

quickly to the points where it could be most useful.

    6.   <u>Studying the Secondary Effects of Federal Programs</u>. Professor Douglas Englebart, who is working on computer-based information retrieval at Stanford Research Institute, recently asked a rather profound question concerning the application of computer-based teaching systems: Assuming that within 5 years we will have available a marvelous new educational technology, what group in the U.S. is most in need of being educated? Is the most "needy" group the students, from grade school to college? (By far the majority of lessons written for PLATO III have dealt with conventional classroom material.)

    Other groups equally in need of education might include poor people, the "silent majority," federal bureaucrats and Congressmen, the "media barons," policemen, or leading corporate executives, to name just a few. However, limitations such as cost and time required for construction suggest choosing groups located in a small geographical area as the first "students" to use early PLATO-like educational facilities.

    A teaching computer in Washington, D.C. could be used bv large numbers of public officials to explore the consequences of alternative courses of action. There would be at least 4 to five years, while the system was being constructed, to develop the models necessary for simulating the social system. Models adequate for educational or thought-provoking or perspective-stretching purposes would not be nearly as difficult to develop as quantitative econometric models.[3]

7. <u>Communications Technologies and Constitutions</u>.
Conventional wisdom holds that a communications technology should
not be mentioned in a constitution. My first inclination is to
agree. But is not a legislative body actually a kind of "social
technology" which is based upon assumptions about existing
physical technologies available for communication? Perhaps the
reason why we set up legislatures in the first place lay in the
fact that "representatives" in different parts of the country
could not communicate with each other rapidly enough unless they
were in the same city. Telephones and television are already
changing this unstated assumption and new technologies will change
the situation even more. Just how the new technologies should be
worked into the governmental system will have to be decided
eventually. The point is that just because particular communications
technologies were not mentioned explicitly in a constitution does
not mean that they were not "in" the document in the unstated
assumptions about how men can and do interact with each other.

<u>RECONSIDERING THE EDUCATIONAL PROCESS</u>

What would a government executive do today if his purpose
were to "disseminate knowledge among the people," as Thomas
Jefferson put it. Judging from the methods the executive
probably used in order to get elected, it is probably safe to
assume that he would go far beyond the buildings, blackboards,
and books which were available in the 1780's. However, by
simply extending the small subset of educational techniques which

were present in earlier centuries, our educational system today is concerned primarily with maintaining or enlarging the schools. Little is heard of the original goal of disseminating knowledge among the people.

The magnitude of the impact of the first electronic communications medium to be used by the university outside its traditional boundaries could lead to the first major rethinking of how to go about the process of education since the first universities, with students and teachers in a ratio of about 10 or 20 to one, were established in the Middle Ages. PLATO could serve to generate interest in educating the public directly by means of other electronic technology and thus expanding the student body to include the whole population.

1. Community Extention by Means of Cable TV. During the next decade or two cable television will increase the number of channels available to most people from the present 3 or 4 to somewhere between 20 and 50. It would seem to be reasonable for the universities to have access to about 5 or 6 of these channels. Such an allocation would give the universities about as much television time as is presently controlled by ABC, NBC, and CBS combined, though with a smaller audience due to competing channels.

There is certainly ample reason for universities to want to expand their amount of television time. Present media coverage of campuses does not present a balanced picture of the activities which take place there. Live transmission or edited video tapes

of lectures, discussions, seminars, evening meetings, and films
made by students or professors would serve to present a more
complete picture of university activities, and would presumably
be of value to the viewers. It would seem that the public would
be far more inclined to generously support their universities if
they were regarded as institutions which served the public,
in addition to the students, by providing useful information
on a daily basis. Accordingly, a new function of universities
which could boost public support of higher education in general
might be the preparation of television programs on health,
nutrition, product quality, news analysis in historical
perspective, the psychology of interpersonal relations, and
discussion programs presenting individuals addressing controversial
issues with the opportunity for viewers to phone in questions.

A few of these kinds of programs are already available on
television, though certainly not in abundance. Is the University,
or some group within it working to enlarge the educational
uses of television in the light of the arrival of cable TV?
If professors prepare lectures for classrooms, why should they
not prepare programs for television? Why should universities
limit themselves to the classroom methodology of conveying
information? Increased use of educational television could
complement or serve to some extent as an alternative to open
admissions.

2. <u>An Electronic World University</u>. The idea of a world university has been around at least since the time of the League of Nations. However, the concept, as it is usually applied, refers to a brick and mortar institution, though having an international focus and usually located on neutral ground. But if one of the functions of the university is interpreted to be the transfer of information to a group of people for purposes of education, then the door is open to a whole new range of possibilities using communications technologies which reach beyond classrooms and lecture halls.

If Walter Cronkite on the evening news can speak to potentially every student in the United States every day, why cannot every student in the country take a course from John Kenneth Galbraith, Herbert Marcuse, George Wald, or any other professor who is willing to devote the time and whom the students want to hear? Similarly, with communications satellites and news reports from Viet Nam and Egypt why is it that every student in the United States, Europe, and Japan (at the very least) does not have a regularly scheduled guest lecture from people such as Jean-Jacques Servan-Schreiber and Eldridge Cleaver?

There can be little doubt that an electronic world university either would require or would bring about a very different kind of international system. Imagine the difficulties which would be encountered if a Russian professor were to teach economics to American students, if an American professor were to teach corporate law to Chinese students, or if a Cuban professor were

to teach the history of revolutionary movements to Latin

American students. Such hypothetical cases are useful in

helping us put our present universities in the perspective of the

idea that a university by its very name teaches universal

knowledge.

The transition to a world with a smoothly operating

electronic world university would in all probability be a

period of unprecedented turmoil in human history. But an

electronic world university can exist without actually being .

called that. Indeed, the evening news on television, cheap

paperback books, the underground press, student exchange programs,

television debates, films of America in the 60's, Prague in the

summer of '68, and Paris in the spring of '68 already constitute

a kind of informal "university." The real question may not be

if or even when we will have an electronic world university

but rather the degree of difficulty which a broad range of

institutions is now having and will continue to have in adapting

to the expectations of successive generations of students raised

in information environments far more complex and technologically

advanced than those existing in the university.

The first extensive use of electronic media in a university

could lead to some major soul searching. Do we want our institutions

to define themselves in terms of the communications technologies,

which by historical accident they have traditionally used, or in

terms of the functions they perform? One might assert that

educational television constitutes an alternative to the educational

function of the university in every way except certification. Why

should educational television be limited to education without certification? Indeed, if the university has become the gate-keeper for social advancement, would it be desirable to create alternative institutions to certify the acquisition of knowledge or skills?

THE FUTURE POLITICS OF THE MEDIUM

If government is thought of as the regulatory mechanism of society, then a mass communications system with built-in feedback would seem to offer very important political possibilities in light of the importance of the feedback process in any regulatory mechanism.

New Demands Generated by PLATO

The existence of the PLATO IV system and its use in a variety of experimental programs could create several new demands on the political system.

1. An increase in the amount of long-range planning on the Champaign-Urbana community, done without charge in order to test the applicability of the PLATO system as a communications device for involving the public in planning, could lead to demands by other communities for the university or state to provide them with similar planning services in addition to the presumed requests for PLATO systems.

2. The location of additional terminals will in all probability become subject to polical debate since the terminals will constitute a scarce and desirable resource.

3.   Champaign-Urbana could become the state's third most
important city, following Chicago and Springfield. As the center
of a new state-wide communications system and possibly the location
of a state planning institute, the Champaign-Urbana area could
expand in the next 20 to 30 years much more rapidly than it has
in recent decades. If the state decides to redefine education to
include the teaching of courses throughout the state by means
of cable TV and if those resources are located in the city,
Champaign-Urbana could become a major television and arts center.
The resolution of the multiple disputes involved in rapid growth
could swamp a new and experimental decision-making process.

4.   The PLATO IV system might lead the government in
Springfield to increase the state's forecasting and planning
activity either in regard to industrial growth or the improvement
of social conditions. If the planning aspects of PLATO were
well publicized, the system could serve to generate interest in
more rationally planning the development of the state. A
greater number of people might come to regard the state as a
competitor with other states in attempting to get high technology
industries which would bring in skilled manpower with high incomes
thus providing more tax revenues and higher standards of living.

Who Will Decide How to Use the Medium?

The emergence of a new communications medium suggests that
new checks and balances and possibly an appeals system should
be developed to resolve the inevitable disputes or conflicting
demands on how to use the system. With regard to the use of

the system as a communications device in the local community,
the following procedures are suggested as a starting point for
further discussion.

1. At the end of an exploration of a particular topic,
each respondent at a PLATO terminal should be asked to
indicate the issues which he or she would like to have
discussed the next time. Of course there should be the
opportunity to suggest topics not on the suggested list.

2. The order of priority of issues would then presumably
be decided by some elected body such as the city council in
consultation with the programming personnel who might advise
on which issues there is adequate background material and
which issues would require additional fact-finding.

3. After the programming is completed in the first draft
form, the elected body or its representatives and other individuals
particularly concerned with the issue being presented should be
allowed to view the program and suggest modifications. Frequently
consensus will permit modifications in wording to be made with
minimum formal procedure. But cases of dispute could be decided
by a committee of the city council or the council itself.

4. Presumably an issue would be presented to the public
several times so that public responses and suggestions could
also be used to improve the program. In cases when a person
makes a suggestion which he does not see incorporated in the next
version of the program, he should be able to appeal the decision
of the programmer to some other group, possibly a committee of
the city council. Such a procedure would help to ensure that

imaginative ideas or ideas about which one person or a small
group feel very strongly will be presented in the explorations.

5. Other media such as radio, television, and newspapers
should be encouraged to criticize the programs presented on the
computer both as a political check and as quality control.

6. The amount of time on the machine will presumably be
decided by the director of the laboratory, but, in due time,
supporting agencies such as the state legislature may decide
that it wants to buy different amounts of time on the system
for different purposes.

A New "Literary" Form

Every new communications medium seems to generate its own
distinctive forms for structuring information. The printing
press greatly increased the number of books and journals. The
mimeograph machine was best suited to the leaflet, the working
paper, and the scholarly article. The xerox machine promoted
letter writing to multiple recipients and extended the readership
of journal and magazine articles. Films greatly extended the
use of animated cartoons. Radio and television produced the talk
show, 15 minute news, commercials, and spot announcements.
It would not be surprising if computer-based communications
media also produce their own literary form.

In addition to "scripts" which include branching sequences
and mathematical algorithms in order to personalize the
information presented, computer-based communications media will
in all probability lead to new forms of scholarly papers

in which specific ideas are attributed to the group but not
the individuals who originated them. The forerunner of
this new literary form is the Delphi Technique developed by
Olaf Helmer and Norman Dalkey at the RAND Corporation. The
method was developed as a forecasting tool for situations in which
the opinions of "experts" would seem useful but in which exact
relationships have not yet been defined. The object of the
method is to combine knowledgeable testimony in a way which
produces at least some convergence on what is probable.

The Delphi Technique, combined with a large-scale, low
saturation computer-based communications system—a nation-wide
system connecting a small group of specialists and not the
public at large—would be an ideal system for building
interdisciplinary models of complex systems. For example,
there is a group of people located primarily in the United
States which is beginning to work on developing a World
Simulation.

Building Aggregate Models

In a certain sense it can be said that a world simulation
is beyond the state of the art. But it may always be if we
compare a world simulation to engineering simulations. We may
never be able to simulate society with the precision that we
can simulate a spacecraft. But there can be little question
that we can do better at simulating society than we are doing now.[4]

The point of comparison for a world simulation should not
be existing simulations of physical systems but existing

simulations of social systems. Whenever a person makes a decision,
he operates his model of the world. Nations also make decisions
and thus conduct "simulations." Before the President or a
Congressman makes a decision he simulates, in his mind, the
consequences of the alternatives he sees. When the President
chooses an advisor, he is looking for a person with "good
judgment." Another way of saying that is, a man whose
mental model of the world is, in the President's opinion, very
nearly isomorphic with reality.

There is a widespread belief that several mental models are
better than one. Otherwise the President would not need
"advisors," only secretaries and helpers. The idea of multiple
models, though highly unconventional in the physical sciences,
has already been institutionalized in the offices of
Presidential advisor, Congressional aid, and recently the
Institute for the Future. The Delphi Technique is essentially
a way of aggregating mental models in such a way that the
aggregate model is better than any single mental model. It is
instructive to consider the similarity of the function of the
Delphi respondents and a computer model used in a simulation.
The "operator" sends out alternatives through the mail (input)
and gets back consequences of projected trends (output). A
Delphi study does not produce an aggregate model of the world but
rather only the output from a single run.

Thus the Institute for the Future and the World Simulation
Organization are, at least to some extent, in the same business--

predicting the consequences of alternative actions. The Institute

uses mental models to get outputs. The World Simulation

Organization will use mental models to build a computer model

to produce outputs. The result of both processes is the same.

The decision-maker sees the output of a simulation of the world,

or some aspects of the world, given certain assumptions.

The uses which will be made of the outputs of both procedures

is decided by another group of people with their own models of

the world.

New Units in the Decision-Making Process

Bobrow has suggested that two operating groups or

agencies be added to the existing elements in the policy-

making process--the public and their elected or appointed

decision-makers. The two groups which he suggests adding

are an anticipatory group and a monitoring group.[5]

There are two objections which can be made to Bobrow's

choice of terms for the two additional groups. First, they

are not functionally well defined in terms of the kind of

information which they would be handling. An information

processing view of a society leads to the view that if the

present social decision-making apparatus is to be improved,

either a new kind of information will be provided or presently

available information will be processed in a new way. Second,

every individual is constantly engaged in anticipating

future occurrences and evaluating the performance of the social

system. Some people do this more conscienciously than others

but to tell one group that it will anticipate occurrences and
another group that it will evaluate the performance of the
social system could actually increase what might be called
technological recklessness. Assigning anticipatory and
evaluative functions to specialized groups might make some
people feel that they have been relieved of the burden of
considering alternative goals or secondary effects of
present decisions.

Two additional groups or functions may be needed, but it
would seem to be better to define them functionally rather than
normatively. The first group (Bobrow's monitoring unit) would
collect data for social indicators. The differences between the
two terminologies is that once the data is collected by the
specialists, the people themselves would evaluate it. The
specialists and the public would have to come to some common
agreement on what data should be collected.

The second group (Bobrow's anticipatory unit) would collect
rather than originate the ideas of the people of the community
about its future. The people in the community include
political leaders, businessmen, architects and city planners,
housewives, ecologists, and storekeepers. The judgments of
all groups are needed to make the community function in the
interests of everyone. The anticipatory group would be charged
with presenting new ideas about goals or policies and the social
indicators on how the system is operating to the public and its
leaders.

Thus the monitoring unit would collect statistical data and

the anticipatory or planning unit would present that information
along with possible future goals to the public. The anticipatory
unit would pass the responses of the public on to the other
media and to the decision-makers.

"Closing the Loop"

Another result of the effort by planners to conceptually
"close the loop" in the policy-making process has been not a new
institution but the invention of "indices of satisfaction".
These measures would provide a means for quantifying the
satisfaction of different groups with a variety of aspects
of human existence including education and culture, health,
housing, the environment, spiritual well-being, personal and group
associations, economic growth, etc.

Among the many problems with indices of satisfaction
is the fact that they tend to neglect both injustices and the
obstacles to correcting them. Indices of satisfaction imply
that the problem of government is dissatisfaction, not injustice.
It might be argued that dissatisfaction results from injustice.
But there is a major problem with this rationale. The problem
lies in the fact that there are many ways in which dissatisfaction
can be explained or rationalized. Consider as an example the
obvious dissatisfaction of the present student generation with
American foreign policy. One explanation for this phenomenon
is to say that the students are dissatisfied with the injustices
which the United States is inflicting on less developed countries.
However, experience indicates that the most common explanation

for student dissatisfaction is that the students are Communists
or that they have been duped by Communist or otherwise
"fuzzy-headed" professors.

Dissatisfaction can be observed, but proposals for reducing
dissatisfaction will vary greatly depending on the reason assumed
for the cause of dissatisfaction. Because dissatisfaction can
be explained in many ways, a procedure involving less ambiguity
would be preferable. Such a procedure would focus directly on
measurable differences in the conditions of different groups
with respect to their access to education and health facilities,
the availability of job opportunities, the absence of the use
of force against them by police or soldiers.

Furthermore, the theory of self-organizing systems suggests
that human dissatisfaction is necessary for continued evolution
of human beings and social institutions.[6] Thus dissatisfaction
perhaps should be regarded not as something to be minimized but
as an indication of the areas in which change is considered
desirable.

Recent thinking in the field of social conflict recognizes
that conflict can serve very useful purposes.[7] A strategy for
achieving peace and justice will include conflict resolution as
only one of its tactics. The civil rights movement, using
sit-ins and mass demonstrations, essentially was aimed at calling
attention to discrimination by escalating tensions. A strategy
of social change which focuses only on tension reduction without
strategies for selectively increasing tensions will be a
strategy which by its very nature favors the maintenance of the

status quo.

A proposition well worth further consideration is the way
in which planning tends to short circuit direct feedback from
the public to decision-makers by providing a path of lower
resistance. However, this path also contains filters due to the
perceptions of the planners. Several of the new methodologies
aim to eliminate psychological effects involved in face-to-face
communication. The same techniques also eliminate the possibility
of confrontation politics. Though the new technologies probably
have their place, their political effects must be given the very
closest attention if they are not to be rejected outright by a
skeptical public.

What Constitutes a Methodology?

Organizations which focus on the development of methodologies
for planning need to pay particular attention to what constitutes
a methodology and for what purposes or interest groups the
methodologies are being developed. Consider the old debate over
whether a forecast constitutes to some extent a self-fulfilling
prophesy. This can be turned around so that any methodology used
to change the future or to change the way people think turns out,
in fact, to be a kind of prediction of the future. The song
"The Sounds of Silence" by Simon and Garfunkel has done as much
to change the future of the United States as just about any speech
by an American President and far, far more than the game Future,
done for Kaiser Aluminum.

Yet few if any of the new applied social science research

institutes have staff members who claim to be specialists in guerrilla theater, for example. However, it can be argued that guerrilla theatre is an innovation in social communication which so far has been equal or greater in importance than the Delphi Technique. Abbie Hoffman and Jerry Rubin have a lot in common with Olaf Helmer, president of the Institute for the Future, and Ted Gordon, project director East. Hoffman and Rubin developed their own methodology (guerrilla theater rather than the Delphi Technique) make use of communications technologies (TV and newspapers rather than a D-net) and have set up their own organization of people to practice the technique (the Yippies rather than a string of Institutes for the Futures). In short the claim that the Institute for the Future practices all methodologies for influencing decisions is quite absurd. It uses a very small subset of the total range of methodologies.

Furthermore, to say that the Institute focuses on the future while other groups do not, misses the point that all present knowledge depends on past experience or observations. Our perceptions of the future depend wholly on our present knowledge and what we can remember. This is what a radical means when he refers to the impact which the Chinese revolution has had on our commitment to improve agriculture in India. Mao did not need a Delphi Technique to influence the decisions of U.S. government and business leaders. He simply made a revolution and thus made credible the possibility of revolution in India if conditions were not improved sufficiently rapidly.

As can be seen from the previous discussion, the growing politics of the planning process will be in large part the politics of perception, at least until the present methodologies are substantially improved. The planning process might even see the rise of something similar to a political party, for example Common Cause or a National Goals Staff. PLATO-like systems, due to their applicability to the planning process could become very much involved in this new arena of political activity.

FOOTNOTES

1. Major parts of this argument were based on notes by William Pearson.

2. Stuart Umpleby, "Citizen Sampling Simulation: A Method for Involving the Public in Social Planning," _Policy Sciences_, Volume 1, Number 3, Fall 1970.

3. Stuart Umpleby, "The Delphi Exploration: A Method for Obtaining Subjective Judgments on Alternative Futures." Social Implications of Science and Technology Report F-1, University of Illinois, August, 1969.

4. Roger C. Conant and W. Ross Ashby have prepared a logical proof of the assertion, "Every Good Regulator of a System Must be a Model of that System," mimeographed.

5. Davis B. Bobrow, "Computers and a Normative Model of the Policy Process," _Policy Sciences_, Volume 1, Number 1, Spring, 1970.

6. W. Ross Ashby, "Principles of the Self-Organizing System," in _Modern Systems Research for the Behavioral Scientist_, edited by Walter Buckley, Chicago: Aldine Publishing Company, 1968, pp. 108-118.

7. Lewis Coser, _The Functions of Social Conflict_, New York: The Free Press, 1956.