those developing curricula and programmes of study.

What Are Canadian Studies?

It is generally agreed that the call for Canadian Studies is not simply a call for more Canadian content in the curriculum. The lack of such content was a problem in the 1960's and early 1970's and remains a problem in a few topic-areas, but by and large it has been overcome.

There are those who differentiate between Canadian Studies and the study of Canada. The latter includes anything and everything dealing with things Canadian, be it history, literature, geography, botany or whatever. It therefore includes all approaches based upon a single discipline. The former term Canadian Studies, on the other hand, is reserved, in this view, for an interdisciplinary, integrated attempt to see Canada whole. It is an attempt to come to terms with the totality of the Canadian experience, arguing that reality is multi-faceted and complex and that no single academic discipline can do more than present one slice of it. There is, in reality, no one royal road. The goal is that the curriculum, at all levels of education, should "help Canadians in some way to understand the physical and social environment that they live and work in, that affects so profoundly their daily lives, and that in turn is affected by their actions."[26] Given this goal, there are obviously many ways of attaining it.

The particular difficulty is to do justice to all facets of the Canadian environment in a reasonably comprehensive way, while at the same time striking a reasonable balance between the regional and the national. In regard to the former, there are still gaps. Symons not long ago pointed to important areas that remain inadequately studied.[27] They included the north ("an academic desert"); broadcasting, especially its historical records ("obscured by decades of inertia and neglect"); science and technology ("Canadians have little knowledge of their notable engineering heritage and of the considerable contributions which have been made by our engineers to science and technology"); and education ("the most neglected Canadian Study.") In addition, in areas which have long paid a good deal of attention to Canadian concerns, new methodologies are being applied and new discoveries made.

As for the regional-national balance, the Canada Studies Foundation has made distinction between Canada Studies and Canadian Studies. The former are defined as those which are of national ("pan-Canadian" is the Foundation's term) application and import; the latter deal only with local or regional concerns. Since the priority is that Canadians see their country whole, in all its diversity, and in its in

ternational setting, the emphasis, argues the Foundation, must be placed on Canada Studies.

Educational Technology

In all of this, educational technology obviously has an important part to play. One of the fundamental goals of Canada, or Canadian, Studies, after all is to explain Canadians to one another and this is no easy task in a country which is so large and so diverse. It is a commonplace that Canada is a country of regions and that these regions are not well-informed about each other. In any given place in Canada, for example, the flow of news is usually national, in the sense that it deals with federal politics, and local, in the sense that it deals with events of immediate interest in that particular place. What is lacking is any sustained account of other regions and their particular concerns and outlooks. This can be demonstrated by an elementary analysis of almost any newspaper, radio or television programme despite the commitment to "national unity" described in the National Broadcasting Act. Educational technology can play a major role in remedying this state of affairs. Educational television, satellite communications, locally produced programmes made available for national distribution, films, radio hook-ups — the possibilities are endless. Beyond these more or less commonplace technologies lie the mind-boggling possibilities of the communications revolution. If the Canadian Studies movement is to achieve its full potential of informing Canadians about themselves and each other in order to produce a richer and more rewarding sense of community, then the potential of educational technology cannot be ignored, as the articles in this special issue of **Canadian Journal of Educational Communication** all in their different ways suggest.

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Media News
Continued from page 2

sophisticated space research applications center at Ahmedabad. They also visited the community science center which provides laboratory facilities and experiments in elementary science to young students in a model similar to Canada's Ontario Science Center. The tour concluded with visits to the Department of Communication at Poona and a brief wrap-up in Bombay.

AMTEC Media Festival Awards

The results of the 1983 Media Festival Awards were not available for publication at press time for this issue. AMTEC members should be interested to know

"Canadian Eh!"
Technological Change and Canadian Studies

By T.R. Morrison

We are currently living in a world in which the products of our own human genius are simultaneously the source of both our most pressing problems and enlivening opportunities. The world we have created, and particularly the maps we have drawn to guide us through the resultant maze, has now become the obsession of our lives. To an extent heretofore rare in history, the ways in which the human mind *invents* reality, *acts upon* this invention and analyses the relation between each, is the central problematique of society. We have not only become conscious, but conscious of our consciousness. Indeed, the new science of artifical intelligence is founded on efforts to "model" this awareness.[1] The result is a world of increasing complexity, much of it human-generated.

Let me provide you with a "concrete abstraction" of what I am talking about. Today, the most dominant focus in social discourse concerns the deplorable state of the economy. Undoubtedly, this is a disturbing situation, one filled with human tragedy. That being said, what can this discourse reveal to us. How does it relate to the theme of human-generated complexity?

When we discuss the economy today, a number of patterns can be noticed. Firstly, we talk of the "economy" as if it existed apart from the invention of man. The economy can be anything we want it to be. Within it, for example, we can raise GNP, by conventional counting methods, by adding and valuing the work in the so-called informal economy, particularly the household.[2] Secondly, when we discuss our economic problems, we do so within abstract models, that is, intellectual inventions of them. We talk of inflation rates, price, interest rates, demand, consumer confidence through the use of models we have created. We also reify these models. We invent them, forget that they are not reality but representations of it, and discuss economic reality as if the models were reality.

Our problems today, economic or what have you, have increasingly less to do with reality, than with our minds' representation of them. This is exacer

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bated by the fact that the time gap between representation of an image of reality and having others share and think through it, has narrowed immensely. This has been brought about primarily by the rapid impact of "compucations technology" (CT) in our society.[3]

The word compuncations may strike one as rather strange. Let me briefly elaborate upon its meaning and significance. The concept deals essentially with a fundamental process currently at work in society: the merging of hard and soft technologies. Throughout the nineteenth and up to the mid-twentieth century, communication could be divided, roughly, into two distinct realms. One was mail, newspapers, books and magazines, printed on paper and delivered by physical transport or stored in libraries. The other realm was the telephone, radio telegraph and television. Coded message image or voice sent by radio signals or through cables from person to person.

Technology, which once made for separate industries, is now erasing these distinctions, so that a variety of new alternatives are now available to information users. Consider the following:

1. The meshing of telephone and computer systems, of telecommunications and teleprocessing, into a single mode.
2. The substitution of electronic media for paper processing. This includes such developments as electronic banking, electronic mail, fascimile delivery of newspapers and magazines.
3. The expansion of television through cable systems, to allow for multiple channels and specialized services and the linkage to home terminals to direct response to customer or home from local or central stations.
4. The reorganization of information storage and retrieval systems based on the computer to allow for interactive network communication in team research and direct retrieval from data bank to home or library terminals.
5. The expansion of computer-managed and mediated instruction.

Technologically, then, telecommunications and teleprocessing are merging into a new mode called "compucations." The distinction between processing and communicating is becoming increasingly indistinguishable. This technological merging, moreover, is leading to the development of integrated human and social technologies: management information and strategic planning systems are prime examples.[4] These integrative soft systems, as the compucations technologies which underpin them, are

generic innovations, since they are intended to be used and applied at a system-wide level. Strategic planning systems, in other words, are applied to the corporate, voluntary and public sectors alike. The lesson is clear: the model is more important than that to which one applies it. This new era of the "triumph of the model" can, as will be discussed later, either liberate or entrap mankind. In any event, any serious discussion of Canadian Studies must, if it is to have any relevance, address the origins and consequences of this emerging "mind set" of a new society.[5]

A young baby today faces a world in which images of reality are rapidly created, codified, modelled, analyzed, acted upon, evaluated, altered, or dispensed with, and linked increasingly to other such images. And, this is an increasingly intentional and deliberate process. Moreover, we have emergent labels for the sciences which propel the process: systems analysis, information science, decision-theory, operations research, artificial intelligence and cognitive science.[6] For educators, people who presumably are the most future-focused of all — that is, they help prepare people to understand, adapt to, and change the world they live in — a perennial question emerges anew: what is it that people should be encouraged to learn and how should that learning occur?

In approaching this question, a fundamental principle must be grasped: There is no meaning apart from context. One's hand has meaning in context of one's body. Education, and similarly schools, have no meaning apart from context. Grasp the context and the assignment of meaning of those things within it is a simple matter. In the following pages, an effort will be made to sketch briefly a particular context within which the meaning of education, and hence any approach to Canadian Studies, might be understood.

Of the various forces which are likely to alter the context of education in the future, two are of vital importance. These are, firstly, the social impacts to be generated by the application of increasing sophisticated innovational technology to the world around us and secondly the interpretation given by man to these processes and developments. Both factors are critical and integrative: technological change and man's interpretation of it each determine action if any. Education, it follows, must attend to both. Let me turn first to technological change.

Technological innovation proceeds in roughly three stages. Currently, we are

experiencing the impacts of developments in each stage. All stages, particularly as each applies to the impact of compunications technology, involve the replacement, amplification and modelling of the mental and physical labour of man and the resultant transformation of human society.

The first stage is that of automation in which man's mental labour is increasingly accomplished through the application of compunications technology. Automation has traditionally been understood to involve the assumption of various kinds of mental activities (recognition, computation, memory, judgement) by computers or computer-driven mechanisms. Current technology pushes this concept even further. Consider the following scenarios:

1. Compunications technology will likely bring about the complete automation of industrial production. In the future, particularly in areas such as energy and materials (electric power generation, iron, cement), factories will emerge which require no manual labour at all.[7]
2. Compunications technology (CT) will bring about automation of knowledge-oriented services and operations. Whenever man's knowledge-oriented activity is carried out in fixed, logical order, a CT can be used to perform this function (e.g. medical diagnosis, cash disbursers). Many clerical duties fall into this category.[8]

3. Compunications technology will lead to major systems innovation. It allows the creation of unified systems that combine sub-automatic functions (e.g. traffic flow systems).

The social consequences of such automation, however, are of equal importance. Two examples of this should suffice. Firstly, there will be increasing emancipation of people from labour for subsistence. For example, since a large portion of office and production work will be replaced by CT, there will be less need for people to serve as mediums for the storage of information and communication.[9] Free time will increase — that is, all the time which may be disposed of freely by an individual. How this will be used is a critical issue for any society. The naive assumption that such "free time" will somehow flow effortlessly into an engagement with learning, the arts and other forms of reflective contemplation, however, flies in the face of a rise in more hedonistic and "antisocial" pursuits which have characterised recent decades. The rise in "free time," then, may pose a political problematique for modern society. This is due, in part, to the fact that many of our institutions and "social control systems" rest, ultimately, on the absence of "free time" among the populace.

A second impact of automation is increasing social restraint. Unlike overt political control, this restraint refers to the limitations which accompany a world

guided by designed functions and systems. Management information systems, for example, will increasingly relate each person's activities within organizations closely through various functions of management, while on-line, real-time, control systems will establish very strict schedules and performance evaluations. Talking cashier systems in supermarkets provide an archetypical example of this development. When such automatic management control systems become commonplace, functional and systematic restraints will replace those of place and time.[10] Whether alienation follows from such developments is an open question hinging on the values and adaptive capacities of people. The "managed society," however, is around the corner. Ironically, many of the calls for improved planning we hear today, lead unknowingly in this very direction.

The second stage in CT innovation relates to knowledge development. If automation supplements man's mental labours by CT, then knowledge-development leads to the amplification of that human capacity. There are two sub-components of the knowledge-development capacity of CT which are worth highlighting. These are problem resolution and opportunity search.

Problem resolution systems of all kinds have emerged recently. These systems, supplemented by CT technology, aim to eliminate risks which may stand in the way of accomplishing goals. These problem resolution systems exhibit three general characteristics. First, they are anticipatory, attempting to detect problems before they become serious and, by predicting future trends, project alternative solutions. The second characteristic is that they focus on discovering hitherto unknown problems. The third trait is that the problems to be resolved by these systems are very complex and the systems for solving these add, in spiral fashion, to the complexity itself. The ability of people to understand the self-generating complexity associated with such emergent problem resolving systems is a critical questions mark for the future.

The second aspect of the knowledge creation function of CT is opportunity search. Opportunity search involves inquiry into the possibilities of future time usage. In this regard, the emergence of what has been called the "information utility," perhaps the late twentieth century archetypical educational institution, will be of critical importance.[11] Information utilities will arise when information becomes a public commodity, similar to water and electricity. The populace will have access to it on an "as needed" basis. This development will substantially increase the opportunities for education for the entire populace and likely force a redefinition of the role of existing public educational institutions. It is likely, as

well, that a whole new industry, the opportunity industry, will emerge to assist people in achieving their informational and educational needs and goals.

The third aspect of the CT revolution will involve, indeed require, systems innovation in society. This means that, in order to accommodate the new capabilities and problems generated by CT, new socio-economic and cultural systems will be required. Many of these, unlike earlier changes, will be "by design." System innovation, in fact, will be the most far-reaching dimension of the information epoch.

Those of us involved in the educational system, proponents of Canadian Studies included, are on the precipice of a major era of social innovation. At this point in time, the educational system faces three options:

1. To continue the development of educational systems in accordance with principles which were born of the nineteenth century. This I call the *"linear response."*
2. To attempt to take within the system, on a piecemeal basis, elements of the new information era. This I call the *"absorption response."*
3. To begin the process of re-designing the educational system in accordance with principles inherent in the new information era. This I call the *"anticipatory response."*

The future of the educational system, its eventual shape, role in society and vitality, depends largely on which of these three options are exercised. Let me comment briefly on each and its implications.

The linear response is based on the assumption that society in future will continue to progress or move in accordance with the same principles which were operative for the last fifty years. In education, this would lead to the continuance and refinement of a number of central organizing principles:

1. The use of formal educational institutions, defined in space and time, as primary delivery mechanisms for societal learning.
2. The continued use of the group as the basis for the organization of teaching and learning.
3. The continued designation of educational institutions as centers for knowledge transmission.
4. The continued pattern of participation and investment in education as a preparation for work and living.
5. The continued role of curriculum as an analytic device for breaking reality down into its supposed component parts.

This scenario would lead, over time, to the building of more and more schools, sub-divided into various groupings for learning, in which people would attempt to learn about separate aspects of reality. Those who urge the establishment of Canadian Studies departments or courses

fall squarely within the tradition.

The absorptive response is based on the view that certain changes are occurring in society which depart substantially from the past and which must be grafted onto ongoing programs in schools. In education, this leads to the following:

1. The incorporation into schools, on a random basis, of certain elements of new CT technology; e.g. microcomputers as devices to extend traditional teaching functions.
2. The separate use of group and individual-centered learning.
3. The modification of knowledge transmission with projects undertaken by "gifted students" who would be encouraged to create knowledge.
4. The development of segmented policies for the investment in tertiary or continuing education as additional opportunities beyond formal schooling.
5. The use of technologically-mediated instruction as a method of achieving traditional education goals in a more efficient manner.
6. The development of technological literacy programs of all kinds.

Both of these responses rest on the global assumpiton that society today is merely experiencing the impact of an *acceleration* in an evolutionary change process. We are witnessing change within the system, not change of the system. By and large, from this perspective, the assumption is that work, leisure, values and knowledge will co-exist in much the same way as they currently do. Many of the processes I have discussed earlier will not occur and are not really occuring. The external environment into which we pour students will be largely the same as that into which we entered: the only difference is that there exists more technological junk to contend with. Basic systems will not change.

As one can surmise, I believe that this assumption is faulty. At minimum, it is tremendously risky. As an example, consider the following. As we know, there are large numbers of people currently being unemployed in industry. Consider plant x which produces product y and, in today's world, has unemployed 1,000 of its work force. The commitment is made to "consider" rehiring when a "recovery" occurs. The lay-off period is one year. What does company x do during the lay-off period? It introduces robotics and micro-computer-based systems to its operation. This, plant x calculates, will allow it to increase its production, reduce its costs, improve its design efficiency and allow a new work and management system to be developed. When recovery comes, plant x will call back 500 employees, of the higher skilled variety. These 500 employees will have to learn how to re-orient to new systems and the company will provide for this. However, 500 employees will be excluded from this

development and learning and, since other companies will be doing the same thing, will find it difficult to obtain work. Moreover, the training available to them will be of a short-term variety. A two-tiered labour market, thus, develops: one group receiving work and ongoing learning opportunities; the other on revolving and temporary training and work assignments. As technological and development further increases, the unemployed, currently defined as "marginal," becomes "mainstream" in the flow of work opportunity. This example suggests, and others can be put forth, that change today exerts multiple impacts which drive to the core of what we understand of social life and its associated values.[12]

In thinking within the anticipatory mode, image is everything. The problem facing education today is that the images currently used to grasp reality were born of a different era and are no longer congruent with the post-industrial world. To use a pathological metaphor: the imaginary universe of the educator is impairing his/her vision of the world as it is. The first step to the future, then, is to rediscover the imaginative capacities within us and to assist others in this process. Canadian Studies, since it is in the fetal stage in the educational growth process, is in a unique position to contribute to this imaginative reconstruction. The tragedy, however, is that proponents of Canadian Studies have developed their organizing principles around images of reality central to the segmented social world of the nineteenth century rather than integrated pan-national systems of the late twentieth century. The very idea of using nationhood as a boundary-making device in the design of education, for example, presumes that such technological and social development, as is implied in compunications, will be significantly affected by and channelled through national cultural experience. Indeed, it may be possible to posit the reverse proposition: that the cultural experience of nations will be channelled through broadly similar and generic technological systems. To draw a line of distinction between technology and culture, Canadian or otherwise, may be more mythological than real.

Generic processes of technological and systems change require the development of parallel and equally generic educational concepts. Even if one wished to illustrate or perpetuate variations on a theme, as many Canadian Studies proponents appear to, the theme itself must be understood. In this regard, Canadian Studies, since it is not bounded by the constrictions of disciplines, can, by focusing on generic change rather than cultural reflections of it, assist in an understanding, not only of where we have been, but where we are going. What, then, are these generic processes?

The complex society we face in the future, particularly because of the CT which underpins it, rests on the interaction of and demands facility in each of three interacting processes: decision-making, implementation and path-finding. The problem with the conventional image of education, essentially a rational and mechanistic one, and the absorptive and linear responses which flow from it, is that it addresses only the middle element: decision-making. Much of what schools foster, through both the formal and informal curriculum, is the ability to make decisions on a rational basis. Rational decision-making, is of course, important. However, it is not sufficient as a base upon which to educate people for the society of tomorrow. Why is this?

First, the numerative and analytic component of rational decision-making has a built-in conservative bias. In society, this leads to an obsession with cost and quantity; not quality and value. It also focuses attention on patching up the old rather than exploring the new. Moreover, rational decision-making leads people to analyse what can be most readily analysed, spend more time on it, and ignore the rest — the "fluffy in life."

Second, the exclusively rational decision-making mode, when it runs wild, as I believe it has today, leads to an abstract and heartless approach to the world. The ultimate expression of this can be seen in a designation of "body counts" in Vietnam, a concentration of "inflation and unemployment rates" as drivers of economic policy, and fixations on "cost per student" calculations in education policy. A purely rational decision-making mode takes the living element out of situations; an element which is of increasing importance in affecting the social patterns of today.[13]

The rational decision-making mode is, thirdly, often negative. Peter Drucker has commented, for example, that "professional management today sees itself as often in the role of judge who says 'yes' or 'no' of ideas as they come up. This inevitably leads to a vetoing of new ideas. New ideas are always impractical."[14] And, I would add, seemingly irrational. It is inherently easier to develop a negative argument than to advance a constructive one. Fourth, the rational decision-making mode downplays experimentation and abhors mistakes. This leads, often, in educational deliberation, to years of "study groups" which help people to avoid what they must confront: having to make, eventually, one big bet. "Paralysis by analysis" is the result. Fifth, the rational decision-making mode does not celebrate informality. Analyse, plan, specify, and check-up, are the verbs of the rational process. Interact, try, test, fail, stay in touch, learn, shift direction, adapt, modify, and see are some of the verbs of the informal processes in society. It is out of these processes, moveover,

that frequent societal innovation emerges.

Rational decision-making is, as I argued earlier, an important skill in a complex society. Students need, however, to be acquainted with other processes if they are to adapt to an integrated society. Indeed, this society, demands it. In this regard, there are two additional processes which schools must foster in future. These are path-finding and implementation.

Path-finding is essentially an aesthetic, intuitive process, a design process. There exists an infinity of alternatives that can be posed as design problems. From that infinity, there are plenty of bad ideas and here the rational decision-making approach is useful as a sorting process. The problem in education today is that we are teaching people "how to sort" before teaching them how to generate the universe from which they should sort. The ability to carve out and explore new pathways to understanding, to see, as Gregory Baterson has suggested, the multiple patterns which connect us to each other and nature, is an essential ability in the information age.[15] Much of the attraction of video games to the young, today, is precisely due to the fact that they appeal to and stimulate path-finding processes. And, it need not be over-stressed, this engagement with alternatives is occurring outside of school. Mere entertainment could not, in my view, hold the attention of the young in the video arcade. It is interesting to note, as well, the number of "three-piece suits" one sees in the arcade during the noon hour. The video arcade, indeed, is, ironically, one of the few situations left in our society in which activity is not structured on an age-segregated basis.

Innovation is the third social process of critical importance to the future. It involves the process of translating ideas into practice in multiple settings. Many good ideas never see the light of day due to lack of understanding of our attention to implementation. Creativity, which is the heart of path-finding, is the process of creating new things; innovation is the process of doing good things. This is the "how" of life. Within the net of complexity which characterizes our society, innovative processes can no longer be taken for granted. Traditional curriculum, based as it is on decision-making, by and large prepares the young for bystander rather than innovative roles. In what ways can we provide the young with experience in innovation?

To summarize, I have suggested that there exists, in light of technological developments in modern society, at least three critical processes with which both young and old alike need to become acquainted. These are path-finding, decision-making and innovation. Moreover, these processes, by definition, cannot be "taught" separately. They are intimately intertwined. Creative ideas

need evaluation. Creative ideas which are positively evaluated need implementation. Mindless innovation can lead to disaster. Decision-making in a vacuum is a vacuous skill.

All of what is transmitted in school, then, needs to be assessed to the degree to which it is fostering people's path-finding, decision-making and innovative capacities. The use of computers in schools is a case in point. Currently, only the decision-making mode in computer usage is being explored, and even here it is a narrow logic which is dominant. The latent consequence of this pattern of development will be to convince the user that the world behaves like a computer. Socio-logic, however, is not equivalent to computer-logic. Have we explored the path-finding and innovative dimensions of the computer? Seymour Papert is one who, in his efforts to have children program computers and reflect on the thought processes which generated their programs, has begun to explore the path-finding dimension.[16] Regrettably, the innovative aspects of computer technology have not been probed in an educational context.

Canadian Studies programs in schools should provide students with a context in which to invent, evaluate and act upon emergent realities. Creating alternate visions of reality, path-finding if you like, is a central process in this regard. Canadian history, like other histories, is replete with examples of "successful" and "failed" social and technological inventions. Students need to be aware of these path-finding endeavours as well as the processes and context which produced them. As well, students need to be acquainted, on a first-hand basis, with path-finding endeavours currently underway in our society. Within all sectors of society, business, government, labour unions, alternate images of physical and social reality are being created and discussed. Finding ways to engage students with the creative and imaginative processes of modern society is a signal challenge to all of education, Canadian Studies included.

Developing the innovative capacities of students is an even more heady challenge, for to strive toward it requires a reintegration of the young into social life. The ability to translate "good ideas" into action is not something which can be learned solely within the confines of a school and its analytic culture. The young must confront, in order to acquire this capacity, such things as the inertia of bureaucratic structures, the interacting web of decisons, the power and prestige orientations of people, the lag between attitudes and technological feasibility, and the "bottom lines" of corporate and public institutions. They must learn how to shape consensus, plan and modify plans in light of experience, motivate and energize others, to learn to achieve objectives in a social and political world.

Innovation is, by definition, a social and political process. It cannot be learned apart from society. If Canadian Studies purports to teach the young about our society, and if that society currently and in future rests on and demands continual innovation, then the opening up of opportunities for the young to learn about and be engaged in innovative activity is of paramount importance.

Schools, if they are to remain as central educational institutions, must also be designed with the emergent patterns of society in mind. By and large, the structure of schools still conforms, to the social context of industrial society, in which one could assume that information was a scarce good requiring only transmission and analysis. The structures of schools, based on these premises, continue to emphasize hierarchy, specialization, disciplines, sender-receiver models of teaching, and absorption and codification of "content." In an information-rich society, these basic premises of schooling must be radically rethought.

If schools are to play a role in fostering the three processes inherent in our emergent society, new organizational forms will be required. An organizational form which rests solely on decision-making will not provide, for either teacher or student, an environment conducive to the stimulation of path-finding and innovation. Rather than, as is our tendency, to consider decision-making as *the* focal principle around which to design the organizational structures of schools, this over-arching structure must be seen as one of three pillars which will make up a new, more dynamic organizational form.

In developing path-finding and innovative pillars within schools, it must be recognized that they will rest on different principles than those of decision-making. The path-finding pillar should be based on a number of small, cross-disciplinary units and problem-solving groups. These groups should establish close links between teachers and students. Their objective is the development of path-finding capabilities in both students and teachers. The close tie between students and teachers is critical, since, as in the case in industry, many new ideas have been born from what has been called "customer innovations" based on direct experience with and modification of the product. These path-finding pillars cannot report through their parallel decision-making structures, for the objective is not to analyse and decide on but to create new ideas. Democracy and free-wheeling exploration must be their definitive characteristic.

The creation of innovative pillars within the overall organizational structure of schools presents yet another challenge. Schools must find ways to develop and monitor their innovative capacity as organizations. Experimental

and strategic planning units, devoted to testing and introducing new ideas, need to be developed. Students should be directly involved in such processes. The introduction of computers in schools, for example, can provide a classic laboratory for the development of an innovative capacity. One of the best ways for schools to develop innovative capacities in the young, then, is to model the process itself.

Conclusion

The field of Canadian Studies, although vaguely defined, has been characterized largely by a quest to obtain, through education, an elevated awareness of the roots of the Canadian cultural experience, and thereby, foster and preserve our nationality. The introduction and application of new technology, particularly micro-computer based compunications systems, does not strike one as something which falls immediately within the domain of Canadian Studies per se. If one broadens the definition of Canadian Studies to encompass the study of those forces which have and are shaping Canadian society, however, then technological change, particularly in the current era, must be a central concern.

In addressing the issue of technological change, within the context of Canadian Studies, the perspective one brings to bear is of critical importance. It has been the argument of this paper that the technological changes which we are witnessing today are generic and will lead, over time, to the evolution of a society which is radically different from that of the past. Accordingly, any program of Canadian Studies, which seeks to help introduce the young or old to this emergent society must also be generic; that is, it must be based upon principles which transcend current educational practice and, indeed, depart substantially from many of the core ideas of Canadian Studies itself. There is, in other words, nothing uniquely "Canadian" about the current compunications revolution. In fact, the changes which are associated with compunications, and the underlying processes which drive them, are pan-national in nature. Their rhythm and tempo do not flow form the exigencies of nations, but are inherent within the technology itself.

If Canadian Studies is to address the question of technological change as a generic phenomenon, as I believe it must, then it will have planted the first seeds of its own destruction as a unique field of inquiry. Decision-making, path-finding and innovation are processes essential to an information society. Their importance derives, not from any roots in the Canadian experience, but from their integral relationship to emergent compunications systems. To understand, and use for human benefit, these new systems requires the engendering in people of a

trans-cultural viewpoint; an attitude which transcends the boundaries of nationality and national identity. Ironically, due to its lack of definition and marginial status in education, Canadian Studies is uniquely positioned to accomplish just this goal.

FOOTNOTES

1. See J. Haugeland, ed., **Mind Design** (Cambridge: MIT Press, 1982).
2. See C. Brown, "Have Production for Use in a Market Economy," in B. Thorne and M. Yabon, ed., **Re-Thinking the Family** (NY: Longman, 1982), pp. 151-167.
3. See Daniel Bell, "The Social Framework of the Information Society," in M. Dertonzas and J. Moses, ed., **The Computer Age: A Twenty Year View** (Cambridge, MIT Press, 1981), pp. 164-182.
4. See Russell Ackoff, Creating the **Corporate Future** (NY: John Wiley, 1982).
5. See W.I. Thompson, **The Time Falling Bodies Take to Light** (NY: Harper, 1982).
6. Morton Hunt, **The Universe Within** (NY: Oxford University Press, 1982).
7. See J. Botkin, Global **Stakes** (Cambridge, MIT Press, 1982).
8. See J. Weizenbaum, **Computer Power and Human Reason** (San Francisco: W.H. Freeman, 1979).
9. See H. Menzies, **Computers on the Job** (Toronto: James Lorimer, 1982).
10. See M.J. White et al., **Managing Public Systems** (NY: Duxbury Press, 1983).
11. See Y. Masuda, **The Information Society** (NY: World Future Society, 1982).
12. This process is described at length in B. Bluestone and B. Hanson, **The De-Industrialization of America** (NY: Basic Books, 1983).
13. See F. Capra, **The Turning Point** (NY: Scribners, 1982).
14. Peter Drucker, Managing **in Turbulent Times** (NY: Harper-Row, 1981), pp. 1-22.
15. G. Bateson, **Mind, Nature and Rality** (NY: Oxford, 1979).
16. S. Papert, **Mind Storms** (NY: Basic Books, 1979).