THE FUTURE IS NOW

WOMEN AND THE IMPACT OF MICROTECHNOLOGY

Report on the Conference

"The Future Is Now":
Women and the Impact of Microtechnology

Held in June 1982,
Ottawa

Edited by
Jacqueline Pelletier
in collaboration with
The Women & Technology Committee

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We dedicate this report to the hundreds of women whose contribution, spiritual and otherwise, helped us to make this all possible.

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This is not only a book, it is an investment in the future.

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Introduction

The Future Is Now. It is a quantum leap, of sorts! A transformed civilization is taking shape with the impact of a technology so new that most of us can hardly name it. How do you bring together a few hundred persons to discuss that future, which is already becoming a reality? How do you keep them interested for three days while motivating them to take charge of follow-up?

Answer: You take a wild guess. Above all, you must not take yourself too seriously. Then, select themes which will concern and fascinate. Find excellent resource persons. Persist with determination through the inevitable confusion and difficulties to the very last word of the final plenary session. When all is over, give in to the laughter of success, to the collective hysteria that follows exhaustion, to the manifestations of friendship and solidarity which crystallize new learning.

"The Future Is Now: Women and the Impact of Microtechnology" was a first, inasmuch as it resulted from the joint effort of four national women's organizations. It was a unique event, since participation far exceeded the expectations of organizers.

Early June: many have requested information, but few have registered. Mid-June: Will we reach our objective of 500 registrants? The conference opens June 25: more than 550 participants register. At times, 600 people are milling through the workshops and the exhibits. The student residences fill up; the meeting rooms are crowded; a flow of information and ideas settles in to last until the end of the event. All points of view are voiced: here, we express concern over health hazards; there, we praise the invaluable potential of computers for the handicapped. While one workshop makes claims for reform, another concludes on the need for individual involvement. Friendships are born; business cards are exchanged; participants greet each other warmly; plans of action are reached. In one room a speaker, stunned to have discovered she is expected to participate in the program, improvises a presentation, while elsewhere, an old lady leaning on a cane marvels, "how lucky you will be to live that!"

Interest did not wane throughout the three days of the conference; this has been confirmed by a survey, conducted several months after the event, which indicated that many cherish their memories of the conference. Having been assailed for several years by baffling and seemingly contradictory information, sometimes disconcerted by the esoteric language of technology, anxious to find directions and to share their knowledge and their fears, participants arrived in Ottawa in an open, questioning frame of mind. In these circumstances, the meeting could only become a dynamic process, welcoming the contribution of each participant, more geared to spontaneous interventions than to the established program.

One of the richest aspects of the dynamics was certainly the acceptance of the need for personal commitment to conference follow-up. It was readily recognized that the adoption of pious resolutions would only serve to adorn the most forgotten shelves. Any corrective

or innovative action must first come from the self, from one's organization, from one's environment. Nothing could be more exacting; nothing could be more certain.

It is a pleasure to publish the report of such a conference! We are even able to report on the personal or public follow-up of several participants. A word to the incredulous: you will never be so happy to have been wrong! To the degree that it was a process, it can be said that the conference, "Women and the Impact of Microtechnology... has never ended. It simmers and urges forward in the spirit and actions of so many Canadian women!

Background

What is happening to women in the current technological revolution? Are they benefiting from progress, or are they victimized by it? Are female workers moving toward new jobs, or are their present qualifications becoming useless? What is the role of women in decision-making processes at various levels, local as well as international?

These issues were puzzling for some in the summer of '81. Their concern led to a first large meeting, held on September 27, 1981, at the New court House of St. Lawrence College in Kingston. Sponsored by three national organizations (the Canadian Research Institute for the Advancement of Women [CRIAW], the Canadian Congress for Learning Opportunities for Women [CCLOW], and the National Action Committee on the Status of Women [NAC]), the meeting brought together about 20 women from Ontario, all active feminists. They agreed that a conference was desirable and that it should:

- Promote a greater knowledge of micro technology and related problems.
- Encourage participants to define a personal plan of action, including the expression of their claims.
- Serve as a meeting point for the exchange of ideas and knowledge.
- Inform of the advantages of micro technology, particularly in the workplace.

A steering committee was immediately set up. In the course of the following months, its members would design the conference, obtain necessary funding, identify resource persons, and hire administrative staff; then, through weekly meetings and hundreds of telephone conversations, discover the hidden charms of working as a team.

Among the major concerns were:

- To elaborate a conference program to meet the needs of beginners, as well as those of women already well informed.
- To identify women as workshop leaders in all sectors.

- To ensure that Canadian women from all provinces could register and be served in their own official language.
- To reach a large variety of interest groups.

Conference Objectives

A second meeting was held in February 1982, at Carleton University in Ottawa, at which, Manitoba, Saskatchewan, British Columbia, Nova Scotia, Quebec and Ontario were represented. Three objectives were defined:

"The first objective is to simplify technological language and explain the workings of microcomputers and word processing equipment to women. The computer industry has developed a jargon which can inhibit the layperson, and which has contributed to an aura of mystification surrounding the whole computer field. And although women are, and will be using technological equipment in the workplace as well as in the home, they have not been given the opportunity to understand the functioning and logic behind these machines.

Through a "hands-on" display at the conference, we are planning to introduce women to the hardware and the software in a non-threatening situation. They will be encouraged to ask questions and to use the equipment. In this way, we can bring together the manufacturers, the distributors, and women consumers and users, and give them an opportunity to communicate. In addition, we plan to have instructional lectures explaining the terminology and outlining the configuration of a simple micro-computer.

The second objective of the conference is to identify and analyze vital issues concerning women and the impact of microtechnology. For this conference, the issues are being defined by women and will be examined from women's points of view. Five key issue areas have been identified: training and retraining; changing employment patterns; safety and health; information access and control; education.

Research on these topics has been limited, and the dissemination of information has been unsystematic. Throughout the planning of this conference, these research limitations have been noted, and it is hoped that research on specific topics, which have not yet been explored, can be commissioned for presentation at this gathering.[1] Also, background research papers, bibliographies, and definitions of computer terminology will be collected and distributed in the information kits that each conference participant will receive.

The third objective is to develop both individual and collective strategies for dealing with the impact of technology. On the individual level, women will be able to examine options for the future in terms of personal goals, education opportunities and possible career paths. On the collective level, women will be able to make suggestions and recommendations on issue areas, so as to influence policy-makers, educators, industry and

managers. These recommendations will then be transmitted to policy-makers *et al.*, through either the cosponsoring groups, or an ad hoc structure, depending on the consensus of the conference attendees and the major groups involved.'[2]

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[1] Lack of funds and time made it impossible to pursue this project.

[2]See Sunday Plenary for list of recommendations and commitments. Ref.: "A Conference Proposal For: THE FUTURE IS NOW: WOMEN AND THE IMPACT OF MICROTECHNOLOGY,' submitted to funding agencies by the Women and Technology Committee, March 1982.

During that February meeting, the program of the conference was decided upon. Very soon afterwards, a pamphlet announcing the conference was distributed across the country, to reach unions, teachers, federal and provincial public servants; then, private enterprises and non-government community organizations. In the spring, local conferences were held to prepare for the national meeting. (In fact, there was little relation between these meetings and the national event, except that several women participated in both, bringing with them ideas expressed locally. Certain suggestions and resolutions from the local meetings were given to the organizers and included by the strategy coordinators in the Sunday morning plenary session.)

Conference Format

As we have seen, the conference was structured around five distinct themes:

- Changing Employment Patterns.
- Health and Safety.
- Education.
- Training and Retraining.
- Information Access and Control.

In addition to the introductory remarks of the well known author, Heather Menzies, four types of activities were held on each theme, and they are introduced in this report in the following order:

- First, a major thematic presentation in plenary session for each of the five themes.
- Second, a variety of workshops dealing with different aspects of the subject and directions for action (Friday and Saturday).
- Third, a presentation in plenary session of a summary of the proceedings, by a strategy coordinator responsible for the theme (Sunday morning).

- Fourth, a session devoted to the elaboration of strategies, the results of which were communicated to a plenary session on Sunday afternoon.

Participants had the choice of concentrating on a single theme, or a combination of themes. At their request, a workshop on networking was organized on Sunday morning, along with the sessions elaborating strategies. During this workshop, a national network of exchange and information was discussed, to ensure follow-up of the conference.[3]

Demonstration workshops were held during the conference and the exhibition room allowed participants to examine the latest equipment. Films and book exhibits completed the practical aspects of the weekend (see Appendix for details).

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[3]See Appendix for the list of participants in that network. We know that the residents of the Montreal area met twice, in September and October, and hope to organize a study group entitled "The Impact of Women or Microtechnology." (E.N. Finally, the world is being set straight.)

LIST OF PARTICIPANTS

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now ...

Notes for Presentation
to

THE FUTURE IS NOW

Women and the Impact of Microtechnology
June 25-27, '82
Ottawa.

Opening Session

Chair:
Julyan Reid, Sociologist and Policy Analyst

Speaker:
Heather Menzies, Researcher/ Writer

Thank you, Julyan, and welcome to Ottawa; or should I say welcome back, for the many of you who were here just over a year ago to address the issue of women's rights under the new Canadian Constitution. Today we're gathered to confront an equally important issue, the effects of a new technology which is propelling us into a second industrial revolution: the technology of computers.

What's happening really is a second industrial revolution. We're moving from the mechanical age into the computer age. In the tiny, accessible, and above all, cheap form of the microchip, computers are automating the production of lumber in sawmills, the assembly of cars in factories, and the assembly of reports in offices of all sizes, shapes and descriptions. The revolution is changing, not only what we do, but how we do it. In a nutshell, employment is shifting from passively filling fixed-formula, mechanistic-type jobs to something more interactive, dynamic and evolving. This requires a new approach to working, and toward job training and education as well: an approach embodied : in the notion of continuing education. Just as "a job to last a lifetime" is becoming obsolete, at least for a great many people, so is the notion of "completing one's education."

So, there's a lot to be done in adapting to this transformative new technology, right? So why is so little being done? When I discuss the issues with government and other decision makers, they reply blandly that the employment question is still in debate. Oh, I say, thinking of the women who are already missing out on jobs because of the automation which has already taken place. Or, when I've had occasion to talk to industry leaders, I find that they're only willing to acknowledge one problem in making the transition into the computer age; this is the skills-shortage problem. They can't see, or else refuse to take responsibility for, the larger picture in which many people, especially women, are being left behind in the transition - being left behind with skills made redundant by automation, yet also surplus to the quota industry needs to solve its skills-shortage problem.

This blinkered, exclusionary thinking makes me so angry. But it also reminds me of a joke, the only one in my repertoire. I heard it at another conference on the employment implications of computer technology. It was told by a management consultant to illustrate his point that being optimistic or pessimistic about the employment outcome of automation simply depended on your point of view.

The joke is set within the context of an Elizabethan drama, during which, one of the characters has to plunge into hell. Well, to effect this little development, they put a trapdoor into the stage floor and at the appropriate moment, zip, away he'd go. Everything went fine until the night when the actor playing this part fell ill and his understudy had to take over. The only difference between them was that the understudy was somewhat corpulent. . . . And, you guessed it, when the big moment arrived and the trapdoor was released, he got stuck.

Quick as a flash a voice called from the back of the theatre, "Halleluja, hell's full."

What I found very interesting was that a number of the women in the audience didn't find the joke quite so funny as did the men, perhaps because they were identifying with those whose plight had resulted in hell being full. Women tend to be "pessimistic" about the employment effects of automation, because they're identifying with women's experience of it. That which is universally, if unspokenly, considered "women's work" in our economy, is being automated, while that work which is being created or enhanced by computer technology is largely considered "men's work."

By women's work, I refer to support work. In the office setting, this takes in administrative support and clerical work - an occupation which accounts for over a third of all women's employment in Canada. Looking more broadly throughout the service sector, into banks, telephone companies, supermarkets, etc., another third of the female labour force is employed in essentially support work, delivering sales and services, and much of this is being automated as well.

On the other side of the computerization coin, the work being created by computer technology is generally work with an initiative or control element, which also characterizes it as men's work and generally off limits to women. As one brief illustration, a U.S. study found that the percentage of working women in managerial positions was only 6 per cent in 1978, compared to 5 per cent in 1947. The office of the future is a place for professional/ managerial "knowledge" workers, not for support workers, because the support services are being automated.

It helps to grasp the profoundness of the changes taking place if you concentrate on the essence of an office. It is an information system. Traditionally, that system has been paper-based and paper-anchored. Now it is becoming electronically based, and therefore, free from steel, concrete and metal filing cabinets.

You no longer need to go to an office, but can "enter" its information system wherever you have a computer terminal and a handy telephone to hook into. This could be in a hotel halfway across the continent, or at home - hence the term, "electronic cottage", and the reviving of "home-work" as a new option in working life-styles. I hope to return to this a bit later, for I have deep concerns at the potential for exploitation, particularly of women, if this becomes the only work option available. Mean- while, we're entering the office of the future.

In order to enter the electronic information system which is the office of the future, you simply key in on your computer terminal. This is the equivalent of unlocking your office door and gaining access to your desk and files. First, you'll probably call up your electronic calendar to check over your day's schedule, and then, perhaps, review the calendars of your subordinates to ensure that they have a full day ahead of them. Then.. you call up your electronic in-basket. You notice an electronic memo from your boss; she wants to see you in her office at 1400 hours. Quickly, you key in a reply and have it routed electronically to her electronic mailbox or in-basket. Next you read a letter from a colleague in a regional office, who would like to see the notes you made on a conference you recently attended. These notes are in your personal electronic files. To send her a copy, you simply key access to the file, type in the command and your colleague's name, and the job is done. No need to hunt out the address or copy it; the address will be in the electronic directory. No need to run off a copy; the notes in digital form will be accessed automatically.

In one office, where I did my research for *Women and the Chip*, the senior professional managerial group with desktop terminals use the electronic information system to do up to 75 per cent of what secretaries used to do for them. They refer affectionately to the system as "my electronic secretary."

I noticed that they've developed a curious shorthand for their electronic messages and memos. For instance, one executive had written: I want 2 C U 4. . . ," I was amazed, but also somewhat chilled at this additional indication of how writing as a separate activity is disappearing through automation. With word processors, we're seeing the automation of retyping, which has been estimated to account for some 70 per cent of typing time. With optical scanner units, we're seeing printed material converted into electronic form without the need of a keypunch operator or data-entry clerk. And with computer systems increasingly being able to interface or talk to each other, there is no need for a human intermediary there either. Hence, retraining women from writing on paper to writing on terminals is a short-term measure at most. Already there is a decline in demand for data-entry clerks. Key punch operators are obsolete. And in the much vaunted, new occupation of word processing, when I was speaking in Peterborough, Ontario last spring, the local Manpower official on the panel with me informed us that there were some 700 unemployed word processor operators in the Peterborough district.

In addressing this issue, we have also to address the need for a new approach to the design of jobs, to accommodate the rapid obsolescence which has become, if not a permanent feature, then at least a prominent characteristic of this period of transition into the computer age. And we must consider this for more than just office workers, since computerization is transforming every sector of our economy, every type of workplace imaginable. Throughout the service sector, the work associated with delivering services is being substantially automated. That's saying a lot, because most people employed in service industries are involved in delivering services, rather than developing or marketing them. Here, too, we're talking about some 30 per cent of the women who work; these include bank tellers and telephone operators. These jobs are commonly referred to as female job ghettos, because of their high concentration of women and, most significantly,

because of their lack of opportunities for advancement. Hence, as computerization advances, automation takes over the work these women do; they are left with nothing to do; they are left behind.

Let me give you a couple of examples. In the telephone industry, the telephone operator used to physically plug cords into a switchboard in order to connect long-distance calls. Now all the skill and knowledge associated with that work has been incorporated into a computer program, and the calls are connected automatically through the electronic exchanges. In the banks, the automatic banking machines (also called automated tellers) represent the final piece in the automated system through which banks now deliver services to bank customers. The skill and knowledge associated with expediting deposits, transfers, etc., are now incorporated in the software, which is activated by the bank customer using the sidewalk terminal on a self-serve basis.

There have been some dramatic reductions in employment. For instance, Citibank Corp., on the forefront of banking automation in the U.S., reduced its teller and other support staff from 10,500 to 5,000 while introducing banking and related automated systems through the course of the 1970s. An insurance company, cited in a University of Calgary study, reduced its typing, secretarial staff by 30 per cent while introducing automation through the 1970s.

I identified three overall trends in my research which, together, spell trouble for women. First, I found a consistent decline in the labour requirements at the level of support staff. Second, there is an increase and intensification of work at a more professional, specialized level of work. Third, there is a growing skills gap between these two levels of work - on the one level, merely handling information, while on the more professional level, using information in analysis, decision-making and so on.

To a certain extent, I think the third, the skills gap, was the most significant of my findings, for it augurs severe unemployment, as the skill needs at the level of work where employment opportunities are growing with the technology increasingly exceed the scope of most industrial retraining programs, to say nothing of the native skills of current support staff being displaced by automation. While I found clear-cut instances of people being displaced by automated systems, I found little evidence of layoffs - the traditional signal of employment disaster. Instead, I found merely a noiseless drying up of employment opportunities. Job vacancies are going unfilled; full-time positions are being replaced by part-time positions; and workloads are being greatly increased, but with no increase in staff, except in the professional, specialist ranks, and even there, usually at the expense of support staff, for the women are not being given the opportunity to move up from positions rendered redundant by automation into the new computer-enhanced positions. They're simply being abandoned through attrition. At the rate women are being left behind by the computer revolution, I concluded in *Women and the Chip*, by 1990, up to 1 million women in Canada could be unemployed.

Let me now turn to the other side of the employment question, the new work. Rather than break the thread of the kind of work I've been talking about all along and discussing the work associated with computer professionals, I'll talk about how computerization is transforming middle management. As you know, traditional middle management is concerned with supervision and administration. As you might not know, a lot of this work is being automated.

Traditional supervisory work is being eroded through such computer "aids" as computer monitoring and computer-aided instruction, which is becoming very popular for industrial training. To illustrate how traditional administration work is being automated, let me go back to the "office of the future" description I gave earlier. Once information has been put into an electronic information system, it becomes instantly accessible to anyone, anywhere else in the system. Hence, if you're an employment counsellor in Moose Jaw, Saskatchewan, and want to know how many unemployed dental assistants there are, you can get the most up-to-the-minute information just by keying in the command for the information. And if you want a percentage distribution according to province, you can get that instantly as well. In other words, the electronic system automates the entire activity of centralized record keeping and report writing. Besides that work being eclipsed by the computer software, the administrative work associated with setting up and running the reporting and recording procedures is eliminated as well.

The middle manager of the future is emerging as a computer-literate professional who administers the resources of electronic information systems. The pattern in Canadian industry is to hire a systems analyst, or an engineer, and parachute her (unfortunately, it's mostly him) into the middle-management ranks. Of course, such an approach contributes to the problem that industry's most worried about - namely, a skills-shortage problem - as the capacity of Canadian universities to turn out these computer professionals is overtaxed. It also leads to the problem I, and most other women are worried about - namely, women being left behind, either still in the ranks of the support staff, or, having finally gained the middle-management stepping stone out of the clerical ranks, left to

wither on the vine of the increasingly redundant occupations in traditional administration.

A solution that would solve both problems and would address the need to which I referred earlier - namely, the need to accommodate ongoing change - is what some people call job redesign, or occupational bridging. The idea is to allow all jobs to evolve, to allow for the redundancy of job functions, rather than the redundancy of people. In practical terms, this would require a combination of education, training and job redesign or work reorganization. It could be packaged as apprenticeship programs, co-op work-study programs, or even affirmative-action programs.

Let me sketch out a couple of examples drawn from a chapter in my new book, under the subtitle *New Directions for Traditional Jobs*. I discuss three new directions for women facing redundancy in traditional support office jobs. These are toward information packaging and formatting, information and information systems management, and third, information brokerage and research. Someone with a flair for design and an interest in layout could move from simply laying out letters and reports as a secretary to formatting information packages in the new Videotext mode. Some courses in computer graphics, Telidon and computer systems would be helpful additions to on-the-job learning deliberately designed into the evolving job description. This career path would lead into personnel and public relations work.

For someone interested in administration and office management, on-the-job projects to formalize her already broad, informal knowledge of how the office works, and outside courses in office administration, plus systems analysis and, perhaps, even systems theory would help build a career as a manager in the office of the future. For information brokerage work, someone who had simply filed and retrieved from files could begin conducting data searches in outside data banks, go on to learn about the contents of and the access protocols to different specialized data bases and, with some outside courses in library science, formulate the keyword probes for retrieving the most relevant information from these outside sources and help organize her own employer's data bases.

As you can see from all three examples, what I see as the; necessary adjustment to the change we're undergoing goes far beyond simple skills training, for instance, on a word processor. The adjustment must accommodate the prospect of ongoing change, ongoing obsolescence of skills and knowledge.

And in case there are any doubters still out there, let me add that it's been estimated that, between the years 1979 and the year 2000, two-thirds of the content of most jobs will have been replaced by new activities requiring new knowledge and skills. The best preparation, then, is to start with a solid, general knowledge base in computer technology: i.e., become computer-literate.

There are many definitions of what computer literacy involves, but there is at least a consensus of what it doesn't involve. It doesn't involve becoming a computer professional or specialist. Just as we all use the telephone without having the foggiest notion of how a telephone works, so we'll increasingly be using the equally powerful information tool, the

computer, without having to know how a computer works. We only need to know how to make use of it. And that's what computer literacy involves.

The first element of computer literacy is, becoming familiar with the different types of computer systems - for calculating and for text editing, and for materials and inventory handling - and the components common to all computer systems: input, output, storage, etc. A second stage in developing a working understanding of computer technology is to learn some of the basic principles at work in them. For instance, programs operate on the principles of logical deduction, which have been around since Aristotle. The either/or operations of this principle correspond physically to the binary switches in an on or off position inside the computer. A third element of computer literacy is, understanding the role of computers in society and the context in which the technology is being introduced. This element not only cultivates a sense of the responsibility attached to technological innovation, but also reinforces the linkage between technological cause and social effect.

Having gained an overall sense of computer technology and its place in society, it's relatively easy to add whatever applied knowledge and skills are appropriate to your line of work. In the examples I gave earlier, application skills would include computer graphics and taxonomy, and applied knowledge would include computer systems in business administration and computer languages for office systems. Certainly, an interdisciplinary education is advisable for maximum flexibility. To a certain extent, people are going to have to tailor their own education programs to adapt their knowledge in whatever is their discipline - economics, architecture, marketing, etc. - to the computer-age context.

But that activity is also part of the new approach that I see is needed. Just as we must abandon the notion of people passively filling essentially fixed job descriptions and think in terms of their more actively pursuing an evolving work career, so we must abandon the notion of people passively digesting a fixed educational prescription and think in terms of their actively taking charge of their own continuing education. In other words, education as something you graduate from at the age of 18 or 21 is being replaced by education as a life activity, rather than fitness and flossing one's teeth.

As a delinquent in the areas of fitness and flossing myself, I can attest to the difficulty of changing basic habits and assumptions about life. But the need to change has been argued for a long time. In a book published in 1970, for instance, Margaret Mead maintained that the present is no longer an extension of the past, but a kind of explosion of the future into our faces. In preparing young people for the world, she reasoned, it's no longer appropriate to teach them what to learn, but how to learn.

To instill this, what is essentially a personal empowering approach to education, she suggested a dialogue model, with students participating in their own education, and thereby taking charge of it for their ongoing growth and development in the workforce. What does this approach to education involve? It involves teaching good research skills; counseling, rather than dictating; and counseling to join professional and craft associations, subscribe to journals, and to form self-help groups, such as the Women's

Networks which are being organized across Canada.

The dialogue model for participation in change would also help women to deal with the deep-seated socialization patterns which orient women toward, and then confine them in, support-type jobs as the only appropriate "women's work" available to them. Eradicating this pattern is as important as education and job redesign in ensuring that women have a place in the ranks of those exercising initiative and control in the computer age, and are not left behind, buried by automation.

Let me give you a couple of examples from my research. The most clear-cut example is in what happened when the office of the future was introduced to the Information Systems department of a large Canadian company, the first department in the company's five-year plan to extend the electronic information system throughout the corporate structure. Over the course of the transition in the Information Systems department, the number of clerical employees fell by 130, while the number of professional-managerial employees increased by 110. Only two of the redundant clerical workers were moved up to the professional-managerial ranks. The rest were given lateral transfers to yet unautomated departments.

When I asked the personnel official what he planned to do when he ran out of the lateral-transfer option, he shrugged, in what I thought was a rather cavalier manner, "Well, I guess they'll go to wherever redundant clerical workers go." I had an image of a kind of refuse heap out back, into which these women would be dumped. This man saw, or chose to see these women strictly as support staff and incapable of anything else.

In the other example, also in the same company, there were two secretaries left in the Information Systems department after all the automation was introduced, one working for the head of the department. Well, with the scope of automation described earlier, you can predict that traditional secretarial work fills up not even half her time. Most of her time, it turned out when I asked her to describe her work, is spent doing information brokerage and systems administration work. When I heard her describing this computer-enhanced work, I thought, "Oh good, they've turned this into a management training position." But no. When I asked her boss whether this was indeed a management training position, he seemed almost shocked at the suggestion.

Information Access and Control

Overview

Chair:
Magda Seydegart, Executive
Director, Human Rights
Research and Education Centre,
University of Ottawa

Speaker:
Inger Hansen, Q.C.
Privacy Commissioner
Canadian Human Rights
Commission

Have you stolen any personal information lately? Would your lawyer be able to defend you successfully if you had?

The answer to the first question is probably "maybe." The answer to the second question is: your lawyer would probably get you off. Now, if you had used a telecommunication facility without any "colour of right," you might be convicted of having obtained the service.

The reason I say that you might be able to get away with stealing personal information about another is because the Canadian Criminal Code requires that, before you can be convicted of theft, you must fraudulently and without colour of right take something, animate, or inanimate, with the intent of depriving another of his property or interest in it. If you have taken personal information concerning another, you may be charged with, and possibly convicted of having stolen the paper, or the floppy disc on which the information was recorded. You might get off easily, because the judge would not be able to take into consideration anything but the value of the paper or the floppy disc, perhaps not in excess of $2.

Is that right? Is it adequate? Should the judge not be able to take into consideration the possible harm that might accrue because of loss of informational privacy? Does the possession of information about you represent power in the hands of another? I think so, and I would suggest that anyone who has access to any kind of personal information about you holds some power over you, has some ability to influence you. That person can grant you a promotion, he or she can deny you insurance benefits, he or she can cause you to be fired, can cause you to lose your good credit rating, can nominate you for political office, can target you for marketing of goods or services, can ruin your reputation in the community, can plan to kidnap your children, can forge your cheques, and learn when you are not at home so that your home can safely be broken into, etc., etc.

Why, then, do so many of us give so much information away about ourselves? Why, then, are so many of us careless with our personal information? Why do we leave it around for strangers to find? Why do we give it to those who may not need it? Why do we care so little whether we are allowed to check the records others keep concerning us? Why do we not, as consumers, insist on knowing what others do with our personal information? Why do we not demand to know in advance the purposes for which that information is collected, how long it will be kept, whether it will be kept confidential, or shared liberally with others? And why do we throw out copies of our credit slips and bank statements - without destroying them so that the information they contain may not be recognized? Why do we provide strangers with details about ourselves when they inquire on the telephone or at our door?

I think we should remedy the inadequacy of our laws to protect personal information, particularly considering the capacity of electronic information processing. Let me first say that I do not think computers are bad; I do not think we should stop speedy and accurate methods of processing information. Needless to say, we all give up some privacy in exchange for services, but we must develop new methods to protect ourselves against too much information being collected, against abuse of personal information, against secret and unauthorized use of information. And I do not believe that codification and encryption alone will solve the problem. I do not think we can, nor do I think we should, stop technological progress. Machines speed up processes; machines reduce errors - but machines may also facilitate fraud and minimize our ability to detect such frauds.

Machines allow us to provide selective access to data. Machines are not greedy; machines are not ambitious or devious. Human beings may be, and they invariably deal with the information, before it is codified and after. That is why we need laws to restrain abuse of personal information, regardless of how that information is processed.

The federal government was the first jurisdiction in Canada to enact fair information practices and, for the last four years, it has been my task to see that the government adhered to its own laws, which grant "an individual" the right:

a. to ascertain what records concerning the individual inquiring are used for administrative purposes;
b. to ascertain the uses to which such information has been put since the proclamation of Part IV, which took place on the 1st of March, 1978;
c. to examine such records, or copies thereof, regardless of who provided the information;
d. to request correction of the personal information; or
e. to require a notation on the record if the correction is not accepted.

If an individual is dissatisfied with the delivery, by any government department or institution, of those rights, that person can lodge a complaint with our office. We will investigate all complaints, and I make findings, public reports and recommendations to the responsible minister. We hear from over 1,000 persons a year, and approximately 200 complaints are fully investigated each year.

The effect of those rights has been very interesting and beneficial. It may be worthwhile to consider whether some, or all of the principles should be extended. My interest in that possibility was heightened when, in February 1980, the Honourable Senator Jacques Flynn, who was then the Minister of Justice, asked me to do a special study into the use of the Social Insurance Number. The study was extended by the Honourable Jean Chretien, and it took us almost one year to complete it.

The study was designed to examine the extent to which the Social Insurance Number is collected and used, the purpose for which it is used, and whether the number serves as a data-linkage device. I was asked to examine possible threats from the use of the number, and the implications of regulation or prohibition of the collection and the use of the number. The minister's question presented me with a Pandora's Box! The number was found everywhere; the problem became larger than the question implied.

I came to the conclusion that the Social Insurance Number is not the real problem. But, secret and inappropriate data linkage is, and we discovered that many people believed that the Social Insurance Number would provide the key that would allow access to all records about the person behind the number.

If this were so, there would be reason for alarm, because total concentration of all information about a person is not desirable and may be dangerous. Access to all information may give the recipient too much power and, if the information ends up in the wrong hands, it may expose the subject of the information to financial, psychological or physical harm.

Data linkage may be good or bad; undisclosed linkage may even be for the benefit of the individual. But why should it take place without the individual's consent or knowledge; why should it happen without public debate to balance the interests involved?

The danger perceived as arising from the widespread use of the Social Insurance Number is, of course, inherent in all data, or combinations of data that serve to identify an individual. But the reaction to the number is symbolic, and it should alert us all to the issue of what kind of data linkage should be permitted or tolerated. I suggest that data linkage and use of personal information collected from an individual in certain transactions clearly defined in law, should take place only after full disclosure of the intended use by the collector and the informed consent of the subject of the information.

Some people value their informational privacy; others are not concerned because, as they say, they have nothing to hide. I would take issue with that attitude, because I believe few

people would leave their door open to allow a thief an opportunity to enter their homes, and the one who steals personal information may cause you a greater loss than the one who takes your bonds and jewels.

The ultimate danger, of course, is something that most Canadians refuse to think about and, if I hadn't lived with it, I wouldn't think about it either. In case of war, terrorism, or occupation by a foreign power, total dossiers on all individuals, stored in one place, can threaten our civil liberties. I need only mention personal records that indicate race, religion, or political opinions and sexual orientation.

The main recommendation I made as a result of the Social Insurance Number study was directed towards the unauthorized, secret use of information. The effect of my proposal, if enacted, would be this: a person or institution collecting personal information in exchange for benefits or services would be forced to disclose its proposed uses. Other uses not authorized in law, or disclosed or consented to later, would be illegal. The protection would cover information given to another, to governments, to a doctor, to an insurance broker, or to a bank, etc.; it would cover disclosure compelled by law (as, for example, census information); it would cover information stored in home computers.

I proposed the enactment of a new criminal offence, to be called an offence against the privacy of another, and that it should prohibit the willful, undisclosed acquisition, alteration, use, processing, manipulation, transmission, or destruction of personal data, not otherwise authorized by law, or by the subject. The prohibition could apply to personal data:

a. provided to obtain a benefit or service;
b. provided under compulsion of law; or
c. placed in the custody of another for storage and the exclusive use of the depositor.

Or to put it otherwise, at time of collection of the information, the intended uses will be discussed, bargained for and agreed to; all other uses, except those specifically authorized by law, would be illegal. The essential ingredients to prove the suggested offences against the privacy of another would be: the identity of the accused; the provision of the data by the subject; the nature of the transaction (that is, the acquisition, alteration, use, processing, manipulation, transmission, or destruction of the data); the absence of disclosure, consent or authority in law; and finally, that the transaction was the willful act of the accused.

To deal with personal data collected from individuals before the enactment of any offence, it would be necessary to provide that uses not consistent with those implicit in the original purpose for which the data had been provided, be against the law as of the date of enactment of the offence. In other words, consent to uses not consistent with the original purpose, would have to be obtained from the subject of the information.

Useful parallel concepts do exist in copyright laws, which protect original works; in patent laws, which protect proprietary rights in inventions; and in the Criminal Code, which creates the offence of theft of some intangibles, such as of telecommunications time. The proof of the civil wrong, or the offence under those laws, is difficult, but not impossible. Proof of the offence which I have proposed may be as difficult; however, difficulty of proof does not necessarily mean that an offence cannot be properly defined or successfully prosecuted.

Such an offence would make inappropriate or undesirable data linkage illegal, regardless of the device used. The effect would be that individuals would be able to inform themselves and weigh the consequences of giving personal information in return for benefits and services, and they would be able to set conditions appropriate to their specific needs, unless the requirement to give the information was legislated. Because it is as easy to modify information as it is to appropriate it, and the modification might cause more harm than the simple taking of the data, the proposed offence would make such modification illegal.

There is a saying in business: "If it ain't broken, why fix it?" I tend to agree, but the offence, if enacted, should be a deterrent to those with access to personal information, whether they are faced with a casual, or accidental opportunity to misuse personal data, or are engaged in espionage. The severity of the sanctions for offenders would, of course, vary with the motive of the person who breaks the law. Presumably, the courts would deal with youthful pranksters in a manner analogous to the way they deal with those who engage in "joy-riding", and with deliberate intruders, who acquire, sell, or use personal data without authority, in the way they deal with people who commit other offences against persons or property. Because the possible motives for, and the consequence of misuse of data may vary greatly, it will probably be necessary to provide for prosecution, both by way of summary proceedings and by indictment.

To prohibit behaviour does not automatically cause it to disappear, and the enactment of the suggested offence would not solve all problems related to the use of the Social Insurance Number, or of other personal data. It should increase public aware- ness of the entitlement of others to some informational privacy and, if the *Criminal Code* were to provide penalties for certain uses of data, preventive security measures would probably be taken by those who collect, store, or use personal data. If there were sanctions in the *Criminal Code*, it is also possible that the courts would find negligence under common law, or *faute* under civil law, if reasonable measures were not taken to prevent the commission of a crime.

It is, of course, also possible that those who collect personal data may insist on release clauses to protect against being charged with such an offence. If individuals choose to provide information in spite of a wide-open release clause, the protection would still apply in respect of dishonest acts of persons other than the beneficiary of the release, but a strong consumer lobby would be necessary to ensure a proper balance between private and organizational rights.

The proposal for an offence against the privacy of another has some additional advantages, in that it would, if included in the *Criminal Code*, apply to everyone in both the public and private sectors, and to both provincial and federal spheres of authority. It does not interfere with provincial laws, such as, for example, those protecting credit information. If necessary, governments would still be able to establish data commissions to control or protect data, and license collectors of personal data within their respective jurisdictions. In addition, the creation of a criminal offence would employ an established mechanism for enforcement; no new legislation or regulation is required to establish procedures, and no new bureaucracy appears necessary.

Finally, barring unforeseen new inventions, the offence would still be a workable concept in a cashless, paperless society, where individuals carry their own data on their so-called smart card.

But we need more than a new criminal offence; an educational program is necessary to enlist the help of individuals to ensure that their own records are up to date and correct. If records containing personal information are inaccurate or out of date, they are useless, and may damage the individual concerned. They may be dangerous. Yet, few people care to check their own records; few seem concerned with the incredible growth in our ability to collect, store, transmit and process information. Few seem concerned with the imminent arrival of the so-called information society, where all records are maintained electronically.

Fair information practices in both the public and the private sectors will become essential. The right of access, the right to seek correction and to complain, must be provided to the individuals concerned. When the collectors of information know that each individual has the right of access, the collectors act more responsibly and fairly. When the authors of reports know that their reports may not be kept confidential, language becomes cautious, derogatory assessments will be supported by examples, or the examples only will be cited, leaving the reader to make up his or her own mind.

In the new information society, everything can be recorded, transmitted and memorized. Nothing disappears with time. What human frailty and laziness provided in the past, laws protecting privacy, and public vigilance must provide for the future. Information which is electronically recorded can be stored in ever- decreasing spaces. It can be retrieved by any identifier that is part of the data. It can be processed and manipulated in whatever way the programmers can imagine. It can be passed around the globe in five seconds, and it need never be destroyed. That is awesome.

The capacity to move away from one's past is disappearing, and, for that reason alone, new attitudes and new protective measures in law must create artificially what fires, volume, loss and laziness achieved in respect of paper files. But laws and standards will not come about until there is a strong demand from the public. One can only hope the demand will be there before it is too late. Fair information practices will lead to storage of less information. More accurate and open information must take the place of confidential inaccessible records. Unsubstantiated data, save where the safety of others or society is involved, ought not be stored. The argument that information will become bland as a result must be met with the counter-argument that only in the rarest of cases should unsubstantiated data be used in the decision- making process that relates to individuals. Only on specified, publicized and exceptional conditions should an individual be denied the right to see records which may profoundly affect his or her life.

I have become a firm believer in fair information practices and laws, and in consumer pressure to have them enforced. Information processing must be subject to control: by the individual concerned, by our governments and by the courts.

I keep telling people to ask the collectors of data:
Do you need to know?
Why do you need to know?
How will you use my personal information?
With whom will you share it?
Will you keep it secure" and confidential?
Will you consult me in order to keep it accurate, relevant
and up to date?

And I also keep saying: protect your personal data as you would protect your cash, your bonds, your jewellery. The facts you do not wish shared may be worth a lot more than a couple of $100 bills.

WORKSHOPS

Centralization vs. Decentralization of Information

Moderator:
Aisla Thomson, Program Coordinator, CRIAW

Panelists:
Margaret Benston, Computing Science and Women's Studies, Simon Fraser University

Ann Hall, Dept. of Physical Education, University of Alberta

Rosella Melanson, Information Director, New Brunswick Advisory Council on the Status of Women

Participants in the workshop examined the advantages and disadvantages of centralization vs. decentralization of information. At first, decentralization appears more democratic, since it broadens access to information. A women's data base could be decentralized amongst women's organizations, but accessible to all women's groups. Applied to business, however, it is feared that decentralization could lead to restrictive and punitive measures in evaluating performance through monitoring the number of keystrokes, the length of telephone conversations, or the frequency of interruptions for women working in their homes.

Among the main issues that were raised are: who controls information; who owns the machines; and what uses are intended by those who own the computers. The use of computerized information for social control is central to the debate on centralization vs. decentralization.

Action:

- To stay informed on the monies granted to Telidon by the Canadian government.
- To use the computer to enhance the women's movement.
- To be better informed on such questions as the distribution and control of information.
- To train for managerial positions in the public and private sectors.

Data Banks - Potential Use for Women's Networking

Moderator:
Lenore Rogers, President, CCLOW

Panelists:
Georgina Heselton, National Chairperson, Coalition of Provincial Organizations for the Handicapped, Telidon Committee

Susan D'Antoni, Director of Distance Education, Ryerson Polytechnical Institute, Continuing Education Division

Susan D'Antoni: An examination of information networks was presented, using distance education as an example. Distance education is particularly suited to adult learners who have many demands upon their time. It is one flexible way of responding to the growing needs of part-time learners. With the rapid evolution of the marketplace, distance education is a must.

People working in distance education have found that one of the major barriers to access to education and training is the lack of information about available opportunities. With technologies such as Telidon, this problem will be erased, in so far as we ensure that the technology reduces, rather than widens the gap between the haves and the have-nots.

Georgina Heselton: The Coalition of Provincial Organizations of the Handicapped (COPOH) is a self-help advocacy organization, made up of persons with many different types and degrees of disabilities. In order that the organization operate effectively as a consumer advocacy group, it is essential that an effective and efficient communications system be established. COPOH experiences communication problems because member offices are located across Canada. Also, information must be communicated to disability groups such as the blind and deaf, and must be available in French.

COPOH endorses the use of Telidon as a means of implementing a national information-sharing network between the national office and its provincial and territorial affiliates. By using Telidon, along with an appropriate national network, all offices will have more effective and prompt access to up-to-date, accurate and factual information from central and local data banks. The information will be available to the members, and content will be controlled by the disabled.

Such a system will facilitate the development of national strategies, and will help to reduce duplicated efforts in planning local issue strategy. Valuable information stored in the data banks will eventually include libraries of technical aids, legal rights, disability benefits, health and welfare services, financial aid, suitable housing accommodations, accessible buildings, career opportunities, peer counseling services, educational opportunities, training programs and human rights.

Among the more evident risks involved are threats to privacy and freedom of information, further increase of technological dependency, and aggravation of existing social, cultural and economic differences. Only by becoming involved can we hope to influence the development of the technology.

Action:

- Women's groups must begin to set up and control their own data banks.
- Distance educators, in particular, must be supplied with current information on all available technological resources.
- We need an updated catalogue of all courses offered through distance education across the country, and of registration fees.
- Women's groups could ultimately keep a list of women seeking employment, and match it with Manpower data.

Case Studies - Information Abuse

Moderator:
Susan McCrae Vander Voet,
National Coordinator, CCLOW

Panelists:
Victor Schwartzman, Freelance
Writer, "Unemployment
Insurance"

Maureen MacDonald, Community
Legal Worker, Dalhousie
Legal Aid Service, "Tenants'
Black List"

Victor Schwartzman: The information gathered by this panelist indicates that Unemployment Insurance Canada has designed a computerized system, called the Benefit Control Program, which serves to monitor selected claimants. According to the panelist, within this system, all women are singled out for special scrutiny. As such, the system exemplifies sexism embodied in government policy.

Maureen MacDonald: The "Tenants' Black List" consisted of an information system that was set up privately to provide Halifax landlords and other "corporate entities" with information on tenants, collected through such unreliable sources as gossip. Disclosure of the existence of the list led to a public outcry. Through the intervention of a cabinet minister, the service was eventually shut down. It served as a powerful example of information abuse.

Action:

- As individuals and members of organizations, we urgently need to act to protect ourselves from information abuse.

Data Banks: Access to Information on Women

Moderator:
Aisla Thomson, Program
Coordinator, CRIAW

Panelists:
Nita Cooke, Representative
of BerCo Information Research Ltd.

Sheila Bertram, Assistant Professor,
Faculty of Library Science,
University of Alberta

Deborah Brecher, Coordinator,
National Women's MaiJing List

Jill Lippitt, National Women's
Mailing List

Panelists discussed the advantages of technology in areas such as indexing and building bibliographies. The technology can be seen as a tool to empower women through rapid diffusion of information and other uses, such as the National Women's Mailing List, which was discussed at length. The technology enables us to record our own history and culture, if we choose to use and develop it according to our needs and interests. This means decentralizing information to make it available to large numbers of women; checking the system so that individual and collective rights are respected; and ensuring that machines and programs are designed to serve the public, and not vice versa. Several of the problems raised were related to copyright, costs, privacy of research, and censorship.

Nita Cooke and Sheila Bertram reported their preliminary finding for a study which was undertaken to explore the ways and means available for the compilation of a computerized bibliographic retrieval system containing information on, or of interest to women. This study was jointly commissioned by CRIAW/ICRAF and the Alberta Women's Bureau. They found that no specific bibliographic data base on women is available to date. They suggested that anyone involved in creating such a data base would have to be aware of,

keep up with, form networking contacts, etc., with all of the varied activities concerned with access to information about women, if only to avoid unnecessary duplication or missing of opportunities for sharing and cooperation.

Action:

- Individuals and organizations should seek information on the National Women's Mailing List, and possibly join. Pressure should be exerted, through funding sources, to have women's journals indexed.

Communications Technology in Business and Industry

Moderator:
Dorothy Morris, Director,
CCLOW; P.E.I.

Panelists:
Joan Newman Kuyek, Community
Legal Worker, Sudbury Community
Legal Clinic

Carol Hughes, Manager of Equipment
and Software Planning, Air
Canada

Nancy Sunderland, Consultant,
Telemet

Computerized corporate communication networks, within and between enterprises, contribute to increased productivity, improved service and decreased cost. Automation cannot eliminate bureaucracy, but it does free workers from boring and repetitive tasks.

Issues raised were:

- The need for massive retraining of workers.
- Machines ill-suited to the operators.
- Security of. information,
- Computer piracy.
- The need to ensure that the users, not the programmers, control the information.
- Dependence on large-scale systems, and the resulting unemployment problem.
- Consciousness raising for managers, aimed at a global approach to the introduction of microtechnology.

Action:

- Women must take responsibility for their own education in the context of the new technologies.

Informatics

Workshop Leader:
Irish Fitzpatrick Martin, University of Montreal

Information is increasingly mediated (i.e., processed, stored and communicated) by technological devices. This "info mediation" (term coined by the author) of all societal activities impacts upon women in every working area: housework, clerical work, medicine, teaching, sales and services, and factory work.

Referring to her study, "Women and Inform mediation: The Six Interfaces of Eve" (Gamma, Information Society Programmed), Iris Fitzpatrick Martin examined the present situation of Canadian women, and the probable effects of info mediation on each occupational category.

Changing Employment Patterns

Overview

Chair:
Rosemary Billings

Speaker:
Patricia McDermott, Sociologist,
York University

Attempting to understand the dramatic scope of the transformation presently taking shape in the workplace is an immense undertaking. So vast is the transition, so rapid the technological advances, that most people risk being left on the sidelines, baffled or amazed, angry or in awe.

As the chip replaces mechanical parts, the labour-intensive economy collapses, leaving masses of unemployed workers and rendering current skills totally redundant. Women are particularly affected, since they are concentrated in the service sector where technology is making gigantic inroads. Secretarial work, banking, ticketing, fast food, reservations,

telephone communications all require less and less human labour.

Those who remain employed face such stressful conditions as machine monitoring and homogenization of tasks. Health hazards are frequent. Those who become unemployed undergo the rapid deterioration of their buying power, a tragic fate for the individual, the family, the community, and also for the national economy.

Such shocking consequences must not deter us, however, from accepting the growing presence of technology in every sphere of life, and trying to come to grips with the issues of the immediate future. Systemic re-organization is required to deal with such pressing concerns as income distribution, quality of working life, control of the marketplace. We need to develop participative management, in which workers are part of all decision-making processes. Men and women must act responsibly by expanding their knowledge of the impact of the technological revolution, by demanding their rights in the workplace and by participating, in whatever way, in the collective questioning about the kind of world we want to create, with the help of microtechnology.

WORKSHOPS

The Integrated Office: What is it?

Moderator:
Sheila McFaddzean

Speaker:
Mary Baetz, Consulting Services

New office technology is quickly creating many simultaneous changes. All change, even for the better, is experienced as a disruption, and disruption is anathema to most organizations. The existing rules, norms, procedures, divisions and hierarchies all work to maintain a steady state, and to isolate and diminish the impact of disruption. How to manage a disruption for which there are no rules, norms or procedures, and which spans divisions and hierarchies, is the challenge facing management.

The key to increasing organization effectiveness is not the selection of appropriate tools, but selection of appropriate methods for introduction and integration of these tools. The new technology has significant implications for the way people will work in the future. Indeed, the definition of "work" will change, and the distinction between work and non-work will blur. This will result from an increase of people working out of their homes, working varying schedules, working part-time, and sharing jobs between or among two or more employees.

Enhanced communication, due in part to electronic message switching and electronic mail, will allow a simultaneous decentralization of offices with a centralization of control for critical parts of the business. The tools of office automation allow for more flexibility in treatment of individual employees and the changing demands of the marketplace. Response time can be shortened significantly, and the quality of decisions made can simultaneously be upgraded.

A number of issues must be dealt with on a strategic level, in order to ensure that the organization as a whole is able to maximize the benefits and minimize the costs (including social) of the new office tools. The first issue is integration of the tools, which fall into three categories: equipment (hardware), information manipulation and management (software), and physical facilities. Many organizations understand the need to integrate the hardware, and thereby, to reduce the need to repeat tasks.

The issue of integration of information management in relation to office technology, however, is less easy to resolve. Each division, department and organization has its own information, which it regards as a resource. The unit will want to retain control over the information, and to manage its use and possible misuse by other units. Yet, the organization will recognize maximum benefit if it has access to all information in a format which the whole organization can understand.

The new technology will be a driving force to an eventual restructuring of the organization. As the various tools are integrated and the organization uses information in innovative ways, new methods of working and relating will emerge.

The new technology will also have an impact on the physical space, lighting, and type of office furnishings required to perform the tasks. For example, present lighting is designed for work at a desk with paper, rather than work on an electronic console, and the same is true of present office furniture.

Every function within the organization will feel the impact of the introduction of office automation tools. Some job categories will disappear, some will be created, and almost all jobs will be affected. Issues of job design, career planning, performance appraisal and the like, will emerge. The training function will generate a considerable amount of work.

The impact of the office tools will be system-wide. Any strategy considered must be based upon a system orientation, and must be measured by its ability to meet the system-wide needs.

Employment for the Handicapped

Workshop Leader:
Pat Israel, Assistant Manager,
AG Neale

Approximately 85 per cent of disabled persons are unemployed. Architectural barriers, archaic attitudes, inadequate education, and expensive aids are seen as the prime causes. In many ways, the new technology will help disabled persons to overcome these barriers. Activities such as shopping and banking will become readily accessible through the home terminal. Homework will reduce traveling problems. Changes are urgently required, however, if the new technology is truly to serve the disabled:

- Career planning, well adapted to the specific needs of the clientele.
- Flexible work hours for everyone, with emphasis on results, rather than amount of time spent on the job.
- Insurance protection for the firms that hire handicapped employees. (Insurance companies currently do not offer such coverage.)

Action: Educational institutions and other agencies serving disabled persons should concentrate on teaching them how to use micro technology as a tool for various skills. To favour the autonomy and mobility of individuals, central agencies, such as tool and aid banks, could be set up by employers. As individuals and groups, we must lobby governments for legislation to amend the different and unequal work rules governing hiring of handicapped employees.

Automation: How & Where It's Happening

Panelists:
Carole Swan and Carol
Collier, Ottawa

The first speaker, Carole Swan, focused on four points in her discussion of the development and introduction of microelectronic technology:

- The competitive imperative: We cannot afford to ignore or stop the development and application of micro-electronic technology. Following this course would provide, at best, temporary protection against job loss, but at the expense of the continuing economic viability of our country.
- The technology will affect different sectors differently. The service sector, the source of a large part of our recent employment growth (particularly for women), is a prime focus of the new technology.

- How the technology is implemented is very important. Microprocessor technology is being applied in a context of women's economic, social and political inferiority. Whether the technology will reinforce the present division of power and authority, or will be a tool to challenge it, remains to be seen.
- The possibility of fundamental change in some of our basic institutions and relationships is real. If micro-electronic technology succeeds in dramatically reducing the need for human labour, how will we cope, given a society that defines and rewards people largely by what they do in the paid labour force?

The second speaker, Carol Collier, discussed values and choices in implementing new technologies. Decisions are being made in the workplace by individuals who exercise choices based on a particular set of values. Unless the values inherent in our hierarchical, male-dominated workplace are changed, the current unequal position of women in the workforce will be reinforced and exacerbated by the advent of micro-electronic technology.

Both speakers emphasized the need for women to be involved in the decision-making processes of automation. Efforts to change discriminatory institutions and systems must continue.

Case Studies - Word Processing in the Office

Moderator:
Lil McIlwain, Senior Counsellor,
Women's Bureau, Manitoba

Panelists:
Karn Sandy, Manager, Word Processing
Consulting Services
Branch, Department /Government
Services, Manitoba

Janice Manchee, Researcher
and Author

Karn Sandy related how the Manitoba government proceeded to set up its Word Processing Consulting Services Branch, of which she is the director. The functions of the program are:

- To supply government programs on the use of word processing technology.
- To supply government programs with the tools required to comply with government policy, and for adequate planning, implementation and management of office systems that use automated word processing equipment.
- To coach and support programs in all aspects of their word processing activities.
- To help programs resolve problems that may arise from the introduction of technology.

- To continue research on word processing issues, and to recommend changes in policy or procedures, as appropriate.

The presentation outlined the urgent need for a global approach to the introduction of micro technology in the office.

The Effect of Microtechnology on Work and Employment

Workshop Leader:
Céline Saint-Pierre, Professor of
Sociology, UQAM

The implementation of micro technology in the workplace affects, not only the volume of employment, but the organization and pace of work, as well as criteria for control and evaluation of performances. The problem of deskilling raises the issue of professional training vs. technical training. Job ghettos are growing rapidly; the labour force is undergoing profound changes, due to the increase in the number of part-time jobs, the decentralization of the workplace, and telework.

How can we move beyond negative attitudes to find realistic and creative global solutions? Women have a particular role to play in this questioning of the meaning of work.

Action:

Among the proposed solutions were:

- Reducing the hours of work.
- A fundamental questioning of work content.
- Rotation of employees to avoid work ghettos.
- Co-managing firms.
- Creating committees to plan the implementation and uses of technology.
- Providing specific training within the framework of global programs.
- Unions must seek to organize more female workers. They, in turn, must play an active role in their unions.
- Unions must demand improved criteria for the implementation of technology, and must negotiate control of part-time work.
- Canadian women's groups must offer leadership on these issues. As a first step, they must ensure follow-up to this conference.

Job Protection: Legislation and Collective Agreements

Moderator:
Michelle Swenarchuk, Labour Lawyer, Canadian Union of Professional & Technical Employees

Panelists:
Katherine McGuire, National Representative, Research and Legislation Branch, CLC

Monique Simard, Women's Committee, CNTU

Canadian workers need improved and comprehensive legislation for the protection of their rights in light of the technological revolution. Trade unions are now beginning to address the issue, but, if all workers are to be protected, it is in legislation that such protections must be enshrined. The following principles should be retained:

- All technological changes must be negotiated between union and management.
- Unions should have access to all information relating to technological change.
- No reduction should be made in the workforce.
- Retraining.
- Limit on deskilling.
- Health .protection should be instituted as soon as suspicions of possible problems arise.
- Micro technology should be introduced step-by-step, not all at once.

Action:

- Unions must embark on a broad campaign to educate their members on the impact of technological change.
- Unions must increase their effort to reach unorganized workers.
- Unions must struggle to strengthen the rights to strike and to organize.
- Women's groups, unions and other community organizations should unite in a coalition to develop a charter of rights protecting Canadians from the negative aspects of technological change.

The Changing Nature of Jobs & Organizations

Workshop Leaders:
Julyan Reid,
Sociologist & Policy Analyst

Pat McDermott, Sociologist,
York University

Certain countries have adopted management systems which could serve as models for Canada. Among these are Japan and Scandinavian countries. In elaborating global strategies to integrate microtechnology in the lives of Canadians, it is necessary to consider both the micro level, (work environment, individual activities) and the macro level (global evolution of society). Women's groups are perceived as being particularly apt to propose well balanced strategies for the future. Problems to be solved include the management of benefits and an equitable redistribution of incomes generated by the new technology.

Action:

- Women workers must unite to demand fair participation in the planning of technological change. Through unions and pressure groups, they must demand legislation and norms to protect their rights, particularly their right to an adequate job.

Occupational Bridging

Workshop Leader:
Heather Menzies,
Researcher/ Writer

Rapid change necessitates an evolutionary and comprehensive approach to training and employment. Occupational bridging, or job redesign is seen as one such approach. In it, the employer allows for the redundancy of job functions, rather than the redundancy of people. Possible elements of this approach could be apprenticeship programs, cooperative work/study programs, and affirmative-action programs. As a result, employees would grow with the evolution of job content and with increased emphasis on their particular skills: a bonus for both employer and employee.

Action:

- Women's organizations should set up job banks and a clearing house of resources for working women.
- Women should set up private courses for teenagers, geared towards top administrative skills.
- Women need to start their own businesses.
- Women must participate increasingly in active politics.
- Women must increase network activities, in order to share their knowledge and experience, strategize, unite in investing, etc.

Women, Computers & Change: The Impact of Computers on Large Organizations

Workshop leader:
Zorianna Hyworon, Executive
Director, Information Management,
Dept. of Finance, Manitoba

Women must learn to view the computer as just another tool, which is precisely what it is. Women have developed attitudes and strengths, which must now be put to work in the area of administration. By participating in corporate decision-making, women influence technological advance and direct it towards the realization of their views of society.

Case Studies

Moderator:
Susan Phillips, Research Officer,
Public Service Alliance of Canada

Panelists:
Patricia McDermott, Sociologist,
York University, "Service and
Retail Workers"

Donna Robinson, Communications
Workers of Canada, "Communications"

Microtechnology has brought about the deskilling of workers. Functions of control/evaluation are increasingly monitored by machines, at the expense of human relationships and a sense of belonging. Work is dehumanized and boredom prevails. Health and security are negatively affected. Humanity is imprisoned by the vision of large corporations.

Two possible avenues of redress were considered:

1. Education of adults, as well as youth, to prepare them for adaptation to rapid change and to use technology while asserting their rights.
2. Union negotiation of specific agreements to protect workers during the implementation of new technology.

Action:

- It is imperative that individuals and groups define what they want from technology and assert their will while pursuing their own projects. It is our responsibility to develop a vision, and to use technology for our benefit.

Microtechnology & Third World Women

Moderator:
Theodora C. Foster, Vice-President,
EDPRA Consulting Inc.

Panelists:
Anuradha Bose, Development
Education Officer, Canadian
Council for International Cooperation,

Laketch Dirasse

A descriptive comment was presented on the psychological, physical, biological and chemical hazards facing women in high-tech employment areas. The specific dangers for Third World women were discussed in the context of socio-political conditions frequently found in their countries. When enacted, protective legislation tends to favour segregation, if not complete exclusion of women from many occupations.

Action:

- Investigate potential health problems. Do not be fooled by propaganda.
- Be aware of links between Canadian business interest and the labour pool of Third World women
- Urge all levels of government to adopt preventive measures and protective legislation, and to promote such measures and legislation in Third World countries.
- Pressure the federal government for adequate testing of all equipment.
- Pressure the federal government to end the unsafe dumping of products and equipment in the Third World.
- Such pressures can be organized through consumer advocacy groups and should be geared, not only to government, but also to the private sector.

Training and Retraining

Overview

Chair:
Ginette Sabourin, Training Officer, House of Commons

Speaker:
Merran Twigg, Director of Women's Division, Ministry of Labour, Saskatchewan

One cannot address the issue of training and retraining for the labour force without taking a comprehensive approach, including a redefinition of work. What is work? What is leisure? Given the magnitude of changes in life-styles and work patterns that have resulted from the micro technological revolution, how do we now plan for a just, adequate distribution of income among Canadians?

The new technology has not increased job creation; rather, the marketplace seems to be narrowing more than ever, with the result that more workers are unemployed while we experience a shortage of skilled labour. Are women ready for this new reality? Surveys indicate that female students are increasingly diversifying their studies into areas such as mathematics, science, management and law. This trend, however, is not yet reflected in the work- place, where women remain confined to ghettos and dead-end careers.

Women who decide to further their education must take a hard look at the workplace and ask themselves what types of skills are now required for what types of jobs. The humanities will survive the supposed takeover of technology, but they will have to be adapted to today's needs. Is the training that one is about to begin open to change, geared towards the new dynamics of the workplace and the society at large? Is training simply a new form of welfare? Microtechnology can help women to free themselves from monotonous tasks, to pursue challenging career paths and creative life-styles, but only if the individual, alone or collectively, takes time to ask the broad questions about work and training, to put forth her views, and to plan her own life-long training path.

WORKSHOPS

Counselling Women about Retraining

Moderator:
Clare Devlin, Women's Programs,
Algonquin College

Panelists:
WS. Babbitt, Teaching Master,
School of Technology, Loyalist
College

Alice Seth, Counsellor, Sheridan
College

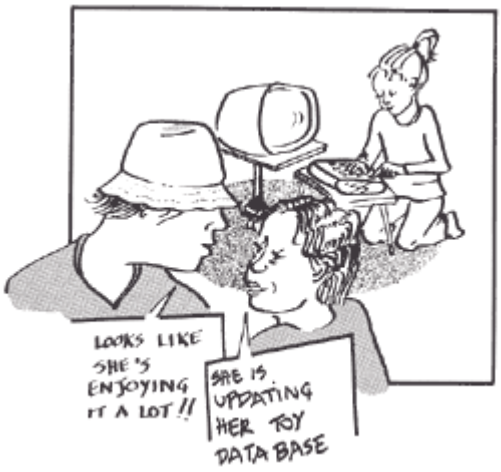
Lisa Avedon, Program Coordinator,
Conestoga College

Lisa Avedon: In light of retraining programs offered at Conestoga College, participants were urged to set up programs leading to careers in computers. In order to help candidates overcome their fear of technology and to encourage the participation of workers, courses could be offered in evenings or on weekends, in unthreatening locales. The use of audio-visual material was suggested, to promote the learning process and rapidly demystify microtechnology. Counseling sessions in small groups could help students examine their

own learning processes and working habits, to identify their needs and interests. Finally, 15 hours of training on the computer, combined with a course of about 60 hours on computer literacy, were suggested as a good starting point to a career in computers.

Alice Seth: Sheridan College offers a five-week course to adult women, most of whom are mothers at home. Candidates must have completed courses in mathematics, physics and chemistry at the Grade 12 level. The program reviews acquired knowledge and skills in electronics and mechanics. Certain classes are held in the laboratory; others in local industries. Beyond providing specific training and motivating women towards careers in technology, the program helps to eliminate stereotypes, through the models of women who have broken all-male barriers in industry.

Bill Babbitt: The Industrial Laboratory Assistant course offered at Loyalist College is a 40 week program, largely funded by Employment and Immigration Canada, which can lead to the Two year Technician Training program. The course stresses the interdependence of technological fields and workers at all levels. Particular attention is paid to student motivation and to improving self-confidence through familiarity with equipment.



Action:

- The importance of in-house upgrading programs for retraining employees, particularly support staff, is stressed.
- Women's communication networks are becoming vital: women must become aware of available programs and new job opportunities, and be encouraged to seek management and decision-making positions.
- Alumni can be useful support groups to provide teachers and students with information about existing courses, new orientation in the field, and job opportunities. Their help can be extended to recent graduates entering the workforce, through evaluation, information sessions and influence networks.

- There is a particular need for a comprehensive directory of training programs available throughout Canada. It is urgent that resources be shared among provinces, and educational programs be standardized.

Directions and Strategies for Training: Implications of the Dodge Report

Moderator:
Lee Farnworth, CFUW

Panelists:
Lynn Wilkinson, Coordinator,
Adult Education & Training,
Labour Market Development
Task Force, CEIC

Lenore Rogers, President, CCLOW

Women are poorly informed and poorly guided in the area: of training programs. The problem is compounded by rapid changes, which keep the workplace in constant flux. Innovations are so rapid that training needs are difficult to identify. Women's training is too often outdated and only serves to confirm their inferiority in the marketplace. To the degree that the National Training Act is concerned with specialized jobs, it ignores the needs of a majority of female workers.

Action:

- The urgent need for educational institutions and employers to improve the coordination of training programs.
- The elaboration of courses providing technical training geared to specific careers in the field of high technology.
- Training that will prepare women to participate in the decision-making process in the workforce

Women, Trades and High Technology: Training Options for Women

Moderator:
Audrey F. Swail, Counselling Consultant, Women's Bureau, Ontario Ministry of Labour

Panelists:
Linda Briskin, Director, Centre for Women, Sheridan College

Jo W. Tombaugh, Department of Psychology, Carleton University

Susan Booth, Women's Workshop, London

Jo W. Tombaugh: While it is true that the technological revolution involves a vast re-orientation of training programs, it certainly does not eliminate traditional sectors. The liberal arts will survive, but will be transformed. Faced with a constantly evolving workplace, having to retrain, and being displaced to new jobs, workers will more than ever need support services, such as guidance, social work, etc. On the other hand, user manuals will be required for the equipment, and designers will be needed to plan the use of space. Therefore, many fields of study can be considered, but teachers and students must never lose sight of the new technological realities.

Linda Briskin of Sheridan College focused on the role of the College's Centre for Women in setting up an introductory course in high technology for women. The Centre organized other related programs, such as assertiveness training, ongoing counselling, and a conference dealing with micro technology from a feminine perspective, to promote studies in untraditional fields.

Action:

- Several Canadian colleges have closed their Women's Centres, in spite of opposition from staff, female students and the community at large. Worse still, some have always denied the need for such a service. Women's groups must exert pressure on colleges to re-open women's centres.

In-house or Out-house Training - The Implications for Women

Moderator:
Carol Armatage, Systems Training Officer

Panelists:
Sher Anderson, Women's Employment Coordinator, CEIC, Saskatchewan

Deanna Melnychuk, Manager, Office Services Group, Northern Telecom

When offered through the employer, training tends to be defined narrowly, according to immediate needs. Consequently, it is not easily transferable to other organizations. Frequently geared to management candidates, it is dominated by male attitudes and excludes most women. The problem is compounded by women's tendency to avoid training for a number of reasons, one of which is math anxiety. Finally, in-house training is directly linked to the financial status of the enterprise: when times are bad, training opportunities are dropped, or seriously curtailed.

Out-house training presents another set of disadvantages. For example, it is almost impossible for schools to forecast needs. As a result, training is frequently obsolete. Full-time day courses are cost-prohibitive and the waiting lists are endless. Moreover, few women are on those lists, largely as a result of poor counseling in the high schools.

Action:

- Women's groups must lobby governments for tuition subsidies for women who seek training in technology-related fields.
- Some women welfare recipients, for example, have access only to courses offered by government. Pressure must be exerted for better counseling and adequate financial support.

Skills Transference/Career Mobility

Moderator:
Eileen O'Neill, CEIC

Speaker:
Sharon Varette, Senior Research Consultant, Abt Associates of Canada

Is the gap widening between low-level and high-level jobs in the high-tech office? Training for women has concentrated on word processing: a dead-end. Before too long, voice recognition and output in computers will eliminate much of the work now linked to the keyboard. To become truly mobile and to break out of the low-level operator jobs, women will have to acquire computer knowledge and skills, while simultaneously pursuing broader studies in their own fields of interest. This forked path could contribute to new career opportunities. Reasoning skills, planning and communications, design and writing are all fields to explore.

Action:

- Canada should follow the example set by Norway in establishing an independent "Work Research Institute" to document the ongoing changes in the job market, to forecast new developments and educational needs. Women must pressure government for the establishment of such an institute.

Math Anxiety: Overcoming Obstacles to New Career Paths

Moderator:
Debbie Jelly, Development Officer, Algonquin College

Speaker:
Catherine Rellinger, Seneca College

Mathematics is not the issue; anxiety is the issue. Students are easily threatened by the fact that, in mathematical operations, there is only one answer. You get it right or you get it wrong. For some, this is a source of great anxiety.

To help alleviate the anxiety, teachers should provide their students with adequate rules for their learning process. Terms should be well defined, so that students have the complete information required for understanding. On their part, students must become more assertive in demanding information and guidelines. The gap between high school and post-secondary training simply exacerbates the problem. Furthermore, counseling for students who suffer from math anxiety is insufficient and inadequate.

Action:

- Counselors at all educational levels must develop better skills to help alleviate math anxiety in women.
- Teachers must adapt their pedagogy to take into account the anxiety factor.

Coping with Microtechnology: Middle-Management Crisis

Workshop Leaders:
Joan St. Laurent, Graduate Student,
Department of Sociology,
University of Ottawa

Marilyn MacDonald, Ottawa

Because it replaces mental labour, the new information technology can centralize information and change the focus of decisionmaking. Information relevant to decision-making tends to become available quickly in a precise form. The decision-making process is pushed higher up the authority hierarchy, to top-level management. Women are under-represented in management at all levels - particularly at the top, where jobs stand to be enriched by the new technology.

Top-level management will make the decisions on how, when and where new technology is introduced. The number of jobs available at that level is not likely to increase significantly.

It is imperative that, through training, retraining, affirmative action programs and other means, women committed to the advancement of women be equitably represented in top management. We must inform women and organize them around the issues; lobby political parties, unions and associations. The issue of how, when and where the new technology is to be introduced requires and deserves unified action by all women.

Action:

- Strategizing, on both an individual and collective basis.
- Individuals must retrain for top managerial skills, accept relocation, and aggressively embark on well planned career paths.
- Individuals and groups must become directly involved wherever decisions are being made on the implementation of new technologies.
- Job-evaluation methods and descriptions must be modified to fit the person, rather than vice versa.

EDUCATION

Overview

Chair:
Martha Colquhoun, Executive Member, CCLOW; Manitoba.

Speaker:
Mary Beth Dolin, MLA, Manitoba, for Education Minister, Maureen Hemphill

At the outset, I want to congratulate the cosponsors, the Canadian Congress for Learning Opportunities for Women, the Canadian Federation of University Women, the Canadian Research Institute for the Advancement of Women, and the National Action Committee on the Status of Women, for arranging such a demanding and pertinent conference as this.

Its theme was anticipated by Alvin Toffler some years ago, in his thought-provoking book, *Future Shock*, when he predicted such major, radical and swift-changing events in the human condition. Add to this technological and sociological turmoil the dramatically changing role of women in society, and you get some idea of the major issues that confront us.

It is appropriate that your conference is held at this time of year, when young people are just graduating from our educational institutions, and are being confronted with challenges of major proportions. I think very few sights are as satisfying, or as hopeful for the future, as that of witnessing these young people, with proof of academic achievement, completing a major stage in their education. But we must constantly remind them that education is a continuous, life-long process. Never before have high-school, community-college and university graduates been subjected to such powerful and sweeping changes, and the need for constant education is urgent.

Sometimes it is difficult to persuade children that they really do need to look upon education, and re-education, as a life-long process. We can all sympathize with the father who hung a sign on his front porch: "For sale, new set of encyclopedias, never used. Teen-age son knows everything."

That respected anthropologist, Margaret Mead, succinctly defined the situation. "We must create," she wrote, "new models for adults who can teach their children not what to learn but how to learn, and not what they should be committed to, but the value of commitment."

When it comes to computers and the technology they represent, it is easy to see no one is doing much to encourage women to make a commitment to "own this field of learning and achievement. Most of you have probably seen the ads for the computer games manufactured by Atari and Intellevision. Whom do you see operating the games? Fathers and sons, and in one case, a daughter. Mother is shown, if at all, as hovering in the background. The Intellevision ads with George Plimpton don't even show women on the screen at all.

Anyone who understands how these slick, expensive ads are made will tell you that they are based on careful market research. The attitudes of the market are known, before the ads are made. In other words, the people who make computer games know they can sell them to upper middle class dads, not moms. Just think about where this leaves women, and more important, their daughters. It is men who buy the games, the home computers; and it is the boys, following the role-model behaviour of their fathers and peers who dominate their use, not just at home, but in the electronic game parlours as well.

So, the ads reinforce this pattern. I personally find it I amazing how quickly these subtle patterns of role-playing, based on sex stereotypes, come into play. The time to challenge these stereotyped images, of course, is now, before they grow deep roots.

An effective place of challenge is the school. In Manitoba, we have scarcely begun. Two microcomputer pilot projects are currently being sponsored by the department and school divisions. In Brandon School Division, children in grades 4 to 9, involving a total of 160 students, are gaining computer literacy by direct interaction with machines which have a variety of learning games. Forty-one per cent of the students in this program are female, but that figure does not represent any bias; it is simply the number of girls in the classes that are taking part.

Another jointly sponsored program, in Winnipeg's Kildonan East Division, involves 5 female and 15 male students in grades 10 to 12. Manitoba has a number of other programs in its schools, but I purposely wanted to mention the Brandon program because it shows the trend towards involving younger and younger age groups. I will discuss some of the other programs in a moment, but I want to re-emphasize the sometimes not-so-subtle sex stereotyping that has entered the computer field with this true story.

My colleague, Manitoba's Education Minister, Maureen Hemphill, shortly after becoming Minister, took a tour of a community college in Winnipeg. (I must mention her, because, after all, I am representing her here.) Anyway, on reaching the computer area, she was literally dragged in to see a very sophisticated computer the school was especially proud of.

Mrs. Hemphill was told she could ask the computer any question she wanted about the school, and the computer would have the correct answer in a matter of seconds. The computer, Mrs. Hemphill was told, had never given a wrong answer.

Intrigued by all this, Mrs. Hemphill typed in to the computer: "What is the floor space of the college?" The lights on the computer flickered, the wheels with the magnetic tapes whirled, and in a few seconds, the answer came out: "The answer to your question, Mr. Minister, is. . . ." Well, so much for chauvinistic computers. If women are to become literate about computers, computers better become literate about women.

The onus will be on women to see that both occur. Much is at stake for women. Let me explain: according to the Science Council of Canada, 30,000 positions are now open in the high-tech industry; it is predicted that, by 1985, Canada will need 8,000 engineers and Ph.D. scientists, and only half that number are likely to be available.

From a job-placement point of view, this is encouraging. But Dr. David Suzuki, perhaps Canada's best known scientist, has emphasized that, not only the lack of literacy in computers, but the lack of literacy in science in general threatens our democratic institutions, because citizens are ill-equipped to decide questions involving use of new technology and serious moral questions about the nature of humanity. Dr. Suzuki contends (and it is difficult to disagree with him) that these issues are far too important to leave to politicians or scientists alone.

And if the situation is poor for scientific training in Canada, it is particularly poor for women. In 1980 only 8 per cent of those who earned Bachelor of Science and Engineering degrees were women. The number was a little better in Mathematics and Physical Sciences, where the total percentage of female graduates in 1980 was 28 per cent. In the computer field, even at the community-college level, men dominate the percentages.

In computer technology this past year, 96 per cent of the enrolment at Red River Community College in Winnipeg was male. And believe it or not, that is actually an improvement over 1977, when 100 per cent was male.

Conditions are not likely to change very quickly, unless we do something about the role models of girls in schools. For example, a study done in British Columbia in 1978 showed that there were only 12 per cent of junior high school teachers who were female. And in senior high the situation was worse. Only 6 per cent were women. There is no reason to believe that statistics from Manitoba would be significantly different.

Dr. Meredith M. Kimball perhaps raised the issue best when she addressed a "Workshop on Science Education of Women in Canada," sponsored by the Science and Education Committee of the Science Council of Canada. She concluded: "It is time to stop debating how large the sex differences are, if they exist at all, or where they come from. We must focus on the important question: Why is it that the difference in participation of men and women in scientific fie lds is so large, when sex differences in intellectual abilities are so small?"

Clearly, there is need for affirmative action when it comes to girls in school and science education, particularly computer science. In a very useful document entitled, *Who Turns the Wheel: Proceedings of a Workshop on the Science Education of Women in Canada,* the following six points are made. They, in fact, summarize much of what I have already said.

The report makes the following points:

- "Most parents encourage boys' mechanical inclinations and girls' domestic ones.
- In school, girls - at the age of 10, when school options start to become available, - receive less encouragement than boys to take math and science courses.
- Role models for girls are rarely scientists.
- Girls are seldom guided towards technical apprentice programs
- Girls are frequently unaware of scientific and technical job opportunities.
- The mass media do little to change these patterns."

For all the talk about computers, educators are doing a poor job of informing the public about the questions which must be dealt with. Louis T. Rader, professor of Business Administration at the University of Virginia, has three questions for those who make school board decisions:

"First, what is meant by 'computer literacy,' which in practical terms might be put this way: 'What should a high school graduate know about computers' or better still, what should a high school graduate be able to do with computers? Merely reading about computers or hearing about them from the teacher does not make our students literate in computers, any more than reading about numbers would make students mathematically literate.

My second question is whether 'computer literacy' is considered by the school administrators to be at the same level of need for students as reading, writing and math. And why not? Computer literacy is now a basic skill of such great dimensions that every graduate requires it. Dr. Donald Michael of the Centre for the Study of Democratic Institutions wrote twenty years ago that 'ignorance of computers will render people as functionally illiterate as ignorance of reading, writing, and arithmetic.'

The third question is whether our teachers are trained in the use of the computers or at least familiar with them and appreciate their potential. Certainly computer literacy for teachers must precede computer literacy for the students, at least until the software makes the teachers' role more to assist the learning process than to teach as in the past."

On this last point, Professor Rader warns of two dangers: the ability of teachers to resist and undermine a system of change which they are not a part of; and the danger of "the unfortunate combination of sophisticated machines and unsophisticated buyers."

These two points are extremely important in Manitoba. As you know, the Pawley Government is a new administration, still within its first year. But very quickly it became evident that major issues had simply been ignored or put aside by the previous government. One area was computers in schools. Therefore, in March, Education Minister Hemphill named a committee to look at the subject of school computers. Mrs. Hemphill, did not want to put - as Professor Rader cautions - "sophisticated machines and unsophisticated buyers" together.

The committee's report has not yet been made public, but I have the Minister's permission to tell you that the committee decided quite easily that, if computers are to be seen as technical aids, there is no problem. There has always been a place for such aids in education, and teachers have adapted to them readily. Unfortunately, computers, while they can be used at the minor level of technical aid for a short period of time, quickly challenge teachers and students into wider and

more sophisticated use.

There is a strong evidence in Manitoba schools that we have gone well past the technical aid stage. Already, 15 per cent of Manitoba schools own their own computers, and another 20 per cent intend to do so by the end of the year. In addition, many school divisions have high-school programs making use of a link to a central computer system in Winnipeg.

Without wishing to give away any of the content of the Minister's Task Force Report, it strongly recommends that new committees be formed to tackle the question of what hardware to use, the question of programs to put into the machines, and a committee to see that enough teachers get computer training to allow this new technology to be properly used. As important as the above issues may be to education decision-makers, I'm sure the common sense and intelligence of teachers will bring forth even more important concerns.

The point is, computers and all systems developed through micro technology must always - always - be considered a tool, and not an end to themselves. There is an ever-present danger that the complexity of computer systems can put a great deal of control beyond the reach of people, and that the computer itself will assume growing power. Some of the new machines, with the promise of artificial intelligence, may usurp established patterns.

An apocryphal story illustrates the point: two scientists had built the world's biggest and best computer. Even using microchip storage capacity and bubble memory, this machine still took up eight storeys of office space, but it had every piece of knowledge known to man. Every human language, every bit of folklore, every bit of scientific information and philosophy was stored within its memory banks.

Finally, the day for posing the most important question in the world arrived, and the scientists slowly posed the question: "Is there a God?"

The computer took nary a second to answer. In its deep, mechanical voice, it boomed forth, "There is now." Frankly, that is often the way in which computer aficionados see computers. It is a frightening prospect. As an educator myself, I can tell you that it is also a prospect educators will not accept.

Of course there will always be a place for the teacher to wipe a runny nose or hug a frightened child, to admonish a class that has been careless of the rules or someone's feelings. That is the human element, which no computer could ever duplicate. But beyond this personal, human touch lies the greater need for broad education, to teach children to live and work effectively in the computer age. They must learn, as I said before, to use computers as tools - and very effective tools they are. But human learning, human understanding, and the need to learn to live fully within our global village on human terms must always take precedence over technical knowledge and technical application of the machines that we have created for our own benefit.

The symbol the Chinese use for the word "crisis" means both danger and opportunity. That is exactly what computers pose to the school system: danger and opportunity. Opportunity to provide new and exciting job opportunities for women, once stereotypes are attacked and discarded; danger, if such technology allows us to forget that education requires a moral and humane content.

There is opportunity as well, in decreasing some of the routine of learning. I have seen children completely engaged in meeting the individualized challenges which computer-assisted learning can present. There is danger if the time spent in front of a machine is taken from the time children spend with one another, learning to socialize.

Writer Tom Wolfe suggested that the 1970s were a decade of narcissism, a decade of the "me" generation. If computers are programmed to meet individuals' needs at the expense of each of us learning to understand and help one another, then western society will not advance beyond the "me" generation.

I don't believe, however, that Wolfe's "me" generation is anything but a minor wrinkle on mankind's collective face. Indeed, there is reason to believe the opposite - that mankind will use computers to extend the abilities of the handicapped, to explore new areas of science from the cosmos to the microcosms.

The ancient Greeks defined happiness as "the full use of one's talents along the lines of excellence." As far as computer technology extends men and women's talents in the pursuit of excellence, it should be neither feared, nor discouraged. The very fact that women are gathered here at this conference to consider the consequences of this new technology is proof that it is being met as a challenge, not as a danger.

WORKSHOPS

Educational Aspects - Strategies for Action

Moderator:
Martha Colquhoun, Executive Member, CCLOW, Manitoba

Panelists:
Mary Beth Dolin, MLA, Manitoba

Grace Parasiuk, Consultant, Women's Studies, Department of Education, Manitoba

Jan Schubert, Assistant Superintendent, Secondary, Winnipeg School Division

Ruth Hartnell, Counsellor, Glenlawn Collegiate, Winnipeg

Gayle Halliwell, Business Education Teacher, Lord Selkirk Regional School, Manitoba

At the first level of technological advance, which we are witnessing, skill requirements for workers may be reduced. This holds true in the large, female worker ghetto of the office. Skills such as manual duplicating, filing, record keeping, and several typing applications are unnecessary: records managers, data processors, reprographic technicians, and word processors use their equipment to handle these functions. Manual skills are becoming increasingly obsolete and the unskilled female graduate or dropout from high school has severely limited occupational opportunities.

How can we prepare young women to deal with the greater emphasis on mental skills? A solid, general education should include business education. Vocational business students should be taught to manipulate the new technology so that they may use it, rather than be used by it. Many young women are not afraid of it. They see the advantages: the ease with which routine tasks are performed, the speed and accuracy attainable, and the unlimited capabilities they now have. Given an up-to-date curriculum, a sharp vocational student is very well prepared to meet the challenges of the office of the future, and to advance in that office. It is important, then, that bright young women not be discouraged from business education as a possible career path.

Action:

- Parents must become involved at all levels of the educational system, to ensure that their daughters are taught adequate math, science and computer skills.
- Computer clubs could be set up to allow female students to network and support each other.
- Teachers must be sensitized to the biases faced by female students, regarding their aptitudes in the area of microtechnology.

Computer Familiarity for Pre-Schoolers

Workshop Leader:
Stan Squires, Director of
Children's Services,
Oakville Public Library

Stan Squires surveyed the program he has developed through the Oakville Library, in the field of access to computers for pre-schoolers. Discussion centred on the training of teachers, and the development of lessons to teach pre-schoolers the use of the computer.

Differences and Similarities Between Girls' and Boys' Reactions to Computers in Schools

Moderator:
Linda Fischer, Research
Consultant

Panelists:
Betty Collis,
Department of Psychological
Foundations in Education,
University of Victoria

Judy Dobson, Math & Computing
Science Teacher, Red Deer Public
School District

Cathi Hill, Principal,
Marlene Batke, Resource Teacher,
and Brenda Bond, Resource
Teacher, Lord Robert School,
Winnipeg

Dwight Renneberg, Computer
Science Teacher, Saskatoon

The fact that women and men have different attitudes towards mathematics has been well documented. Research suggests that social conditioning may contribute highly to this situation. The presentation focused on possible intervention techniques, within educational settings, to prevent or minimize the association of a similar sex-related pattern with microtechnology.

Action:

- Early classroom exposure to computers, to reduce sex stereotyping.
- Family nights at schools, to demystify the computer.
- Computer literacy mandatory in teacher training.
- Teaching of programming through non-mathematical programs.
- Controlled and democratic access for all students.
- Development of well adapted programs, based on the integrated use of the computer in the classroom.

School Policy and Planning

Moderator:
Pat Masters, Affirmative Action
Coordinator, Carleton Board of Education

Panelists:
Linda Fischer, Consultant,
Toronto

Lorna Wiggans, Math Consultant,
Toronto Board of Education

Barbara Robertson, Sociolinguist

The session featured a viewing of the film, "Make it Happen," and a look at the reward patterns which have led women into dead-end career choices. Having been rewarded for kindness, femininity and generosity, women have tended to seek support jobs that require limited training. They have been convinced of the uselessness of such courses as mathematics in their future, and so have avoided them. The poor representation of women in mathematics is seen as a major factor in their ultimate exclusion from the technological field. While women are in a minority, technology is being used to promote traditional values and institutions. Society is receiving a facelift, but under the surface, socio-economic realities remain.

Action:

- All action must be geared primarily to attitude change. Teachers and counselors should upgrade their knowledge of existing educational programs and resources, and of the job market.
- Families and schools alike must unite to raise young girls' consciousness of such situations as math anxiety, submissive/passive behaviours, the rewards of professional success, and assertiveness and autonomy.

Alerting High-School Students to Implications of Office Automation

Workshop Leaders:
Joyce Peterson, Teacher, Toronto Board of Education, and Researcher, New Technology Working Group

Gail Posen, Teacher, Toronto Board of Education, and Researcher, New Technology Working Group

Alternatives to the traditional high-school curriculum are being developed at the Toronto Board of Education, with a view to preparing students for the technologically transformed workplace. The presentation centred on the new curriculum units and the rationale behind them.

Action:

- Resource lists, prepared by the workshop leaders who have been responsible for creating the curriculum units, were mailed to the workshop participants.

Statistics Made Easy with Microcomputers: Junior High and Older

Workshop Leader:
Betty Collis, Faculty of Education, University of Victoria

Concepts in both descriptive and inferential statistics can be taught effectively, using the computational and graphics capabilities of a single classroom microcomputer. Non-mathematical examples and a microcomputer are especially well paired to demonstrate the use of statistics for prediction.

Examples of such programs and strategies for classroom development were the focus of the presentation.

Computer Literacy Including Programming for Grades 3 to 12

Moderator:
Ann lones, Ontario Ministry of Education

Panelists:
Pat Richardson, Elementary Teacher on Sabbatical, University of Alberta

Sharon Mott, Learning Resources Officer, Curriculum Branch, Alberta Education

This presentation consisted of a brief overview of the elementary, junior and senior high-school computer literacy program being implemented in Alberta schools during 1982 through 84. A more detailed analysis of the elementary computer literacy teaching unit, outlining the role of the unit in developing positive attitudes towards computer technology among both girls and boys, was followed by two "hands-on" sessions demonstrating courseware and computer programming activities that could be used in elementary schools. Copies of the Alberta Education reports on computer literacy and lists of learning resources that could be used to implement a computer literacy program in elementary schools were distributed to the session participants. Review copies of the learning resources were on display for more detailed examination.

It was concluded that a computer literacy program that begins at the elementary-school level has a high potential for eliminating, or reducing sex stereotyping in computer technology. This session generated discussion of comparable programs being planned in other provinces, courseware being developed to teach basic skills in various subject areas, and the need for more female educators to become involved in computer applications in their classrooms. The availability of computer equipment at the session allowed some interaction with courseware and simple computer programming activities.

Action:

- Parents, trustees, teachers and administrators should press for the universal implementation of computer programs at the elementary level, when such factors as math anxiety, sex stereotyping and lack of confidence are less likely to intervene.
- All such programs should be prepared by teachers, with particular concern for the learning process in children

Telidon in Education

Workshop Leader:
Anna McKague, Manager of
Information & Educational
Services, Norpak

Telidon, or Videotext as it is generally known, was introduced only a few years ago; yet, it has become the focus of much national attention, and is already being used by publishers, retail chains, government departments, and educational institutions throughout North America. If its popularity grows at the current rate, it is obvious that Videotext could have a tremendous impact on our businesses, homes and schools.

In the sessions, two main areas were examined: the implications and applications of Videotext in education; and the strategies necessary for women to become more involved with this new technology. In the first area, discussion centred on such issues as proper regulation of the creation of appropriate Videotext material intended for school children; the impact on society of universally available education in the home; the role of the teacher in developing educational Videotext material; and the role of the government in control and dissemination of such material.

Regarding Videotext and women, the idea was raised that women historically have been excluded from involvement in development and use of "high technology." The role of women in high-tech industries, now and in the future, was discussed, as well as the varying Videotext careers that women may pursue. Finally, it was suggested that since Videotext is a more "friendly" medium than the average computer, those who find computers intimidating may be more successful in the Videotext.

Action:

- More research is required on the effects of the growing use of technologies in the classroom, and particularly the long- range effects. School boards must be advised of the need for a comprehensive approach to the introduction and use of computers for teaching and learning purposes.

Microcomputers in the Elementary Classroom: Music, Environmental Studies and Memory Development

Workshop Leader:
Julia Boucher, Math & Computer
Consultant, Halton Separate
School Board

The session centred on a hands-on demonstration of programs developed for, and used in elementary schools to teach the use of microcomputers.

Counselling Strategies to Counteract the Female Fear of the Chip

Workshop leader:
Ruth Hartnel1, Counselor,
Glenlawn Collegiate, Winnipeg

Among the major forces creating problems for women in the future and present world of work are power inequality, lack of positive role models, educational inequality, insufficient numbers of women opting to study math and science, sexist textbooks and reduced career aspirations. Also contributing are the socialization process, the manner in which women are portrayed in the media, government attitudes toward women, and the non-unionization of women.

The presentation expanded on all of these issues and touched upon the means available within the educational system to counteract their negative effects. Some of the actions to be under. taken immediately are listed below.

Action:

- Counsellors must first confront their own biases and review their counseling practices.
- Teachers' associations must lobby their boards to hire more females for the secondary schools, to provide role models for female students.

- Counsellors can introduce students to female career speakers and organize information sessions on women in trades. They can display career posters that show women performing various tasks.
- Seminars for parents could contribute to attitude change in expectations for their daughters.
- Counselors could run workshops for teachers, on math and science anxiety, and the role of the teacher in dealing with this phenomenon.
- Another strategy is to set up a peer support group, in which students would help other students cope with untraditional career choices, and encourage girls to enter math- and science-related fields.
- Educators must challenge the developers of written information to eliminate sex biases and stereotyping.
- The counselors must be prepared to take an activist role, addressing leading questions to their clients and colleagues, informing them on myths and facts. Other ideas include:
- Developing career kits or games for women.
- Directing attention to the accomplishments of famous women.
- Initiating a women's studies course.
- Planning a future studies courses.
- Discussion groups could be set up, including men and women, to examine the causes of anxiety in the home, the educational process and the workplace; and to develop in young women the capacity to cope with inevitable changes.

Health and Safety

Overview

Chair:
Claire Marie Fortin, Health and Safety Officer, Labour Education Studies Centre, CLC.

Speaker:
Jeanne Stellman, Executive Director, Women's Occupational Health Resource Centre, School of Public Health, Colombia University

Post-World War II. with the age of plastics and atomic energy, and with the development of chemicals (5 million chemicals are known today), saw the massive introduction of macro technology. Many health hazards resulted from this revolution, a large number of which are still unrecognized and, worse still, unstudied.

An analogous situation has arisen today with the massive introduction of micro technology. Unstudied health problems are; of growing concern.

We are witness to the re-creation of the factory in the office: the replication of the problems of the chemical workplace. It is confiscating our skills, and breaking them up into routine tasks in a dangerous work environment. Office work is now following the mass-production theory: if you interchange parts of a job on an assembly line, you can also interchange workers. We are losing the individuality that might also be a major loss to society.

In considering the health and safety aspects of the new micro technology, one must realize that usually, the design of video display terminals (VDTs) and computers includes little concern for the human, the other extremity of the machine. Work areas leave no place for a personal touch. Workers are isolated in the machine/ operator interface, and social interaction deteriorates. Indoor pollution is aggravated, although most employers will not recognize it. Finally, keystroke supervision or monitoring creates undue stress, and can eventually result in physical disease.

To counteract these negative effects in the short term, individuals should pursue demands such as: 10 minute breaks every hour, or 15 minutes every two hours; antiglare screens and frequent eye examinations; proper shades on windows and document holders on the machine; proper lighting and adequate chairs. Workers should help themselves by exercising frequently and sitting properly (using foot rests, for example).

In the long term, more research is needed, especially on the effects of radiation. We must improve the education of business people, machine designers and managers alike. We need more openness in worker-management communications, less confrontation and more cooperation. Job redesign, to allow for rotation among a variety of tasks, would certainly reduce fatigue and boredom, and contribute to an increase in the knowledge and skills of workers.

WORKSHOPS

Stress in the Workplace

Workshop Leaders:
Francoise Antonini-Capet,
Faculty of Pharmacy, University
of Montreal

Grendon Haines, Vice
Rector, Concordia University

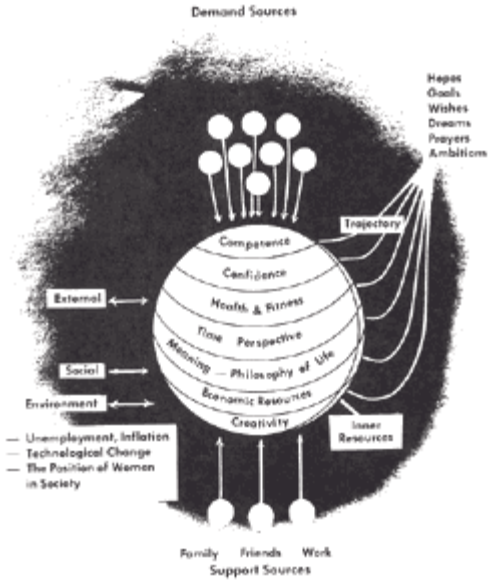
A presentation was made on the human psychophysiological reactions to stress (mainly neuro hormonal): how pressure and stress can lead to physical problems and disease. Discussion centred primarily on the role of workplace stress sources (chemical, physical and psychological) in triggering such reactions.

Stress Management

Workshop Leader:
Freda I. Paltiel, Senior Advisor,
Status of Women, National Health
& Welfare

The paper delivered by Freda I. Paltiel on "Stress Management" presented some definitions and concepts; some results of empirical investigations by Frankenhaeuser, Niosa, Haynes and Feinlib, Maslach and Jackson, Pines and others; some perspectives on stress and burnout in women; and an analysis of combating stress and burnout. A synthesis of the research, clinical experience, and policy-development experience of the author was presented, and formed the basis of a wide-ranging discussion on stress management. The schema is attached for inclusion in the proceedings.

COMBATTING STRESS AND BURNOUT



Freda I. Paltiel
Senior Adviser, Status of Women
Dept. National Health and Welfare
OTTAWA, January 25, 1982

Ergonomics

Moderator:
Greta Nemirofl; Director, CCLOW;
Quebec

Panelists:
Ruth Heron, Ergonomist, Transportation
Development Centre, Transport Canada

Françoise Poirier, Ergonomist,
Laval University

The object of ergonomics is the study of humans performing tasks. Francoise Poirier presented an overview of job analysis in the light of three factors, fundamental to any occupation:

- Physical environment; i.e., the global organization surrounding a task and exerting an influence on performance.
- Physical charge; i.e., physical effort required, posture in performing certain tasks, and specific aspects such as repetition, rhythm, movement. etc.
- Mental charge, which may be defined by the intensity of mental activity required by a work situation. The degree of watchfulness and the density of required information are significant factors in determining mental charge.

Applied to a workplace in which microprocessors are widely used, ergonomics raises fundamental questions about the conditions and consequences of the operator/screen interface on the one hand, and the autonomy of workers on the other.

Ruth Heron reported on a study in which measurements of mental, physical and visual load were obtained for operators of various types of video display terminals (VDTs), and for a group of office workers not using the VDT. These measurements were supplemented with follow-up observational procedures. Results suggested that: 1) for VDT operators, symptoms of load will be manifested mainly among those carrying out dull, repetitive tasks on a full-time basis; and 2) use of the VDT apparatus is associated with ergonomic problems, which compound the stressful effects of continuous routine work. It was argued that, as women are mainly employed in such jobs, these findings pertain primarily to them.

It was also suggested that the ergonomic problems related to full-time VDT operation would be maximally reduced only through new approaches to job design. Relevant criteria were discussed.

Action:

- Both labour and management must see to it that dull, repetitive, functionally organized jobs are replaced with multi-function jobs.
- Jobs must be designed to include decision-making, so that all employees share in a sense of responsibility and contribution.
- Self-pacing, in harmony with the workers' flow of energy, should be substituted for machine-pacing.
- All physical arrangements in the work environment must be organized to favour the mental and physical health of all workers.

Home-work: Present & Future

Workshop Leader:
Rhonda Love, Assistant Professor, Community Health, Faculty of Medicine, University of Toronto

The session featured an examination of what has been learned about women doing piece work at home and the poor conditions surrounding that work, and how knowledge about home-work in the garment industry can be applied to computer work at home, to protect the interests of modern women. The major problems were examined, such as deskilling, stress, and machine pacing and control of worker productivity. Possible legislative measures were discussed, as well as the possible advantages of home-work for specific sectors of the workforce, such as the disabled.

Action:

- The unionization of women must be intensely pursued, and unions must be pressured from within so that all negotiations will include worker-protection clauses that take into account all aspects of the new technological work environment.
- Women's groups should raise the awareness of their membership through conferences and workshops of all kinds, promoting retraining and career planning.
- Women's groups must pursue the systematic lobbying of government to promote improved legislation.

VDTs

Moderator:
Nancy Miller-Chenier, Researcher

Panelists:
Jane Armstrong, Research
Analyst, CALEA

Gary Cwitco, Stan Representative
(Specialized in Health & Safety),
Communications Workers of Canada

Eileen Beck, Consultant, Working
Environments, New York

Jane Armstrong's presentation focused on why unions are concerned with VDT safety, particularly in relation to levels of radiation. The analysis included a look at the various types of electromagnetic radiation emitted by VDTs. Much evidence I supports the suspicion that government-approved standards are insufficient for adequate protection of the worker. Health hazards, I in particular birth defects and miscarriages, were examined.

Gary Cwitco described how the introduction of VDTs in the workplace has created a new, more stressful environment. Using the example of telephone operators, it was shown that the job fits almost perfectly into Bertil Gardell's five key conditions of stressful work: 1) machine pacing or machine control; 2) monotonous, repetitive work; 3) lack of meaningful contact with other people; 4) piece rate payment systems; and 5) authoritarian. control systems.

The presentation outlined the difficulty of achieving solutions, which comes about because solutions require change in what employers see as a fundamental management right: the power to organize work. The problem will be solved only by shifting the balance of control over the way in which the technology is used, from those who own it to those who use it.

Eileen Beck concentrated on concrete measures to reduce VDT-related health hazards, such as eye fatigue and muscular/ skeletal problems. Elements of a solution include frequent rest breaks (10 minutes per hour), use of antiglare screens, repositioning of the terminals, regular eye examinations, adequate lighting, use of document holders, and use of footrests.

Participants raised several issues of concern:

- Does smoking in the vicinity of a VDT increase the level of radiation?
- Do plastic partitions around terminals contribute to eye-strain?

- Are there examples of management cooperating with staff or unions to provide a healthy working environment?

Action:

- Short-term activities should include unionization of workers who use the terminals, education on the impact of VDT use on health, and the involvement of workers in every aspect of planning and implementation of VDTs.
- Unions must strive to shift the balance of control over the way in which the technology is used, from those who own it to those who use it.
- Continuing education for workers and managers, and further research on specific and broad issues related to VDT use must become top priority for labour and management.

Worker Protection: Legislation on Health & Safety

Moderator:
Lynn Kaye, Acting General Manager, Canadian Union of Professional & Technical Employees

Panelists:
Jane Stinson, Research Assistant, CUPE

Katherine McGuire, National Representative, Research & Legislation Branch, CLC

A crucial question to be answered before any legislation on technological change can be written is the scope of employers' rights. A review of the Freedman Report and the Woods Task Force (1960s) recommendations was presented. Discussion centred on the Canada Labour Code and existing provincial codes, a look at what has been accomplished, and a critique of the weaknesses.

What do we need in legislation?

- Clarification of what constitutes technological change, to limit exemptions.
- More advance notice of change.
- A clear statement that no change will be introduced until an agreement has been reached with the bargaining agent.

- The assurance of expanded private and public programs to protect workers (training, full employment, income support, etc.).

We also need:

- More government research on health issues, so that minimum standards can be established.
- Universal workplace health and safety committees.
- Privacy legislation.
- Pension reform.
- Legislation to offset foreign protectionism and to ensure Canadians a fair share of the jobs created by the new technology.

Action

- Each union, or group of employees should set up a committee to examine such issues as the effect of VDTs on health.
- This committee should set guidelines for the purchase and installation of new equipment, and formulate recommendations for management.
- Seminars, newsletters and the like should be increased to inform employees of their rights and interests.
- Employees could be surveyed on their health, and feelings concerning the changing workplace. In the long term, such accumulated information could point out areas of problems.

Demonstration Workshops

Throughout the conference, hands-on demonstrations were offered, giving participants an opportunity to observe and use computerized equipment.

Basic Introduction To Computers

Workshop Leader:
Diane D. Ludlow, Manager,
Academic Support Services,
Computer Centre, Concordia University

The current proliferation of computing equipment indicates a need for everyone to learn the basics of the technology. Many people admit to being "unscientifically inclined" and are consequently very apprehensive about using computer equipment. That is simply due to learning a unique, new field during adulthood; the only true hurdle is learning to

overcome any apprehension about acquiring new skills; an apprehension which is unfounded, as technology has made computer use easier today than ever before.

This introductory computer workshop was devoted to an explanation of the basic "computer shop talk," a look at the main categories in computing (hardware, software and telecommunications), and the processes by which computers are programmed and the information made available to the user. Overhead projections were used to facilitate the initiation process.

Action:

- It was suggested that women who must stay at home might buy a terminal and link up to a computer to pursue their work or studies.
- Women should inquire about government retraining assistance programs, and lobby for increased access to these programs. They should also explore, and take advantage of, all existing programs offered by local universities and colleges.
- Commercial training institutes should be avoided, as they are extremely expensive and generally low on technical knowledge. Training should be provided free of charge in the workplace.

Technology and Women's Issues - Equal Pay, Right to Work, Affirmative Action

Participatory Research Group

This workshop centred primarily on the issue of strategy. The complexity of the micro technological revolution has not been fully realized, but already, most people use this technology in everyday life. The concerns related to micro technology are shared, not only by women, but by the community at large, including the trade union movement. For women in particular, however, the introduction of micro technology is having an impact on many other struggles, including the right to work, equal pay, affirmative action, and child care. How do we want to be affected by the new technology?

How do we want to use it? Of course, different groups and constituencies will develop different strategies to meet their specific needs; but together, they must build a broad-based movement for a coordinated and effective campaign, to ensure that all working people will gain from the new technology. Alliances between the women's movement and the trade union movement are particularly vital. We must reject the assumption of a confronting relationship among unions, women and management, and develop new approaches to negotiation.

High Tech Overview

Tom Spruceton, Leigh Instruments

Introduction to Microcomputers

Workshop Leader:
David Miller, Vice President,
Compumart

The session featured a hands-on introduction to micro-computers; specifically, to the actual hardware.

The Home Computer: The World at Your Fingertips

Workshop Leader:
P. Anne Wilson, Director of Sales,
CATV Products, NABU Manufacturing
Corporation

Micro-computers are the rage, and one of the most explosive new businesses of the 1980s. It is predicted that they will secure at least a 50 per cent growth rate throughout the decade, and that sales world-wide will reach 5 million units by 1985. The boom is testimony to the declining price, matched by corresponding increases in performance, which have resulted in a growing, general awareness of the capabilities of microcomputers.

Today, they are more than the glorified electric toys of hobbyists and hackers. Micro-computers are making inroads into the appliance field, becoming indispensable, multi-purpose tools. They are beginning to fill their designers' promises to create new options for the way we work, shop, travel and communicate. (A demonstration of the uses of the home computer was included.)

Sunday Morning Plenary

Introduction

Strategy Coordination

Team Leader:
Jacqueline Pelletier, Consultant,
program and strategy development, Ottawa

“ The strategy coordination team met last night to prepare this morning's session. As we discussed the workshop reports, it became obvious that, despite the specific focus of this conference, all of the usual feminist concerns were being raised by participants. Day care, abortion, unemployment... it has been literally impossible to discuss the impact of micro-technology on women without encompassing all of these concerns.

This probably does not come as a surprise. Our experience indicates that indeed, women tend to take a holistic approach to situations. In that sense, this conference is typical of the feminist model: avoid isolating the facts; get a total picture. We all know that this approach is slow in terms of results, but it may be far more radical than the traditional male tendency to isolate a subject, deal with it quickly, and neglect the consequences.

Last night, we developed a design which, we think, corresponds to the dynamics of this conference. We hope it will help you get a better understanding of the process, and that it will contribute to your appreciation of the feminist approach to problem solving (*see graphic on page 104).*

At the core of the flower, we find society as it is now. Outside and all around the flower is the developing society, towards which we are constantly and urgently pulled by rapid technological change. Each petal represents one of the specific areas of concern to women: health, education, contraception, peace, employment, etc. All of the concerns overlap, as do the petals. One cannot resolve day care problems without also addressing the "equal pay for work of equal value" issue, for example. Microtechnology overlaps all other feminist concerns: it affects every aspect of our lives, and as we progress towards the future, the overlap will increase.

This complex picture of reality has dominated our debates throughout this conference. At times, it created confusion and frustration. It would be nice to isolate one problem and deal with it, but we know that to be impossible. And so, we try to combine generic and specific approaches, and, in our own feminist way, gradually, we move towards action plans and solutions. ”

Models for Raising Women's Awareness of Technology

Moderator:
Susan McCrae Vander Voet,
CCLOW

Panelists:
Leiba Aranoff; Coordinator of
Staff Development in Service
Training, Ville Marie Social
Service Centre

Susan Smee, Director, CCLOW;
Saskatchewan

Marianne Williams, Adult
Education, O.l.S.E.

A report was presented by women who were involved in the organization of a seminar, a one-day conference, and a series of three mini-conferences dealing with women and micro technology, on the development of content and format with specific concern for the adult learning process, particularly in women. The workshop consisted of an open discussion on the best means to raise the awareness of women, with respect of the impact of micro-technology and the need to pursue one's education and involvement to deal with it. In preparing conferences, seminars, or other such activities, it was suggested that the following principles should serve as guidelines:

- Participants should enjoy the event and have a good time. Learning can be fun!
- There should be ample opportunity for the sharing of experiences.
- Problems must be put into context, rather than be presented piecemeal.
- Participants should be thoroughly aware of the purpose of the event and the reasons for taking time to increase their knowledge. Why are they here? What will it bring them?
- Male participation must always be defined clearly so that the event remains an opportunity for women to exchange with women.
- Participants must not be left with a despair that can be averted by planning strategies for change, based on what they would like to take place in the areas of concern.
- Coalitions should be encouraged between and among similar interest groups (unions, etc.).
- The media must be used extensively to reach as many women as possible, and to present them with facts, rather than the fictions too frequently served by the press.
- Where workers are non-unionized, lunch-hour conferences can be arranged to inform women of upcoming events, or to share the results of recent events.

Throughout the conference, a team of "strategy coordinators" one for each theme, attended the various workshops and studied the workshop reports in an attempt to synthesize the general orientation of discussions, with particular focus on future strategy ideas. Their purpose was to supply participants with an overview of issues and strategy trends, so that they, in turn, could define their own action plan during the Sunday morning strategy workshops. The strategy coordinators met regularly with their team leader, to discuss the emerging trends within the conference and to prepare for a Sunday morning session, during which, each would brief the participants on one of the themes.

The idea of having strategy coordinators, or content synthesizers, proved to be extremely helpful. It allowed participants to gain a broad. view of the issues and solutions being discussed in the various fields of interest, and was instrumental in the development of comprehensive action plans. Having attended a diversity of workshops on varied subjects, having been exposed to exhibits, films and discussions, participants needed this opportunity to draw a synthesis of their conference experience.

SYNTHESIS OF WORKSHOPS

1. Health and Safety

Strategy Coordinator:
Helene Kearney, Researcher,
Centre de sante et de services
sociaux (CSSS) Centre-Ville,
Montréal

" The numerous problem areas which were discussed in the 'Health and Safety' workshops can be related to two main issues. The first is that of *physical and radiation-linked problems.* The solutions to physical problems (eye, muscular, postural) include proper equipment, adjustability of keyboards and video screens, proper lighting, reduced environmental disturbances, chairs of proper height and support. The workshop of the health hazards related to radiation showed that studies in this area are far from conclusive, and that research is badly needed on the effects of low-level radiation.

The second-priority issue is *job-related stress,* which, according to participants, is being exacerbated by the deskilling process, isolation of workers, and machine monitoring techniques. Many of the solutions, such as stress management through exercise and proper health habits, are focused on the individual.

More encompassing solutions would include job redesign and the involvement of the worker in the process of implementing change. Job rotation is seen as an effective way to avoid monotony and stress, while increasing the individual's sense of belonging.

Keystroke monitoring should be strictly limited, if not completely banned. In one workshop, someone raised the example of worker evaluation being supplied on a print-out! This type of depersonalized approach must be rejected. Unions should be central in this process; they must keep their members better informed of current technological changes and problems, and of their rights. Continuous liaison is needed with women's groups, and could take the form of a coalition whose main objective would be to circulate current information on micro technology and workers' rights and interests.

Finally, it was stated that data banks planned by women for women, are a must."

2. Changing Employment Patterns

Strategy Coordinator:
Sabina Rohlfs, President, IF
Interface Consulting Inc.,
Ottawa

"Four major concerns and problems were raised during the workshops on 'Changing Employment Patterns':

- Loss of jobs.
- Deskilling of existing jobs.
- Work monitored by computers.
- Loss of social contacts and isolation of workers.

Many suggestions and strategies were proposed on how to deal with the problems and concerns. They can be divided into three groups:

1. Strategies directly applicable for systems being introduced right now, or in the near future (short term).
2. Strategies which need further investigation, or which will take some time to be achieved (medium term).
3. Strategies which require a considerable amount of investigation; their pursuit may change our society and its values along with the overall economic situation (long term).

1) Short-Term Strategies, applicable for systems being introduced right now, or in the very near future:

- Use participative design techniques for the planning, design and implementation of new systems.
- Use a multi-disciplinary approach.
- Technology must be managed properly; make sure that different design choices are considered.

- Make sure that new systems provide jobs for people with different skill levels.
- Make sure that new systems provide jobs for the handicapped.
- Provide occupational bridging.
- Consider job rotation.
- Consider job sharing and flexible working hours.
- Obtain greater control of training.

2) Medium-Term Strategies:

- Educate women on technological change.
- Get women into decision-making positions.
- Organize the unorganized.
- Broaden collective bargaining agreements to address the major concerns and problems described above.
- Consider reduction of work hours.
- Introduce appropriate legislation.
- Study models from other countries addressing the major concerns and problems described above.

3) Long-Term Strategies:

- Review definition of gross national product (GNP).
- Review overall macro-economic policy.
- Review welfare and income distribution policy.
- Examine the role of multinational firms in our economy and in Third World nations.

So what can we do now?

- We can raise each other's awareness of the problems by talking to each other at work and at home.
- We must become computer-literate (community colleges offer appropriate courses)
- We must become generalists, rather than specialists. We need a broader education.
- We must accept the fact that learning is a life-long occupation, and prepare for it in education and career planning.
- We must establish a clearing house to collect and make available to others the information on the impact of microtechnology and potential solutions.
- We must specify policies for co-operation with the Third World.
- We must have a charter of rights for technological change, accompanied by a political and educational campaign to raise awareness of the problems.
- We must organize a coalition of women's groups, community groups and unions.
- We must lobby the government.
- We must get women into politics.

There is a lot of work to be done, but the problems are certainly not insurmountable. However, if we do not do it ourselves, nothing will change, because nobody is going to do it for us."

3. Access to Information

Strategy Coordinator:
Magda Seydegart, Executive
Director, Human Rights Research
& Education Centre, University of Ottawa

" A prime concern expressed by those who participated in the 'Information Control and Access' workshops is that women need to create and control their own data bases. Not only must we design our own programs - we must also determine their uses, thus taking steps to make technology empower women. In this process, we can refer to existing feminist models, such as the National Women's Mailing List (NWML). What makes this model 'feminist' is that it is participatory, self-identifying, not totally dependent on outside funding, and it applies non-sexist indexing terminology. Furthermore, it has a multiplier effect: all women can have access to the information. Organizations are encouraged to enquire about, and possibly join, the National Women's Mailing List, and to contact the Canadian Research Institute for the Advancement of Women (CRIAW) for information on its new talent bank.

Participants insist that, in setting up their data banks, women's organizations should start by identifying their needs. Only then should they find a system: one which they can control, rather than vice versa. Possible uses of data banks include:

- Lists of women looking for employment, which could be accessed by potential employers.
- Lists of legal decisions affecting women, and proposed legislation.
- Political developments of specific concern for women.
- Lists of women with specific expertise.
- Funding sources.
- Women doing research or writing on feminist issues.
- Catalogues of courses with related information, such as registration fees.

Within women's organizations, particular interest groups, such as the handicapped, could maintain and update their own data bases. It was also suggested that equipment should be shared where possible. This would seriously reduce hardware and software costs. Sharing could be organized between women's groups, or with other groups of compatible interests.

In the area of security, participants underlined the urgency of defining laws to cover theft, misuse, erasure, or sale of information. International agreements are needed to cover the export of data. Some discussion centred on the Freedom of Information, and Privacy Act, which apparently will be receiving third reading within a few days. If it is passed, we should all become familiar with this act, and learn to use it. Furthermore, it was strongly stated that no one should give out information lightly. Women should check their records. Don't limit yourself to fighting the use of the Social Insurance Number (S.I.N.). It is the broader concept: of unmonitored linking which we must oppose. Any piece of information can be used to identify a person: date of birth, name of mother, etc. S.I.N. is but one such piece of information.

Finally, participants also raised the issue of language and computer literacy, necessary tools if we are to have access to information and to the legislation governing its uses.

4. Education

Strategy Coordinators:
Pat Webb, Manager, DMS Training,
Bell-Northern Research, Ottawa

Jacqueline Bourdeau, Student,
Educational Technology,
University of Montreal

"The information gathered from the 'Education' workshops has been regrouped under three headlines:

1. Students;
2. Teachers and Administrators;
3. Parents and Society.

1. Students:

Participants feel that young girls must be taught how to use computers at the earliest stages of their elementary schooling. Each classroom should be equipped with a computer. User clubs for girls could be set up in each school, to provide support and motivation, and combat the sex-related stereotypes before it is too late. Much emphasis should be given to the importance of future career choices and the need to pursue mathematics and science courses through high school and college or university.

2. Teachers and Administrators:

The training of elementary, and even pre-school teachers should include computer literacy. Teachers should be well informed about sex stereotyping, and should be encouraged to develop computer programs themselves. This might help to eliminate stereotyping, while supplying students with programs well adapted to their needs.

3. Parents and Society:

Some of the questions which arose focused on how to Promote support of daughters in mathematics and science. Participants also think that parents and school administrators alike should be given a chance to learn how to use computers, so that they will acquire a better understanding of the realities of their youngsters' learning environment.

All workshops came to the conclusion that we need to elect women to decision-making positions, locally and provincially, throughout the education system. We need also to network and Promote role models for girls. We must find various ways of opposing the concept that girls aren't good in mathematics and science. Finally, we must convince girls to seek a career and refuse to be relegated to dead-end support role. ”

5. Training and Retraining

Strategy Coordinator:
Carmen Paquette, Consultant,
adult education, Ottawa

“On the whole, workshop participants feel that the present training and retraining situation is quite dismal. They agree on the urgent need to end the retraining of women for obsolete jobs, and find it appalling that so many women are still being directed towards secretarial jobs. A major problem lies in the fact flat government retraining continues to be perceived as a depository for welfare recipients.

Participants agree that some work has been done to improve raining and retraining conditions, but they feel that it has been largely inadequate for the needs. For example, retraining women for word processing in the office is a step in the right direction, but it is leading to their obsolescence in the medium term. It certainly is not a comprehensive solution. Affirmative action retraining is also a step in the right direction, but it, too, is leading women in to middle-management positions, which are precisely the types If positions which will be disappearing with the expansion of the new technologies. Participants certainly did not suggest that affirmative action should be abolished; however, they do think hat we must realize its limitations and examine better, broader avenues for the future.

The National Training Act was discussed. Participants feel hat this act cannot be of much help to women, because it is focused on industrial jobs - an area where we continue to have only limited access. Women, it is felt, are at risk of being left out of the application of this piece of legislation.

One recent and growing development is vendor training. A major limitation in that area is that management tends to limit the number of employees who receive training, largely as a result of the high cost of the equipment. Workers are encouraged to question the distribution of funds within their institution, and to seek participation in the decisions surrounding capital expenditures and money allocated for training.

Comparisons between in- and out-house training led to the observation that in-house training is advantageous, because it is offered on location; however, participants said, it is frequently geared towards those who are perceived to have potential for management positions; i.e., men. Outside training often corresponds more closely to the needs and interests of women. Unfortunately, however, many women are badly informed of their existence and of conditions for enrolment.

Participants insist on the need to develop an active, continual retraining attitude: an attitude that says, "We are in control of our lives and we must be continually learning what we need to retain control." There were differences of opinion on what is considered as appropriate training, but on the whole, it was agreed that a good balance is required, between generic retraining - transferable skills in decision-making capabilities, communication and problem solving - and specific skills in computer use. Some participants put forth interesting ideas for the design of courses, which would include counseling, so that women would increase their awareness of their personal learning style, their own career path and their own life-style, while receiving hands-on training.

Elsewhere, it was stated that we need a directory of information on the successful training models which prepare women for the future. Let us not forget that we are training re-entry women, who are underemployed, potentially displaced, or have just recently moved into middle-management positions; immigrant women; and women from diverse regions, whose needs are specific. It is unrealistic to think in terms of a national training program! We must consider the unique needs of each region.

CO-SPONSORING ORGANIZATIONS: COMMITMENT TO FOLLOW-UP

Strategy coordinator reports were followed by a brief presentation from the president of each of the cosponsoring organizations. The latter were asked to give a realistic indication of their organizations' commitment to conference follow-up. It was felt that this information would assist the participants in their action plan decisions.

Lenore Rogers, President, Canadian Congress for Learning Opportunities for Women (CCLOW)

" CCLOW is made up primarily of women who are adult educators, and as such, are committed to life-long learning. Our members work in colleges, universities and high schools. They are involved in counselling, developing re-entry programs, pre-trades training programs, and they are continuously sharing information on their work. We are very interested in developing a directory that would list all of the programs offered in educational institutions that are of specific interest to women.

In the past months, we have been networking locally, provincially and nationally, on a multitude of educational issues. Our members have met with education ministers and administrators in the provinces, and we are involved with another national organization in responding to, and initiating retraining programs at the federal level. We have presented information to the federal government about the National Training Act, and will continue to lobby for change in this area.

We have organized a number of pre-conference events in various regions, and intend to pursue with post-conference educational. We will also encourage the development of programs in our educational institutions. Many of our members can influence curriculum development, the hiring of women, the disbursement of grants. We intend to use this influence to the advantage of all women.

Dorothy Morris, Board Member for P. E. I., replacing Margrit Eichler, Canadian Research Institute for the Advancement of Women (CRIAW)

"The purpose of our organization is to promote research for the advancement of women; however, we do not limit ourselves to research. We also encourage communication and information sharing among women across the country, at all levels: community, university, college, etc. We publish research reports, and invite women to submit their papers to CRIAW for publication. We sponsor research in a limited way, by giving small grants.

CRIAW is in the process of developing a talent bank, which could be of use to many women across Canada. By accumulating information on researchers, we will be able to link them to groups who are looking for resource persons for research, conferences, lectures, etc. This is a fine example of ways in which women can use microtechnology to their own advantage, retaining control over the complete process.

Eventually, we will have a computerized research bibliography retrieval system. We are presently examining models developed in other countries, to that effect.

Doris Anderson, President,
National Action Committee on
the Status of Women (NAC)

"NAC has 207 member organizations, representing over 2 million women. A lobby, it pressures government. We are structured into a variety of committees, including one on employment and micro technology. We are presently considering the possibility of moving our offices to Ottawa, closer to the federal government, which it is our mandate to lobby.

NAC has great potential to exert pressure wherever it is needed. We have various means of influencing decisions. For example, we are now preparing a brief for the Labour Canada Task Force on Microelectronics and Employment, headed by Margaret Fulton.

We think that it is time to pressure the government for the establishment of a workers' research institute of the type already in existence in Norway. This institution could study the kinds of problems women are going to be facing in the workforce, and propose solutions. There is money available for this - some of it could come from the National Science and Engineering Research Institute of Canada. Pressure for this should come out of this conference. The Canadian Advisory Council on the Status of Women has money to do research, and should be directed to start looking at the effect of microtechnology on women's health.

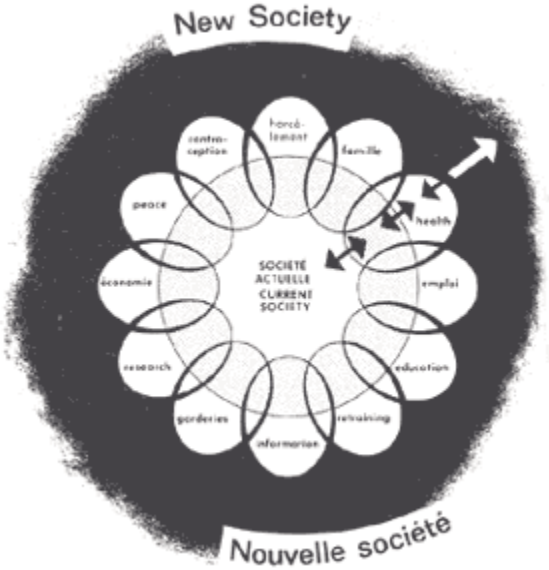
Networking is necessary between organizations. We will cooperate with the three other sponsoring organizations, and other women's groups, to pursue the issues raised during this conference.

NAC is prepared to do the lobbying and pressuring required, but other people must get involved across the country to get better legislation, research, to pressure provincial departments of education to improve curriculum. Finally, we are open to suggestions from the workshops. "

Eileen Clarke, President, Canadian
Federation of University Women

" Our federation was founded in 1919. We have 120 clubs across Canada, totalling over 12 thousand members. We were instrumental in having the Royal Commission on the Status of Women established in 1967, as a result of which, the Canadian Advisory Council on the Status of Women was set up. We lobbied all levels of government during the recent constitutional debate.

One of our purposes is to encourage our members to participate in all aspects of public affairs. We try to get women into decision-making positions, on boards, commissions. We try to get women elected as mayors and MPs.



At our upcoming triennial conference, we will address a resolution to set up another office in Ottawa. If accepted, this will facilitate lobbying for federal appointments for women.

Education is our top priority. We give fellowships, and six grants of $600 each, to mature women, to help them to upgrade their education if they wish to return to the labour force. Locally, our clubs give scholarships to young and mature women.

Our 120 clubs are very involved in the local communities, organizing career counseling, conferences, lectures, etc. Our executive is elected for a three-year period. During this triennial period, our theme has been "Our Technological Society."

If we are to affect events, we must be knowledgeable. To this end, we have already held a number of conferences dealing with various aspects of microtechnology. "Communication Through Microelectronics" is the theme of our triennial conference. We hope to inform our members and identify problems for which solutions must be found. It is our intention to raise the issues addressed at this conference at our own meeting , and to make a full report to our Quebec members.

INVITATION

Dr. Ratna Ray, Labour
Canada Task Force on
Microelectronics and Employment

The Sunday morning plenary session ended with a "pep talk" by Dr. Ratna Ray, Director, Women's Bureau, Department of Labour. Dr. Ray is responsible for the current Labour Canada Task Force on Microelectronics and Employment.

In a brief, but highly stimulating talk, Dr. Ray invited participants to pursue their training actively, with the intent to seek promotions to top managerial positions. She insisted on the necessity for women to participate fully in the implementation process of the new technologies. Finally, Dr. Ray strongly encouraged participants to submit their views to the Labour Canada Task Force on Microelectronics and Employment.

Sunday Afternoon Plenary

Conclusion: What are the next steps

During the second half of the morning, participants divided into six groups: five around the main themes, and a sixth on the topic of networking. In these groups, they discussed action plans, with special emphasis on individual and small-group commitment. This approach was suggested by the conference organizers as the best means of ensuring follow-up. Most conferences end with the lengthy adoption of resolutions that are quickly noted and promptly forgotten. The intention here was to concentrate on participant involvement and encourage specific commitments. During the Sunday afternoon plenary, six workshop representatives reported on the decisions of their groups.

1. Education

" As individuals, parents, teachers, members of large organizations, we intend to, and we encourage all participants to:

- Monitor the number of boys and girls who are enrolled in mathematics and science at the high-school level, and the number of male and female teachers in these subject areas. We will pressure school boards to ensure that these numbers are equalized.
- Inform teachers, through educational exchanges, professional development and other means, on the need to provide extra encouragement to young women, if they are to perform effectively in the field of microtechnology.
- Ensure that the producers of software have, and follow guidelines for sex-fair presentation of their products, similar to the guidelines for school textbooks established in some provinces.
- Enhance career counseling for high-school girls, to improve career readiness and the realization of their responsibilities. We must inform them on the realities of the world of work, which they will soon be entering.
- Pressure school boards to do research on topics such as the sex-fair issues; and specifically, to pressure the Canadian Association of School Trustees, who have not yet published their long-awaited study on sexism in education.
- Bring young women from community colleges and universities, who are studying mathematics, science, or microtechnology, into the high schools to work with female students and serve as role models.
- Help teachers who are math-anxious themselves, particularly female teachers, to overcome this problem so that they will be better advisors and instructors.

- Promote the participation of women on school boards and curriculum committees.

2. Training and Retraining

" Our first action proposal is addressed to the entire group attending this conference. We ask your support for the following statement:

'We, the participants at this conference, intend to state strongly to Judy Erola (Minister Responsible for the Status of Women) and Lloyd Axworthy (Minister of Employment and Immigration), in a telegram, the following:

- Given that training and retraining for women are necessarily on a large scale
- Given that employers have not shouldered the responsibility for training, and that no ways are used now to compel employers to train

We insist that employers be compelled to train and retrain women, and that the mechanisms for compelling them include, but not be limited to:

1. Federal contract compliance
2. Laws entrenching employment rights, whenever technological change, is introduced.
   Our group has obtained a commitment from CCLOW to submit the following demands to the Canada Employment and Immigration Centre:

- To include in the National Training Program a computer literacy program, to orient women to occupations in the computer field.
- To use the Skill Growth Fund to provide hardware to colleges for delivery of same.
- To considerably scale down dollars spent on traditional office training in geographic areas where automation is changing these jobs.
- To ensure availability to women of specific skill courses in technology.
- To ensure Women's Outreach projects and Women's Employment Centres are fully informed and involved in launching these courses and reaching their clients with information on their availability. A personal commitment was made by Joan Woodcock Goodman, of Saskatchewan Working Women:
- To develop a method, and to disseminate new technology training information and information relating to control over our work lives, locally, to women looking at training and retraining. This is to be done in conjunction with local women's groups, community groups, community colleges, unions, etc.
- To work with local and regional CEIC personnel to ensure good training opportunities in high tech are available to women (both industrial and institutional). These opportunities are to include all support services required by women. Clare Devlin, Coordinator of Women's Programs at Algonquin College in

Ottawa, announced her intention to propose to Equal Opportunities sections in the federal government departments, designs for general or pre-skill training programs which can lead women to a greater understanding of opportunities and specific training programs. This commitment is based on the belief that the federal government is the major employer of under-employed women.

Note: It was agreed by the assembly to table this request temporarily; until we could hear from the workshop on "Changing Employment. Patterns." We were informed that a similar proposal would come forth from that group.

From the 'Conseil d'intervention pour l' accès des femmes au travail,' a network aimed at re-entry women, came a commitment to pressure CEIC to sponsor programs that are relevant for women in getting access to the paid workforce. The Conseil will also attempt to make women and government aware of the fact that clerical and word processing programs are only short-term solutions.

There was a note of concern, during our discussion, that the Ontario Department of Education has cut the subsidies to local school boards for evening, adult education programs that were easily accessible to women. Ontario-based lobby groups should intervene on this issue.

It is the intention of one participant (Wendy Lawrence) to recommend to the Ottawa Women's Lobby that they hold a weekend workshop on computer literacy, including hands-on experience. She also intends to recommend to the executive of NAC that they encourage local member groups to do the same.

The National Capital Region chapter of Women in Science and Engineering committed themselves to preparing a list of organizations which provide forecasts of future employment opportunities, to be used in the conference proceedings, in order that women may choose appropriate areas of study.

The final plan of action was for the inclusion, in all our activities, of immigrant, native and black women, followed by a request that each participant take the resources she had gathered from the conference and use them in a daily relationship with any women lower in the job scale than herself.

3. Health

“Alana Joram, from Toronto University, informed participants of a questionnaire that has been distributed to their staff association members by a Committee for Technological Change in the Work Place. The questionnaire deals with such topics as VDTs and health hazards. Results will be compiled shortly, and could be of help to other women who share these concerns.

Lobbying techniques were discussed, and it was suggested that we resort to such tactics as letter-writing to ministers.

We encourage all participants in this conference to get involved in health and safety committees at all levels, especially; where they can influence legislation. In Regina, one participant is involved in the first steps towards a baseline study, and it is her intention to give particular attention to the health hazards related to low-level radiation. The Canadian Labour Congress has already done such a study, and the federal Health and Welfare department is producing one in the upcoming months. We should make an effort to read these documents and promote their recommendations.

Some Canadian unions have developed model clauses that, should be circulated amongst other unions for future negotiations. CUPE, the Communications Workers of Canada, the Canadian Union of Postal Workers and the Public Service Alliance of Canada have all set precedents with health-related clauses. All unions should be made to adopt such clauses.

Since NAC intends to submit a brief to the Labour Canada Task Force on Microelectronics and Employment, we ask that special consideration be given to concerns about the health hazards. The National Institute for Occupational Safety and Health has produced a major study. We encourage participants to study and promote its recommendations.

We invite organizations, such as the Business and Executive Women Network, the Business and Professional Women Clubs, and the National Association of Women and the Law, to collect information on the introduction of technology in the workplace and to organize boycotts of offending employers.

Each of us must join women's groups and/or a union to promote her views. Individual action is simply not sufficient. We Support the recommendation that will be put forth by the "Changing Employment Patterns" workshop, to the effect that NAC should lobby to obtain the creation of a Worker's Research Institute.

We were informed that the Carleton University Department of Engineering has created a Chair of Office Automation. One of our discussion members, who is a member of CUPE, will ask her union to approach the university for research on such subjects as low-level radiation.

4. Information Control and Access

“We would like to invite NAC, in conjunction with the other cosponsoring organizations, to form a coalition to pursue a study of the issues as they relate to information control and access, specifically where women are concerned. Five of our members are interested in contributing to such a coalition. They are: Dorothy Richardson and Liz Stimpson from Edmonton, Alberta; Flora Patterson, Jean Higginson and Daphne McCree, all from Ontario.

Individual actions, which could be taken by all women, include lobbying for legislation requiring public and private institutions to report at regular intervals to all those on whom they have records in their data base(s), indicating what information is being held. Suggestions for legislation should be included in conference workshops, women's groups meetings, letters to MPs, etc.

We can encourage institutions to become aware of our concerns by insisting on putting limitations on the use of personal information when we give it. As well, each of us should collect information on the data base systems in her area and get involved in the development process, so as to have an influence on regulations. We must become familiar with the Freedom of Information and Privacy Act, and use the legislation as it was, intended, to find out what is on 'file' on each of us.

5. Changing Employment Patterns

“ The group arrived at strategies for both individuals and groups. On an individual level, participants were urged:

- To establish and/or get involved in workplace micro technology committees as soon as possible, to inform and educate co-workers on upcoming changes and how to deal with them.
- Those who are union members should pressure their executive members to initiate measures for education of members on microtechnology. .
- We must all continue consciousness raising activities wherever we are, especially among pre-teen and teenage girls, and among low-income workers who suffer from lack of confidence and other problems related to being in the margins of the labour force.
- We can all write to federal and provincial ministers of labour, calling for affirmative-action plans and contract compliance. Proposals for group action include:

Note: It was decided to table this suggestion until the report from the workshop on "Changing Employment Patterns" was heard.

1. For CRIAW:
to set up a clearing house for literature and research on micro technology, and make it accessible to all women who need it.

Note: CRIAW representatives have made a commitment to use their newsletter to share any information that participants would like to submit to them, but they are not yet in a position to commit their organization to the bibliographic function required as a clearing house.

2. For NAC:

- This conference is concerned that the introduction of microtechnology has a fundamental impact on the structure of jobs and organizations that results in negative effects on the quality of jobs, career mobility and opportunity, and organizational effectiveness. We are particularly concerned that the introduction of the new technology will have a disproportionately negative effect on women in the paid labour force.
- We believe that there is an immediate need for an organization or institute that can provide practical research in, and models of, job and organizational restructuring and design, in order to meet the goals of both employees and employers in the application of the new technology. The research, consultation and demonstration provided to firms should be developed for both large corporations and small businesses.
- We propose that the federal government, in consultation and association with other governments, management and labour, fund this initiative through one of the following options: 1) the establishment of a Work Research Institute under the mandate of the National Science and Engineering Research Council, based on the Norwegian model; 2) funding from the Department of Regional Industrial Expansion to an existing Work Research Institute in an established Canadian university; 3) a grant of $5 million to the Canadian Council on Working Life and/or similar provincial centres, to establish practical research and consultation functions.
- We propose that, whichever model is adopted by the federal government, women should be an integral part of the planning, and should constitute at least one-half the direction and professional staff of such an organization. Canada cannot afford to fall behind world developments in the creation and application of micro technology. Good human resource utilization and better overall organization effectiveness are key factors in positive economic and social development"

Note: NAC President Doris Anderson, agreed to follow up on this recommendation, and Sabina Rohlfs, of Interface Associates, offered to help.

The recommendation elicited various comments on the issue of research. It was suggested that research must address the structure of the micro technological industry as a global organization, playing women workers in various countries off against each other. It was also stated that we need new definitions of such concepts as the GNP, to include an accurate assessment of the value of services.

The group then proposed, and received conference endorsement for the following principles regarding workers' rights, which were developed by the Confédération des syndicats nationaux, and slightly amended during the workshops:

- All technological change in the workplace must be a matter of negotiation, either between unions and employer, or employees and employer.
- Union or employee must have access to all information relating to upcoming changes.
- There must be a complete safeguard of the volume of work done; no reduction in the workforce.
- Employers must be compelled to invest in the retraining of present workers.
- There must be limits on the deskilling that results from technological change.
- There must be strong protection of health. These protections must be initiated as soon as the symptoms of the problem are recognized. Employers must not wait until the problem is proven, and the damage done.
- Technological changes should be introduced step by step.
- No electronic monitoring of workers.

It was further endorsed that these principles should be legislated, in order to protect workers in non-union worksites. It was also recognized that union protection is important to women, and that participants should return to their home provinces with the intention of lobbying for legislative change to remove the unfair and repressive clauses that block unionization.

Note: The above principles will be included by NAC in its brief to the Labour Canada Task Force on Microelectronics and Employment. Michelle Swernachuk, who is responsible for the NAC committee on microelectronics, will attempt to have the principles adopted by the NAC executive.

Finally, the women from the "Training and Retraining" workshop agreed to meet with the representative from the "Changing Employment Patterns" workshop, to draft a letter to all members of Parliament, which would include the above principles and elements of the original recommendation from "Training and Retraining" (see letter, Appendix).

6. Networking

Several women attending this workshop agreed to exchange names and contact addresses, in the hope of eventually organizing some form of national network to deal with microelectronics as it relates to women. The prime objective would be to stimulate existing groups and organizations, local and national, to devote energy to the issue, share

information and resources, pursue research, etc.

It was agreed that the Canadian Advisory Council on the Status of Women would be approached by the spokesperson for this workshop, and encouraged to begin research on women and micro technology. Lucille Roy agreed to prepare a list of interested participants (see Appendix).

Conference Follow-Up

Will the meeting held under the theme 'The Future is Now" have contributed to fulfilling the wish expressed by the Montreal network, that in the future, women will have an impact on microtechnology? The future will tell, but one thing is certain: the participants of the conference have not remained passive. Many have upgraded their training; some have taken courses in computer literacy, others, in advanced management. A few have bought a home computer, while others have undertaken research. The conference has convinced at least one participant to modify the subject of her doctoral thesis: Betty Collis, of the University of Victoria, is focusing on the high-school age group in an attempt to identify the various components that make up "attitude to computers" and to learn if there is a sex difference in response to any of these components.

All in all, conference results are not yet revolutionary, but, as we say. . . step by step! Here is an overview of the activities which, according to last January's survey, have been influenced by the conference.

1. Task Force on Microelectronics and Employment, Labour Canada

- As she had promised, Michelle Swernachuk, President of the NAC committee on employment, submitted a brief to the task force in the name of her organization.
- The Canadian Home Economics Association also submitted a brief, as did the Canadian Congress for Learning Opportunities for Women, and the Committee for Women and Technology responsible for setting up our conference.
- K. Jean Cottam, Ph.D., who is particularly concerned with the combined negative effects of radiation emanating from VDTs and cigarette smoke, submitted a brief as well.
- The President of the task force, E. Margaret Fulton, has informed us that after the conference, she made every effort to include in the final report a good number of recommendations dealing with the feminine condition.
- Finally, the CCLOW has also addressed its brief to the Canadian Employment and Immigration Advisory Council's task force on the effects of microtechnology.

2. Symposia

Since June 1982, several other symposia have been held, dealing with some aspect of micro technology. In certain cases, the resource persons stressed that the knowledge they had acquired at our conference had been very useful. Developments indicate a real synergy, meeting all our expectations, as the following list shows:

- Françoise Poirier, full professor at University Laval, presided at a meeting, "La micro-informatique dans le travail et l'éducation. The proceedings of the symposium will probably be available on request.
- Two hundred Montreal women gathered for a one-day study session, entitled "Le monde mysterieux des ordinateurs" (The Mysterious World of Computers), organized by the YWCA
- In August, Eileen Clarke, past President of the Canadian Federation of University Women, presented a report on the "Future is Now" conference during that organization's triennial meeting in Winnipeg. Speaking at that meeting's banquet, Naomi Griffiths, Dean of the Faculty of Arts at Carleton University, dealt with "Social and Ethical Implications of New Systems of Communication.
- The group, "Community Resources for Women of Kitchener, Ontario, chose microcomputers as the subject of its annual meeting, held in March 1983.
- In July, Alan Mirabelli of the Vanier Institute of the Family shared certain ideas acquired at our conference, when he was main speaker at the meeting of the Canadian Home Economics Association.
- Arleigh Smith dealt with the effects of microtechnology on the office during a November meeting of the University Women's Club in Perth, Ontario.
- In October, 200 people concerned with international development and education participated in a conference sponsored by the Manitoba Council for International Cooperation. The subject of one of the workshops was "The Impact of Micro-technology on Canada and the Third World".
- The Committee on the Feminine Condition, of Corner Brook, Newfoundland, took on the responsibility of their organization's provincial meeting. Its theme was "Women and Work," and a workshop was devoted to microtechnology.
- In November, Sher Anderson was speaker at the symposium, "Women and the Computer Age," held in Regina. As a result of this symposium, action research groups were established in Saskatoon and Regina.
- In March 1983, Sabina Rohlfs of Interface Associates, Ottawa, addressed the "International Computing Symposium" in Nuremberg, West Germany. The theme was "Office Communication: Promises, Problems and Pitfalls."

3. Work and Employment Patterns

- In January 1983, the CSN published a booklet, entitled "Les puces qui piquent nos jobs," which deals with problems related to the implementation of technology in the workplace and the demands of labour.
- Sari Tudiver, Project Coordinator for the Manitoba Council for International Cooperation, is doing research on the impact of micro technology on the work of women in Canada and the Third World. She is particularly interested in means to ensure that technology will contribute to the progress, rather than the deterioration of the quality of life of women in these countries.
- The Director of the Office of Equal Opportunities for Women, Public Service Commission of Canada, Johanna Hickey, organized an information session, which led to the creation of a task force to examine the present state of automation within the Public Service. This group will present its recommendations to managers of all federal departments.
- The Affirmative Action Program of Ontario's Department of Health offered four, two-day sessions to department employees, to inform them of the impact of micro technology on office work.
- Better informed because of our conference, Bonnie Carroll, Coordinator of Equal Opportunities at the Public Service Alliance of Canada, continues her work within the Committee of Technological Change. In that capacity, she has been involved in research to educate members, and has contributed several articles for publication in the weekly information bulletin of her organization.

4. Education, Training and Retraining

- A variety of courses and workshops was set up by Clare Devlin, then Coordinator of Women's programs at Algonquin College in Ottawa. These courses were so successful that they were repeated during the 1982-83 winter session. As she had promised, Claire took steps to make federal departments more aware of the need to retrain women, although she claims to have had little success yet.
- Andra Budden of Ryerson Polytechnical Institute, Toronto, has designed and established a pilot project, entitled "Contemporary Careers: Options and Opportunities." The program includes six major components: 1) acquire computer literacy; 2) build strength in math; 3) develop research and problem-solving skills; 4) discover and refine management talents; 5) assess personal goals and career options; and 6) obtain practical information on the current job market.
- Joan Bradley, Program Coordinator for the Carleton School Board, has announced that a colleague, Laurie Walker, has just published a booklet dealing with careers in microcomputers, to inform secondary-school students.
- Rosemary Norris, Coordinator of Job Opportunities for Women within Employment and Immigration Canada in Newfoundland, has sought to increase the awareness of job consultants and women's groups. She has also approached the Continuing Education Department of Memorial University to promote courses in computer literacy for women.

- From Dartmouth, Nova Scotia, Nettie-Mae Campbell has let us know that she has commenced a study on the impact of micro technology on adult education, with special emphasis on women.
- Bronwen Wood of the Secretarial Department of St. Lawrence College in Kingston, has participated in the creation of a course in word processing, offered since last fall. This one-year course is geared to a global training, which takes into account the information process as a whole. Bronwen has also organized workshops and seminars within the community, and will soon be assisted by her female students in that task.
- Motivated by her experience of the conference, Gail Mounteer of MWT Learning Associates, Ottawa, has designed one- and two-day courses to demystify micro technology for women. She is now frequently invited to speak and to offer her course in the National Capital Region.

5. Personal

The preceding pages give a good idea of the activities influenced by the conference held in June 1982, in Ottawa. Not found here, however, are personal comments, manifestations of friendships born between workshops, concepts suddenly grasped, fears which have finally vanished, new personal and professional challenges. Those who believe that sometimes little things make a large difference, can feel reassured. Through osmosis, through a multiplying factor, through some 600 people motivated by the success of their meeting, last June's conference will have had its impact on microtechnology.

Conclusion

Some conferences are considered a success because events have matched the predetermined program and schedule - a rare commodity. Others are appreciated simply because in their course, something happened, something clicked which was worthwhile to the participant. For many, the conference described in the preceding pages falls into the latter category.

"It was a total learning experience, an environment such as we had never experienced, say some participants. "The learning process was indissociably linked to the caring and sharing attitudes of the persons involved."

This holistic quality was further obvious in the conceptual frameworks of the guest speakers and workshop resources. Without exception, emphasis was placed on the need for comprehensive approaches to planning, for systemic re-organization and global implementation strategies that take into account all aspects of the environment and persons to be affected by technological innovations.

It may be that the events and mood of the conference emerged from an effective conjuncture of feminist paradigm and subject matter. Viewed by holistically minded and equality-conscious persons, micro technology does appear to have the potential to positively transform society. In a sense, the conference became the living proof that, when handled with care, technology does provoke the emergence of new and creative modes of learning and interacting.

Women of diverse, and sometimes conflicting views inter- faced, respectful of each other's methods and beliefs, and motivated to identify areas for possible joint action. Despite their apprehensions about the negative impact of microtechnology, they were able to distinguish between the technology itself and the methods for its implementation. Finally, they committed themselves to personal action - a dynamic manifestation of autonomy and responsibility .

Without a doubt, the future needs many more women in microtechnology. Now.

Appendix

FIRST NATIONAL CONFERENCE ON WOMEN AND MICROTECHNOLOGY

"Women and the Impact of Microtechnology" is the subject of an intensive three-day conference to be held at Carleton University from June 25 to June 27, 1982. The event includes a broad selection of workshops to be led by specialists in various relevant fields, including Heather Menzies, author of *Women and the Chip* and the soon to be released *Computers on the Job*; Patricia McDermott, sociologist; Jeanne Stellman, Executive Director of Women's Occupational Health Resource Centre, Columbia University; P. Anne Wilson, Director of Sales CATV Products, NABU Manufacturing Corporation; and the Honorable Maureen L. Hemphill, Minister of Education, Manitoba.

The objectives which have been outlined for the conference include the familiarization of women with microtechnology, the analysis of all of the fundamental issues relating to micro -technology and its impact on women, the development of individual and group strategies for using technology to the advantage of women.

The conference will, for the first time, bring together experts from a variety of professional, commercial and academic fields to discuss the issues which revolve around the integration of women into new areas within a changing labour force, and to participate in a variety of workshops and demonstrations. Some of the subject areas which will be discussed at the conference include: education, ergonomics, ' training and retraining, health and safety, math anxiety, and I office automation.

For further information, please contact: Communicator Associates: 238-6444 (613). For registration information, contact: Lynda Barrett: 737-2973 (613).

Women and Micro technology Conference Resolves Strong Actions.

FOR IMMEDIATE RELEASE
OTTAWA, June 28, 1982... Over 600 women from all across Canada resolved to take immediate actions to ensure that microtechnology is used for the benefit of women, rather than the reverse.

The Future is Now: Women and the Impact of Microtechnology was a three-day conference held in Ottawa, June 25 - 27, to examine the issues and make recommendations in the areas of employment, training and retraining, education, health and safety, information access and control, as well as legislation related to all aspects of the micro technology industry.

The sponsoring organizations of the conference were the Canadian Congress for Learning Opportunities for Women (CCLOW) , the Canadian Federation of University Women (CFUW), the Canadian Research Institute for the Advancement of Women (CRIAW), and the National Action Committee on the Status of Women (NAC).

The following actions were instigated:

1. Employment, Training and Retraining

(i) A letter will be sent immediately to all federal MPs, insisting that employers (under federal jurisdiction) be compelled to train and retrain women. Suggested measures for doing this include the introduction of federal contract compliance, as well as new laws entrenching specific employment rights wherever technological change is introduced.

(ii) The Canada Employment and Immigration Commission will receive requests for special programs to be set up and for the allocation of training funds directed towards the integration and advancement of women in the microtechnology industry.

(iii) There will be regional lobbying of Ministers of Education to ensure that suitable, affordable training courses in computer literacy are established.

(iv) That special attention be paid by provincial governments to the needs of immigrant, native, handicapped and poorly educated women is also a priority.

(v) It is recommended that a national **Work Research Institute** be established to provide informed guidance in the humane application of the new technology. Funding from federal and provincial governments is requested and women must be involved in the planning of such an institute.

2. Education

(i) The conference delegates agreed to lobby Ministries of Education and school boards to introduce strong measures to ensure that high-school girls pursue math and science studies, and are counseled about careers requiring these subjects.

(ii) Women must be involved in the decisions about curriculum changes, the introduction of computer hardware into schools and the development of suitable software programs to encourage girls' interest in micro technology and computer science from an early age.

(iii) Statistics on the number of women math and science teachers and the number of girls in math and science courses should be available.

3. Health and Safety

(i) The conference delegates demanded urgently further information on the possible radiation hazards of video display terminals (VDTs), since, at present, there is no conclusive scientific study in this area.

(ii) All workers should become informed about the health dangers and the stresses of those jobs in the microtechnology industry which have already become "women's work," such as the operation of VDTs and assembly line work.

(iii) A **Charter of Rights** related to micro technological change is proposed, which should include clauses about advance notice of such change and its step-by-step introduction, safeguards regarding deskilling and reductions in the size of the workforce, and provisions for both training and health safeguards.

4. Information Access and Control

(i) The conference delegates urge all women to find out what information is contained in their personal and security files, and to lobby for freedom of information and other protective legislation re: theft and/or sale of the information in data banks.

(ii) Groups and individuals are urged to make full use of available data base facilities for the exchange of information relating to women's concerns and their employment needs.

5. Other Recommendations

Numerous other recommendations regarding actions to be taken by the organizing groups were endorsed by the conference delegates.

6. Networking Coalition Formed

A coalition was formed from the conference, with the purposes of:

(i) Establishing a National Micro technology Network with the task of exchanging information and lobbying for action; and

(ii) Identifying urgent needs and ensuring that appropriate measures are taken.

All women are urged to inquire from the local branch of the conference organizing groups how they may participate in this network.

FOR FURTHER INFORMATION, please call:
CCLOW: Lenore Rogers (416) 461-9264 or (306) 569-3811
CFUW: Eileen Clark (514) 739-7360 or (514) 733-3142
CRIAW: Johanna Hickey - (613) 996-4208
NAC: Doris Anderson - (416) 922-3246

Letter Addressed to Members of Parliament

July 5, 1982

Dear Member of Parliament:

The conference, Women and the Impact of Microtechnology, held in Ottawa, June 25-27, 1982 under the cosponsorship of the Canadian Congress for Learning Opportunities for Women, the Canadian Federation of University Women, the Canadian Research Institute for the Advancement of Women and the National Action Committee on the

Status of Women, brought over 500 women.

Participants, representing community groups, concerned women, trade unions and employers across Canada, voted to endorse the following resolutions:

1. Microtechnology will have its greatest impact on the service sector, where the majority of women are employed. It is estimated that over 40% of clerical workers will lose their jobs.

   Whereas training and retraining will be required on a large scale, and

   whereas employers have not shouldered their fair share of training responsibilities,

   the participants of this conference resolve to bring to the attention of the members of Parliament, the urgent need to compel employers to take affirmative-action measures to train women. *We urge that the mechanism for compelling employers to improve opportunities for women include, but not be limited to, contract compliance.*

2. In order to meet the challenges of technology and distribute its rewards in a fair and equitable way, we ask members of Parliament to adopt in principle the following rights:

- The introduction of all aspects of technological change must be negotiated between the union and the employer. where a union exists, or between the employer and employees.
- *Legislation* must use the *broadest possible* definition of technological change.
- *All necessary information* relating to the introduction of technological change must be *available to all employees.*
- The volume of work shall not decrease as a result of technological change; *no employee shall be laid-off.*
- Employers shall be required to retrain redundant employees.
- *No employee shall suffer extensive deskilling* as a result of. the introduction of technological change.
- There shall be no electronic or technological *surveillance of employees.*
- *Employees shall have the right to refuse work* that is unsafe or unhealthy.

As concerned women conference participants and members of the fair sponsoring organizations, we count on you to act on these resolutions.

For further information, please contact the conference committee at:

P.O. Box 236, Station B,
Ottawa, Ontario
K1P 6C4

Network List

set up at the June 25-27 1982 Conference, Ottawa

a

ANTHONY, Donna
(403)-477-7729 m/h
(403)-427-8501 t/w
11 227 - 93 Street
Edmonton, Alta.
T5G 189

de CCPEF
from CCLOW

ARMSTRONG, Barbara
(613)-236-6321
66 Glebe Ave.
Ottawa, Ontario
K1S2C3

Working with microcomputers to offer services and continually learn how to use the technology. Interested in supporting the exchange of information at all levels with women.

AVEDON, Lisa
(519)-885-3393
343 Coleridge Drive
Waterloo, Ontario
N2L 2V5

b

BAATZ, Rosanne
(514)-482-5759
15 Parkman Place
Westmount, Quebec
H3Y 2L4

Member CCPEF CCLOW member
McGill Alumnae

McCREE Daphne
2154 Beaconwood Drive
Gloucester, Ontario
K1J 8M4

MELANSON, Rosella
(506)-388-9660
N.B. Advisory Council on Status of Women/
Conseil consultatif sur la condition de la femme au N.B.
386 rue St-George
Moncton, N.B.
E1C 1X2
Contact for N.B.

MENZIES, Heather (613)-829-6348
861 Forest Street
Ottawa, Ontario
K2B 5P8

MORRIS, Dorothy
(902)-894-9439
Women's Employment Development Program
129 Kent Street
Charlottetown, P.E.I.
C1A 1N4

n

NEWBERY, Wendy
(519)-886-5943
114 Erb Street West
Waterloo, Ontario
N2L 1T5
Want to maintain contact and committee; possible volunteer input.

Student working along with

Willing to offer time to networking organization development, program planning background.

BEDARD, Lois
15 Gervais Drive
Dan Mills
Toronto, Ontario
M3C 1Y8

Organized Working Women. We held a microtechnological conference in Toronto, Ont in February 1982, slanted toward evolving not only 1. an understanding of microprocessing, its advantages and disadvantages, but also 2. its dangers and ways in which women working under *bona fide* collective bargaining units could negotiate a) VDT health and safety standards, b) training and retraining clauses, c) union "educational leave" for company-sponsored training to offset deskilling underemployment and unemployment. We will see that the Ontario Federation of Labour receives resolutions for policy development at their annual meeting.

BOURDEAU, Jacqueline
(514)-270-7318 m/h
(514)-738-2473 t/w
étudiante a la Faculté des sciences de l'éducation
Université de Montréal
Case postale 6128, succ. A
Montreal H3C 3J7

BOWER-BINNS, Gwen
(613)-733-8886
211 Lennox Street
Ottawa, Ontario
K1G OK3
Ontario Status Women Council

Kitchener-Waterloo Status of Women and other community groups to discover what the problems are in our area (Waterloo is a big insurance town). We are exploring what our next steps will be in reaching the women involved.

NUGENT, Andrea
(613)-729-5760
154 Cowley Avenue
Ottawa, Ontario
K1Y 0G6
M.A. student, Journalism, Carleton University 4-6 months free time available for research, as of June 27,1982.

P

PATTERSON, Flora
National Library of Canada
395 Wellington Street
Ottawa. Ontario
K1A 0N4

PELLETIER, Jacqueline
(613)-563-0681 t/w
a/s ICRAF
151 Slater
Suite 425
Ottawa, Ontario
K1P 5H3
Animatrice de l'atelier
Workshop Chairperson

PEPPIN, Gail
(416)-444-3491 m/h
(416)-592-3354 t/w
Public Relations Division
Ontario-Hydro
700 University Avenue
Toronto, Ontario
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Wish to see issues raised, progress

BUTEAU, Helene
(613)-837-3944
7914 Decarie Drive
Orleans, Ontario K1C2K3
Recherche dans le domaine la femme et la microtechnologie ".

C

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K1N 7G l
Fédération des Femmes Canadiennes - Françaises

d

D'AOUST, Danielle
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1600 rue Berri, suite 230
Montréal
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Travail non-traditionel

DEVLIN, Clare
Women's Program
Algonquin College
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K2A 3V3
Women's organizations

DUMAS, Marie-Claire (514)-521-9447
4475 rue Brébeuf
Montréal, Québec
H2S 3K8
Etudiante M.A. en communications U.Q.A.M.

f

FARNWORTH, Lee (613)-224-

above, and go beyond conference through network system. Interested in attaining a national networking list, participating microtechnology, and exchanging information at all levels and on all issues affecting women.

PETRACA, Pat
(613)-237-0732
99 Glebe, Apt. 1
Ottawa, Ontario
K1S 2C2
Office Women Network
Office Women Credit Union
Office Women Lobby

r

RICHARDSON, Dorothy
c/o D. Anthony
11227 - 93 Street
Edmonton, Alta.
T5G 1B9
Mrs. Richardson left "Edmonton, Alta." as address

RIOPEL, Célyne
(613)-995-2410 t/w
257 Slater - 4^{e} étage
Ottawa, Ontario
K1P 5H9
Commission fédérale des droits de la personne

ROGERS, Lenore
(306)-569-3811
Program Coordinator
Regina Plains Community College
2708 -12th Avenue
Regina, Sask.
S4T 1J2
CCLOW President
Présidente du CCPEF
Agree that we need a linking, but do not want to expend energy on

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1094 Falaise
Nepean, Ontario
K2E 6P8
F.C.F.D.U. C.F.U.W. Steering Committee, June 25-27, 1982 Conférence

g

GAMACHE, Lawrence
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(514)-679-0140 (257) t/w
50 Champs dleuris
La Prairie, Québec
J5H 3Y8
Analyste en systèmes. Membre du Comite sur la microtechnologie de la Fédération des Femmes du Québec.

GAUDREAU, Manon
(819)-777-4784 m/h
45 Hadley
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J8Y 3K6
Présidente du club de Hull de la Fédération Canadienne des Femmes Diplomées Universités.

Informaticienne, Bell-Northern Ottawa. Disponible pour travail pratique d'informatisation.

h

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(613)-996-0396 t/w
611 - 1435 Morisset Ave.
Ottawa. Ontario K1Z8H4
Graphic Designer.
Concern with ways for union to act on micro technology at level of shop steward with Equal-Opportunities responsibility.

organizing a new organization: use our own resources and networks.

ROY, Lucille
(514)-343-6780 t/w
a/s Dep. I.R.O.
Université de Montréal
Case postale 6128, succ. A
Montréal, Québec
H3C 3J7
Secrétaire de la Fédération des Femmes du Québec et, a ce titre, membre- répondant auprès du Conseil d'administration pour le Comité F.F.Q. sur la microtechnologie.

S

SAURO, Valleri
(416)-889-1790 m/h
(416)-669-5651 t/w
22 Maryvale Crescent
Thornhill, Ontario
L4J 2H4
Wish to address concerns raised at conference through network

SELWIN, Ruth
(514)-866-9941 (18) t/w
Director of Community Programs
Management Centre for Women
Y.W.C.A.
1355 Dorchester Blvd.West.
Montreal. Quebec
H3G 1T4
Organizing computer-consciousness courses/seminars, conferences on health hazards, etc.

SIMARD, Gisele
(514)-729-0670
3858 Dandurand
Montreal. Quebec
H1X 1P4

HIGGINSON, Jean
70 McEwen Ave.. Apt. 706
Ottawa, Ontario
K2B 5M3

HOPKINS, Jonleah
(403)-668-3257
P.O. Box 4504
Whitehorse, Yukon Territory
Y1A 2S8
Yukon Status of Women .

i

INGLIS, Dorothy
(709)-753-0494
9 Maxse Street
St. Johns, Nfld.
A1C 2S6
Newfoundland now NDP

j

JACKMAN, Nancy
(416)-961-7744
184 Roxborough Drive
Toronto, Ontario
M4W1X8
NAC - want a computerized list of what women are interested in - so they can be notified of *lobbying needs.*

l

LANE, Chris
(204)-949-2446
Reg. Coord. Equal Opp. for Women
Public Service Commission of Canada
500 - 286 Smith Street
Winnipeg, Manitoba
R3C 0K6
Federal Public Service, Women in Empêchée de participer a la conférence. Présidé le Comite ad hoc sur la microtechnologie de la Fédération des Femmes du Québec.

SMITH, M. Joan
(613)-521-1681
(613)-237-0866
53 Glen Avenue
Ottawa, Ontario
K1S 2Z8
Publicity and promotion

STINPSON, Liz
Microtechnology Action & Alliance
113 Madison Avenue
Toronto, Ontario
M5R 2S3

STUBBS, Mayling
59 George St.
Waterloo, Ontario
N2J 1K8
Chairperson, Kitchener-Waterloo Status of Women; member, Community Resources for Women, etc.

t

TATZ, Shebah
(613)-233-7692
35 Robinson Avenue
Ottawa, Ontario
K1N 8N8
At present I have no affiliation. I am willing to be volunteer worker and can use my capacity as programmer to aid a women's network.

TAYLOR, Fay Lindley
(819)-994-6902 t/w
530 Laurier Ave. West
Suite 1110
Ottawa, Ontario
K1R 5E1

Manitoba and Saskatchewan

LAURENCIN, Janine (613)-833-2848 m/h
(819)-997-7414 t/w
Route rurale 2 B.602
Cumberland, Ontario
K0A 1S0

LAWRENCE, Wendy
(613)-234-9645 m/h
(819)-997-6057 t/w
182 Booth Street
Ottawa. Ontario
K1R 7J4
NAC Executive
Membre de l'Exécutif CAN

LYE, Corinne
(416)-527-6590 (281) t/w
Canadian Centre for Occupational Health
250 Main Street East
Hamilton, Ontario
L8N 1H6

m

MacFADDEN, Jo
(613)-238-6444
Communicators Associates
409 Queen Street
Ottawa. Ontario
K1R 5A2
Professional communicators trying to run national/local awareness campaigns related to microtechnology to be used for the benefit of women and the enhancement of society.

Willing to do what is necessary to effect change locally, globally, etc. Public affairs, teaching, sales background.

w

WILLIAMS, Jean
(514)-935-3610
44 Academy Road, Apt. 8
Montreal, Quebec
H3Z 1N6
Helping organize meeting, Y.W.C.A. on Dorchester St. West, Tuesday, Sept. 21,1982 at 20:00

Exhibits, Books and Films

Exhibits

The following displays were open to participants throughout the conference.

Algonquin College of Applied Arts and Technology
Educational Requirements Slide Show

Bell Canada
Telephone Equipment for Special Needs

Bell-Northern Research Ltd:
"The People Place"

Canada Employment and Immigration Commission
National Job Bank
"Choices"

Carleton University
Simple Computer Animation

Compumart
Commodore Super Pet Microcomputer

Computer land
IBM Microcomputer
Apple Microcomputer

Connaught High School
Logic Boards

Cybernex
Computer Terminal Sensitive to Touch
"If You Can Teach You Can Train Our Micro to Help"
Graphic Terminal

Films

The following films were made available to interested participants.

So What's It All About
41 min.
Introduction to the technology and application of microprocessors (silicon chips).

Sink or Swim
40 min.
Illustrates the problems faced by businesses and equipment manufacturers in accommodating the advent of microprocessor technology.

And What of the Future
41 min.
Predicts future development, application, and impact of micro-processor technology.

Bureau de Demain
14 min.
Outlining future changes in the traditional office.

Fast Forward Series: Security
30 min.
Looks at devices available for Security, noting that our most important resource is becoming information itself.

Chips
21 min.
A "Fifth Estate" program dealing with microchip technology and how it affects our lives.

Fast Forward Series:

IBM Canada Ltd.
Audio Typewriter Display Writer Personal Computer

Leigh Instruments Limited
Crash Position Indicator
Mechanical Strain Recorder
Cockpit Voice Recorder

NABU Manufacturing Corporation
Cable-Compatible Microcomputer

National Women's Mailing List
Computer

Women in Electronics
Electronic Components Slide Show

Books

On Friday and Saturday, books were displayed by:

Canadian Congress for Learning Opportunities for Women (CCLOW)

Canadian Federation of University Women (CFUW)

Canadian Research Institute for the Advancement of Women (CRIAW)

Canadian Women's Studies (Toronto)

Development Education Corporation (Toronto)

Fireweed, **A Feminist Quarterly (Toronto)**

National Action Committee on the

Implications
30 min.
Examines the implications of this rapid change for society.

Telidon (Français)
13 min.

Breaking Through
20 min.
Looks at women in trades and technology.

Make It Happen
20 min.
Looks at women and how they acquired their present jobs.

Tomorrow's Technology: Today's Headache
15 min.
Examines health hazards of video display terminals.

Fast Forward Series: Biomedics
30min.
Designers demonstrate achievements in biomedical engineering.

New Technology: Whose Progress?
35 min.
A new production which critically examines the new technology.

Office of the Future
13 min.
Outlines future changes in the traditional office.

Fast Forward Series: Games
Introduction to the world of micro-electronic computer games.

Why Aren't You Smiling?
20 min.

Status of Women (NAC)

Octopus Books (Ottawa)

Women's Press (Toronto)

Looks at the changing role of secretaries.

Fast Forward Series: Humanizing the Technology
Demonstrates current achievements in robotics.

Telidon (English)
13 min.

Now the Chips Are Down
53 min.
Deals with technological change, focusing on silicon chips and the impact this technology will have on the labour market all over the world.

Microtechology and Our Jobs

a reading list for office workers

Prepared in 1981, revised
in 1983 by Ingrid Wellmeier
of the New Technology
Working Group,
145 Atlas Avenue,
Toronto, Ontario M6C 3P4
(416) 652-0310

Financial support from:
Labour Canada
The Women's Bureau of the
Ontario Ministry of Labour
The Women and Technology Committee
The Women's Bureau of
Labour Canada

The use of word processors, video display terminals (VDTs) and all kinds of computer technology in automated and streamlined offices has drastic implications for working people. This is a reading list for people who wonder about what will happen to their jobs if and when their employers decide to take advantage of the latest technological advances. This list is designed to help everyone gain access to information about the changes taking place. In order to benefit from the new technology, workers must know all about the advantages and disadvantages offered by these innovations. That way, people affected can promote "good applications" and prevent dangerous or unhealthy uses of new technology and also protect themselves against loss of control over their work and loss in pay, which sometimes follows changes. Most important, workers can protect themselves against job loss and demand some of the benefits made possible by the new technology, such as reduced working hours and better working conditions.

The list is divided into four sections:

1. General Information;
2. Labour Publications;
3. Health and Safety Issues;
4. Films.

Within each section, the references are listed alphabetically according to author. In all cases a brief description of the article, book or film is provided and a note on where to get the material is included. Most of these publications are available for sale in bookstores such as the Women's Bookstores in Toronto and Ottawa, the Development Education Centre in Toronto, Octopus Books in Ottawa, and other bookstores across the country. Local Labour and Women's Resource Centres and libraries will have copies of many of these items.

1. General

Information

Bergom-Larsson. Maria (1979)
Women and Technology in the Industrialized Countries, Science and Technology Working Papers Series, No.8

A very good introduction to broader problems which technology poses for women. This report includes a section on the computerization of various kinds of office work (pages 25-28). *UNIT AR, 801 United Nations Plaza, New York, N.Y.*

Brady, Patty (1981)
Microtechnology: Shorting the Circuits, in Broadside, Vol. 2, No.9

A good introduction and overview from a feminist perspective. Includes a section on health hazards. job loss and a short bibliography. *Broadside. P.O. Box 494, Toronto M5S 2T1.*

Braverman. Harry (1974)
Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century

This excellent book outlines the development of work - especially clerical and service work - by examining the historical growth of large corporate enterprises in the 20th century. *Monthly Review Press, 62 West 14th Street. New York. N. Y. 10011.*

Canadian Advisory Council on the Status of Women (July 1982)
Microtechnology and Employment: Issues of Concern to Women

In this "Brief to the (Labour Canada) Task Force on Microelectronics and Employment," the authors focus on unemployment, new employment and the quality of the work environment. The Brief is in English and French.

Canadian Advisory Council on the Status of Women, Box 1541, Station B, Ottawa K1P 5R5.

Canadian Forum (April 1982)
Micro-technology and Canadian

Labour: Part Two

Under this heading, three articles are included: one on collective bargaining and public policy, one on women's jobs and a third on multinationals.

The Canadian Forum, 70 The Esplanade,
3rd Floor, Toronto, Ontario.

Cheveldayoff, Wayne (February 28,1979)
Working Women -- Force of the
Future, in the Globe and Mail

The reporter notes large discrepancies in the government's predictions on women's entry into the labour market - "the predicted rate... for 1986 has already been reached" - and the training facilities to enable these workers to fill the predicted skill shortages.

Globe and Mail. Toronto, Ontario.
Counter Information Services (1980)

The New Technology, Report No. 23

An excellent comprehensive introduction to the new technology and the critical issues arising when it is implemented. *Counter Information Services, 9 Poland Street, London W.1.*

CSE Microelectronics Group (1980)
Microelectronics: Capitalist Technology
and the Working Class

This collectively written book outlines the current economic situation and places the production and use of micro technology within this context. One chapter deals with banking in more detail, while the last chapter is a discussion of alternatives. *CSE Books, 55 Mount Pleasant, London WC1X OAE.*

Financial Times of Canada,
Special Report (March 9, 1981)
War of the Words: Fighting for the
Word Processor market

This report includes a comprehensive overview of the Canadian word processor market, as well as discussion of resistance by workers and managers to the new technology. *Financial Times of Canada.*

Garson, Barbara (1975)
All the Livelong Day: The meaning

and Demeaning of Routine Work

A look at how people in a wide variety of routine jobs restore meaning to their work. This book includes chapters on keypunching, clerical and typing work. *Penguin Books, 625 Madison Ave. New York. N.Y. 10022.*

Garson. Barbara (July 1981)
The Electronic Sweatshop: Scanning the Office of the Future, in Mother Jones

An excellent article about the critical issues resulting for workers in the electronic office; includes a section on the new technology, another on health hazards and a list of articles and films useful for organizing office workers. *Mother Jones, Foundation for National Progress, 625 Third St., San Francisco, CA 94107.*

Globe and Mail, Report on Business
(May 4,1981)
Report on the Office and Computers

A business perspective which includes discussion of the "office of the future." Globe and Mail, Toronto, Ontario.

Globe and Mail, (January 1 through January 7,1983)
The Chip: Killing Jobs and Creating Peasants

This well researched series focuses primarily on the unemployment which will result from the implementation of microelectronics, but also discusses changes at work, and training and job possibilities. *Globe and Mail, Toronto, Ontario.*

Goldhaber, Michael (July and August 1980)
Politics and Technology: Micro-processors and the Prospect of a New Industrial Revolution, in Socialist Review, No. 52

A sophisticated analysis examining the context and implications of the most recent technological advances. *New Fronts Publishing Co., 4228 Telegraph Avenue, Oakland, Calif. 94609.*

Government of Canada, Department of Communications (1980)
The Office of the Future

This brief pamphlet promotes the development of the Canadian office equipment industry without a realistic evaluation of the problems created for workers in the "office of the

future." In French and English. Federal Department of Communications. Ottawa, Ontario.

Huws. Ursula (1982)
Your Job in the Eighties, A Woman's Guide to New Technology

One of the most comprehensive discussions of new technology and women's jobs to date. An excellent introductory resource written especially for women. *Pluto Press. Unit 10. Spencer Court. 7 Chalcot Road. London NWl BLH.*

Johnson, Walter (1980)
Brave New Technology, in Our Generation, Vol. 15, No.2

A review essay of Joan Kuyek's "The Phone Book," this brief article shows how technological change at Bell has been used to centralize control in the hands of management, and suggests this is an issue which faces working people everywhere today. *Our Generation Associates. 3981 St. Laurent Blvd., 4th Floor. Montreal, P.Q.* H2W 1Y5.

Labour Canada Task Force on Micro-Electronics and Employment (1982)
In the Chips: Opportunities, People, Partnerships

The Task Force recommends the promotion of high technology industry in Canada, using tax incentives, credits and other programs. They also recommend the establishment of a Centre of Technology, Work and Human Priorities to help create job and training opportunities and to monitor the social and economic impact of the new technology. *Free copies from: Publications Distribution Centre, Labour Canada, Ottawa, Ontario K1A 0J2.*

Laxer, Robert M. (1978)
Technological Change and the Workforce

General introduction to technological change at work. not specific to micro-electronics. *Ontario Institute for Studies in Education. 252 Bloor Street West, Toronto. Ontario*.

Lowe, Graham, Craig Heron and
Cy Gonick (December 1979)
Battle for the Workplace, in Canadian Dimension

An excellent background article for developing an understanding of the changes in the work process, which lead up to and include automation. Good historical and theoretical introduction to the struggle for control of work between workers and managers. *Canadian Dimension. Ste. 801. 44 Princess St. Winnipeg. Manitoba R3B lK2.*

Matteis, Richard. J. (March and April 1979)
The New Back Office Focuses on Customer Service, in the Harvard Business Review

This article describes re-organization in the giant U.S. Citibank services management

group. Work in the "back office as a factory" is compared to that on an assembly line. *Harvard Business Review. Boston, MA 02163. U.S.A.*

McDermott, Patricia (December 1981)
The New Demeaning of Work, in Canadian Dimension

A concise outline of the problems women workers may encounter as a result of the introduction of micro-electronic technology. *Canadian Dimension, Ste. 801, 44 Princess St., Winnipeg, Manitoba R3B lK2.*

Mertes, Louis H. (March and April 1981)
Doing Your Office Over Electronically, in Harvard Business Review

The U.S. Continental Illinois Bank has cut out paper and, through electronics, made the office location irrelevant for executives who can dictate from a telephone anywhere in the world. Those who operate the electronic equipment which makes this possible continue to work in large central locations. *Harvard Business Review, Boston, MA 02163, U.S.A.*

Menzies, Heather (1981)
Women and the Chip: Case Studies of the Effects of Informatics on Employment in Canada

A good introduction to the effects of microtechnology on women's employment in Canada. Four case studies (corporate head office, major insurance company, bank, and supermarket) are followed by analyses and predictions. The conclusion contains recommendations, and a brief appendix lists "Occupations with Good Future Prospects." *Institute for Research on Public Policy, 2149 Mackay Street, Montreal, P.Q. H3G 2J2.*

Menzies, Heather (1982)
Computers on the Job: Surviving Canada's Microcomputer Revolution

A description of office automation and where it takes place is included in this discussion of Microtechnology in Canada. Suggested jobs and career paths, as well as education and training for the future, are outlined by Canada's best known author on this topic. *James Lorimer and Co., Egerton Ryerson Memorial Building, 35 Britain Street, Toronto, Ontario M5A 1R7.*

Newsweek (June 1980)
Machines That Think

An optimistic "gee whiz" overview of computer and chip technology. Lots of photos and information about fantastic possibilities, but little discussion of the consequences for working people. *Available from Newsweek.*

Peters, Wendy (April 1, 1981)

Regan Defends Job Automation, in the Globe and Mail, Report on Business

A report on the federal Labour Minister's speech at a conference on "Micro-electronics and the Work Environment" in 1981. *Globe and Mail, Toronto, Ontario.*

Print Project Books (1980)
The Techno/Peasant Survival Manual

A fascinating book for people of all ages, this work truly "demystifies the technology of the 80s." It includes chapters on microcomputing, fiber optics, lasers, genetic engineering, space shuttles, satellites, atomic energy, modern weapons technology and artificial intelligence. The book is filled with illustrations and photos. *Bantam Books, 666 Fifth Ave., New York, N. Y. 10103.*

Sandberg, Ake, Editor (1979)
Computers Dividing Man and Work: Recent Scandinavian Research on Planning and Computers from a Trade Union Perspective

A collection of articles by writers devoted to the democratization of the workplace and the economy. Cooperation within the field of computers, systems development and planning between researchers and unions provides a starting point for this research. *Arbetslivscentrum (Swedish Centre for Working Life), Box 5606, S-11486, Stockholm, Sweden.*

Science Council of Canada (1980)
The Impact of the Microelectronics Revolution on Work and Working (Proceedings of a Workshop sponsored by the Science Council of Canada, Committee on Computers and Communication)

This report deals with job displacement, unemployment, quality and organization of work, health and safety issues, manpower policy and planning. *Free from: The Publications Office, Science Council of Canada, 100 Metcalfe St., Ottawa, Onto K1P 5M1.*

Science for the People (November and December 1981)
Wrestling with Automation

Special issue includes articles on robots, micro technology and publishing, manufacturing, secretarial work, and the Pentagon. Book review of Microelectronics: Capitalist Technology and the Working Class. *Science Resource Center, 897 Main Street, Cambridge, MA 02139, U.S.A.*

Scientific American (September 1982)
The Mechanization of Work

An entire issue devoted to automation and micro-electronics. Articles on agriculture, mining, design and manufacturing, commerce, office work, and women's work. Lots of

statistics, tables and graphics. *Scientific American Inc., 415 Madison Ave., N. Y., N. Y. 10017.*

Time (January 3, 1983)
Machine of the Year
A series of articles on the microcomputer in America; includes history, hardware, software and many aspects of computer applications. *Time Magazine, U.S.A.*

Warskett, George (Spring 1981)
Information, Competition and Cybernetic Work, in Studies in Political Economy - A Socialist Review, No.5

An excellent article showing how the economy's need for information grows as competition increases. Traditional means are being used to solve this problem - new technology is displacing workers in the information field. *Studies in Political Economy, Box 4729, Station "E", Ottawa, Ontario K1S 5H9.*

Working Women (April 1980)
Race Against Time: Automation of the Office - An Analysis of the Trends, in Office Automation and the Impact on the Office Workforce

Excellent comprehensive article on the topic of office automation and women in the workforce. *Working Women, Notional Association of Office Workers, 1224 Huron Road, Cleveland, Ohio 44115, U.S.A.*

Women's Bureau, Manitoba Department of Labour and Manpower(September 1979)
Office of the Future, in About Women, Vol. 4, No.5

Discussion of job displacement, skill and career issues to help women office workers prepare for the future. *Women's Bureau, Manitoba Department of Labour and Manpower, 241 Vaughan Street, Winnipeg, Manitoba, R3C 1T6.*

Women's Voice (1980)
Job Massacre at the Office
Good description of the word processor and effects of automation in the office. Written for office workers, this pamphlet includes strategies for positive action. *Women's Voice, P.O. Box 82, London E28 DW, U.K.*

Zeman, Zavis (1979)
The Impacts of Computer/Communications on Employment in Canada: an Overview of Current OECD Debates

An excellent survey of recent literature with excerpts from 42 key reports. *Institute for Research on Public Policy, 2149 Mackay Street, Montreal, P.Q. H3G 2/2.*

Zeman, Zavis and Robert Russel (January-February 1980)

The Chip Dole, in CIPS Review

A brief overview of the debates on unemployment caused by technological change. *Canadian Information Processing Society, 243 College Street, Toronto, Ontario.*

Zimmerman, Jan (January 1981)
How to Control the New Technology Before it Controls You, in MS

Introduction to office automation and women's work, includes section on health hazards and "A Secretary's Bill of Rights." *MS Magazine, U.S.A*.

2. Labour Publications

American Labor (1981)
American Labor, No. 13, Special Issue on New Technology

Comprehensive, brief and informative publication with special focus on practical bargaining strategies and demands. Includes a list of resources for further information *American Labor Education Center, 1835 Kilbourne Place N. W., Washington, D.C. 20010, U.S.A.*

Association of Professional, Executive, Clerical and Computer Staff (1980)
Automation and the Office Worker - Report of the Office Technology Working Party, APEX

Discussion of the impact of electronic technology on office workers, including issues of employment, health and safety, skills, and job satisfaction. The paper includes recommendations, a model agreement and a glossary. *Association of Professional, Executive, Clerical, and Computer Staff (APEX), 22 Worple Road, London SW19 4DF, U.K.*

Attenborough, Susan (1982)
Microtechnology

An excellent booklet about microtechnology, its applications, impact on employment, women and health and safety. Includes a section on legislation, collective bargaining and suggested strategies.
National Union of Provincial Government Employees (NUPGE), 204 - 2481 Riverside Drive, Ottawa, Ontario Kl V 2E1.

Canadian Union of Postal Workers (January 1979)
Postal Workers Struggle Continues

Outline of the critical issues affecting Canadian postal workers; includes a discussion of

computers and automation. *Supplement of the Canadian Union of Postal Workers newspaper.*

Canadian Union of Public Employees (May 1980)
Technological Change - The Little Machines that Bring BigLay-offs, in The Facts, Vol. 2, No.8

Brief look at how the new office electronics will affect working people.
Canadian Union of Public Employees, 233 Gilmour Street, Ottawa, Ontario K2P OP5.

Jenkins, Clive and Barry Sherman (1979)
The Collapse of Work

Two prominent British unionists show how and why unemployment will increase drastically in the next ten years. The growth of microprocessors is part of this development and the basis of a "third industrial revolution." The authors believe we must revolutionize our attitudes towards work and leisure in order to deal with this crisis.
Eyre Methuen Ltd., 11 New Fetter Lane, London Ec4P 4EE, U.K.

Kuyek, Joan Newman (1979)
The Phone Book: Working at the Bell

This book presents an inside view of Bell - what it's like to work there, as the author did for three years. Interviews with operators, service representatives, installers and others are followed by discussion of how technology is used and how the corporation itself has changed over the years - usually to the detriment of Bell's employees and customers.
Between the Lines, 97 *Victoria St. North, Kitchener, Ontario.*

Labour Council of MetropolitanToronto
VDT Newsletter
Published four times each year, this newsletter focuses primarily on health and safety issues, and reports on legislation and union contract clauses, which address some of the problems which arise when working at VDTs.
Labour Council of Metropolitan Toronto, Room 407, 15 Gervais Drive, Don Mills, Ontario.

Ontario Public Service Employees Union (1981)
The Chips are Down! OPSEU Bargaining '81
This two-page flyer covers technological change, equal pay, and issues of money, jobs and health in preparation for the 1981 round of bargaining.
Ontario Public Service Employees Union, 1901 Yonge Street, Toronto, Ontario.

Rada, Juan (1981)
The Impact of Microelectronics

This global perspective is one of the best, up-to-date. comprehensive examinations of the

employment impacts of information technology. *International Labour Organization, Geneva, Switzerland.*

Steelworkers (February 1981)
Office, Technical and Professional Workers Join the Steelworkers in Steelabour, Vol. XLVI, No.2 (Canadian Edition)

Discussion of the new technology. health and safety. and equal pay in relation to office and technical locals recently organized by the Steelworkers. *United Steelworkers of America, 55 Eglinton East, Toronto, Ontario.*

United Auto Workers (September 1980)
Keeping an Eye on VDT's (by Anne Field), in Solidarity

This three-page article deals with health and safety hazards arising from work at VDTs and how the UAW is working to protect their 10,000 to 20,000 members affected. *United Auto Workers, Canadian Locals.*

Women's Work Project (1978)
Women Organizing the Office

A practical guide for office workers who wish to form a union, this pamphlet also outlines problems on the job, including automation (pages 32-36) and the history of clerical work. *Women in Distribution, P.O. Box 8858, Washington, D.C. 20003, U.S.A*.

3. Health and Safety Issues

Chenier, Nancy Miller (December 1982)
Reproductive Hazards at Work: Men, Women and the Fertility Gamble

A broad look at health issues which affect fertility, this report includes a section on VDTs. *Free from: Canadian Advisory Council on the Status of Women, Box 1541, Station B, Ottawa, Ontario K1P 5R5.*

Conn, Melanie (Spring 1982)
VDTs .. Very Damning Testimony, in Health sharing

A brief report on some of the health hazards which have been associated with VDTs; includes a list of resources. *Women Healthsharing, Box 230, Station M, Toronto, Ontario M6S 4T3.*

Craig, Marianne (February 1981)
Office Workers' Survival Hand- book: A Guide to Fighting Health Hazards in the Office

A comprehensive paperback covering all aspects of health and safety for office workers,

with special emphasis on new technology in Section 4, Chapter 9. Suggested broad strategies include using the law and organizing a union.
BSSRS Publications Ltd., 9 Poland St., London W1, U.K. Distributed by Trade Union Book Service, 265 Seven Sisters Road, London N4, U.K.

Labour Council of Metropolitan Toronto (September and October 1980)
Health Alert - Video Display Terminals, Vol. 4, Nos. 3 and 4 of the Health and Safety Newsletter of the Labour Council of Metro Toronto

Comprehensive inventory of health and safety hazards resulting from work at video display terminals. *Labour Council of Metropolitan Toronto, 15 Gervais Drive, Toronto.*

Makower, Joel (1981)
Office Hazards: How Your Job Can Make You Sick

Another comprehensive look at health issues for office workers with one chapter (8) devoted to the "office of the future."
Tilden Press, 1737 DeSales Street Northwest, Washington, D.C. 20036.

New York Committee for Occupational Health and Safety (1980)
Health Protection for Operators of VDTs/CRTs

A small pamphlet, which provides a good overview of the most important problems and some of the solutions. *NYCOSH, 32 Union Square, Room 404, New York. N.Y. 10003. U.S.A.*

U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Health and Safety (June 1981)
Potential Health Hazards of Video Display Terminals

Results of a study to determine the hazards of working with VDTs. Radiation and chemical substances in the air were found to be within acceptable levels, while visual and muscular complaints were found to result from glare, and keyboard or screen height.
For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Walsh, Barbara (December 1980)
Big Brother is Watching You... And Killing You Too, in the Toronto Clarion

A useful discussion of the radiation effects of video display terminals.
Toronto Clarion, Toronto, Ontario.

Working Women Education Fund (April 1981)
Warning: Health Hazards for Office Workers - An Overview of Problems and

Solutions, in Occupational Health in the Office

This report covers problems , relating to stress, VDTs, air quality and ventilation, and design problems. The results of a health and safety survey are included, as well as some simple and inexpensive ways to reduce office health hazards.
Working Women Education Fund, 1224 Huron Road, Cleveland, Ohio 44115.

4. Films

British Broadcasting Corporation (1978)
Now the Chips are Down (50 minutes, 16 mm)

An excellent, broad-ranging introduction to the social and scientific implications of the microprocessor. *BBC Film Sales, Manulife Centre, 55 Bloor Street West, Suite 1220, Toronto M4 W lA5*.

British Broadcasting Corporation (1980)
And What of the Future (40 minutes, 16 mm or 3/4" video)
The last of several sequels to "Now the Chips are Down" examines the effects of micro-electronics on jobs in the future. Examples from the Washington Metro, a Dallas supermarket, offices and a bank in New York, a Scottish hospital and a London school.
BBC Film Sales, as above.

Canadian Labour Congress,
Labour Education Studies Centre (1983)
Microelectronics Revolution: Ready or Not! (20 minutes, ¾" videotape)

Encourages an understanding and discussion of new technology and its applications. Raises questions such as "what is so revolutionary about this technology?".

Canadian Labour Congress, 2841 Riverside Drive, Ottawa, Ontario K1V 8X7; also available in regional offices of the CLC.

Education Media (1982)
The New Technology: Whose Progress? (35 minutes, 16 mm)

A critical examination of microelectronic technology, which analyses the claim that new technology will revolutionize our lives.
Education Media, 2 Ridgemount, Ridgeroad, London NW2, England. Available at the Development Education Centre in Toronto.

National Film Board (1980)
Office of the Future (14 minutes, ¾"videotape)

This film is part of a $12 million campaign by the federal government to promote the "office of the future" in Canada.

Available from regional offices of the Federal Department of Communications for public viewing.

Ontario Educational Communications Authority (1978)
Fast Forward 1 and Fast Forward 2 (30 minutes, ½" videos)

A "gee whiz" approach to the new technology. See especially "The Microelectronics Revolution," in which "specialists discuss the microprocessor, 'an electronic marvel that we can talk to and train" (OECA).
Ontario Educational Communications Authority, T. V. Ontario, Toronto, Ontario.

Sky Works (1982)
Good Monday Morning (30 minutes, 16 mm)

An excellent film which brings out the problems faced by office workers, through interviews of women across the country. This "in-their-own-words" style of presentation makes the film strong and direct. Commissioned by the National Union of Provincial Government Employees (NUPGE).
Sky Works, 566 Palmerston Avenue, Toronto. Ontario.

(For a bibliography of French language sources, refer to the French version of this document.)