The computerization of Canadian universities

PART 1: The Computer Dream

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Winston Windermill (IBM number 108-284-801), honors biochemistry student, is cramming for his undergraduate examinations. He has chosen to write his exams in mid-June in order to have a leisurely summer, and has only 45 days left to prepare.

His friend, Harlequin Tiltmaster (IBM 159-482-951), is preparing for his finals, too, so they meet on the way to school and chatter about hockey statistics. Harlequin, in the same academic course as Winston, has decided to write his exams in early July.

Building 47, like most other buildings at Every University, is a highrise, glass and steel, somewhat sterile-looking. Inside, the elevator, with uncomfortable acceleration, whisks our heroes to the eighth storey of the library, a floor similar to every other floor. Winston and Harlequin walk to a cubicle, shut the sound proof door, sit down next to a computer terminal and dial the central data bank of biochemical information, located in far-away Ottawa.

For the next three hours the pair carry on a dialogue with computers across the country — learning, criticizing, perfecting, watching film clips on the TV monitor, typing questions and responses into the machine, hearing audio snippets from medical speeches, discussing findings with each other and collecting reams of printed data which they take home with them and study.

> **Technology as such cannot be isolated from the use to which it is put; the technological society is a system of domination which operates already in the concept and construction of techniques.**
>
> **Herbert Marcuse**

Just an average day at the university really...

Science fiction? Only in the sense that it hasn't happened yet. The computer, and the incredible potential of computers, has already begun to revolutionize universities and the learning process. In a very short time most of the basic parts of the traditional educational institute — the library, classroom, professors, and administrators — will disappear from our universities or at best play a supplementary role to computer-assisted learning.

The potential of computers snowballs daily as new applications are discovered and put into practice. This rapid pace of changing computer technology, plus the high cost of sophisticated hardware, is holding universities back from jumping feet first into the concept of the electronic university. But as universities continue to do their own research and development, and study the needs of education, the day of intensive computerized learning gets closer.

In less than two decades computer technology in the field of education has advanced dramatically from the adding-machine level to a stage where technocratically-run universities are forseeable.

How can computers be plugged into our universities?

In many ways; among them: the study of computers, studying other subjects via computers, the changing of libraries from book warehouses into electronically accessible data banks, administration of the university and national computer networks to facilitate the flow of academic and administrative information.

The first advantage of integrating computers into the academic world is an obvious one — the ability to instruct students in the use of equipment and teach them how to program computers. As computers become more and more omnipresent in our daily lives (the computer industry will be the largest single industry in the world by 1980), society needs people who understand and can administer the technology. As universities buy or rent computers they also set up departments of computer science to train their students in the finer points of operating and programming the machines.

In this way, the university plays its role as a supplier of skilled manpower to meet the current needs of industry.

The next step is to program other academic courses through the computer, so that it can help students learn other materials such as science, mathematics or foreign languages. This is usually called Computer-Assisted Instruction (CAI).

There are three basic types of CAI: the drill and practice system used to supplement the standard curriculum; the tutorial system to teach math and reading where the teacher supplements the computer; and the dialogue method which involves direct interaction between the student and computer.

Computer-assisted instruction on a mass scale necessitates large comprehensive data banks for storage of information pertinent to university courses. This means electronically accessible libraries, with efficient information retrieval.

The most common method consists of microfilm (for storage) video screens (for retrieval) and computer terminals (for electronic control). And so on until libraries as we know them become obsolete in the university of the future.

Computers are being widely used in North America by university administrations for efficient registration and rapid analysis of sociological and academic trends among the student and faculty population. Registration at most universities in this country is done by computer cards.

Computers are also useful for calculating university resourse utilization; particularly in studying the complex patterns of room allocation, time slots for lectures and the availability of staff.

And of course, computers can be used to facilitate top-level administrative information flow, both internally and between universities. File cards on exchange students and faculty are an example of this use.

A by-product of this mechanization of university administration is the loss of jobs for lower-echelon administrators. The ever-growing "automation vs. employment" dilemma. That leaves us with only the students, the computer people, a few academic supervisors, a handful of administators — and a whole bunch of new, gleaming, whirring computers.

The danger of a 1984-Brave New World type society where all students are programmed by the same central computer is a very real one.

An extension of this will be the evaluation of students and the grading of their courses. Some computer scientists envision a continual objective evaluation (by computer) which will mean an end to examinations. The computer could record and assess a student's progress every time they used the computer.

Students will still spend only a small part of their day learning from the computers. How does a computer mechanically judge the human experiences, the day-to-day influences of the outside world? How will we be able to relate to computer learning in an age of increasing alienation caused in part by our advanced machine technology? Will the computer universities so systematize the present form and content of higher education so that the occasional outbursts of non-conformity which occur now and then will be eliminated?

Who is going to own, operate and control the educational computers? Private corporations? The government? It's inconceivable under the existing social system that such an all-encompassing form of mass education would be allowed to serve any interests other than those of the status quo.

What about the potential for state control and conditioning — technocratized mind-control and indoctrination on the national level such as the world has never seen before?

These questions remain unanswered as the technological juggernaut rolls steadily onward.

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PART 2: The Canadian View

Canada, while by no means a pioneer in the research and development of computer technology, is rapidly becoming a world leader in the application of that technology to university education.

Within the next five years there will probably be a nationwide computer network connecting every Canadian university to every other one by a complex arrangement of computerized telegraph lines and electronic transmission via satellite.

This will give every university's computer (s) access to other universities' computers, making the total academic resources of Canada available to every student in the country.

This network, the Canadian University Computing Network (CANUMET), is now being studied and designed by some 200 experts in government, universities and the computer industry.

This technologically inevitable integration will by no means be a smooth transition, because of the great variety of computer languages that are used to program computers in Canada. The information-flow between two computers programmed differently would be blocked as suddenly and surely as two people talking different languages.

Another computer system, 'star network' with the National Research Council's massive computer at the centre, is currently studying the possible ways of standardizing computer language. The NRC network is also used for research and development exploration of other possibilities for computerized education.

The practical functions of the network at this time — it has been operating for several years — are the comparative cheapness of using the NRC's powerful computer, and the access to specialized scientific data banks that NRC is beginning to construct.

Slowly but surely the national university-computer jigsaw puzzle is piecing itself together, with aid from government and education experts, and IBM.

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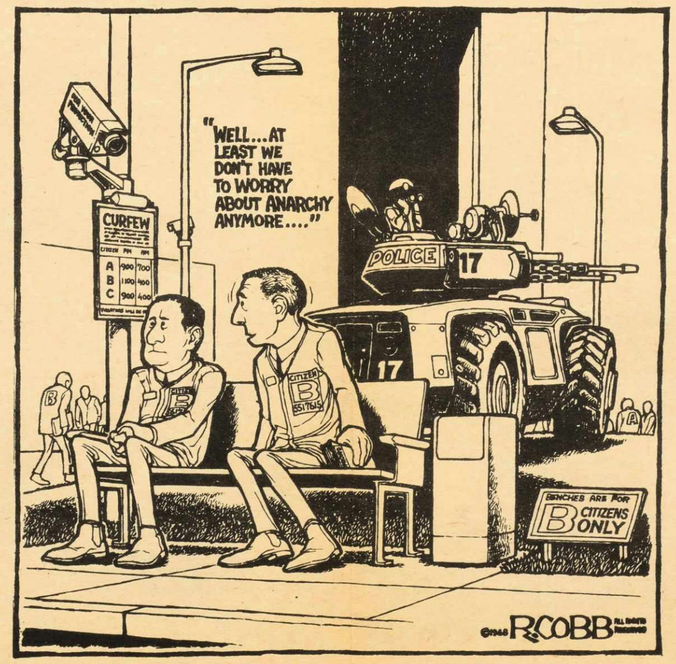

PART 3: The Monopoly Obstacle

And now from the people who brought you the computer, a sweeping new innovation that will dramatically change industry — monopoly.

International Business Machines Corporation (IBM), with assets over $5 billion, is the world leader in the computer business. In gaining that position, IBM has been through two anti-trust suits, filed by U.S. government and two suits charging monopolistic practice, filed by competitors.

A multinational corporation (although only four per cent of its shares are owned outside the U.S.), IBM owns 80 per cent of the world computer market. It controls the majority of the domestic markets in Canada, the U.S., Britain, France, Japan, West Germany and Italy.

Huge multinational corporations like IBM supercede international boundaries and have developed power to rival that of most national governments.

To consolidate its monopoly, IBM has made certain that university students, the potential operators and buyers of computers, are trained on IBM equipment. This has often meant that employers, rather than train graduates on other makes of equipment, have found it easier and cheaper to switch to IBM hardware. This also ensured IBM of the universities as a sales market.

IBM offers educational discounts on machinery and gives frequent grants to universities who own or rent IBM equipment. This guarantees that, as new studies are done on their computers, IBM can develop new products and new uses for the machines.

It also gives outright research grants to educational institutions and donates to university building-fund campaigns.

IBM maintains a super-slick travelling display package that moves about the country from university to university, showing films, equipment, samples, computerized programs, graphics and brochures.

And when the sales department falls down on the job, there are more blatant and insidious business connections. Members of the top IBM brass sit on the Boards of Governors at many Canadian universities.

Oh, it's hard work maintaining an effective monopoly, having to be on your toes 24 hours a day. As CANUMET gets to the stage where it needs a body to govern and administer the network, you can be sure that IBM will be looking to its own network, which stretches from coast to coast.

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Let's hope there are some educators who object strongly enough to a foreign company running our university education system. And let's keep our fingers crossed that the computer producers don't turn their monopolistic power to programming these computers that are affecting our daily lives.

But these hopes would be less tinged with dire apprehension if the people running corporations like IBM didn't look so very much like the people who run our universities, our economy and our government.