Communications Chapter 16

Telecommunications 16.1

A technological revolution has descended upon the Canadian telecommunications system, and that revolution may transform, not only telecommunications proper, but Canadian society itself. Canada, in common with other industrialized countries, is in the midst of a revolution brought on by the meshing of communications and computers in ways that have transformed signals, systems and carriers. With lasers, fibre optics, micro-computers and generations of high-powered satellites, it is becoming possible to provide almost universal access to all the new computer-based information services. Such major changes in the technology of information-handling are bound to have revolutionary impact, not only on social structures, but on the nature and meaning of individual lives.

These technological advances affect the terminal, switching and transmission equipment used in telecommunications. In the case of terminal and switching equipment, it is the emergence of a new generation of small, inexpensive computers with enormous capabilities. Voice, visual and data communications are already being sent in digital rather than analog form because the former is cheaper, faster and more accurate. Even now, the telephone companies are moving to electronic switches which are little more than durable computers complete with memories and other features. In October 1978, the Science Council of Canada in *Communications and computers: information and Canadian society,* pointed out that the cost per byte (binary digit) of random access memory has declined an average of 35% a year since 1970, when the major growth in the adoption of semi-conduction memory elements began. Canada is moving into an era when it will cost less to buy a micro-processor than to fill a car with gasoline. According to the federal Department of Communications (DOC), this drop in hardware costs will bring about a host of new business and home computer applications including, in particular, the possible introduction to every home and business of two-way TV systems comprised of a computer terminal attached to an ordinary TV set. Two-way TV will render possible in the 1980s the general use of such hitherto futuristic services as electronic mail, teleshopping, electronic banking, remote sensing and security services, teleconferencing, computer-conferencing and information-retrieval from data banks all over Canada and the world. Already some of these are in commercial use, and trials are proceeding with the rest. Canada has developed two such systems.

New technologies will also soon enable telecommunications transmission systems to carry much more information at far less cost. For example, the traditional copper cables carrying electrical pulses have been replaced by hair-thin optical fibres at national defence headquarters in Ottawa. The science council, in its 1978 position paper on communications and computers, pointed out that fibre optics are proven and tests for durability and reliability in everyday working conditions are under way. These high capacity glass fibres carry light signals and are immune to electrical interference. By using high-frequency light (laser), 10,000 times more information can be carried on glass fibres the thickness of a hair than on regular telephone copper wires. In fact a 200-TV-channel capacity could be developed if there were enough software or programs to make use of them. DOC officials predict that in the 1980s optical fibres will start replacing the copper cable used in telephone and cable-TV transmission systems.

Communications satellite technology, in which Canada is a world leader, has also undergone significant evolution. At present, satellites act rather like huge microwave towers in the sky and are used for long-distance voice, video and data communication. Until the launch in January 1976 of the experimental Canadian-American communications technology satellite, later named Hermes, these satellites were essentially low-power, so that large, expensive earth stations or antennas were needed to pick up satellite signals. According to the science council, the significance of Hermes and its