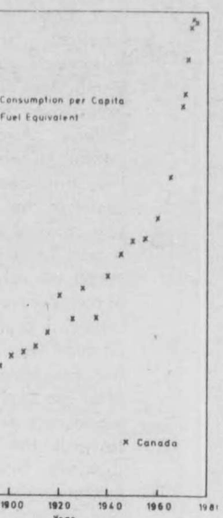

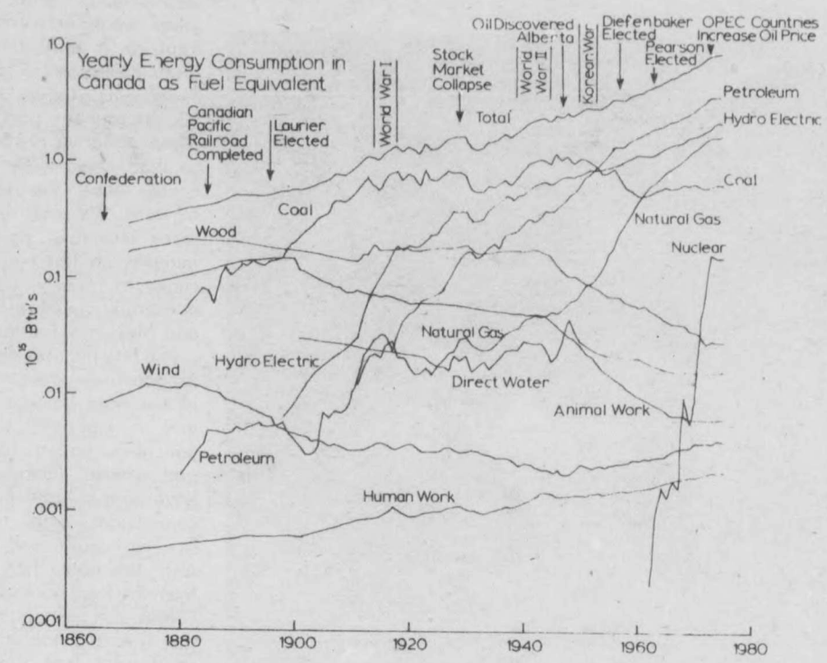

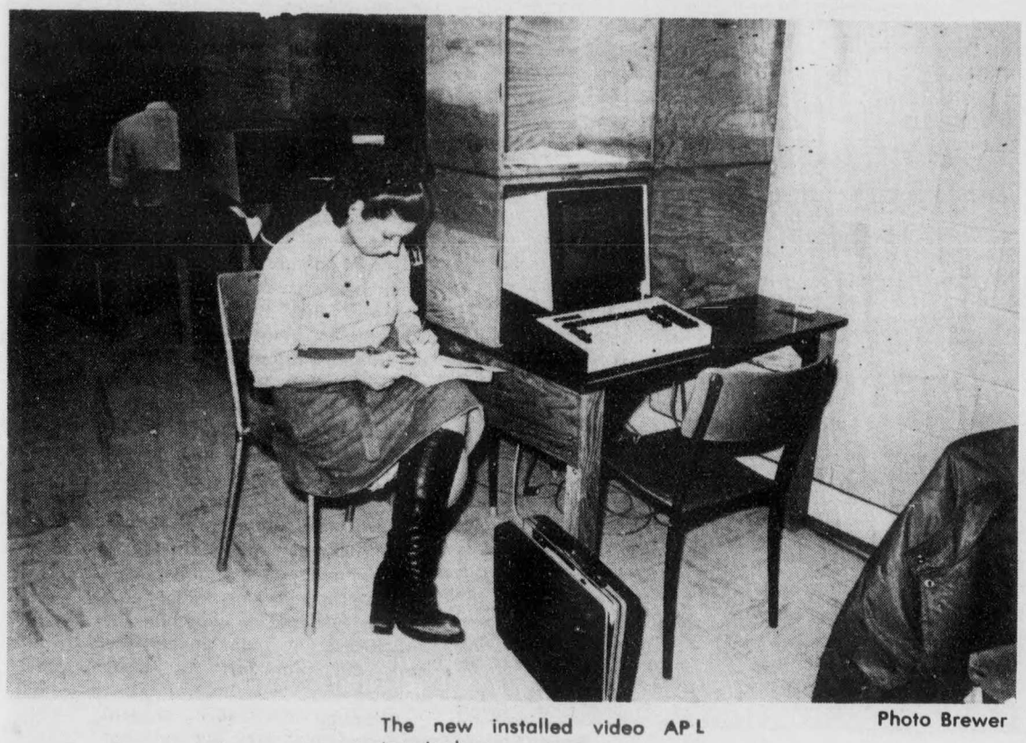

The new installed video APL terminals

Photo Brewer

Ice Free pavement courtesy
The civil department

responsibility will be transferred to biomedical engineering departments based in the regional hospitals. Such departments have been created in Saint John and Fredericton, thus far. In this activity, the Institute does not compete with consulting firms or with individual professional engineers. Rahter, an essential service is being provided until the necessary capability is built up within the health care system.

By S.E. MASRY

Digital Mapping is a new approach which is finding increasing use in various industrial and governmental organizations. One important reason is the fact that "digital maps" can form the bases of information systems in areas such as agriculture, forestry, utilities, transportation and communication. Another reason is that they overcome at least some of the problems in the revision of conventional maps. Maps in digital form allow the application of faster and simpler methods for detection of changes and the incorporation of the update data.

Two courses in digital mapping, one undergraduate and one graduate, are now offered in Surveying Engineering at UNB. These courses deal with different aspects of the collection, storage, retrieval, display, and structuring of the data. Other aspects such as the generation of Digital Terrain Models by advanced correlation methods of photographic densities are dealt with in another course at the graduate level. (The simple principle of Epipolar Correlation was developed at UNB in 1972). It is expected that at least one more course will be initiated in this important area.

The hardware available to support activities in this field consists of an interactive CRT display, a table digitizer with magnetic tape drive, an analytical stereoplotter with an on-line orthophoto printer, a PDP11/60 computer, as well as the central UNB computer.

Research efforts are being concentrated in areas such as digital correlation, map revision, data structures, and off-line editing techniques. In digital map revision, a simple method was developed for detection of changes in a digital data base, and for combining the detection and digitization operations into an efficient digital map revision system.

CIVIL

The Department of Civil Engineering at UNB is presently involved in testing an "ice-free" pavement surface on the Hillsborough River Bridge at Charlottetown, P.E.I. The asphaltic concrete surface was applied to the bridge and causeway in June of 1978. The mix contains an European product called Verlimit, a granular material that acts as a de-icing agent embedded in the surface. Both the method and the material have been used in Europe, and trials in Canada are currently underway.

Professors David Innes, Walter Dohaney, Frank Wilson and Albert Stevens have been awarded a contract by the Federal Goverment to evaluate the performance of the surface over the next two winters. In addition to evaluating the mix design and strength characteristics of the asphalt, the team will be monitoring the performance of the surface and its effectiveness to prevent freexing on the road surface.

For the past severul years there has been considerable discussion on the energy policy of the Canadian government and what it should attempt to achieve. Many questions have been asked such as: is Canada short of energy resources? should the price of petroleum be controlled? if so what level? should Canada develop natural gas resources in the Arctic? should a pipeline to transport natural gas from the Arctic be built? what energy conservation measures should be taken by the government, if any? as well as many others.

All of these questions depend on predicting the amount of energy that will be consumed by Canada in the future. It is of course always very risky to predict what is going to happen, and since nothing is certain everyone has an "opinion". In order that the predictions of the future can be made on the soundest possible basis, a study was carried out by Dr. F.R. Steward of the Department of Chemical Engineering on the amount of energy consumed within Canada since it became a national state.

Two diagrams are presented below which summarize some of the results of the study. One diagram gives the annual energy consumed in Canada since Confederation as "fuel equivalent" in 10 15 Btu's (quads). The diagram also shows the amount of energy supplied by the various major sources. The fuel equivalent basis involves a correction for those sources which give direct work such as hydroelectric, animal work, direct-drive water and wind. The actual work was corrected by an efficiency factor based on the amount of fuel that would be required to replace that work with an appropriate fuel consuming device. This is believed to give a fairer relative comparison of the various sources.

It can be seen from this diagram that the energy consumption within Canada has increased approximately 28 times in just over 100 years. There are numerous fluctuations in this increase. For instance, a large rate of increase in the first two decades of this century, a sharp decrease during the Great Depression, and another large rate of increase in the sixties. In the early years of Confederation, wood and animal work were the major sources of energy. In the early part of this century coal was the dominant energy source. At the present time, it is of course petroleum with hydroelectric second and natural gas third.

It is also interesting to note that when a new source becomes significant, it first increases in importance at a rapid rate and then gradually levels off. This has been the case for coal in the early part of the century, petroleum between 1910 and 1930, hydroelectric between 1910-1930, natural gas between 1950 and 1960, and finally nuclear energy in recent years. This diagram is the historical picture of energy consumption in an expanding industrial country.

The other diagram shows the per capita consumption of energy i in Canada since 1870 in 10 6 Btu's; once again, on a fuel-equivalent basis. There has been a steady rise with some fluctuations from a level of 80 million Btu's per year to well over 300 milion Btu's per year. This number has increased rapidly since 1960. Canada has the highest consumption of energy per capita of any major country in the world including the United States at this time. Canada passed