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Canadian cures and preventions

Measures to clear pollution haze

With Canadian anti-pollution regulations as stringent as they are, Canadian consultants, engineers and manufacturers have had to put their heads together to come up with effective products and services. Now, their expertise is available not only at home, but to countries throughout the world.

Here, Canada Courier describes those laws and regulations which have been put into effect or are being implemented. Elsewhere in the issue are details of some of the goods and services offered by a number of Canadian companies in the pollution control field.

In the words of the Science Council of Canada, "Canadians have acquired an environmental conscience."

And in the last few years Canadian governments, at both federal and provincial levels, have passed new laws and activated old laws, in attempts to clean up the environment and preserve resources.

In June, 1971, the federal government established the Department of the Environment, also known as Environment Canada. The department is involved with the control of air and water pollution, management of solid wastes, control of the ecological impact of major developments, control of noise, management of environmental crises and management of the federal government's own facilities across the country.

In the Canadian system of government, the provinces have jurisdiction over natural resources lying within provinces. This includes air and water. Nevertheless, the federal government has power to control certain aspects of pollution, through its jurisdiction over fishing and navigation. Although the federal government also has authority to deal with pollution problems that spill over provincial and national boundaries, in practice it has worked co-operatively with the provinces in tackling these problems.

In the field of water pollution control, the federal government has passed several new laws and updated an old one. Under the amended Fisheries Act of 1970, Environment Canada is establishing national effluent regulations for the country's main industries.

Regulations have already been made for Canada's largest industry, pulp and paper mills, and for another big industry, chlor-alkali plants. The regulations were developed in co-operation with the provincial governments and the industries concerned, and specify limits on the wastes which these industries can discharge into waters frequented by fish. In effect, these regulations protect all rivers.

The pulp and paper regulations will bring about a 70 per cent reduction in pollution by old mills. New mills will have to eliminate pollution as completely as the best

pollution abatement technology available permits. The regulations apply to all mills — new, expanded, altered — but dates of compliance for existing mills are being determined on a mill-by-mill basis.

The regulations specify substances which are deleterious: total suspended solids, decomposable organic matter and wastes which are toxic to fish. A test is described for determining the toxicity of the effluent: in a 96-hour period, an 80 per cent fish survival must be obtained on a mixture of 65 per cent effluent and 35 per cent water, in order for the effluent to be classified as non-toxic.

Regulations for the chlor-alkali plants control the discharge of mercury into waters frequented by fish. The regulations reduce the emissions in the liquid effluent to 0.005 pounds (0.002kg) of mercury per ton (1016.4kg) of chlorine produced. The regulations also require daily record-keeping and regular reporting by companies of their consumption of mercury.

The regulations set limits in pounds of pollutant per ton of product rather than in degrees of concentration, so that no mill can comply merely by diluting its effluent with water.

Regulations and guidelines are being developed for the following industries: petroleum refining, fish processing, de-inking from pulp and paper operations, mining, animal feedlots, municipal wastewater plants, plastics plants, steel-making, petrochemical plants, cadmium-using industries, and metal-plating.

Two other acts, both the responsibility of the Department of Indian and Northern Affairs, are designed to protect northern waters. The Arctic Waters Pollution Prevention Act of 1970 lays down stringent anti-pollution regulations in "shipping safety control zones" which extend up to 100 nautical miles offshore in Arctic waters north of the 60th parallel. The Northern Inland Waters Act of 1970 controls the depositing of waste in waters in the Yukon and the Northwest Territories by providing for the licensing of the use of these waters. Both acts will be more and more important as the mining, oil and transportation in-

(Continued on page 2)



This Canadian system gives a continuous mass emission monitoring of pollutants from an industrial stack. See Western Research & Development story on page 4.

Eight calves, one donor

Alberta Livestock Transplants Ltd. of Calgary, Alberta recently reported what it thinks is an agricultural first: the birth of eight fullblood Maine-Anjou calves, all brothers and sisters conceived by one female, but carried and given birth by seven different Jersey and Holstein mothers. There was one set of twins.

Although it is hoped to eventually export frozen fertilized embryos, the freezing process has not yet been perfected. At the moment, Alberta Livestock Transplants is interested in developing the technology of embryo transplants. Of course, Maine-Anjou bull calves are available for immediate export. Maine-Anjou heifer calves will be available for export July 1, 1974.

Although experiments in embryo transplants have been going on for several years, the birth of the eight fullblood Maine-Anjou calves from one donor is believed to be the largest number of purebred Maine-

Anjou calves born from a single operation.

The donor cow was stimulated by the use of hormones to produce a number of eggs, instead of the normal one or two. Five days after fertilization, the embryos were removed by delicate surgery and implanted in recipient females. The implantation is usually one embryo to one recipient, but it is possible to implant two eggs in a recipient if twinning is the objective.

Each egg implanted has similar brother-sister genetic potential and will not acquire characteristics of the recipient foster mother. There is no apparent difference in the growth of fetuses during normal pregnancy compared to recipient pregnancies. Once the transplanted egg has been implanted into the recipient uterus, there is no more chance of rejection or abortion than during a normal pregnancy.

Just as artificial insemination was the technique used in the last decade for the propagation of the

blood lines of superior bulls, embryo transplants offer similar possibilities in the 1970s for expanding the numbers of offspring which can be obtained from excellent dams.

Code 1-1



Edna and Harold Biensch of Neilburg, Saskatchewan show their eight fullblood Maine-Anjou calves conceived by the cow Cetella.

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canada
 **courier**

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industries develop in the Canadian North.

The revised Oil Pollution Prevention Regulations of 1971 were made to prevent oil spills from ships in Canadian waters. The Regulations were made under authority of the Canada Shipping Act and are administered by the Department of Transport.

In the control of air pollution, Environment Canada is responsible for the Clean Air Act of 1971. Under this law, the department is establishing air quality objectives that are the same throughout the country. However, the authority to administer and enforce these objectives lies with the provincial governments.

Under this law, the federal department is also expected to provide leadership in the compilation of source emission data, prescrip-

tion of national emission standards, strengthening of national air quality objectives, control of air pollution from all works under federal authority, and the control of the composition of fuels produced in Canada or imported into the country.

The department has already set up national air quality objectives for five major air pollutants: sulphur dioxide, particulate matter, carbon monoxide, photo-chemical oxidants and hydrocarbons.

Programs to provide equipment to the provinces to monitor air quality have begun. The programs are designed to monitor and assess the quality of the ambient air in the populated regions of Canada on a continuing basis. Measurements now being taken include soiling index (the soiling or darkening potential of the pollutants in the atmosphere), suspended particulates and lead, dustfall and sulphation rate, and sulphur dioxide.

Because businesses which existed before these laws and regulations were passed now face high short-term clean-up costs, the federal government has established two programs of financial assistance. One program exempts industries from the 12 per cent federal sales tax on pollution control equipment. The other is an accelerated capital cost allowance available under the Income Tax Act.

The courts can impose stiff penalties on those who are prosecuted and convicted. Fines under the Clean Air Act can run as high as \$200,000. Violations of the Arctic Waters Pollution Prevention Act can cost \$100,000 for ships and \$5,000 per day for individuals.

The maximum fine under the Oil Pollution Prevention Regulations is \$100,000. Under both the Fisheries Act and the Northern Inland Waters Act fines can go as high as \$5,000 per day.

However, over the last few years the number of prosecutions has not increased. This is because the government is relying more on administrative methods to decrease pollution and is being more selective in whom it prosecutes. By "administrative methods", the government means negotiation: the government takes the view that it is more efficient to negotiate with, rather than prosecute, industry. Through negotiation, the government and a company determine a timetable for the company to establish or improve pollution abatement facilities. The government is also being more selective in whom it takes to court, prosecuting only those companies that do not comply with the negotiated agreements. In one notable area — oil spills — the number of prosecutions has increased since 1970.

As noted near the beginning of this article, the provinces have authority over certain aspects of pollution control. The provinces can set their own regulations in many areas, although if federal and provincial regulations overlap, companies must comply with the stricter set. Every province has set up some kind of pollution control agency, ranging from a division of an already existing department to a wholly new department. All provinces are also increasing and upgrading their pollution abatement manpower. Code 2-1

Knife for all reasons aids geology buffs



Small, but efficient, is this multi-purpose geological knife from Beaver Industries.

An instrument that combines all the basic requirements necessary for field trips is the GEO-401 geological knife manufactured by Beaver Industries Limited, Vancouver, British Columbia.

Used by geologists and amateurs alike, this compact unit weighs less than 2 ounces (56g) and is approximately 3 inches (66mm) long. Its 10X magnification lens enables close up examination of small properties in ore samples and its magnet can be used to determine if the minerals which occur in certain rock formations contain iron ore properties or if they are of the non-magnetic type.

Embedded on the side of the knife is a streak or color plate which permits the user to identify the type of contents in a given ore

sample simply by rubbing the sample against the streak plate. There is also a needle for probing or digging out minute mineralization from rock samples and an internationally accepted hardness scale listing hardness in comparison to diamond.

In addition to the blade, file, bottle opener and screw driver contained within the instrument, a reliable compass and a lighter which operates effectively — even after being submerged in water — are included. An added feature for companies or persons who wish to use the knife for advertising purposes is the space on the knife where insignia or messages can be placed — either through hot stamping or by attaching decals. Code 2-2

Cost savings, increased efficiency keynote this company's operations

Any hospital, business or institution can save money, increase efficiency and improve the quality of its services — by consulting Information Science Industries Limited.

Involved in management consulting and computer services since its inception in 1968, this Ottawa, Ontario, company offers services that range from data processing to entire administration systems of a business or institution. In North America ISI is a leader in its specialty — the hospital administration field.

At Canada's fourth largest hospital, the Ottawa Civic, ISI has installed key-punching staff and management consultants to provide more than 37 services that reduce the hospital's expenses by more than \$1,000,000 a year. Additional systems being installed are expected to raise the savings to \$2,000,000 annually.

The services — which reduce costs and increase efficiency by improving the flow of information and eliminating needless duplication — include such diverse matters as nurse scheduling, store in-

ventory, medical reports, lab reports, engineering costing, departmental efficiency studies, payroll and food services.

In the data processing area, which ISI sees as producing the most substantial savings, data is entered on punch cards and processed daily on the company's computer. This system is being expanded to permit capturing of results of lab tests on cathode ray tube terminals which will be linked to a printer. This will enable results to be entered directly into the terminal by the lab technician.

For the hospital's medical branch three major systems were developed. The records system provides the doctor and the administrator with seven reports, both monthly and year-end, including the hospital services summary, death listing, discharge listing, tissue report, infections report, gynecology and diagnostics. It has since been expanded to integrate hospital operations in such areas as anesthesia, therapy, poison control and bed census.

The medical information retrieval system is used primarily for

statistical research. For this, ISI developed a computerized software system, Serchr, to provide instant information on tape, disk or cards from a computerized data base or file.

The third system provided to the medical branch and one which ISI sees as being of great benefit is the "peer review", a service which offers reports on the performance of doctors. This system analyzes for each doctor such items as the average length of patients' stays in hospital, the average number of visits per patient and the use of hospital equipment and lab tests.

Based on the expertise gained at the Civic Hospital, ISI now offers complete system packages in the 37 areas. All systems can be modified to meet the requirements of the hospital client and all are adaptable to people rather than adapting people to the system.

In addition to its hospital services ISI provides service bureau facilities to government and its software packages (Serchr, Stag, Tsar and Detran) are widely used by government and industry. Code 2-3



ISI staff maintain a close watch at the Ottawa Civic Hospital. The management consulting and computer services firm — specialists in the hospital administration field — provides 37 services and reduces the hospital's expenses by \$1,000,000 a year.

Problem solving and planning are specialties of the house

Flexibility, adaptability and a multi-disciplinary approach to problem solving and planning, account for much of the success of Sorés Inc., Montreal, Quebec.

A research and planning organization, Sorés specializes in the applications of the latest techniques of economic, physical and social evaluation — including operations research and econometrics — to the planning process.

One of the company's most satisfying achievements was the recently completed 15-month study of Algeria's construction materials industry. During this project Sorés pioneered the simulation or quantitative approach to problem solving and planning.

The simulation approach, relying heavily on the use of computers, involves the use of mathematical models to establish the relations between different elements under study. By changing the elements or the various relationships, the firm is able to simulate the numerous possibilities open to planners.

The flexibility and adaptability of the Sorés approach mean that each planning problem can be treated on the basis of its unique requirements and new methods can be developed in the course of the project. Rather than sell a specific package or technique, the staff analysts are skilled in modifying and adapting sophisticated mathematical techniques to the practical needs of the planner or project.

The firm's affiliation with SNC Inc. (discussed elsewhere in this issue), one of the largest engineer-

ing firms in Canada, enables Sorés to broaden its scope and resources and to call upon technical support in the areas of mining, construction, water resources and hydrology, industrial plant, public works and environmental control and engineering. SNC's many offices throughout the world also provide Sorés with on-the-spot support facilities.

Another Sorés achievement is the winning of the United Nations International Development Organization (UNIDO) contract for a detailed and comprehensive 15-year study of Algeria's pipe and tube manufacturing industry.

Now underway, this project will define the country's various piping products and their uses, assess future demand and production potential, predict likely substitutions for different fabrication materials and specify capacities and types of facilities required to meet the demand.

In dealing with large scale projects, Sorés undertakes feasibility, management and market studies, carries out economic, social and physical evaluation, is involved in statistical analysis in a wide range of applications and provides solutions of a financial, legal, operational, physical and social nature.

Established only 10 years ago, Sorés has already provided its services to 16 countries. The firm currently is carrying out inter-regional communications studies for the Canadian government, working on a simulation model of Quebec's social aid program, and studying the construction materials industry in Bolivia. Code 2-4

New operating and x-ray table was Canadian gift to China

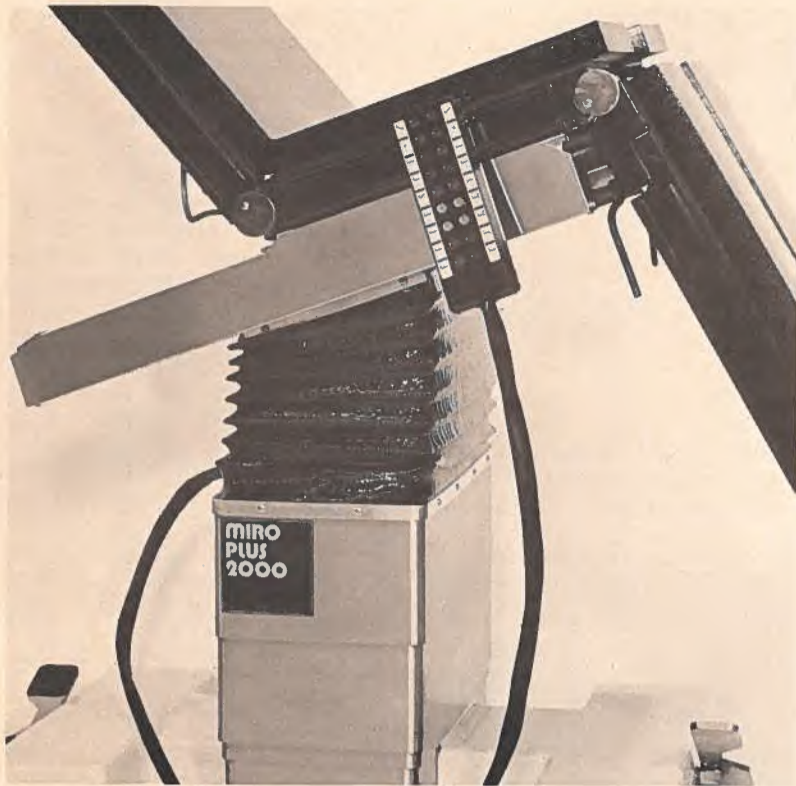
One of the gifts donated to the People's Republic of China by Prime Minister Pierre Elliot Trudeau and Mrs. Trudeau on their recent trip was a totally new major surgical table designed and manufactured by a Montreal medical equipment firm.

The combination operating and x-ray table, known as the Miro Plus 2000, was designed by Bio-Millet Laboratories Inc. in conjunction with the Quebec Center for Industrial Research. It is being manufactured by Bio-Millet.

Several features of the table permit x-rays to be taken during an operation without moving the patient or x-ray equipment. First, the top of the table is made of an x-ray permeable material, with supporting metal being used only on the sides and ends. Second, there is an x-ray cassette-carrier which can be positioned under any part of the table. It holds standard 14 by 17-inch (35 by 43-cm) plates. Third, a new mechanism allows the top to slide from one end of the table to the other so that in effect the top moves in relation to the base. This means the base no longer obstructs certain x-ray angles.

The top of the table can be angled and positioned to any standard surgical position. The tabletop is only four inches (10cm) thick, permitting the surgeon to operate comfortably in a seated position. The top is also wide enough (22 inches/56cm) to allow for comfortable positioning of the patient's arms without the need for constraints or additional apparatus.

The table's hydraulic system is powered either by electricity or by an auxiliary foot-operated hydraulic system. Table movements are



The mobile version of Bio-Millet's Miro Plus 2000 operating and x-ray table is shown in the chair position.

controlled by a remote-control push-button console which can be placed with the anesthetist's equipment or attached to the table rail. Buttons are encased in a soft plastic to prevent accidental triggering of a button during an operation. Graphic symbols of all positions are printed beside the buttons.

The table is available in both fixed and mobile models. The fixed version has an option of a moveable arm, through which gas, fluid and medical connections can be channeled. The necessary cables are laid in the operating room floor

at the time of construction and pass up through the base, into the extension arm and to the anesthetist's console. In this way, the technical equipment enclosed in the operating room walls can be connected to the table, clearing the operating room floor of many cumbersome cables. The arm itself can be moved up to 80 degrees of center on either side of the table.

The electrical mechanism of the table is isolated from the metal chassis in order to make accidental contact and electrocution impossible.

Code 3-1

Convenient access to remote computer

Quick, easy and inexpensive access to a remote computer is now as easy as a-b-c with the portable IPSA-100 Video Data Terminal manufactured by I. P. Sharp Associates Limited, Carleton Place, Ontario.

A convenient take-anywhere communications terminal, the IPSA-100 opens the door to a computer anytime and at anyplace where there is a telephone and a television set. It is compactly packaged in a lightweight briefcase and is ideal for use by scientists, engineers, doctors, salesmen, business executives and students.

The IPSA-100 is an inexpensive IBM 2741 compatible terminal that communicates directly with computer systems via telephone lines. The terminal features a high quality APL keyboard which generates alphanumeric data that are silently displayed on any unmodified television. For added convenience, the keyboard can be removed from the case and the acoustic coupler, also removable, is on a long cable to reach the phone. If desired, a standard data set supplied by the telephone company can be used.

Operation of the IPSA-100 is simple. The operator connects the unit to the VHF antenna input screws on the back of the television set, selects a channel on the TV and fine-tunes the terminal to the channel with the IPSA-100's channel selector. The computer service

is dialed and the telephone handset placed on the acoustic coupler. Status lights on the keyboard indicate carrier connection and when the computer is ready to receive data.

The applications of the IPSA-100 are unlimited. For instance, a doctor can use the terminal from his home or office to look up medical records or a travelling salesman can make stock inquiries and send in orders from his motel room. And, with direct computer access, there is no need for a staff to handle calls and no mailing delays: the computer gives immediate feedback when and where it is needed.

I. P. Sharp Associates, incorporated in 1964, is one of the largest Canadian-owned companies to specialize in computer systems and service. Its business activities include: consulting and contract programming; computer products; APL-PLUS time-sharing service; proprietary software and education.

In addition to the IPSA-100, the company makes such products as a high-speed readout system for direct-reading spectrometers, a device for collecting and transmitting data directly from an instrument to an on-line computer over ordinary telephone lines and a data monitor for testing interconnections between modem and terminals.

Code 3-3



From a hotel room it is possible to communicate directly with a remote computer. The quick and inexpensive link-up is made possible with the IPSA-100 portable video data terminal produced by I. P. Sharp Associates, Carleton Place, Ontario.

Dome gives all-round protection



Economical, maintenance-free and aesthetically pleasing — the all-aluminum domes engineered, fabricated and installed by Dominion Aluminum Fabricating Limited, Toronto, Ontario. This particular dome, standing 26 feet (8m) off the ground and with a 150-foot (46-m) diameter, covers a clarifier tank at an Alberta pulp mill where it prevents the formation of ice on the clarifier mechanism and ensures that the system operates effectively and efficiently regardless of weather conditions. Lightweight and corrosion resistant, the all-aluminum dome is designed to withstand 40 pounds per square foot (195.2kg/m²) of snow and winds of 100 miles per hour (160km/hr). Octagonal in shape, the design is based on the use of four modular truss-type beams 5 feet (2m) in depth and of welded construction. The beams are interconnected by secondary trusses of special extrusions that form a triangular configuration. The secondary trusses are of bolted angular construction and the whole assembly is designed to be bolted together on site with no field welding necessary. Aluminum sheeting is used for the cladding; stainless steel fasteners attach the sheeting to the structure. An economical solution for liquid and bulk material storage, the domes are also a permanent solution to the problems of odor, fog and ice associated with industrial process and sewage treatment systems. Dominion Aluminum also manufactures such equipment as telescopic helicopter hangars and aluminum bridges and exports to several countries, including England, France, Australia, Chile and Denmark.

Code 3-2

Top-quality gelatin capsules

Strict quality control, including rigid inspection of each capsule, is the hallmark of Scherer-G. C. Limited, a Windsor, Ontario manufacturer of hard, empty, two-piece gelatin capsules. The company makes about ten million capsules a day.

Pharmaceutical grade gelatins constitute the basic ingredients of the capsules. The gelatins are then combined with demineralized water and certified dyes to produce the final gelatin solution. To maintain viscosity, the liquid is stored in heated, stainless steel tanks.

At the next stage, stainless steel pins are dipped in the gelatin: automatic timing is vital to assure proper build-up of gelatin on the pins. Next, the pins are rotated in order to distribute the gelatin evenly over the pin surfaces. The capsule halves are then exposed to purified air to extract moisture.

Once dry, each capsule half is stripped from its pin. The

cap and body are cut to the required length and joined.

Capsules and material samples are inspected at various stages. Qualities checked include color, dimension, odor, taste, moistness, acidity, appearance, brittleness, solubility, plate count and salmonella count. Defective capsules are removed. Those that are finally sold conform to customer specifications and all Canadian and United States food, drug and cosmetic regulations.

After the capsules have received final inspection and have been counted, the customer's name, symbol or code number may be imprinted. Finally, the capsules are packed in aluminum-lined, moisture-proof fibre drums and shipped by rapid transportation to their destination.

The company makes the capsules in five sizes and about 2,000 color combinations.

Code 3-4

Vancouver company supplies fully-engineered systems

The sale of specialized technology in the form of fully engineered systems is the business of Chemetics International Limited, Vancouver, British Columbia.

Established in 1967, the company already has attained an enviable reputation for its technological expertise in four major areas: chemical plants and services; chemical equipment; oxygen bleaching systems; and pollution abatement services.

Work on pollution abatement projects involves the supply of professional services covering all aspects of air and water improvement. Services include: laboratory and pilot plant investigations; preliminary and detailed engineering; construction supervision; contract management; and plant commissioning services.

In North America, Chemetics will carry out detailed engineering, construction and commissioning of pollution abatement facilities as well as the design and construction of chemical plants on a "turn-key" guaranteed price and performance basis. In other countries, Chemetics offers process guarantees along with procurement and supply of all equipment, assistance in selection of a local contractor, start-up assistance and over-all supervision.

For chemical plants and services, Chemetics offers feasibility studies, engineering design, construction, construction supervision, purchase of equipment, plant start-up, operator training and plant management. The firm has such chemical plants available as: sodium chlorate, using either dimensionally stable metal electrodes or

graphite electrodes; calcium hypochlorite; and chloralkali, using either mercury or diaphragm cells.

Oxygen bleaching systems are also a Chemetics specialty. The firm has the capability and experience to design and construct the whole plant or it can modify or expand existing bleach plants incorporating the oxygen stage. Chemetics recently completed the first bleach plant to incorporate a new oxygen bleaching process on a "turn-key" basis for the Chesapeake Corporation, West Point, Virginia.

Depending on the client's needs, Chemetics, a subsidiary of Canadian Industries Limited, can provide all or any portion of an engineering package. Code 4-1



An incineration system for pulp mill odor control installed by Chemetics International Limited.

Self-cleaning, self-priming pumps

Self-cleaning, self-priming pumps designed to handle sewage or effluent are available from Monarch Industries Limited of Winnipeg, Manitoba. The company has 38 years' experience making pumps, mixers, hydraulics and castings.

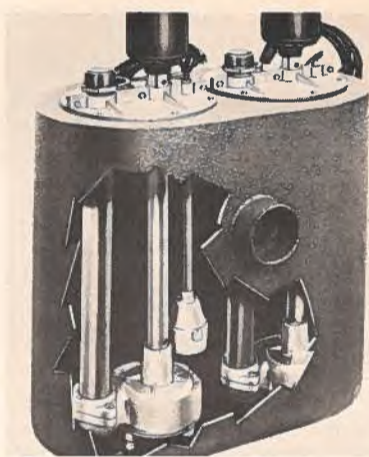
The BE series of self-priming pumps for septic tank effluent have capacities up to 65 United States gallons per minute (246 liters/minute) and heads up to 54 feet (16.4m). Suction valves flip open to permit full flow of water and close to keep the pump primed for the next pumping operation. Check valves prevent back flow. Disposal units, ideal for domestic sewage service, are available in kits.

The YS series of submersible-type effluent sewage pumps are designed for industrial and domestic use. Completely sealed, they require no lubrication. Pump capacities are 42 U.S. gallons per minute (159 liters/minute) with 1/3 horsepower motor and 68 U.S. gallons per minute (257 liters/minute) with 1/2 horsepower motor.

The YS pumps are equipped with John Crane mechanical seal semi-open cast-iron impeller, oil-filled motor with automatic overload protection, permanently lubricated ball and sleeve bearing, 25-foot (7.6-m) electrical cable, double diaphragm switch and large screen for keeping solids out while letting a maximum flow of liquid through.

The C series of non-clog centrifugal sewage pumps are available with options suitable for sewage lift stations, blending, foundry wastes, packing houses, canneries, slurries, distillery wastes, refineries, etc.

The C series pumps are made with vertical or horizontal mounts. The vertical installations are used



Monarch's WC21 duplex unit is designed for pumping raw sewage. The pump has an asphalt-dipped steel tank, two diaphragm control switches each with a 10-foot (3-m) vented cable, and a three-inch (7.6-cm) discharge. It is also available with a fiberglass tank.

for dry pit applications where floor space is at a premium. The horizontally-mounted units have independent front and back legs to lessen pipe strain and for easy servicing.

The WC series of column type wet pit pumps and the WS series of submersible-type pumps are designed for raw sewage and light industrial applications. These pumps have a three-inch (7.6-cm) discharge and can handle spherical solids up to 1 3/4 inches (4.4cm) in diameter. They have capacities of up to 50 U.S. gallons per minute (180 liters/minute).

All pumps are made of sturdy cast iron, poured in the company's own foundry, and are coupled with brand name electric motors.

The smaller effluent and sewage pumps are manufactured in large quantities ready for shipment. However, the larger units are usually manufactured as required, to customer specifications. Code 4-4

Special purpose air purifier

Pollution-free air was the priority that prompted the production of the K Air Purifier, developed by E. A. Kutryk Industries Ltd., Calgary, Alberta.

Designed to remove pollution from air discharged at asphalt mixing and batch plants and mobile paving installations, the portable K Air Purifier consists of a compact heavy duty scrubber with water holding and reclaim tank.

Operation of the K Air Purifier is simple and its results effective. In use, the cylindrical scrubber is hydraulically positioned horizontally above the water tank. Contaminated gases and dust-laden air from the asphalt batching operation are collected in clean water at high pressure as it passes through the scrubber. There, as the water swirls and sprays through the length of the scrubber, purification

Western R & D has new instruments to measure air pollution at source

Two new instrument systems which monitor air pollution at the source have been developed by Western Research & Development Ltd. of Calgary, Alberta.

The continuous stack emission monitor CSEM tells a plant operator how much process waste is going up the stack. The monitor measures specific components of the stack gas, in concentrations ranging from 5 parts-per-million (ppm) to 50,000 ppm. The instrument gives a continuous reading on sulphur dioxide concentration, sulphur effluent and stack gas volume. The system works in all weather conditions.

Because the data is continuous, the plant operator can detect an upset in the process as soon as the effect reaches the stack. The continuous data also gives the operator a complete record to use in performance evaluation.

The measurements are made right on the stack: an installation is mounted on a cat-walk at an elevation varying from about 75 feet (23m) to 200 feet (61m), depending on the height of the stack. Electronic signals from this equipment are sent via a cable to the control room where the computers and chart records are located. Remote calibration is performed from the control room, limiting stack-climbing to routine maintenance. The equipment mounted on the stack is housed in a shelter to protect the instruments from severe weather conditions.

Although the equipment was designed for monitoring emissions from sulphur recovery plants, the systems can also be used in oil refineries, thermal power plants, petrochemical operations, asphalt plants, and many other industries.

Western Research & Development has also developed a system for monitoring sulphur recovery efficiency and optimizing the Claus

sulphur recovery process. Called the AFR-REM, the system is based on the ratio of sulphur dioxide to carbon dioxide in the plant feed and tail gas.

The system deserves attention for several reasons: the efficiency readout and the carbon dioxide value are delivered continuously and instantaneously; all the sulphur compounds are measured, including both the vapor and liquid sulphurs, so that the recovery efficiency is obtained; the readouts are displayed in the plant control room, which means that the operator can optimize the system at any time; and diagnosis of plant operation can be aided by studying the system records.

The system works in the following way: a specially designed sample line continuously withdraws a representative sample of the tail gas from across the entire diameter of the duct and delivers it to the oxidation unit. After water is removed, the sample flows to the analyzing components of the AFR-REM system. To prevent the sulphur from condensing and plugging up the line, the sample is heated to a controlled temperature within the line.

The entire system is housed in a transportable shelter and is delivered to a plant location as a fully completed operational unit. It requires a minimum of maintenance and calibration.

The concept developed in the AFR-REM system for sulphur recovery is being developed for application to other industrial processes, including the thermal power generating industry.

The company also provides consulting services on environmental problems; designs, installs and tests new equipment for pollution control; and conducts other industrial research. Code 4-3

pletely unattended.

When in transport position a typical K Air Purifier measures approximately 60 feet (18m) long, 10 feet (3m) wide and 14 feet (4m) high. In operating position the height to the top of the scrubber is 20 feet (6m) plus the clean air stack.

Estimated weight, clean and empty, is 3,900 pounds (1,771kg) and the purifier will handle up to 80,000 cubic feet (2,265 cubic meters) per minute.

E. A. Kutryk Industries Ltd., whose business is the custom steel and alloy metals fabrication of components and equipment for various heavy industries, is interested in acquiring export markets or licensing arrangements for its "K Air Purifier." Code 4-2



The portable K Air Purifier, designed to remove pollution from air discharged at asphalt mixing and batching plants and mobile paving installations, is produced by E. A. Kutryk Industries Limited, Calgary, Alberta.

System probes underwater too Detecting petroleum leaks

Leak "X" Detection Devices Ltd. is a two-year-old Ottawa, Ontario company which designs and manufactures systems to detect petroleum leaks. The systems can be used to detect petroleum leaks from any type of storage or transmission facility, including underwater pipelines.

The basic elements are Leak "X" cable, Leak "X" monitor and terminating resistor.

The cable consists of a twisted pair of woven stainless steel conductors coated with a dielectric which will dissolve only when in contact with petroleum or a petroleum derivative. When there is a leak, no matter how minute, the dielectric deteriorates, causing a fault. This is indicated on the monitor.

The system can be used with pipelines by putting the cable adjacent and parallel to the pipe. Storage facilities are protected by probes of cable installed vertically in perforated tubes. Buried utilities can be protected by installing the cable directly over the plant at a shallow depth: if an excavator disturbs the surface over the underground installation, an alarm sounds. Leaks and spills in waterways can be detected and contained by using the company's weirs and booms.

If there has been a spill, the weirs can be joined together at each end to surround the product as a boom until the slick is removed. In this application, the company calls the booms "retention weirs".

The retention weir can also be used to surround barges while they are discharging cargo at dockside. The weir can have the Leak "X" cable attached semi-permanently, with the cable also attached to a monitor for constant checking.

To detect petroleum products in

sewers or water courses, the detection weir is anchored at a point in the mouth of the out-fall sewer, or at a point across a waterway where the petroleum is suspected. The detection weir will discover the presence of petroleum products within hours of contact and relay a signal to any point desired.

The complete system also includes fault locator, variable fault locator, open circuit locator and conductance soldering unit. The first three items eliminate the need for complicated instruments and calculations, by indicating the exact distance to faults.

The fault locator measures the distance, in feet or meters, to a fault — really a leak — in the Leak "X" cable, or any cable of known resistance. It will also measure the length of cable being installed or on a reel, and will monitor cable during installation to detect any damage in the dielectric.

The variable fault locator measures the distance to a fault in a piece of inaccessible cable. The cable can be inside a conduit, in reel form, underground, in liquid or on distribution poles. The instrument can also be used to monitor lengths of cable during installation or to detect damage to the dielectric.

The open circuit locator determines the distance to an existing open circuit or break in the Leak "X" cable or a cable of known resistance.

Difficulty with conventional soldering practices is often encountered in miniature electronic constructions, where congestion of wiring and parts makes items adjacent to the targeted ones prone to heat damage. The conductance soldering unit has overcome this potential difficulty in the Leak "X" system.

Code 5-3

Teamwork the key to consultant success

T. W. Beak Consultants Limited of Montreal, Quebec, has carried out a wide variety of environmental protection assignments in Belgium, Canada, France, Iran, New Zealand, Turkey, Scandinavia and the United States.

The 11-year-old company has built up a strong team of biologists, chemists and engineers who can handle assignments ranging from simple toxicity tests of commercial products to the complete engineering of urban waste treatment systems.

The company's pollution control programs include in-plant modifications to reduce pollution at the source, feasibility studies of different treatment processes, development of equipment and processes, planning of long-term abatement programs based on existing

and projected waste loadings, and engineering and project management of pollution control facilities.

Recent company research on environmental matters includes studies of a proposed forest utilization project in Turkey, studies of thermal pollution from a nuclear plant in Michigan and monitoring of mercury in Connecticut and Washington.

The company has conducted feasibility studies of primary and secondary treatment for pulp mill effluent in France, designed a treatment facility for effluents containing chlorides in Michigan, and studied the treatability of iron ore concentrator effluents in Canada.

The company's biological work has included studies of toxicity and odor in fish tainting and a survey of toxicity standards of fully treat-

ed refinery effluents.

The company operates two well-equipped biological and chemical laboratories in Toronto and Vancouver, three engineering offices in Montreal, Toronto and Vancouver, and satellite offices in Calgary and Portland, Oregon.

Beak is a subsidiary of Sandwell and Company Ltd., a Canadian consulting engineering firm which specializes in the design and construction of pulp and paper mills around the world. Through this relationship, the resources and talent of the parent company and several associated firms specializing in coastal engineering, materials handling, forest management and mining development, are readily available to Beak.

Code 5-1



Scientist at T. W. Beak Consultants laboratory uses a gas liquid chromatograph to measure the level of organic compounds in industrial waste water.

Chromic acid recovered, re-used

Waste chromic acid generated by plating operations is no longer an environmental hazard thanks to the improved treatment system developed and introduced by Eco-Tec Limited, Toronto, Ontario.

The Eco-Tec Reciprocating Flow Ion Exchange system not only recovers essentially all chromic acid; it recovers it for re-use, thereby eliminating the need for costly destruction and avoiding the prob-

lem of sludge removal.

In addition to its recovery efficiency of 99.5 per cent, the unit also removes undesirable metallic impurities with the result that when the chromic acid is recycled back into the plating bath the electrolyte has been found to work more effectively than the original bath.

While some chromic acid recovery systems have been considered too costly, too large and

too easily corroded by chemicals, the Eco-Tec system is inexpensive and compact. It occupies only 30 square feet (3m²) of plant space and can be installed up to 300 feet (91m) from the actual plating bath. It also overcomes the corrosion problem by using corrosion-resistant plastics.

The Eco-Tec recovery unit combines the use of three short beds, one containing anion, and the other two cation exchange resins. Rinse water is first pumped into a cation pre-treater where cation impurities are removed by the resin. The water is then pumped on to an anion bed.

In the anion bed chromate ions are removed by the resin and the essentially purified water is recycled. The anion resin is regenerated with sodium hydroxide and this effluent is pumped through a cation bed and collected as concentrated chromic acid — about 12 ounces (.336 kg) per gallon. The cation beds are then regenerated with sulphuric acid.

The Eco-Tec system operates automatically, requiring little or no supervision. It is simply installed and is adaptable to all sizes of plating operations.

Tested in Canada and the United States, the system is now ready for world markets. Currently, Eco-Tec Limited is planning to produce standardized units capable of accommodating plating operations ranging from eight ounces (.227kg) of chromic acid an hour up to 30 pounds (14kg) an hour. Code 5-2



Dr. Elmer Nagy, research scientist with the developmental chemistry unit of the Canada Centre for Inland Waters, applies a chemical herder to oil on water to prevent the oil from spreading so thinly that it cannot be picked up by mechanical means.

Inland waters research

How much pollution can water take without irreparable damage? How can wastes be treated more effectively? How can waters be conserved and recycled?

Answering these and other questions is the work of the Canada Centre for Inland Waters in Burlington, Ontario. Established six years ago by the federal government and now part of the Canadian Department of the Environment, the Centre has already made several contributions to better water management.

It provided much of the research

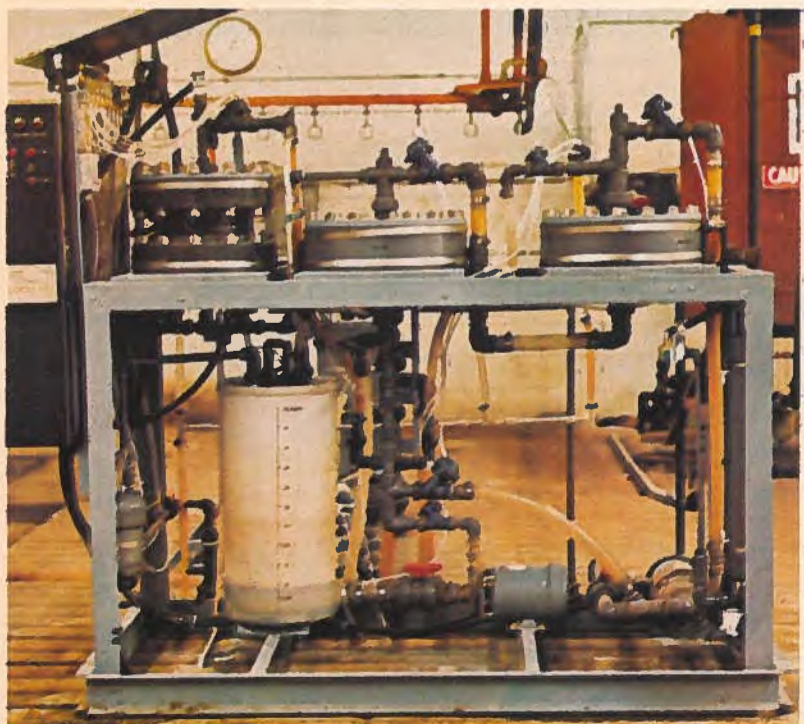
behind the report to the International Joint Commission on the pollution of the lower Great Lakes and the St. Lawrence River. This research resulted in the enactment of legislation and the start of programs by federal and provincial governments in Canada. The report's recommendations also led to the Canada-United States Great Lakes Water Quality Agreement. The agreement stipulates quality standards, effluent types and target dates.

Other research is being conducted by the Centre's staff of 600. For example, the hydraulics laboratory houses a giant towing tank in which current meters for measuring water flow are calibrated. The meters are sent in from all over Canada and are used to help assess the country's water inventory.

Some other work the Centre is doing includes: studies of mercury distribution and methods of safely removing mercury from sediments; studies on NTA (sodium nitrilotriacetate), a possible replacement for phosphates in detergents; the development with other agencies of a national contingency plan to deal with spills of oil and other toxics; the study of waste heat input to lakes and rivers; remote sensing of water resources, and diffusion of pollutants in lakes.

Perhaps the most unusual work of the Centre is its social science research. Since, in the last analysis, pollution control depends on how much the public is prepared to pay and to do, social scientists are assessing the sociological, geographical, legal and economic aspects of activities related to water management.

Code 5-4



Efficient, inexpensive and corrosion-resistant, Eco-Tec's reciprocating flow ion exchange system recovers waste chromic acid for re-use.

New system speeds up bank proofing, encoding

A quicker and more flexible system for bank proofing and encoding has been developed by NCR Canada Ltd. at its Waterloo, Ontario plant. The system is known as the NCR 775.

In the major application of bank proof, all debt items are proved equal in amount to the total credits for the transaction. The system also sorts cheques and other documents for subsequent distribution either internally or externally.

By internal programming changes, the 775 equipment can also be used for credit-card billing, lock-box accounting and encoding of loan coupons.

The system is also the first of its kind to provide a complete automatic operating status display. Sequential messages, flashed on a display

panel, indicate which functions are being performed. This reduces the possibility of erroneous entries. The display also helps an operator, whose work has been interrupted, resume data entry in the proper sequence.

Programs can be entered in the system through either magnetic tape cassettes or the console keyboard. The system's magnetic core memory can store up to 85 individual totals of both dollar values and item counts. High dollar processing techniques improve the movement and control of float money.

Operator comfort and efficiency have been taken into consideration in the design of the system. The company made a two-year study of the capabilities and work habits of proof machine operators. As a result,

every part of the system, from the internal operating speeds to the placement and angle of the keys, has been engineered to make possible maximum output with minimum operator fatigue.

The company has also developed a comprehensive 12-lesson course for system operators. This is believed to be the first training package ever offered banks as part of a proof and encoding system.

With field tests finished, the first 775 systems came off the assembly line in October, 1973. The company has already received 2,000 orders from banks in the United States.

NCR Canada has been making business machines for more than 70 years. It entered the computer age in 1961. Code 6-1



Preveno Industries Marketing Manager Yvon Cyr shows Albert David of Dominion (grocery) Stores the Inter-Cash system for protecting businesses from theft. Cashier puts money through slot into safe which has been mounted under a cash register. The remote control box which opens the safe is shown above the safe, but would normally be placed farther away from the cash register, in a spot convenient for the manager. The system is ideal for theaters, hotels, motels, small grocery stores and small businesses.

Preveno designs system to deter thieves

An easy-to-use system designed to protect businesses from hold-ups has been developed by Preveno Industries Ltd. of Montreal, Quebec. The system, called Inter-Cash, reduces the amount of money on-hand, and, should there be a hold-up, forces a thief to stay on the premises so long that he is likely to get caught.

Inter-Cash consists of a steel safe with a lock that is timed electronically and operated by remote control. The safe can be put anywhere: on a wall, a shelf or under the cash register. Money that is not needed for making change is taken out of the cash register and put into the safe through a sliding door and a slot.

When the manager wants to remove the money, he or she turns a special key in the control box and waits for the timing mechanism to open the lock. The manufacturer will set the timer for whatever period the customer wishes (usually

two to eight minutes).

The safe cannot be opened unless the special key activates the control box timer. Even if the wires are cut and the circuit jumped, the safe cannot be opened. Once the timer is in operation, it can be stopped — but it can't be speeded up.

Stickers on the cash register and at the entrance to the business warn would-be thieves that the company is protected by this device. Additional protection can be gained by connecting the system to an alarm.

A "multi-unit" control has been developed to protect businesses with more than one cash register. This unit can control as many as 24 safes at once, but permits only one safe to be opened at a time.

The company has sold Inter-Cash to businesses in Australia, England, France, Hong Kong and Japan. Code 6-2



Operator works at NCR Canada's new 775 system for proofing and encoding bank documents. The system is quicker and more flexible than previous equipment.

SNC offers complete spectrum of pollution control services

A 60-year-old Montreal firm of consulting engineers offers a complete range of pollution control services.

Surveyor, Nenniger & Chênevert Inc. (SNC) has experience in: the design of water supply systems and sewage treatment plants; the collection, conveyance, filtration and control of fumes suspended in air streams; the development of new techniques for the disposal of solid wastes; and noise control.

The company has worked on projects for many different industries, including power development, mineral processing, metal finishing, pulp and paper, food processing and petroleum refining. It is also involved in town planning.

One of SNC's most recent projects is the sophisticated effluent treatment system at Air Canada's engine maintenance base in Dorval, Quebec. The wastes produced by this plant contain dangerous substances such as cyanides, chromates, acids and alkalis. SNC designed a system in which the chemicals neutralize each other.

In air quality management, the company has developed skills for accurately predicting the dispersion of pollutants from power and industrial plants in different meteorological conditions. SNC does stack sampling, ambient air and dispersion studies, process design, and management of pollution control programs.

Recently the company undertook a study to predict the ambient sulphur dioxide concentrations that would result from operation of a

proposed thermal power station at Megara, Greece. Examination of the data enables SNC to recommend those design parameters that would prevent the sulphur dioxide concentrations from exceeding levels safe for human, animal or plant life or for property.

SNC engineers have been studying ways of coping with solid waste disposal problems since 1964. Methods studied include recycling, composting, incineration, sanitary fill and the production of marketable products from the pro-

cessed wastes.

The company's services in noise control range from testing to designing and installing equipment. SNC is increasingly active in solving acoustical and vibration problems in commercial and industrial settings.

The company has worked in more than 30 countries and has offices or representatives in Algeria, Australia, England, Equador, France, Germany, Ghana and Greece. Code 6-5



After effluents have been treated for toxicity on Air Canada's aero-engine maintenance base, they are brought together in this neutralization pit. Here the pH is adjusted and all heavy metal hydroxides are precipitated in the form of sludge. The waste treatment system was designed by Surveyor, Nenniger & Chênevert Inc.

SWARU wins 1973 engineering award

A garbage incinerator with several differences won the 1973 civil engineering award of excellence from the Association of Consulting Engineers of Canada.

The East Hamilton Solid Waste Reduction Unit (SWARU), designed by Gordon L. Sutin & Associates Ltd. of Hamilton, Ontario, has the capacity to burn 600 tons (544.3 metric tons) of garbage a day. The unit uses the heat to generate steam, separates magnetic metals for recycling, produces very little smoke and smell — and reduces garbage volume to five per cent of the original. When compacted at the final landfill site, the sterile ash produced by the unit can provide usable land within five months. (The unit was described in Canada

Courier about a year ago.)

One of the key differences between SWARU and conventional incinerators is pulverization: at SWARU, garbage is first pulverized, then burned.

Gordon L. Sutin & Associates is a firm of consulting engineers and environmental planners. The company is especially interested in incineration of municipal solid waste and in studies of air, water and land pollution.

The Association of Consulting Engineers of Canada and Canadian Consulting Engineer magazine present annual awards in five categories for significant engineering projects. The top award in each category is the award of excellence. Code 6-3

Wherever the demand MacLaren will go

Complete consulting services in all aspects of environmental engineering are provided by James F. MacLaren Limited, Willowdale, Ontario.

A 23-year-old company, MacLaren specializes almost exclusively in environmental engineering. The primary fields of activity are: water supply; collection, processing and disposal of all solid wastes; air pollution monitoring and control; planning of the optimum utilization of water, land and air resources; monitoring and control of urban noise pollution; and monitoring of rivers, lakes, streams and ground water to observe such conditions as mineralization, organic pollution and stratification.

MacLaren's services progress through comprehensive planning and basic feasibility and financial studies, into design, and on to supervision of construction, operation and management. Scientific monitoring and reporting on the condition of all resources, as well

as the monitoring and analysis of effluents and pollutants by chemists and biologists, complete the full environmental service.

The 200-member firm provides its services to federal, provincial and municipal governments, to industries of all types and to such international organizations as the World Bank, the World Health Organization, the Inter-American Development Bank and the Canadian International Development Agency.

Overseas projects, which account for about 25 per cent of the firm's work, are normally handled by the company's wholly-owned subsidiary, MacLaren International Limited. In most instances, these projects are carried out in association with local consulting firms.

MacLaren currently is working on projects in Haiti, Jamaica, Cyprus and Nigeria and will provide its services wherever the demand exists. Code 6-4

Computer takes over street traffic control

Digital electronics is the name of the game at Automatic Electronic Systems Incorporated, Montreal, Quebec.

In less than 10 years the firm has introduced several new products that are used by major companies in Canada and the United States and the company was recently awarded the largest single contract in North America for computerized street traffic controllers. The contract, in excess of \$1,000,000, involved the sale of 1,000 AES-80 Microprocessors for use in the city of Baltimore.

Using the AES-80, the traffic

controller is a unit that, based on inputs from vehicle detectors and a central computer, dynamically adjusts traffic cycles at intersections. Located in a housing unit at the traffic intersection, the AES-80 processes system sensor data, activates traffic light interval sequences and communicates via telephone lines to the central computer. The product replaces conventional electro-mechanical controllers that do not allow for computerized traffic control.

The versatile AES-80 (standard equipment in 10 of the company's products) has its own symbolic lan-

guage and is subroutine oriented, using an automatic push-down stack for routine linkage. A program development control console, supporting a teleprinter and a paper tape reader, is offered for program preparation, debugging and on-line monitoring.

Designed around a data transfer concept, the AES-80 is a bus organized machine. An 8-bit three-state processor bus is used as the main highway for data traffic between registers and the data memory. The source and destination of data travelling along the processor bus is under complete micro-

program control.

A unique feature of the micro-processor is the ability to intermix types of memory in both data and instruction memories. Memory modules of 256 words each (8-bit data memory or 12-bit instruction memory) of many types may be intermixed.

Among the company's other products available for export are: the S-300 Tele-protection unit — a data set for transferring fault con-

ditions between stations in a power network; the S-500 Time Division Multiplexer — for concentrating Telex, TWX and data inputs over a single line to increase efficiency of data communication between major cities; and the Remote Terminal Unit — used extensively by power utilities, telephone companies and oil processors to transmit alarm and status reading to a central station. Code 7-1

More feats than fighting fires

Fighting forest fires is just one of the feats quickly and easily performed by the CL-215, an amphibious aircraft manufactured by Canadair Limited, Montreal, Quebec.

The first aircraft designed specifically for forest fire control — and recognized internationally for its effectiveness in that field — the CL-215 is equally effective in other areas, from search, rescue and patrol operations to aerial spraying and aerial surveying.

Besides fighting forest fires CL-215s have transported hundreds of tons of vital supplies to areas that are far from airways, communication facilities and navigational aids. They have also sprayed nearly a million acres of spruce forest against budworm infestations.

The eight new CL-215s which will soon run off the production line for service with the Government of Spain will perform two primary roles: patrol and forest firefighting. Equipped with search radar and other electronic equipment, the CL-215s will enable their crews to locate and assist vessels and aircraft in distress. They will

also be used to police movements of fishing vessels in Spanish waters and to detect and identify smugglers.

During the fire season the aircraft can be easily switched to their fire fighting capability at very short notice. They can also be converted rapidly for aerial spraying or emergency transportation.

The CL-215's newly developed versatility is creating world-wide interest and the aircraft was a highlight of the September 1973 International Aerospace Show at Sao Paulo, Brazil, where it demonstrated its water bombing capability by deluging the runway with six tons of water it had scooped up from a nearby lake.

Also demonstrated was a series of manoeuvres — climbing, turning, slow flying — which showed why pilots are able to fly the aircraft in confined spaces at low speeds and low altitudes.

For fighting forest fires the CL-215 has two internal tanks with a total capacity of 1,176 gallons (5,350.8 litres). The tanks — which can be equipped to mix retardant automatically while scooping water

— are filled through retractable probes as the plane skims across the surface of the water at 70 miles per hour (112.6km/hr) or they can be filled through ground hoses in under two minutes.

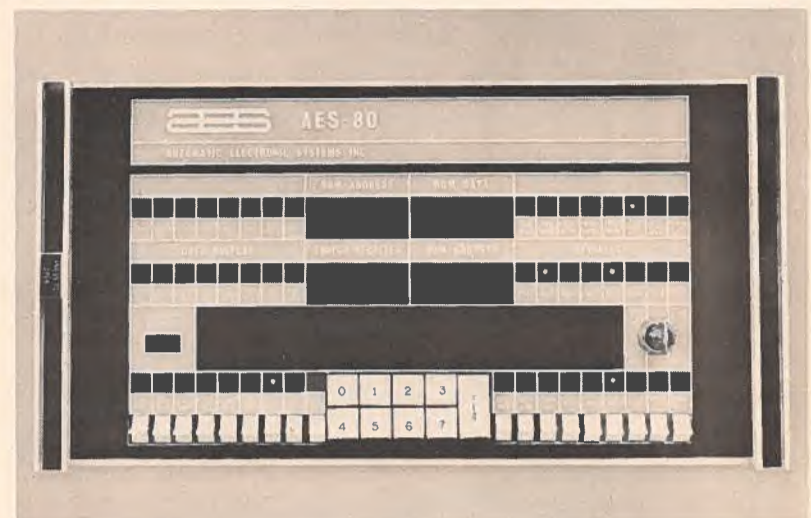
In combating infested forests the CL-215 can spray 11,000 acres (4,451.7 hectares) in a single 24-minute mission. The extra advantage here is that, even with the spray system installed, the aircraft still retains its fire fighting capability.

For aerial surveying — forest fire mapping, forest inventory, insect and disease detection, oil pollution location and tracing — the CL-215 is fully equipped with airborne remote sensing equipment such as infra-red scan line and multi-spectral photography.

The aircraft is powered by two engines with constant speed, three-bladed propellers.

Of the 39 CL-215s manufactured by Canadair Limited, 15 are used in the Province of Quebec. So far, others have been exported to Spain, France and Greece.

Code 7-2



The control console of the AES-80 Microprocessor, a unit used in computer controlled traffic light systems.

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The CL-215 amphibian aircraft has been used to spray spruce forests against budworm infestations. The plane is also a "water bomber" for fighting forest fires and is used for aerial surveying, patrol, search and rescue operations.

Industrial design consultants can help companies increase profits



Claude J. Gidman, director of Claude Gidman Design Associates, studies model of Kenworth truck his company designed.

A truck cab, a food handling system for a jumbo jet and a subway car may not seem to have much in common. In fact, they were all designed by the six-year-old Montreal company of Claude Gidman Design Associates.

This industrial design consulting company works in the fields of transportation, mass produced products, packaging, space planning, exhibitions, corporate graphics, human engineering and concept presentation.

The designers work in collaboration with engineers, architects and experts in product planning, cost control and marketing.

The Claude Gidman goal is to increase clients' profits, cut production costs, expand markets, produce a greater diversification of sales, make existing products more efficient, anticipate demand and

create new products timed to meet demand.

The designers work in their Montreal office and on location. When designer and client can discuss a project by telephone, mail and occasional meetings, the work is carried on at the designer's office. When continual consultation is necessary — often during initial studies or prototype building — the designer will work on location with the client.

One company assignment involved the design of a tilt-cab for a Kenworth truck series. The company wanted a specialized truck for shorthaul runs in urban traffic, where manoeuvrability is of the greatest importance.

The truck has several unusual features: a 25-degree slant windshield which improves visibility and aerodynamics; a cab that's

compact, but still has room for driver and two passengers; instruments grouped for ease of handling. When engine servicing is necessary, the cab can be tilted forward 50 degrees. The full-size mock-up built by the Gidman design staff was used to create the tooling for most of the cab's surfaces, including the integral floor and engine cover unit.

Other Gidman designs include: the driver's cab for a New York area transit authority's subway and surface commuter trains, an all-terrain "fun" vehicle for an American manufacturer of recreational vehicles, special plastic food and beverage trolleys for a firm producing interior aircraft components, and other mass transit items.

Code 8-1



The "Cube" in style

More than 100 years of experience in quality furniture manufacturing stand behind the products of Willis and Company of Canada Limited, Ste-Thérèse, Quebec. Well known for its finely crafted pianos, Willis has also made a name for itself in the office furniture market. Rigorous quality control, prompt delivery and attractive pricing have ensured customer satisfaction and a fast growing export market. The company's newest addition to its lines of fine office furniture is the executive "Cube" series shown here, featuring cathedral grain veneers, full veneer top and slab end panels. Available in a choice of light oiled walnut or dark English oak finishes and veneers, the Cube series also features a transparent plexiglass writing tablet and a file drawer large enough for legal or letter sized filing. All drawers have quality oak interiors, are secured by theft-proof tumbler locks and are opened by finger grip operation. Full extension bearing slides operate the file drawer while full suspension bearing slides operate the other drawers.

Code 8-2



The first set of Canadian coins designed to promote the 1976 Olympic Games in Montreal will have a geographic theme. One side of all coins will show a profile of Queen Elizabeth.

Striking coins for Olympic Games first of series now on sale

"The Olympic idea — ours to keep alive!"

That's the theme for the Canadian coins being struck to commemorate the 1976 summer Olympic Games in Montreal. These coins should interest collectors of silver, coins and Olympic souvenirs all around the world.

Seven separate series of sterling silver Olympic coins will be minted, with the first coins being distributed in December 1973. Each series will consist of four coins, two of \$5 value and two of \$10, and all with different designs. The coins will be legal tender of Canada.

The coins will be sold at banks all over the world. They will also be available through agents in various countries who will acquire their coins by direct order from the Canadian Mint. As well, proof-like coins in sets of four for each series will be available to individuals who wish to buy directly from the Mint in Ottawa, through its mail order service.

The December 1973 issue has a geographic motif, with the four coins depicting the map of the world, the map of North America, the Montreal skyline and the skyline of Kingston, Ontario where some of the water sports will be staged.

The second series, scheduled for spring, 1974, will feature four Olympic symbols: the Olympic torch, the Olympic flame, a laurel wreath and an olive branch, all with an appropriate classical background.

The third series, which will prob-

ably be issued in fall 1974, will illustrate the early Canadian sports of lacrosse, archery, boat races and horsemanship.

The fourth series, scheduled for spring 1975, will cover Olympic track and field sports.

The fifth series, scheduled for fall 1975, will illustrate Olympic water sports.

In early spring 1976, the sixth series will feature Olympic team and body contact sports.

The seventh series will be a souvenir issue and is scheduled for June or July 1976. Olympic sites at Montreal and Kingston, possibly including an aerial view of the Olympic stadium, will be shown.

Coins will be struck from sterling silver blanks (92.5 per cent silver and 7.5 per cent copper alloy) and minted in both proof-like condition for collectors and new, uncirculated quality.

Fine silver content will be 0.723 troy ounces for each \$5 coin and 1.44 troy ounces for each \$10 coin. Because of the long-term upward trend in silver prices throughout the world, both numismatists and other collectors should find the coins of special interest.

The \$5 coin will have a diameter of 38mm and the \$10 piece, a diameter of 45mm.

Actual mintage figures are to be based on firm orders received. Quotas are to be established for each major market to ensure equitable distribution of the coins to numismatists and collectors throughout the world. Canada's Post Office is in charge of the marketing program. Code 8-3

Sticking with it!

A patented glue, sealer, hardener, weather-proofer, dust-proofer and bonding agent — all in one — is manufactured by Frank T. Ross & Sons (1962) Limited of Toronto, Ontario.

Weldbond "universal space age bonding adhesive" bonds cement, bricks, concrete, asbestos, plaster, metal, glass, wood, slates, tiles, building panels, boards and blocks, linoleum, fabrics and each to each other. It is ideal for plasterers, carpenters, cabinet makers, floor-layers, painters and decorators.

Mixed with five parts of water, Weldbond seals interior brick, block, concrete, cement and asphalt. It prevents gas, oil and salt damage to driveways and sidewalks and is an excellent paint base. It also hardens concrete, parging, plaster and mortar, seals porous exterior brick, masonry, concrete and cement against moisture and repels water from all types of structural masonry above ground. It is excellent for garage, basement and factory floors because it prevents dusting of concrete surfaces.

Weldbond is concentrated and thinned with water only. It does not require heating or mixing. It

appears white in the can but dries to a water-clear film.

It can be applied with a brush, roller, sponge, spray gun or soft broom. It becomes tacky quickly and will dry within an hour on porous surfaces. It will give a good strong bond within 24 hours and will be extremely strong within a few days. The sealing mixture of 5 parts of water to 1 part concentrated Weldbond dries in about one hour.

Weldbond does not become brittle with age, with storage or on the job and, after setting, withstands all climatic conditions. It will not deteriorate or crack and is non-flammable and non-toxic. Its elastic qualities allow for reasonable building movement.

Concentrated Weldbond is impervious to gasoline, oil, grease, salt, molds, fungi, weak alkalis and weak acids. The concentrate has at least twice the coverage of other adhesives and the Weldbond adhesive mix gives even greater economy.

It is available in containers ranging from 5-ounce (141-g) to 45-gallon (204.5-litre) capacities. Code 8-4