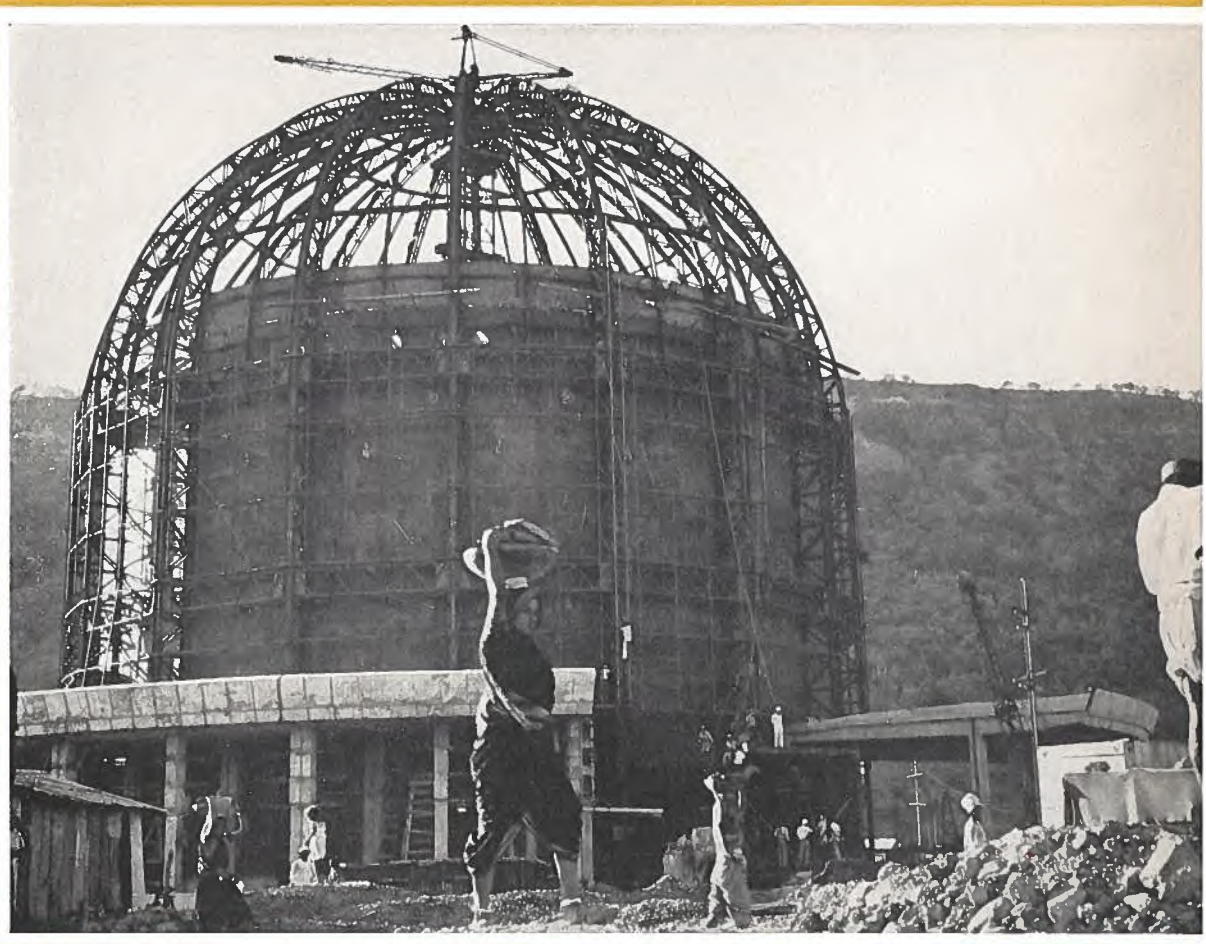
SEPTEMBER 10, 1960

foreign trade

CANADA



EXPORT TRENDS IN NUCLEAR PRODUCTS (pages 2-16)

Established in 1904

foreign trade

OTTAWA, SEPTEMBER 10, 1960 Vol. 114, No. 6

cover Building materials move on power hoists and, in the traditional way, on heads, as the Canada-India reactor and laboratory near completion just outside Bombay. The photograph shows the hemispherical steel dome (now closed in and covered with aluminum paint) that houses the pile, and the beginnings of the stone-walled annulus around the base. The reactor went critical in July. For a glimpse into nuclear developments in other countries and the implications for Canadian suppliers of equipment and services, see pages two to sixteen.

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CANADA

editorial

Export Trends in Nuclear Products

Now that atomic energy developments are proceeding at a more measured pace, it is possible to get a clearer picture of the prospects for trade in nuclear products.

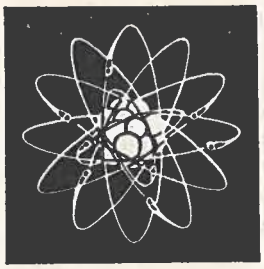
The articles that follow point up the need for exporters of these products to think not exclusively of today but rather of developing future sales. These are being influenced by the desire of many countries (at all stages of industrial development) to benefit from the technological experience and prestige that come from sharing in atomic energy developments.

Producers of nuclear commodities will be required more and more to consider exporting components and expert knowhow (as well as co-operating with local engineers and industries) rather than supplying complete equipment. In this respect, nuclear exports do not differ from those of other engineering products: the single, compact export is being steadily replaced by more complex arrangements requiring great flexibility and imagination on the part of the exporter.

Canadian manufacturers of nuclear products are in a good position to succeed in foreign markets. The industry in Canada is backed by 15 years of experience in the operation and construction of research reactors and the use of radioisotopes, reaching back to the earliest days of the atomic age. Now, under Canada's power reactor program an operating power reactor is close to becoming a reality. Canadian firms have actual power reactor hardware to show and will shortly be able to point to operating experience.

With the sober outlook prevailing today in the atomic field, it should be easier for Canadian manufacturers to assess foreign requirements and take steps to prepare the way for future sales. Selling sophisticated technology is not done over the counter: years of preparation are needed for effective and long lasting results. And firms that take part in projects abroad are confronted with new problems which will lead to the development of new manufacturing skills and applications of their technical knowhow.

—R. A. FRIGON,
Chief, Engineering and Equipment Division



Mexico Develops Nuclear Energy

Mexico works to keep abreast of developments in nuclear energy and looks abroad for some supplies and technical knowhow. Canadians have a chance to compete for a share of the business while the industry is still in its formative stages.

A. A. LOMAS, *Assistant Commercial Secretary, Mexico.*

STEP BY STEP during the past decade, Mexico has evolved a program of research and development in nuclear science. This program has now reached a stage of considerable interest to Canadian suppliers of nuclear equipment and engineering services.

Probably the most significant measure in the past ten years was the establishment, late in 1955, of a National Nuclear Energy Commission (Comisión Nacional de Energia Nuclear, or CNEN). The law that created this commission made it clear that the general subject of nuclear energy was of such national importance that the responsibility for its development must rest with the Government. As a result the State, through CNEN, controls the Mexican program in almost every respect, including the exploration and exploitation of radioactive mineral deposits, scientific research and, eventually, the production and use of atomic power.

To understand Mexico's present position, it is useful to review results to date and the objectives of CNEN. Ultimately its aims are the production of electric energy from Mexican nuclear sources and the application of nuclear science to agriculture, medicine and industry. Since its establishment, CNEN has followed a coherent six-point program which can be summarized as follows:

- the training and preparation of personnel
- international co-operation
- the exploration and exploitation of mineral resources
- scientific research, theoretical and applied
- protection from radioactivity
- the application of research to agriculture, medicine and industry.

Scientists Trained

Working closely with the National University and universities in the provinces, CNEN has established faculties and courses to prepare Mexican scientists. These are now coming of age and well-qualified persons are travelling in a steady flow to the United States, Britain, France and Canada on scholarships for postgraduate research. A massive central library containing atomic studies from many countries has been assembled in Mexico City to supplement university libraries and CNEN has already published more than 80 original studies prepared by Mexicans.

Private enterprise is also participating in the educational program. The Mexican Light and Power Company, a Canadian-based firm, has provided ten scholarships for Mexican engineers to study nuclear engineering abroad. This company and the University of Mexico are members of the Atomic Industrial Forum of the United States.

Recognizing that Mexico made a later start than many other countries in establishing an atomic energy program, CNEN has taken an interest in promoting relations with similar organizations in other countries in order to benefit from their experience. Mexico is a member of both the International and the Interamerican Atomic Energy organizations and later this year will be host to a mission of experts from the International group which will visit this country to study its atomic developments. CNEN considers that Canada and Mexico have certain similar geographical and economic conditions, and it is therefore especially interested in Canadian developments in atomic energy.

Uranium Sources Located

Working closely with other government organizations, CNEN has mapped out an intensive exploration program to locate uranium reserves. To date more than 50 ore bodies have been found; the most promising are in the northwestern states of Sonora, Chihuahua and Durango. Extensive tests have been made and it is expected that these ores will provide raw material for a "yellow cake" concentration plant, soon to be built. A small pilot plant with a capacity of about ten tons a day is already in operation in Mexico City but the design and location of the first commercial operation will not be settled for several months, pending results of further tests and exploration. One CNEN technician has already visited Canada to study

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Canadian methods of uranium extraction and concentration.

Closely linked to all other aspects of its work is the CNEN program of pure and applied research conducted in its own laboratories, in the universities, and by Mexicans studying abroad. In co-ordination with the University of Mexico, the Commission operates laboratories for studies in radiation, radioisotopes and inorganic chemistry; it is now building Mexico's first subcritical reactor. This reactor, which will be fueled with natural uranium, will be purely experimental. It will be followed, however, by a larger critical reactor which, in turn, will be the forerunner of an experimental installation to produce atomic-electric power.

Applied Research

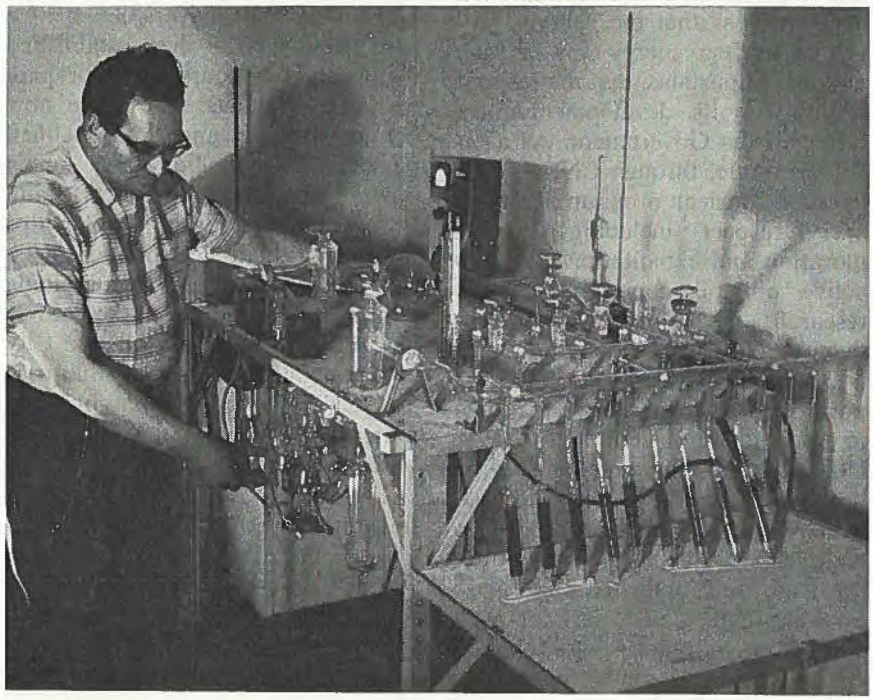
Despite the limitations of its basic research and development program, Mexico has made important progress in the application of nuclear energy to agriculture, medicine and industry. As noted, one of the principal aims of CNEN has been the eventual production of atomic-electric power. It has been estimated, however, that only about 65 per cent of Mexico's economically potential hydro-electric power has been used to date. Thus CNEN has been able to pursue its research in nuclear power without the urgency that has impelled more power-hungry nations. In addition to hydro potential, Mexico has vast reserves of gas, oil and coal, some of which will certainly be used to generate thermal power before any commercial atomic energy plants are installed. Meanwhile, CNEN will continue to install experimental reactors and will watch carefully the results obtained from the commercial reactors being operated or built in the United States, Britain, Canada and European countries.

Nuclear energy is also being used in the form of radioisotopes. CNEN estimates, for example, that about 60 beam-therapy units—some of them made in Canada—are already operating in Mexico. In its own shops and laboratories, CNEN is making geiger counters and in the near future will probably be producing other types of equipment to measure radioactivity. In addition, some industrial applications have been made, including an important development by CNEN and PEMEX, the national oil monopoly, for using radioactive tracers to locate stoppages in oil pipelines.

It is to the use of isotopes in agriculture, however, that CNEN is applying maximum effort because agriculture is still considered Mexico's most important industry. Here radioactive tracers are being used to improve crop varieties and research with isotopes to produce higher seed yields has been emphasized.

What to Offer

What do these developments mean to Canada and to Canadian companies? It is a basic principle of CNEN that Mexico's atomic energy program will be developed by Mexicans. At the same time, this country will certainly watch technical advances in other countries and this should mean opportunities for Canadian research agencies and private companies to offer know-how and related products and services. Mexico has not signed bilateral agreements with any other countries for this purpose nor are there many foreign firms active in



In the government-owned laboratories of the National Nuclear Energy Commission (CNEN) a Mexican technician makes adjustments to an intricate experimental layout. Since 1955 many such technicians have been trained under the government-sponsored education program, carried out in co-operation with Mexican universities and private industry.

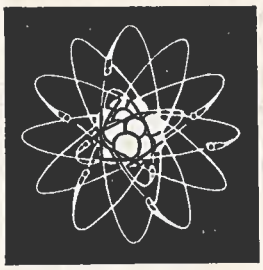
the market. It has been reported, however, that French, Belgian and U.S. companies have made offers in connection with the uranium ore concentration plant and the critical reactor that are soon to be built, and this competition is certain to increase.

The market potential in Mexico in the general field of atomic development can be summarized as:

• *Mineral exploration and concentration*—The basic exploration unit, the geiger counter, is already being made in Mexico but other more specialized measuring equipment is imported. There is also some opportunity to offer engineering know-how for the design, construction and operation of uranium ore concentration and treatment plants.

• *Reactors*—Mexico's first subcritical experimental reactor is already under construction at the National University. This will be followed by a critical experimental reactor and eventually by a prototype commercial reactor. This program opens possibilities for selling reactor components, ancillary equipment and technical knowhow. Sales potential for uranium reactor fuels will depend largely on progress made in producing uranium oxides in Mexico but it is apparent that these will not be available for some time.

• *Radioactive isotopes and related equipment*—The application of radioactive material in agriculture, medicine and industry is much further advanced than the country's ability to supply these materials from domestic sources. As a result, there will be for some years a growing market for imported isotopes and for the equipment—such as beam-therapy units and gammacells—with which they are used. Canadian firms must expect strong competition in this field from the United States, Europe and Japan. There is a market in Mexico for Canadian products and services for atomic research and use; major customers at present are the Comision Nacional de Energia Nuclear, the universities and hospitals. Canadian firms wishing to investigate these opportunities should contact the Commercial Division of the Canadian Embassy in Mexico for suggestions on the best way to approach the market. •



Brazil in the Atomic Era

Tenders will be called this year for country's first nuclear power plant; two other reactors already produce most of isotopes needed. Outlook for imports of uranium not yet clear.

WILLIAM JONES, *Commercial Counsellor, Rio de Janeiro.*

BRAZIL, the largest and most populous country in Latin America, is as one might expect the leader there in the development of and plans for the use of nuclear power and products. A symptom of this is the title of this article—a direct translation of the name given to an atomic exhibition officially opened in Rio on July 16th. During the week of July 10th the Brazilian Nuclear Energy Commission played host to the Second Meeting of the Inter-American Nuclear Energy Commission. During the following week it played host to the Third Inter-American Symposium on the Peaceful Application of Nuclear Energy. In these gatherings it was apparent that Brazil has made great strides in the nuclear field and in particular in the planning of the first nuclear power plant to be established in South America.

First Power Plant Planned

Brazil's need for nuclear power plants is understandable. Its coal resources are not large and are located in the extreme south. Its hydro-electric resources, as far as experts on future Brazilian economic development can foresee, are insufficient to meet the power needs of the areas with concentrated population and industrial development. And, despite the state-owned oil industry's intensive campaign to find and develop new oil resources, even the optimistic Brazilians (and most Brazilians are optimistic) are beginning to wonder whether resources are restricted to an already-developed field in Bahia, which is in the northeast. It is true that efforts are being made to use the sun for power purposes, but as yet even the Brazilians do not consider that this source will prove economic in the foreseeable future. As a result they are, in increasing numbers, looking to nuclear energy to solve their power problems.

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The Brazil National Commission for Nuclear Energy has determined upon the mouth of the Mambucaba River, between Rio de Janeiro and São Paulo, as the site of its first nuclear power plant. Although the studies are not yet completed, the Commission has indicated that capacity will be between 150,000 and 200,000 kw. and it has appointed a group to supervise the establishment of this plant. This group has already called upon foreign suppliers of nuclear power-plant equipment to state the nature of their abilities and register their names on the list of those who should receive calls for tender during the next six months. Because Brazil is short of foreign exchange, it may well be that any firm successful in its bid to supply this nuclear power plant will have to include a provision for some sort of credit financing. Moreover, the successful bidder will probably be associated with a Brazilian-based engineering and construction firm so that the maximum proportion of the components will be available from domestic sources of supply and paid for in cruzeiros. By ensuring that the Brazilian-produced portion of the contract is as large as possible, the Commission will also ensure that domestic contractors will obtain experience useful in the future. It is at present examining the industrial potential of Brazil with a view to determining the extent to which capable producers can supply components at an economic cost.

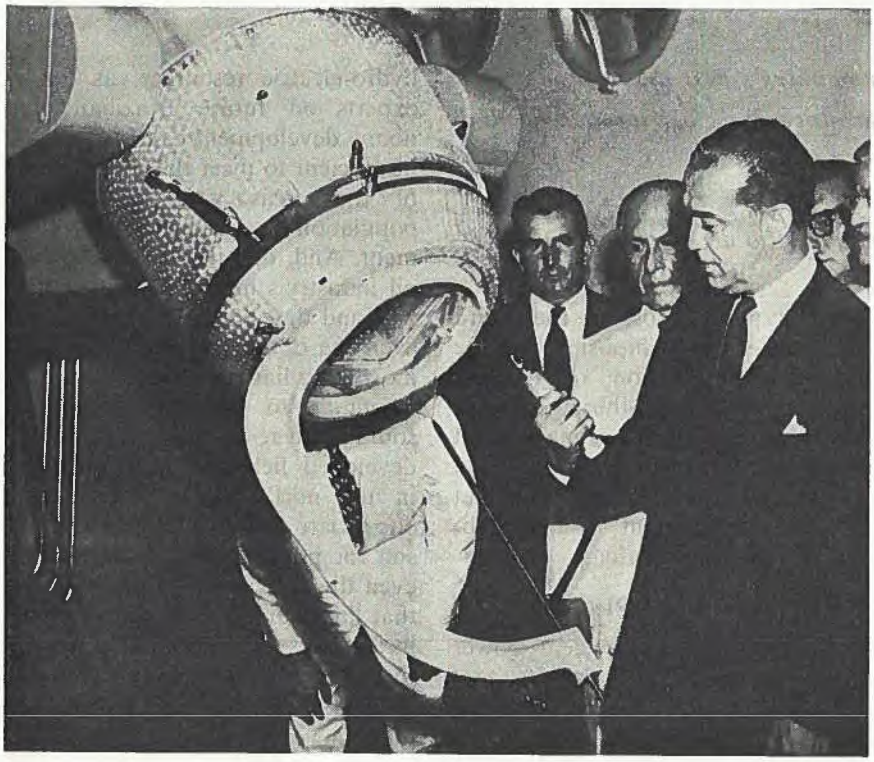
Opportunities for Canadians

Should the Mambucaba project proceed as expected, it is likely that some contracts will be let during the second half of 1961 or early 1962, and the plant should come into operation by 1965. Even if Canadian firms should make offers for the whole plant and be unsuccessful, the possibility of supplying parts to the successful bidder and the nuclear source of power—i.e., the uranium needed to complete the plant—will still remain. The Mambucaba project therefore provides opportunities for Canadian firms as prime or subcontractors or as suppliers of uranium.

Buying Uranium

Although Brazil will require uranium for the Mambucaba plant, and will probably need it for the one which they build after the first has proved successful, the future of Brazil as a potential market for Canadian uranium suppliers is by no means clear. Much will depend upon the success of development plans and their effect on the difficult foreign exchange problem, and upon the success or failure of the Nuclear Energy Commission in finding adequate and economic domestic ore deposits. The Commission describes the quest for and production of basic raw materials as occupying first-rank priority in its program.

Early in June, the Atomic Energy Institute in São Paulo announced the development of a new chemical process for extracting uranium from monazite, a domestic ore. (There are at present facilities for producing 5,000 tons a year.) A pilot plant has been installed and



Brazil is one of Canada's best customers for cobalt beam-therapy equipment and a number of Canadian-made units are doing duty in Brazilian hospitals. Here President Kubitschek examines one of them on an inspection tour in Rio de Janeiro. The biggest importer of these units at present is the Government, mainly because of the existing system of exchange controls.

small quantities of reactor-grade uranium produced. If this new process proves suitable for large-scale application and richer sources of uranium are not found meanwhile, it seems likely that the extent to which this country will meet its own future uranium requirements will be determined by the minimum production deemed desirable for national security and by the availability of foreign exchange to buy the remainder abroad. At present, one company is mining caldasite, a zirconium ore with uranium content, and two others are mining and concentrating monazitic sands. A plant to produce sodium uranate has been started and two others are planned. In a country as large and as unexplored as Brazil, one can assume that there are a number of undiscovered uranium-ore bodies and that, as the interior is developed and the apparent domestic demand increases, prospectors employed or encouraged by the Nuclear Energy Commission will locate more suitable and economic deposits than the present ones.

Training Specialists

Under the guidance and encouragement of the Nuclear Energy Commission, Brazilian institutes have made and are making rapid advances in the provision of facilities and courses for the training of specialists in the nuclear field. The first swimming-pool reactor in South America was installed in São Paulo in 1957 and went critical in September of that year. Around this centre an intensive program for the training of scientists and technicians is well under way and Brazilians have shown both ability for and adaptability to this type of work. Another reactor, of the Triga type, has recently arrived in Belo Horizonte and will shortly be installed in the Institute of Radioactive Research there.

The São Paulo reactor in particular has augmented studies of the use of isotopes in agriculture. It has offered courses on their application and the reactor itself produces a variety of them. Similarly, there are courses on the medical application of isotopes in well-equipped laboratories especially for the purpose. The Belo Horizonte reactor, purchased from the United States, is reported to be intended for the production of isotopes for medical purposes. Unfortunately, difficulties encountered in the import of radioisotopes make the sale of these products to Brazil extremely difficult, except for a few uses with high priority. It can generally be considered that Brazil is self-sufficient in isotopes except for extremely powerful radioactive sources which cannot yet be produced internally or for which there is such small demand that domestic production would be unwarranted economically. In the long run, it is probable that the Brazilians, who are extremely proud of their technological advances, will endeavour to produce all their requirements and indeed to export, if only to neighbouring countries. Although Brazilian scientists and business leaders are well aware of the potential value of isotopes in special industrial applications, it is doubtful whether they will come into widespread use for some time. This is because there are many basic production problems to be sorted out and standards to be established before they turn to examination of these finer points.

Beam-Therapy Units

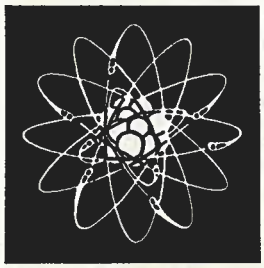
In the beam-therapy field, Brazil is the largest market in South America and the one with the greatest potential. A number of Canadian-produced units are already in operation in various hospitals throughout the country and additional purchases are being considered. Canadian suppliers encounter strong competition from European and U.S. private firms. However, as Brazilians normally wish the best equipment, Canadian equipment often has the edge, even in the face of price shaving, etc., by competitors. Much of the present active interest in imported equipment of this type and value is restricted to government-controlled or supported organizations, because imports by the Government are paid for with dollars which cost only Cr.$100 each, while private hospitals, clinics or doctors must purchase import dollars at a rate which at present is approximately Cr.$230 to U.S.$1.00. Private groups normally do not have sufficient funds at their disposal to buy equipment at this rate of exchange, and were they to do so, the cost of treatment with the equipment would, from the point of view of the relatively small segment of the population which would need and could afford such treatment, be excessively high. The reasoning of such patients and their physicians would be that, as suitable equipment is available in government institutions, arrangements with the appropriate government authorities would permit them entry into government hospitals for treatment at little or no personal cost.

Outlook

In brief, the future of atomic energy in Brazil is closely tied in with the success or failure of the country in its present drive to develop and diversify its economy. If this drive is successful and continues, it may well be that production of power by nuclear means will be a great contributing factor. The extent of this contribution will depend in large degree upon Brazil's ability to tackle its foreign exchange problems within the next few years.

Millionth Curie Exported

Recent shipment of a Theratron B cobalt 60 unit and source to Brazil from Atomic Energy of Canada Limited marked the export of the millionth curie of Canadian-produced isotopes; cobalt 60 for cancer treatment accounts for over half of this. In the past 12 years some 4,000 shipments of radioactive materials have been made to no less than 50 countries.



Sweden Sets Up Atomic Reactors

Both the Government and private industry are working in the atomic field; lack of energy resources is leading Swedes to concentrate on nuclear power studies.

A. P. BISSONNET, *Commercial Counsellor, Stockholm.*

SWEDEN generates about 95 per cent of its electricity from hydro power resources. With demand for power increasing by about 6 to 7 per cent a year, it is estimated that the remaining potential which can be developed at reasonable cost will be exhausted within 15 years. After that, additional capacity must come from generating stations using fossil or nuclear fuels. Because Sweden has practically no domestic coal supplies, its fuel consumption at present is based almost entirely on imported oil, more than one-third of which is used as fuel for domestic heating. Of Sweden's total imports, fossil fuels account for 20 per cent and this percentage is rising. From an economic point of view it is therefore important that the Swedes develop improved power and heating efficiency schemes. An active nuclear energy program is naturally one of these.

Organization

According to Swedish law, control or operation of reactors or other nuclear installations is subject to licence and these are available to both government corporations and private enterprise.

In 1947 a special corporation was formed to take charge of industrial nuclear projects—AB Atomenergi (Swedish Atomic Energy Company). The State owns four-sevenths of this corporation and public utilities, engineering, electrical and other industries, shipyards, vehicle and aircraft factories, power producers, insurance companies, etc., own the remainder. AB Atomenergi is really a link between government and industry on nuclear matters.

In addition to AB Atomenergi, the following important Swedish corporations are actively engaged in atomic development programs:

Vattenfallsstyrelsen (State Power Board)—the largest single power producer in Sweden

Atomkraftkonsortiet (AKK) — a consortium of leading private power companies

Allmanna Svenska Elektriska AB (ASEA)—The Swedish General Electric Company

AB Bofors—the famous arms company working with its subsidiary Nydqvist & Holm AB

Johnson Group—large shipping interests, working with Westinghouse

Swedish Shipbuilding Research Foundation—working with shipyards, AB Atomenergi, and universities on nuclear propulsion

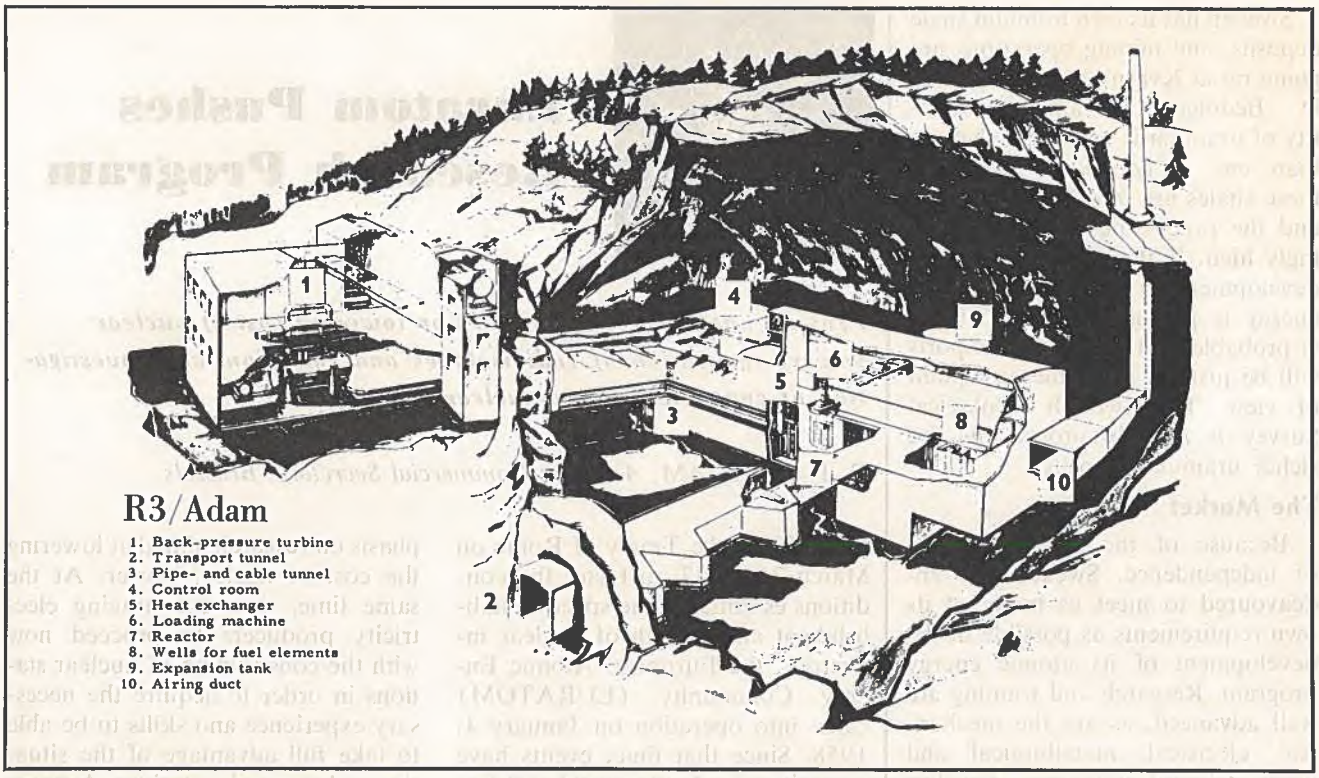
Sveriges Mekanforbund—Association of Swedish Mechanical Industries.

In deciding on a program, Sweden has adopted what might be termed a "wait-and-see" attitude. At this stage she is certainly not in a position to decide on any one line for the development and use of nuclear power. Nor, bearing in mind the traditional national policy of independence, can she do nothing and rely on imports. Rather, it seems, she has elected to try several approaches to the development and use of nuclear power, learn what she can from limited imports, and decide later what policy is best. In doing this, the economic factors outlined at the beginning of this article are being carefully weighed.

As mentioned above, a large proportion of the energy imported is used for domestic heating. To an increasing degree, central district heating schemes are being developed for large urban centres. As a result, the possible use of nuclear reactors for these heat supplies is being studied. The feasibility of combining these with power production through back-pressure turbines could eventually mean a market for a large number of such units in the range of 30 megawatts thermal upwards.

The reactors described below are prototypes built for experience and are not necessarily economic. Not until the late 1960's will Sweden have a large-scale nuclear power station designed to produce electricity or heat competitively; the installed nuclear capacity by 1975 will, it is estimated, be 2,000-3,000 megawatts. In the meantime, Sweden is methodically going about the development of an industry that will largely meet its own requirements in raw materials and equipment.

- **R-1**—Sweden's first experimental reactor has been operating since 1954. Situated 60 feet below ground



The R-3-Adam reactor hall is placed in a rock excavation that has an internal gas-tight coating of concrete and steel sheet. —Drawing courtesy Atomenergi Aktiebolaget.

in the city of Stockholm; designed for 300 kw. but now operated continuously at 600 kw. Has three tons of natural uranium metal rods for fuel, canned in aluminum tubes, with five tons heavy water as a moderator. The natural uranium includes 21 kilograms of U-235. Used for research and experimental work and the production of radioactive isotopes.

• **R-2**—This reactor is located at Studsvik, 80 miles south of Stockholm on the Baltic coast. It is a 30-megawatt reactor supplied by American Car & Foundry Industries Inc., of the United States, for material testing and due to go into operation some time in the autumn of 1960. Of the modified swimming-pool type, it uses enriched uranium and ordinary water.

• **R-3-Adam**—Sweden's first applied nuclear project. Located just outside Stockholm at Farsta, in solid rock, this reactor is to supply the surrounding area with 65 megawatts for heat and 12-14 megawatts for electric power. It is expected to come into operation in late 1962 or early 1963. It is a pressure tank, heavy-water type of reactor.

As a logical development in heating, low-pressure steaming is also being investigated by those working with this reactor for possible use in the pulp industry.

In its R-3 reactor program, the semi-state AB Atomenergi is working closely with other organizations and companies. ASEA (The Swedish General Electric Company) is the main supplier of components and, with its own laboratories, is co-ordinating detail design work. The fuel elements are being manufactured by ASEA and Kohlswa Jernwerks AB and consist of long tubes of natural uranium. Loading mechanisms are being designed by Nydqvist & Holm AB (locomotive and turbine manufacturers) and the State Power Board is doing much of the construction. In addition, Kohlswa Jernverks AB has been studying UO_2 sintering, and AB Svenska Metallverken and AB Bofors have undertaken materials research. The uranium is expected to come from domestic sources at Kvarntorp and will be converted to uranium dioxide powder by the Atomic Energy Company.

• **R-4-Eva**—A 100 - megawatt power station, probably sited at Finnerödja, about 150 miles west of Stockholm, will be Sweden's first full-scale atomic power plant. Although 1965 was the time originally fixed for this reactor to come into operation, it is now delayed and may not be operational before 1967 or 1968. This will be a pressurized, heavy-water type of reactor.

Meanwhile the State Power Board and AKK—the consortium—are considering the import of a reactor in the near future, especially in view of the power industry's desire to gain as much experience as possible before switching over to atomic power.

Sweden has its own uranium shale deposits, and mining operations are going on at Kvarntorp and Ranstad in Bedingen. Available quantity of uranium is estimated at more than one million tons. However, these shales are of rather low grade and the processing cost is exceedingly high. If the normal course of development in the use of atomic energy is pursued for the '70's, it is probable that substantial imports will be justified from the cost point of view. The Swedish Geological Survey is actively prospecting for richer uranium deposits.

The Market

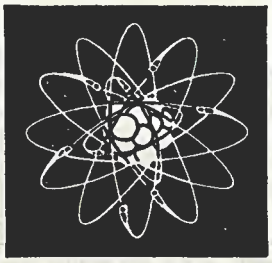
Because of the national policy of independence, Sweden has endeavoured to meet as many of its own requirements as possible in the development of its atomic energy program. Research and training are well advanced, as are the mechanical, electrical, metallurgical and other relevant industries. Swedish industry in general has shown an active desire to venture into the atomic field.

There will, none the less, be a market in Sweden for specialized apparatus and equipment used in the atomic field that the country cannot itself produce economically. Instruments, electronic devices, computers, prospecting instruments, some chemicals for research—these are but a few. For the uranium mill at Kvarntorp, the crusher is being purchased in Germany, the screening equipment in Sweden, and the heavy media separation plant from France.

Special pumps and valves with instruments could come from Canada, as could fabricated titanium and Zircaloy.

There is a limited market in Sweden for products using radioactive sources. There are only three beam-therapy units in Sweden and probably a market for another three if funds and trained personnel to operate them are available.

Canadian radioactive isotopes with uranium and cobalt-60 sources should also find a limited market. ●



Euratom Pushes Research Program

Projects approved stress studies on lowering cost of nuclear power, application of radioisotopes and radiation, and investigation of controlled thermonuclear reactions.

P. T. EASTHAM, *Assistant Commercial Secretary, Brussels.*

SET UP by the Treaty of Rome on March 25, 1957, to foster the conditions essential to the speedy establishment and growth of nuclear industries, the European Atomic Energy Community (EURATOM) came into operation on January 1, 1958. Since that time, events have necessitated a fundamental and far-reaching change in the approach to nuclear power development in the Community. The sense of urgency that characterized the earlier planning stemmed on the one hand from the large increase expected in energy requirements, and on the other to the fear of a shortage of traditional supplies of fossil fuels. The first premise remains valid, particularly because of the high level of industrial production in the Community. However, the shortage of traditional fuels, which in the post-Suez period seemed a likely possibility, has not materialized. On the contrary, the Community now has a large surplus of coal and assured supplies of gas and oil in France and the Sahara.

Acquiring Experience

In these circumstances, electricity producers have been inclined to look at nuclear-power stations in terms of straight economics and, on the whole, have been in no hurry to commit themselves to large undertakings until nuclear power has become competitive. Therefore Euratom is putting even greater emphasis on research aimed at lowering the cost of nuclear power. At the same time, it is encouraging electricity producers to proceed now with the construction of nuclear stations in order to acquire the necessary experience and skills to be able to take full advantage of the situation when such stations become competitive.

The Euratom Commission recently published its third General Report covering the period from March 1959 to April 1960. It describes the activities of the Commission during this period and reviews the present state of the Euratom research and development programs. In addition, it contains some interesting forecasts on the development of nuclear power in the Community over the next twenty years.

Future of Nuclear Electricity

Euratom experts have concluded that by 1980 the Community could have installed nuclear power in excess of 40,000 megawatts, or the equivalent of 250 nuclear power plants of 150 megawatts each.

To reach this conclusion, the experts took estimates of general energy requirements, determined the portion to be provided by electricity, and then calculated the amount that could come from nuclear power. The extent to which this figure could be achieved de-

pends naturally on the cost of the nuclear kilowatt relative to the traditional one. Here they applied the following estimates based on the Pittman Report for B.W.R.-type stations:

COST OF POWER

	1960-65
Traditional stations	about 8.7 mills
Nuclear stations	about 11 mills
Difference between the cost of nuclear and traditional kwh.	nuclear higher by 20-30 per cent
	1965-70
Traditional stations	about 7.3 mills
Nuclear stations	about 7.5 mills
Difference between the cost of nuclear and traditional kwh.	equality
	1970-80
Traditional stations	about 7.3 mills
Nuclear stations	under 7.3 mills
Difference between the cost of nuclear and traditional kwh.	nuclear distinctly cheaper

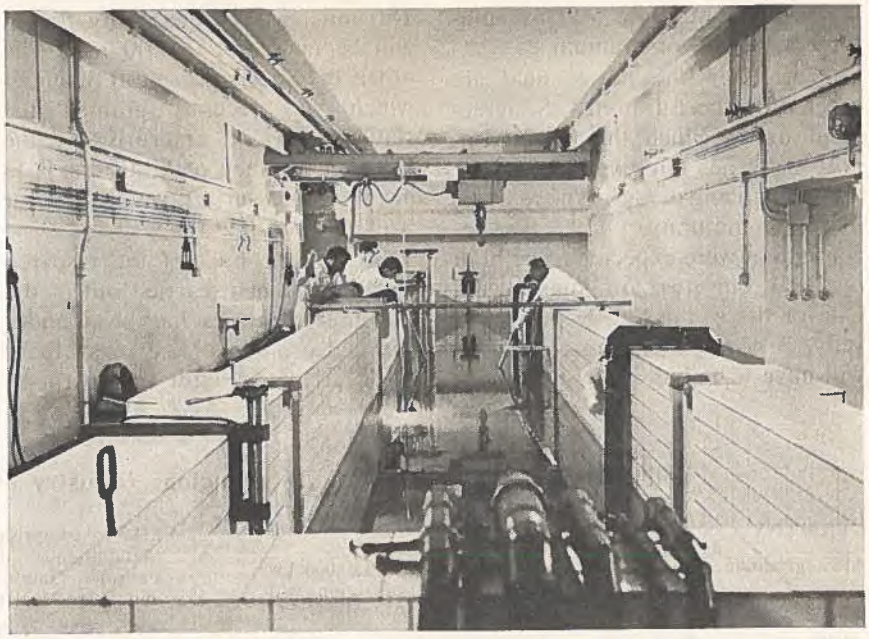
The following table summarizes their conclusions:

	1960-65	1965-70	1970-80
Nuclear portion of new capacity		1/3	2/3
Requirements accessible to nuclear power in 10^9 kwh.	14	105	342
Requirements to be satisfied by nuclear power in 10^9 kwh.	14	53	228
Net installed nuclear power in megawatts	2,000	7,600	32,600

In 1980 nuclear power would provide about 30 per cent of total electrical energy, or more than the total electricity to be produced by all sources in 1960.

Euratom Research Program

In addition to nuclear power, the Euratom research program covers the application of radioisotopes and radiation, as well as the study of controlled thermonuclear reactions.



Research technicians in the Nuclear Energy Centre at Mol, Belgium, handle uranium bars under water in a hydraulic channel, after removal from the BR 1 reactor.

The program may be carried out in the Joint Nuclear Research Centre through supplementary contracts or joint enterprises with private firms, through contracts of association with member countries, and through agreements with outside countries. Rather than create a new and separate research centre, the Commission plans to integrate into the Joint Nuclear Research Centre existing installations in various parts of the Community. These arrangements and consequently the planning of the research program were, until just recently, in the preliminary stage, chiefly because of delays in the integration of the ISPRA Research Centre. However, this difficulty was removed in July when the Italian Government ratified the Convention transferring the centre to Euratom. Plans call for a working force of 1,500 in ISPRA and expenditure of $40 million on new installations by 1962. In addition, an agreement has just been concluded between Euratom and the Belgian Government for completion and common exploitation during a 20-year period of a high-flux reactor and other facilities at the Mol Nuclear Energy Centre. This will involve expenditure of $20 million in the next two years. Agreements in principle have been reached with the Dutch Government regarding the Petten establishment and the German Government for the Karlsruhe establishment.

As for research on power production, Euratom is participating in two OEEC projects: the boiling heavy-water reactor at Halden, Norway, and the Dragon project at Winfrith Heath, Britain, a graphite-moderated, gas-cooled reactor. Euratom has also undertaken, in co-operation with Atomic Energy of Canada Ltd. under the bilateral agreement concluded last year, research projects in natural uranium reactors moderated with heavy water and organically cooled. Under the Euratom-United States agreement, research has been carried out on hydrogen-moderated reactors cooled with water or organic liquids, and also on plutonium re-cyclage. A contract has been concluded with a Dutch firm for the study of a homogeneous suspension reactor. The Commission also proposes to develop a fast breeder reactor in co-operation with Britain and the United States, but unlike the projects

in those countries, it will use plutonium instead of uranium 235.

Projects in the power field are centred on the Euratom-U.S. agreement under which the Export-Import Bank has offered to contribute to the financing of U.S.-type reactors in the Community. Of the five reactors that were expected to be built by 1963, only two are going ahead. One of these, the SENN project in Italy, is now under construction. It will have a boiling-water reactor of 150 mw., with a possibility that it will be increased to 200 mw. The other, the SENA project in Belgium, which was recently granted the status of a joint enterprise by the Euratom Council of Ministers, is to have a pressurized-water reactor with a power of 200 mw.

So far, the bulk of the research and development carried out in the Euratom countries has been under national programs. At present there are nearly 50 reactors in operation or under construction in the Community, of which 10 are primarily power rather than research reactors. The Euratom program is designed to supplement national efforts in the peaceful applications of nuclear energy and to assist in the co-ordination of projects.

Although the development of nuclear industres in the Six has been slower than was expected, forecasts give some ground for optimism about the long-term prospects. ●

Principal Organizations in the Nuclear Industry of the Community*

GERMANY	
AKS, grouping six companies	Construction of a 150,000 kw. reactor, in co-operation with Atomics International
AVR, grouping 12 electricity producers	15,000 kw. reactor at Jülich
GEK in Bavaria, comprises the Bavaria "Land" and five private companies	Construction of reactors
SKW, grouping five enterprises	Construction of two big atomic stations
Versuchsatomkraftwerk Kehl, grouping two companies, including the Rhineland-Westphalia Electricity Company (which owns 80 per cent of shares)	Atomic research
KBB, 50 per cent of whose shares are held by the authorities	Construction of reactors
GKSS, comprising shipbuilders, oil companies and shipping lines	Construction of reactors for ships
BELGIUM	
Centre d'Etude de l'Energie Nucléaire "CEN" The CEN is the cornerstone of Belgium's nuclear industry and belongs both to the authorities and to private concerns	Training of technicians, research and experimental work
SEEN, grouping 20 companies	Training of engineers and research workers in Anglo-Saxon laboratories
SYCA	Installation and operation of nuclear appliances
Bureau d'Etudes Nucléaires "BEN"	Nuclear station engineering
Belgo-Nucléaire	Design, development and sale of reactors; manufacture and retreatment of fuel elements; radioisotopes
NDA Europe, grouping the American NDA and the Société Générale des Minerais	Engineering
MMN, comprising the firms Metallurgique de Hoboken, Fabrique Nationale, ACEC and Belgo-Nucléaire	Manufacture of fuel elements and reactor cores
BELCHIM, representing Belgium's participation in the international organization	Research and construction work at Mol
EUROCHIMIC, for the chemical treatment of irradiated fuels (factory at Mol)	
Uraninga, a syndicate of companies	Setting-up in the Congo of an isotope separation plant
FRANCE	
Atomic Energy Commission (CEA) an official organization	The basis of France's atomic program
Electricité de France (EDF) state-controlled	Construction and operation of power reactors
ATEN, a documentary organization	Exchange of information, public relations work
Aldocatom, Algerian subsidiary of ATEN	Same function as above
France-Atome	Study of atomic industrial complexes
Indatom	Nuclear engineering
Auxi-Atome	Nuclear engineering
SATNUC	Engineering, particularly in the field of nuclear chemistry
GETEA	The study, manufacture and operation of all nuclear materials
SERATOM	Engineering
SADERN	Operation of nuclear appliances
CARATOM	Production, sale, loan and maintenance of research and experimental equipment
Conservatome	Preservation of products by means of irradiation
Propatome	Atomic propulsion of ships
Sud-Atome	Same as above
CERCA and SICN	Production of nuclear fuels

*Reproduced by courtesy of *L'Européen*, Brussels.

Brevatome	Administration of industrial property rights, contracts, licences and patents
Cofinatome	Financing of industrial atomic projects
Alsatian-Atlantic Atomic Energy Group	The nuclear industry
Fluviatome	Applications in the field of aviation
Franceville Uranium Mines	Uranium
SARIE	Radioisotopes and their applications
CICAF	Sintered nuclear fuels
SRTI	Research into gaseous distribution processes
SIMO	Ores, engineering
SETU	Narbonne uranium factory (EDF contract)
SIMU	Prospection and operation of uranium deposits
SOD	Manufacture of heavy water
USSI	Construction of a plant for isotope separation
FRAMATOME	Construction of nuclear reactors
Centre Lyonnais d'Applications Atomiques	Research
ITALY	
CISE (Information, Research and Experimental Centre). 90 per cent of shares held by the State	All work connected with nuclear research
SENN	Construction of an atomic station in southern Italy
ENI	Research into radioactive elements
AGIP	Installation of a power station near Milan
NETHERLANDS	
Reactorcentrum Nederland, with majority control by State, representing the basis of the Dutch atomic energy program	All work connected with nuclear research
KEMA, grouping electricity producers	Construction of a reactor at Arnhem
SKK	Atomic propulsion for ships
SEP, grouping electricity companies	Construction of an atomic power station at Gertruidenberg
Neeratom	Installation of atomic power stations

India's Atomic Program Progresses

Canada-India reactor, India's second, went critical in July; plans for three power reactors now taking shape. Market for needed capital equipment may develop; uranium metal will come largely from domestic sources.

H. A. GILBERT, *Trade Commissioner, Bombay.*

THIS year marked the completion of the second step in the production of electricity by the use of atomic energy in India when the $20 million Canada-India Reactor at Trombay, some 20 miles northeast of Bombay, went critical on July 10. Canada's share of the capital outlay was $10.7 million. The initial step was Apsara, India's first atomic reactor of the swimming-pool type, which went critical on August 4, 1956.

In 1955 it was jointly agreed by the two Colombo Plan partners, India and Canada, that a Canada-India Reactor, patterned after the NRX reactor at Chalk River, should be constructed. With the help of the experience gained by Canada at Chalk River in the preceding eleven years and with the assistance of personnel, equipment and knowhow donated by Canada, Indian scientists, engineers, architects, artisans and labourers have toiled with the Canadians to produce one of the biggest reactors of its kind in the world. It will provide facilities for fundamental research in physical, chemical, biological and metallurgical problems related to atomic energy. In addition, it will be able to produce radioactive isotopes for use in medicine, agriculture and industry—in due time, probably enough radioisotopes for India's total requirements, with a surplus for export. However, in terms of industrial development the C.I.R. is even more important, because it will provide a training-ground at home for the thousands of engineers who will be required to carry out India's plans for producing atomic power to meet the ever-increasing demand of ever-growing industry.

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The C.I.R., though basically it duplicates the Chalk River reactor, has been modified to meet local requirements. For example, the Chalk River reactor is housed in a conventional brick building but the pile at the Canada-India reactor is contained in a hermetically sealed, steel cylindrical shell, with a hemispherical dome which is air-conditioned to provide an even level of temperature and humidity necessary for the proper functioning of the electronic equipment and also to make possible temperate working conditions for the operating staff. In addition, the design includes a built-in safety factor necessary in a thickly populated area like the outskirts of Bombay. This steel dome, covered with aluminum paint and later to be clad with anodized aluminum sheet, provides a glistening landmark for passengers on planes arriving at the nearby Bombay airfield. The visitor travelling by road sees, as he rounds the hump of the 800-to 900-foot hill behind which the reactor and its accompanying buildings nestle, a spectacular sight.

On the right, like a finger pointing heavenwards, stands the 400-foot stack for waste gases. In the centre sits the silver glistening dome of the reactor proper, with its surrounding stone-walled annulus. Leading away from this runs the three-quarter-mile-long jetty that carries to the sea the pipes through which the cooling water is pumped. On the left, for all the world like a young mushroom pushing its way through the earth, is the ball-shaped reserve water tank, constructed of prestressed concrete and with a capacity of 850,000 gallons. The more sports-minded have likened this structure to an enormous golf ball sitting on a tee.

A condition not met in Chalk River and for which the C.I.R. has had to be modified is the high temperature of the cooling water, which comes from the northern extension of Bombay harbour. The temperature of this water varies from about 80 degrees F. to over 100. On an incoming tide in the height of summer, the surface water reaches a temperature as high as 110 degrees F. (Chalk River water temperature does not exceed 70 degrees.) Accordingly in the C.I.R. the water-cooling system has had to be modified by the inclusion of heat exchangers. In addition, because the coolant is sea water, there is special provision for offsetting the corrosive effects of salt.

When the adjoining laboratory and other buildings have been finished and the landscaping completed, India will have a reactor of which all those who played a part in its construction will be justly proud.

Electricity from Atomic Power

India has its coal fields, its many hydro- and thermo-electric power plants, and its oilfields. But, though there are plans for their expansion and further development, it is recognized that the country's rapidly-increasing power and energy needs will not be met from these sources alone. The Atomic Energy Commission of India is therefore planning for nuclear power stations. The first one is to be built in the Bombay-Ahmedabad region, with the hope that it will be completed by 1965-66. It is proposed that this plant consist of two power reactors of 150,000 kilowatts and involve an expenditure of $62 million. Two additional power stations have been recommended for inclusion in the Third Five Year Plan but their location has not yet been decided. Also included is a recommendation for financing the purchase of fuel in the form of 100 to 120 tons of uranium a year.

Foreign Collaboration

India is seeking foreign collaboration in planning power reactors. Several countries have already expressed a willingness to assist. From various reports it appears that Russia will be working with India in the erection of the first plant near Ahmedabad in the newly formed and power-hungry state of Gujerat. Both the United States and the United Kingdom will probably enter into negotiations with India in the near future for constructing additional reactors in power-deficient areas.

As the building of power reactors will involve collaboration between India and foreign governments or consortia of foreign companies, the supply of the needed capital equipment not available from Indian sources will come for the most part from the countries involved, with due regard to competitiveness in price and quality.

Uranium Sources and Needs

On the southwest coast of India in the State of Kerala there are deposits of monazite estimated at 1.5 million tons. Indian Rare Earths Private Limited has been working these deposits for several years. Thorium (10 per cent) and uranium (0.3 per cent) have been obtained from these sands as by-products and shipped for refining to the atomic energy establishment at Trombay. Uranium and thorium have been discovered in Bihar State and further promising deposits of uranium-bearing ore in Rajasthan. India's total reserves of uranium are reckoned at 30,000 tons and of thorium at 500,000 tons.

Though there is a potential yield sufficient to meet India's needs, these indigenous sources have yet to be developed. At present, however, India's requirements of uranium metal are small. Consumption at the C.I.R. will not exceed four to six tons a year and even then, this consumption is unlikely to begin for another year or so, when the C.I.R. is operating at capacity for extended periods. Metal for the initial fuelling of the power reactors will not be required until the first one nears completion some five or six years from now.

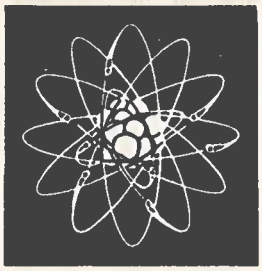
It is evident that indigenous sources of uranium should be sufficient to meet India's requirements in the near future and when these

requirements increase as the power reactor program advances, her reliance on offshore supply will depend upon the extent to which extraction from indigenous sources is developed.

Isotopes

The advance in nuclear development has been reflected in the medical field, in which India is joining with other nations. Up to the present, there are six cobalt 60 deep-therapy units being used in India to treat cancer. Canada donated three of these under the Colombo Plan and sold two commercially; the sixth is a small unit obtained from Germany. Provision has been made for three more units to arrive this year as a part of the 1960 Colombo Plan allocations from Canada. With the general recognition by the Indian medical profession of the superiority of cobalt 60 therapy units over deep x-ray therapy equipment, demand for these is growing rapidly. Whether import licences will be granted to satisfy this demand in face of India's shortage of foreign exchange will depend largely upon the recognition that this method of cancer treatment is not only more economical to set up but will also save foreign exchange.

Two years ago the Indian Government purchased from Canada a gamma cell for agricultural research; this was installed in the Agricultural Research Institute near Delhi. As industrial development advances and the need of maintaining quality control to meet world competition becomes obvious, the use of gamma cells will become widespread. So far, they have not been introduced into Indian factories. ●



Germans Study Nuclear Power

Atomic energy program lays stress on nuclear power; as it develops, so should collaboration between Canada and Germany in this field.

G. F. MINTENKO, *Assistant Commercial Secretary, Bonn.*

GERMANY made a late postwar re-entry into the field of nuclear research and development, yet the Federal Republic today should be ranked among the leading countries in the field.

There are four research reactors operating in the Federal Republic, two more are on order, and a seventh is under construction. A number of others, including full-scale power reactors, are under detailed consideration. Some 260 German firms are engaged in one phase or other of the nuclear field.

In 1955 West Germany obtained from the Western Allies the right to carry on nuclear research and development. In the same year the Federal Government formed a Ministry for Atomic Affairs which is charged with the task of co-ordinating all government functions concerned with the development and exploitation of nuclear energy. All of West Germany's work in this field is for peaceful purposes. Early in 1956 an advisory body, the German Atomic Commission, was formed; its membership consists of leading nuclear scientists, industrialists and economists.

Nuclear Power Objectives

In 1957 the Commission announced and the Atomic Affairs Ministry subsequently endorsed what is known as the "500 Megawatt Program", which is a statement of German objectives in the nuclear power field. Under this plan, it is proposed to have, by 1965, 500-megawatt nuclear energy stations. This capacity will be developed from four or five plants of the following types:

1. A graphite-moderated, gas-cooled natural uranium reactor.

2. A heavy-water-moderated and cooled natural uranium reactor.

3. A light-water-moderated and cooled reactor with slightly enriched uranium.

4. A high-temperature reactor with gas cooling and enriched uranium.

5. A reactor cooled by an organic substance, with natural or slightly enriched uranium.

The plants would be built by private enterprise but the Federal Government would assist in their financing in various ways.

Even at the time that the plan was published, it was not foreseen that nuclear energy would represent

in the very near future a fully competitive source of electric power. Realization of the plan was intended, however, to provide the German reactor-construction industry with experience and to familiarize German agencies for supplying electric power with the problems of exploiting nuclear energy.

In the last three years the cost of power produced from plants burning fossil fuels has come down appreciably and power from nuclear plants, from a purely economic point of view, has become even less attractive. It is thus extremely doubtful that the objective of the plan will be reached in 1965, but it is probable that the following five years will see the implementation of at least part of the Commission's program. Three of the five reactor types proposed by the Commission (types 1, 2 and 3 above) are being studied in detail by electric-power producers and firms designing reactors.

Market for Uranium

Understandably, heavily industrialized Germany expects in the future to design its own nuclear equipment and to become an exporter of atomic plants. This should, however, still leave room for profitable collaboration between Canadian and German firms engaged in this field. From the point of view of the Canadian uranium-mining industry, Germany should become a relatively interesting market from the late 1960's on. The extent of German uranium requirements will depend not only on the number of power reactors in operation but on the design, and consequently the fuel requirements of, these reactors. Officials and industrialists engaged in this sphere do not seem up to now to have committed themselves irrevocably to any particular type of design as best suited to German conditions. The approach is a pragmatic one, involving in the first instance working with a number of different types. It is perhaps a hopeful sign, however, that the first German-designed reactor, now under construction at Karlsruhe and expected to go critical late this year, is a 12,000 kw. heavy-water-moderated and cooled natural uranium fuel plant. This design was in many respects inspired by that of Atomic Energy of Canada Limited's NRX installation at Chalk River. ●

Commodity Notes

Aluminum

URUGUAY—Aluminio del Uruguay S.A., an associated company of Aluminium Ltd. of Canada, has planned substantial extension of its plant in Montevideo to keep up with the increasing demand for aluminum products.

The company will install immediately a new extrusion press with a capacity of 1,500 tons, and a rolling press of 1,800 tons capacity during the first months of 1961.

Aluminio del Uruguay S.A. is one of the principal enterprises in Uruguay. The existing plant in Montevideo produces 2,000 tons a year of aluminum sheets, angles and extrusions, and the new extension program will practically double its present capacity—Montevideo.

Apples

UNITED KINGDOM—The official forecast of the 1960 dessert apple crop in England and Wales is 14.9 million bushels, the biggest crop on record. This tops the 12.9 million last year and the five-year average (1955-59) of 11.7 million bushels.

The crop of Cox's Orange should reach 6.1 million bushels compared with 4.2 million last year. Worcester Pearmains prospects are poorer at 3.4 million bushels compared with 4.0 million last year. Other varieties may reach 5.3 million bushels, 700,000 more than in 1959.

Production of cooking varieties is also expected to be exceptionally high. Of a total crop of 16.8 million bushels, Bramleys may account for 11.1 million. Last year the total cooking crop reached 13.7 million of which Bramleys accounted for 8.7 million—London.

Apple Juice

UNITED KINGDOM—British apple growers are being urged to enter the soft fruit-drink industry. Experts say that the obvious outlet for surplus fruit is in apple juice production first, because it makes use of the

greatest proportion of apples and second because the British have become accustomed to fruit juice, especially cloudy or pulpy products.

Bristol University's Long Ashton Research Station has been investigating the economics of apple juice production and has pointed out the high cost of making clear juice and also the variability of the product. The research station is therefore experimenting with the blending of apple juice with other products such as pineapple, orange, raspberry and prune juice—London.

Bamboo Television Antennae

JAMAICA—Forty-foot bamboo poles are being exported from Jamaica to Canada to be used on Canadian houses as TV antenna towers. The Canadian businessman who thought of this use for bamboo says that bamboo TV poles have proved capable of withstanding strong winds and bad weather better than metal ones —Kingston.

Canned Fruit

SOUTH AFRICA—The California Packing Corporation of the United States has leased the fruit-canning factory of the Tulbagh Fruit Industries (Pty.) Ltd., for five years from July 1, 1960, with option to purchase any time within that period. The South African Preserving Co. (Pty.) Ltd. has been established to control this arrangement, and it is proposed to market the fruit, previously sold under the names "Capehill" and "Rockhill", under the "Del Monte" label. These products will, on export overseas, enjoy the benefits of British preference where this applies.

Tulbagh is about 80 miles by rail and road from Cape Town and is the centre of an area growing excellent quality fruit—Cape Town.

Confectionery

JAPAN—The Japanese Ministry of International Trade and Industry has announced, effective in September, the allocation of U.S.$1,260,000 for the import of confectionery from all countries—Tokyo.

Electric Power

SPAIN—A credit of $9.4 million has just been granted by the Export-Import Bank to Compañia Sevillana de Electricidad for construction of the Cristóbal Colón thermic plant near Huelva (southwest Spain). It will be used to buy turbines, generators and other equipment from General Electric. The new plant will have a capacity of 62,500 kw. and should be completed during the first quarter of 1961—Madrid.

Electric Power

COLOMBIA—The municipality of Armenia, in the Department of Caldas, is initiating a campaign for installation of a hydro-electric or thermo-electric plant. It will supply power to this city of 100,000 persons and to the surrounding rural area. In the Department of Antioquia, the city of Dabeiba (population 21,000) is planning to instal a 400 kw. power plant—Bogotá.

Generators

SWITZERLAND—Brown-Boveri & Co. Ltd., of Baden, Switzerland, has opened a new factory at Birrfeld to make generators and motors of over ten metric tons. The new plant, with an investment value of about Sfr.87 million, employs some 400 people—Berne.

Jet Aircraft

BRAZIL—A fleet of 22 jet aircraft of the *Paris* type, manufactured by the Maurone Salnier factory in France, have been bought by the Brazilian Government. These aircraft, plus eight others purchased several months ago from the same company, will be used to carry government officials on the Rio-Belo Horizonte-São Paulo-Brasilia route. The transaction is of a barter nature and the cost of the planes, valued at U.S.$176,000 each, will be paid in coffee—Rio de Janeiro.

Minerals

UNITED STATES—Mineral production in Michigan in 1959 was valued at $368.6 million, compared with $343.5 million in 1958, according to the Bureau of Mines, U.S. Department of the Interior. Increased activity in the construction industries resulted in larger shipments of cement, gypsum, sand and gravel, and crushed stone. Cement production, valued at $78.9 million, again ranked first in value followed by iron ore $64.3 million, sand and gravel $37 million, salt $35.1 million, copper $34.9 million, stone $30.2 million, and petroleum $29.8 million.

Metallic minerals accounted for 27 per cent of the total value of Michigan's mineral production in 1959, compared with 30 per cent in 1958. Copper output totalled 56,415 short tons, down from the 1958 total of 58,005, though higher unit prices (31 cents per pound) increased the value of shipments from $30.5 million to $34.9 million—Detroit.

Nylon Fishing Nets

INDIA—A Japanese firm will establish a Can.$800,000 factory to make nylon fishing nets at Mahuva in the State of Gujerat. The factory will employ 100 workers and will produce nets worth Can.$27,000 every month —Bombay.

Oil

INDONESIA—An economic co-operation agreement involving a credit of 18.8 billion yen for oil exploitation in north Sumatra has been signed between Permina

Oil Company of Indonesia and the Japan Exploitation Company. Permina will repay the credit by granting 40 per cent of all excess crude oil produced during the next ten years. Permina's present annual production is reported to total 800,000 tons, but it is expected that with Japanese aid it will rise to 2.5 million—Djakarta.

Paper

SPAIN—The Spanish Government, wishing to boost annual paper output, has declared the group of Spanish companies coming within the so-called Plan CEPAL (Central de Papeleras Libres) to be "of national interest". Plants in Cataluña and the Basque provinces will be modernized and new ones created in Galicia and Aragón to produce paper competitive in quality and price. The Galicia plants will turn out 45,000 metric tons a year of newsprint; the Cataluña plants 15,000 metric tons of writing paper; the Basque provinces 3,000 tons of special paper (transparent for drawing or airmail); Aragón 9,000 tons of greaseproof paper, 20,000 tons of cardboard, 20,000 tons of kraft and 40,000 tons of corrugated cardboard (processed and prepared in Aragón)—Madrid.

Paraffin

BRAZIL—Petrobras has announced that Brazil is now exporting paraffin. It is estimated that during the first year of operation, shipments may be valued as high as $10 million—Rio de Janeiro.

Plastic Toys

IRELAND—Gaeltarra Eireann (a government agency) is to build at Spiddal, County Galway, a new factory to make plastic toys. The plant is expected to be completed towards the end of the year—Dublin.

Steel Pipes

INDIA—India's first large-diameter steel pipe plant is scheduled to go into production in September. Part of the new government-owned steel complex at Rourkela (built with German collaboration), the plant will have a capacity of about 150,000 tons a year of electric resistance weld pipe, ranging from 8 inches to 20 inches outside diameter. Production is expected to meet the entire Indian demand and allow a substantial margin for export to neighbouring countries.

The first sales contract has been signed for the supply of 51,000 tons of 14-inch pipe to Burmah Oil Company (Pipe Lines) Ltd. The pipe will be used to build the second stage of a crude oil pipeline from Assam to a refinery now under construction in Bihar—New Delhi.

Sugar

GHANA—Ghana's Industrial Development Corporation and Agricultural Development Corporation have jointly embarked on a £3½ million sugarcane plantation scheme at Komenda in the Western Region.

A representative of a Dutch firm of sugar consultants undertaking the work says that eight varieties of sugarcane have been planted for experimental purposes. The current rate of sugar consumption in Ghana is about 40,000 tons a year and the new refinery to be built under the scheme should produce about 20,000 tons a year—Accra.

Synthetic Rubber

BRAZIL—Plans are under way for construction of a synthetic rubber plant in Recife (formerly Pernambuco) using alcohol extracted from sugarcane as a basic raw material. The plant will have a capacity of 21,000 tons a year. The project is part of the industrialization program set up by the Brazilian Federal Agency for the development of northeastern Brazil—Rio de Janeiro.

Textiles

VENEZUELA—In the industrial area of Maracay, the central zone of Venezuela, work has been started on a large textile factory. The new plant, Texfin C.A., will cost approximately Can.$1,800,000 and will be one of the most important textile plants in Venezuela. It will produce high quality silk and cotton textiles and will eventually employ some 1,200 workers—Caracas.

Uranium

BRAZIL—A uranium pilot plant built completely in Brazil is now operating at the São Paulo Atomic Energy Institute. The new plant is expected to produce 30 kilos of pure uranium per day—São Paulo.

Tours of Territory

P. A. FREYSENG, Assistant Commercial Secretary in Vienna, Austria, will be in attendance at the Canadian Government exhibit in the Brno International Trade Fair from September 11-25.

D. J. McEACHRAN, Assistant Trade Commissioner in Hong Kong, will visit South Vietnam, Laos and Cambodia from September 4-24.

R. K. THOMSON, Commercial Counsellor in Vienna, Austria, will be in attendance at the Canadian Government exhibit in the Zagreb International Fair from September 10-25.

Businessmen who would like these officers to undertake assignments should get in touch with them at their posts as soon as possible. Write to Mr. Freyseng and Mr. Thomson at Vienna, Mr. McEachran at Hong Kong.

Colombia Needs Engineering Services

Hydro-electric development, irrigation schemes, resources surveys, new industries—Colombia needs all these to provide for a growing population. These projects call for skilled engineering services, some from abroad. Canadian companies willing to make a serious approach to this market might win a share of the business.

NEIL L. CURRIE, *Assistant Commercial Secretary, Bogotá.*

COLOMBIA, a country of 14 million people, has many natural resources waiting to be developed. This development is needed urgently because the growth in population has nearly equalled the rise in production in recent years. In addition, as in other countries undergoing industrialization, the population is shifting from the country to the city.

Industrial and agricultural output have been increasing in the last two years and this has meant a greater demand for electric power development, for industrial construction, for irrigation projects, and for new roads and bridges. Some of the engineering services needed for these projects can be supplied by Colombians themselves. For others, they must look to foreign countries. This means that Canadian engineers may find opportunities for their special skills in this country, mainly in four fields: hydro-electric and thermal-electric development, irrigation and drainage schemes, resource surveys, and general industrial engineering.

Hydro-Electric Development

Hydro-electric schemes offer Canadian engineers particularly worthwhile opportunities. Colombia's hydro-electric potential is estimated officially at 75 million kw., with only 500,000 developed and 380,000 under construction. Another 113,000 kw. of thermal power is being developed. The mountainous terrain effectively divides the country into distinct areas and makes the construction of transmission lines expensive. Thus most generating stations serve only the surrounding area and appear small by North American standards. The capacities of the stations probably do not give a true idea of the size of the projects that will include dams, sluiceways and complementary installations. Nor would a direct comparison of costs be a true guide, for the cost structure is different from that in North America or Europe. However, the partial list of projects under way or planned, shown in Table I, will give some idea of the potential.

Three important official entities operate outside the aegis of the Instituto. They are:

1. Corporación Autónoma Regional del Valle del Cauca—in charge of electrical, agricultural and industrial development of and irrigation projects for the huge, rich Cauca Valley.

2. Empresas Unidas de Energia Eléctrica de Bogotá—which controls several services in the Bogotá area, including hydro-electric development.

3. Empresas Públicas de Medellin—which is responsible for the development of hydro-electric projects in the Medellin area, as well as other services. It also administers the services.

If a Canadian firm is to win any engineering business in Colombia, it is probably essential for it to have an office in the country or to be connected with a local firm. Foreign engineering companies are achieving considerable success by joining forces with local engineering or construction firms. The local firm has access to additional knowhow in this way and the foreign firm obtains an entrée into the market. Voluminous correspondence and even occasional trips into the country by representatives of foreign firms seem to achieve little. Canadians should bear in mind, however, that contracts for feasibility studies and design services usually

are won after a patient cultivation of the market.

Railway Development

Another major development is approaching implementation—the exploitation of thousands of acres of forest and agricultural land along the new 1,000-kilometre railroad from Bogotá (the capital) in the interior to Santa Marta on the Caribbean Coast. This will be the first complete rail line from Bogotá to either the Caribbean or Pacific Coasts. It follows roughly the eastern side of the Magdalena Valley down to the sea.

A project to tax the ingenuity of engineers is the provision of an inexpensive means of connecting the rail line at Santa Marta with Barranquilla, the major port on the Caribbean. Santa Marta is a secondary port and a beautiful resort area. Separating Barranquilla and Santa Marta are the mouth of the Magdalena River, a large area of sandy, swampy land, and a large salt water lake called Cienaga Grande which at times of heavy rainfall has an appreciable flow seaward. At the present time some planners feel that the connection must be by canal through the swampy land despite the relative slowness of this method.

The large areas of potential agricultural land through which the railway runs will need drainage and irrigation. Official estimates put the arable area at nearly half a million acres, which will all be made accessible at the same time—when the last spike is driven. It is suitable for growing rice, cotton, corn, sugar and tropical fruits and for raising cattle. In addition, large tracts of hardwood forest will be tapped.

This land is in the largest single area still awaiting development, aside from the great and virtually uninhabited eastern plains. Yet it represents less than half the land

COLOMBIAN HYDRO-ELECTRIC PROJECTS, UNDER WAY OR PLANNED

TABLE I

Entity	Name of Project	Capacity	Estimated Cost	Engineers	Financing
Corporactión Autónoma Regional del Valle del Cauca Apartado Aéreo 2366 Cali, Colombia.	Calima	120,000 kw.	U.S.$25 million	OLAP, Bogotá	IBRD & Government
	Yumbo	33,000 kw.	Ps. 45 million	not yet known	IBRD & Government
Empresas Unidas de Energia Eléctrica de Bogotá Calle 14 #12-50 Bogotá.	Salto II	68,000 kw.	U.S.$17.6 million	OLAP	IBRD & Empresas
	Laguneta	20,000 kw.	Ps. 20 million	OLAP	IBRD & Empresas
Empresas Públicas de Medellin Apartado Aéreo 940 Medellin.	Guadalupe III	80,000 kw.	U.S.$18 million	Campeon Bernard of Colombia, Moreno of Brazil, Brown & Root of U.S.	IBRD & Empresas
	Nare River	150,000 kw.	not yet estimated	not yet known	IBRD & Empresas

The Instituto de Aprovechamiento de Aguas y Fomento Eléctrico, Carrera 13 #27-00, Bogotá, is a centralized agency that assists in the design, contracting and financing of projects undertaken by 15 municipal entities. Some of these entities and the projects they plan are listed in Table II.

TABLE II

Entity	Name of Project	Capacity	Estimated Cost	Engineers	Financing
Centrales Eléctricas del Tolima Calle 12 #2-39 Ibagué.	De Prado	45,000 kw.	Ps.45 million	Sogie, France	IBRD & Government
Electrificadora de Cundinamarca, S.A. Carrera 13 #27-00, Piso 3 Bogotá.	Rio Negro	10,000 kw.	Ps.16 million	Sogie	Instituto, Govt. & Department of Cundinamarca
Central Hidroeléctrica del Rio Lebrija Carrera 19 #24-56 Bucaramanga.	Rio Sogamoso	150,000 kw.	not yet estimated	not yet known	Govt. & Empresa Colombiana de Petroleos
Centrales Eléctricas del Huila Neiva.	Betania	30,000 kw.	Ps.45 million plus U.S.$7 million	not yet known	not yet known
Central Hidroeléctrica de Caldas Apartado Aéreo 83 Manizales.	La Esmeralda	26,600 kw.	U.S.$4.6 million	Integral of Medellin	IBRD
Instituto de Aprovechamiento de Aguas y Fomento Eléctrico Carrera 13 #27-00, Piso 3 Bogotá.	Paipa (Thermal)	33,000 kw.	Ps.70 million	French consortium	Government & Instituto

suitable for irrigation, according to official estimates. The following areas are still to be irrigated in various parts of the country.

Cauca Valley	740,000	acres
Sinu Valley	990,000	"
César Valley	2,470,000	"
Magdalena	4,940,000	"
Others	1,240,000	"
Total	10,240,000	"

Resources Surveys

Although Colombia is rich in mineral and water resources, no general resources survey has been carried out. Some planners feel strongly that the country should apply to the UN Special Fund for assistance in such a project. A partial resource survey of the Eastern Cordillera is already planned and an application has been made to the Special Fund. A survey would take three or four years to complete and would cost about U.S.$300,000. Interested firms should contact the UN Special Fund in New York. Considerable aerial photography has already been done in some areas under the aegis of the Instituto Geográfico and Canadian companies have been responsible for a large share of this work.

Industrial Engineering

The Government has declared that it will encourage growth of the following industries through price supports and import restrictions. The products they turn out will replace imports and this will allow more of the limited foreign exchange income to be spent on capital goods.

Industrial	
beverages	rubber
tobacco and cigarettes	non-metallic mining
textiles	basic metals
wood	metallurgical industries
pulp and paper	chemical products
	petroleum products
Agricultural	
wheat	wool
vegetables	cotton (long staple)
cocoa	edible oils
spices	

This list serves as a rough guide to industrial development and to the type of industrial engineering services that will probably be required. Colombia has its own capable engineers, architects and contractors but specialists are still needed.

The pace of industrialization is indicated by the fact that machinery and electrical equipment now makes up the largest single class of imports. Imports of trucks, machinery and telephone apparatus more than trebled during the past year.

Projects Planned

Among the industrial projects under way or planned are:

Soda ash plant on the Caribbean coast—an expansion to the present property costing Ps.23 million. Output will be 100 tons of soda ash a day and 40 tons of electrolytic caustic soda. A 10,500 kw. electric power plant is to be built on the site.

An oil company, Ecopetrol, in conjunction with the Colombian Government, plans to build an ammonium nitrate plant at Barrancabermeja with a capacity of 50 tons a day. It will cost Ps.137 million.

Unbleached pulp—Container Corporation, with Cartón de Colombia and the Colombian Government, is building a plant, also at Barrancabermeja, to produce unbleached pulp for cardboard.

Paper products—Grace and Company is building a plant near Cali to produce bonds, printing papers and light kraft from sugar-cane bagasse.

Tissue—Richmond Pulp and Paper Co. of Canada Ltd., through Kruger Paper Inc. of New York, plans to start construction shortly of a plant at Pereira to produce tissue.

National steel mill, Paz del Rio—is installing a rolling mill and has applied to IBRD for assistance in installing another bank of coke ovens, a pelletizing plant and an additional rolling mill. ●

Refractories in India

INDIA'S refractory industry has grown substantially in recent years with the progress of industrialization and development of the iron and steel industry. In 1958-59, India produced 450,000 tons of refractories valued at Can.$15 million, compared with 280,000 tons in 1955-56.

Annual installed capacity according to types produced at the end of April 1959 is as follows:

Bricks and shapes—firebricks 480,040 tons, silica refractories 58,000, basic refractories 29,000, high alumina refractories 10,000, and insulating refractories 6,400.

Other types—fire cements and mortar 85,800 tons, and dead burnt magnesite 40,320.

Last year India imported over Can.$7 million worth of refractory products, bricks and other refractory construction material, chiefly from West Germany and the United Kingdom. Other suppliers were Denmark, Belgium and Holland.

On the basis of schemes already approved it is expected that by 1962 total production capacity will have reached 1.04 million tons of bricks of all kinds, 220,000 tons of fire cements and mortar, and 70,000 tons of dead burnt magnesite. At the end of the Third Five-Year Plan (1961-66) installed capacity should be near 1.5 million tons.

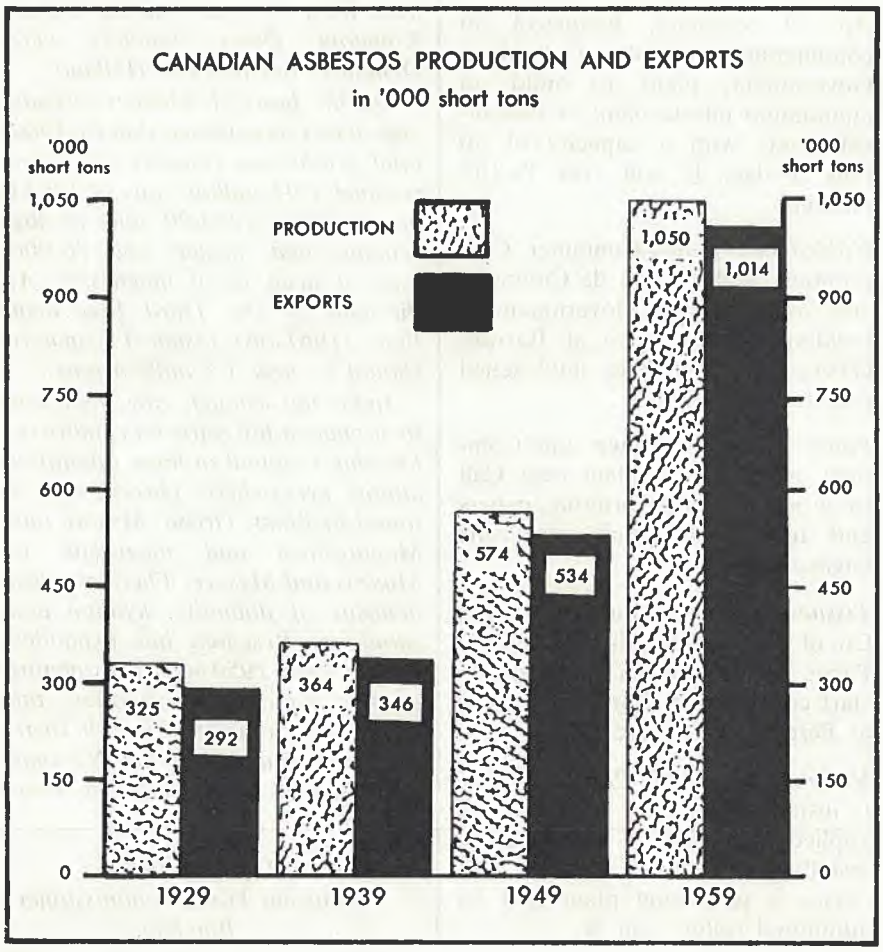
India has enough raw materials to support a big refractory industry. Fireclay is found in large quantities almost everywhere, chrome ore is found in Bihar, Orissa, Mysore and Maharashtra and magnesite in Madras and Mysore. There are also deposits of dolomite, kyanite and siliminite. Research has expanded greatly since 1950 with the opening of two national laboratories, the Glass and Ceramic Research Institute in Calcutta and the National Metallurgical Laboratory in Jamshedpur.

G. P. MORIN,
Assistant Trade Commissioner, Bombay.

Canadian Asbestos for World Markets

Producer of nearly 60 per cent of the world's asbestos, Canada depends on foreign demand to market its soaring output. Who buys it and what countries compete with us?

R. P. MULVIHILL, *Metals and Minerals Division.*



CANADA continues to be the world's leading producer of asbestos fibre; an estimated 50 to 60 per cent of the asbestos used today throughout the world originates in Canada. Experts believe that the largest deposits in the world are to be found at Thetford Mines and Asbestos, in the Province of Quebec. Last year Canadian mines produced 1,050,000 tons out of an estimated world output of two million tons from 35 countries.

Asbestos is not the name of a single mineral but a term applied to a variety of fibres that differ widely in composition. They have a number of qualities in common, however—they will not burn or rot, are impervious to weather, and termites will not attack them. Chrysotile, the Canadian type and the most widely used, can be described as an hydrated silicate of magnesium. No one knows exactly when asbestos was first discovered in Canada, but commercial mining began in 1875. (The company that initiated operations then is today the only family-owned Canadian asbestos firm.) By the 1920's, output had reached 300,000 tons.

Canada now has ten firms producing asbestos—nine in Quebec and Ontario, and one in northern British Columbia—and it has been able to maintain its leading position first gained at the beginning of this century. Two of these firms have only begun operations in the last few years, and the others have modernized their plants and increased their capacity.

Mining and milling are the two principal operations carried on: mining is done by both the open pit and underground methods and milling involves crushing, drying, screening and grading the fibre. Canadian mills have a rated capacity of 64,800 tons a day and fibre recovery ranges from 3 to 20 per cent, depending on the ore being fed to the mills and the grades produced. Six per cent is the average recovery.

The Canadian industry has been built upon export markets and about

CANADIAN EXPORTS OF ASBESTOS FIBRE

	1958			1959		
	Short tons	Dollars	Percentage in tons	Short tons	Dollars	Percentage in tons
United States	582,366	48,426,000	67.2	629,231	54,638,177	62.1
Europe	123,097	19,673,305	14.2	179,795	27,066,987	17.7
United Kingdom	65,304	7,859,913	7.5	69,234	9,128,713	6.8
Asia	32,752	4,445,309	3.8	66,428	8,661,598	6.6
Latin America	35,955	5,814,036	4.1	39,568	6,299,644	3.9
Australasia	23,759	3,904,630	2.8	25,537	3,958,068	2.5
Africa	3,397	618,820	0.4	4,129	678,105	0.4
Total exports	866,630	90,745,013	100.0	1,013,922	110,431,292	100.0

95 per cent of total output goes to foreign countries. Last year shipments were made to 56 countries and were valued at a record $110,431,282. In fact, asbestos ranked seventh among the primary and semi-processed metals and minerals that Canada exported in 1959. In recent years, the greatest competition in export markets has come from South Africa, Southern Rhodesia, and the U.S.S.R.

Asbestos Products

Seventeen Canadian firms specialize in the manufacture of asbestos products such as pressure pipe, board, siding, floor tiles, insulation, shingles, textiles, papers, packings, brake linings, clutch facings and many other items. Countless other firms use asbestos as an industrial raw material in their products. Asbestos cement products, principally pipe and sheet, have assumed great importance as construction materials in Canada since 1948, when the first plant for making pressure pipe was built near Toronto. The figures below indicate the remarkable expansion that has taken place in this division of the industry in the past twenty years.

Although the export trade in asbestos products cannot be compared with that in asbestos fibre it has obtained an encouraging volume of business. One of the keener exporting firms shipped manufactured asbestos products to approximately 35 of the 43 countries that purchased Canadian asbestos products last year. Such factors as transportation charges for heavy asbestos-cement products, labour costs, tariffs and the practice of manufacturing where possible for domestic use have meant that the build-up of our export business in asbestos products has been slow. It is significant, however, that the volume of production has almost reached domestic demand and exports in 1959 rose to $1.9 million, an increase of approximately 300 per cent in the past ten years.

ASBESTOS PRODUCTS

	1939	1949	1959
	(in millions of dollars)		
Production	1.8	10.3	30.5
Plus imports	1.1	2.6	4.0
Total	2.9	12.9	34.5
Less exports	.5	.4	.7
Apparent consumption	2.4	11.5	33.8

Problems Encountered

A great deal more than just the taking of orders is involved in building a business the size of our asbestos industry. As one would expect, the Canadian firms are active in all market areas and technical agents—or at least those specializing in sales of industrial raw materials—are appointed wherever possible. A number of the fibre-producing companies also maintain factories turning out asbestos products and ship mainly to these plants. In most cases, however, the sales managers of the various firms are constantly making round-the-world trips, calling on present and potential customers in foreign markets. This is the most effective way to carry on a business almost entirely dependent on export.

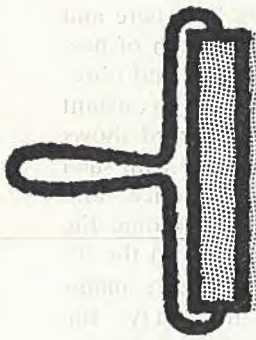
Competitive prices both here and abroad and the introduction of new materials such as plastics and fibreglas make progress a constant struggle; however, the record shows that the industry can cope with such problems. Technical service and product research have become the main vehicles of progress in the industry. The fibre producers maintain laboratories to study the technical problems of customers and both questions and ideas are brought in to these laboratories by the sales force. These problems are worked out and recommendations made—for example, on which of the more than sixty different qualities of fibre is the most economical to use and will provide the specific properties the customer wants in his product.

Outlook

Because of foreign competition and greatly expanded Canadian production, the industry has not operated at capacity in the past year. But there are signs pointing to greater world demand in the future, such as the growing use of asbestos fibre for making pipe, sheet, floor tiles and other products. Research into the making of better asbestos products is constantly going on and new developments, such as the recently announced progress in the use of asbestos in asphalt for road-paving, will enable the industry to operate at full capacity in the years to come.

World Wheat Report Ready

Canadians concerned with the trade and processing of wheat will be interested to learn that the International Wheat Council's publication *The World Wheat Situation, April 1960,* has now been printed. The report is published in three languages: English, French and Spanish. Readers who would like to have copies should write to the International Wheat Council, 28 Haymarket, London, S.W.1, England. Price per copy is $3.00.



Paints and Varnishes

The Market in Japan

Japan's paint and varnish industry supplies most of domestic needs; imports in 1958 totalled only 3,087 metric tons compared with local production of 227,827. Specialty paints can be sold here if they are considered important to Japanese industry.

N. W. BOYD, *Assistant Commercial Secretary, Tokyo.*

THE Japanese paint industry, it is generally agreed, owes its origin to the introduction of lacquer from China. It was not until 1930, however, that manufacturers of paints attained an important position in the Japanese chemical industry. By 1938, production exceeded 100,000 tons. The main types were oil paint 71 per cent, insulating paint 10 per cent, lacquer 7 per cent, spirit varnish 6 per cent and water paint 6 per cent. The significant development since 1950 has been the trend toward manufacture of a high proportion of synthetic resin paint—from 4 per cent of total production in 1950 to 20 per cent in 1958. Over the same period, the relative importance of oil-paint production declined.

Over-all output of paint in Japan has risen steadily since 1953. The following table gives a breakdown of the 1958 production of 227,827 metric tons.

JAPANESE PAINT PRODUCTION 1958

	(metric tons)
Boiled oil	7,289
Oil paint	56,922
Oil varnish	6,040
Enamel paint	14,476
Lacquer	21,230
Spirit varnish	9,589
Water paint	3,719
Insulating paint	6,980
Synthetic resin paint	52,662
Others	48,920
Total	227,827

JAPANESE IMPORTS AND EXPORTS OF PAINTS AND VARNISHES IN 1959

	Imports		Exports	
	Quantity	Value (c.i.f.)	Quantity	Value (f.o.b.)
	(kilos)	('000 yen)	(kilos)	('000 yen)
Paste paints	113,295	8,673	69,375	3,680
Ready-mixed paints	985,958	263,705	531,957	64,605
Anti-corrosive paints	150,304	38,743	86,771	12,941
Synthetic resin varnish	275,329	106,005	195,147	49,923
Natural resin varnish	40,234	10,288	232,461	43,963
Ships bottom paints	429,499	117,462	35,088	5,940
Enamel paints	183,980	32,084	295,812	58,476
Cellulose lacquers, synthetic resin base	1,179	725	8,123	1,708
Cellulose lacquers	166,604	69,615	34,775	10,173
Insulating coatings, synthetic resin base	118,221	67,854	12,600	3,335
Insulating coatings, containing synthetic resin or cellulose derivatives, n.e.s.	17	105	9,140	1,418
Lacquers, containing synthetic resin	20,894	5,639	116,714	38,380
Water paints, synthetic resin base	2,551	1,585	156,380	25,451
Synthetic resin lacquers, n.e.s	171,259	65,602	68,358	24,172
Coatings, containing synthetic resin, n.e.s	26,872	9,393	29,275	12,434
Water paints, n.e.s	77,872	2,356	124,683	13,312
Total	2,764,068	799,834	2,006,659	369,911

Growing Domestic Market

The higher output in recent years has been absorbed almost entirely by an expanding domestic market. One factor in this expansion has been the increasing activity in the construction of houses, offices and transportation facilities— including ships, rolling stock and automobiles. The development of synthetic resin paint has resulted in new uses because of its low flammability and resistance to rust, and demand for it is increasing.

Plant deliveries in 1958 totalled 224,147 metric tons, up 9 per cent over 1957 deliveries of 205,495 metric tons. The estimated domestic market demand by percentage in 1959 is as follows: construction 22,

ships 17, rolling stock 17, machines 9, electrical machine meters 9, furniture 7, chemical and mining industries 4 and others 14. This left 1 per cent for export.

Foreign Trade

Japan is a net importer of paints and varnishes but imports are small in relation to domestic production. In 1959, they totalled only 2,764 metric tons, down slightly from the 3,087 imported in 1958. The United States, the United Kingdom, Denmark and West Germany were the top four of 20 supplying countries.

The accompanying table shows types of paints and varnishes bought and sold in Japan in 1959. Less than 1 per cent of Japan's production is exported and virtually all is taken by its Asian trading partners.

Imports Restricted

Paint and varnish imports into Japan are subject to a customs tariff ranging from 15 to 25 per cent. With the exception of paint for the electric-wire industry, paint and varnish imports enter Japan under the restrictive Foreign Exchange Allocation System. Under this procedure, an allocation of foreign exchange must be obtained from a foreign exchange bank plus an import licence from the Ministry of International Trade and Industry. As a general rule, few licences are granted for non-essential and luxury items. Paint for the electric-wire industry is imported under the newly established Automatic Allocation System but approval must still be obtained from the MITI.

Until Japanese import restrictions are relaxed, only the varieties of paints considered advantageous to, and required by, Japanese industry will be allowed entry. It is perhaps this factor above all others that will determine market prospects for Canadian paint producers in Japan. The Commercial Counsellor in Tokyo will be pleased to examine market opportunities for individual specialties of Canadian exporters. ●

The Market in Chile

Chile's well developed paint and varnish industry meets present needs, but will require more raw materials from abroad as new construction proceeds, particularly in the devastated south.

A. EDWARDS, *Office of the Commercial Secretary, Santiago.*

THE Republic of Chile has a well established and progressive paint industry which produces a wide range of products including ready-mixed paints of all types, water paints, waterproof paints, synthetic resin enamels and varnishes, marine and latex paints, acid-resisting paints and varnishes, rust-resisting paint, cellulose varnishes, and lacquer for automobile refinishing and industrial use.

There are some 25 firms engaged in the industry and production is ample to meet domestic demand. No official statistics are available for the paint industry but the following is estimated consumption for the past four years: 1956, 7,259 tons; 1957, 7,584; 1958, 8,681; 1959, 10,148.

Industry Protected

The local industry enjoys freedom from competition from imported paints and varnishes. Government protection takes the form of a prior import deposit of 1,500 per cent of the c.i.f. value of the imported product, which is held by the local exchange control authorities for 90 days. In addition paints and varnishes are subject to import duties ranging from 30 to 40 per cent of the c.i.f. value. As a result, the cost of imported paints is prohibitive.

Some paints and varnishes enter Chile through the free zones, but the volume is negligible. In addition, special quality paints may be brought in by the big copper-mining companies provided no comparable product is made in Chile. In practice, the copper companies import little so-called "special" paints because of the local industry's progress in manufacturing these types.

Construction Boosts Demand

In the past few years consumption of paint in Chile has risen slightly, but lack of funds for the building industry has not brought the volume of expansion that the paint industry would like. However, the present Government has encouraged a building program that should reverse this trend, and the industry seems to be entering a period of renewed activity. In addition, the recent earthquakes in the south, which destroyed about 50,000 houses and heavily damaged about 100,000 others will no doubt boost demand for paints and varnishes of all types when reconstruction begins. The Chilean paint and varnish industry is undoubtedly looking forward to several years of full production and sales.

In order to meet this demand paint manufacturers will require bigger quantities of raw materials and Canadian exporters could probably find an interesting market in Chile, provided prices are competitive. The main sources of supply at present are the United States, Britain, the Netherlands and Germany.

The Commercial Secretary will be pleased to put Canadian exporters of raw materials in touch with producers of paints and varnishes in Chile. ●

Trade and Tariff Regulations

Ceylon

CHANGES IN TARIFFS AND BANK CREDITS—A cablegram from the Canadian Commercial Secretary at Colombo reports that the Government of Ceylon imposed credit restrictions and raised customs tariff rates on August 13, 1960.

New preferential tariff rates (applicable to Commonwealth countries, including Canada) are given as follows (former rates in brackets):

Beer and ale, 12 rupees* per gallon (9 rupees); whisky more than five years old, 237.75 rupees per proof gallon (218.75 rupees); confectionery, 100 per cent ad valorem (60 per cent); air conditioners, 145 per cent (105 per cent); synthetic apparel, 100 per cent (35 per cent); synthetic piece goods, 100 per cent (apparently refers to only certain kinds; some formerly 15 per cent, some 100 per cent); motor vehicles, 3,400 rupees plus 300 per cent of c.i.f. value exceeding 6,000 rupees (cars 27½ per cent to 150 per cent, lorries, 15 per cent to 22½ per cent).

Bank credit is *restricted* for import of air conditioners, fountain pens, automobiles, and whisky, but *facilitated* for imports of food, textiles, cotton yarn, pharmaceuticals, fertilizers and agricultural implements.

The bank rate is raised from 2½ per cent to 4 per cent.

Details are expected to be available shortly. Inquiries on the new rate on specific items may be made to the Department.

Ghana

IMPORT TARIFF—Changes in rates of duty on several items in the Ghana tariff were made effective July 20, 1960. The main items affected are motor vehicles, storage batteries, aluminum sheets, and certain textiles.

Full details have been received by the Department of Trade and Commerce, Ottawa. Information on the new rate on any specific item may be obtained from the Department.

Ghana does not grant preferential tariff treatment to goods from Canada.

Pakistan

IMPORT CONTROLS—The arrangement of the Pakistan import tariff schedule was revised on July 1, 1960, to conform to the Brussels system of nomenclature. At the same time, changes were made in the rates of duty payable on many items.

Full details of the changes have been received by the Department of Trade and Commerce, Ottawa. Information on the new rate on any specific item may be obtained from the Department.

Pakistan does not grant preferential tariff treatment to goods from Canada.

Republic of Congo

IMPORT RESTRICTIONS INTRODUCED—The Canadian Government Trade Commissioner in Leopoldville, Republic of Congo (formerly Belgian Congo), advises that outstanding import licences for all imports except those already shipped and covered by documents or paid for and covered by letters of credit opened before August 6, 1960, have been cancelled. Applications for licence renewal or new import licences must be directed to Congolese authorities in Leopoldville.

New regulations are being issued prohibiting the import of many commodities, and import duties on others are being raised. Information as to the categories of commodities affected will be published when available. Inquiries regarding exports to the Republic of Congo should be addressed to the International Trade Relations Branch, Department of Trade and Commerce, Ottawa.

South Africa

REPRESENTATIONS RESPECTING THE TARIFF—The South African Board of Trade announced recently that it has received the following representations respecting the tariff:

Increase in duty on:

1. Plastic flexible ducting
2. Portable platform scales from 500 lb. to 2,100 lb.
3. Railway weighbridges
4. Golf bags

Reduction in duty on:

Cotton woven tape known as "Easy-Pleat-Tape" for self-pleating of curtaining

*One rupee equals about 20 cents Canadian.

Rebate of duty on:

1. The following for the manufacture of bicycle dynamo lighting sets:
concave lamp glasses
magnets (demagnetized)
sintered bronze bearings
eyelets
torsion springs
2. The following raw materials for the manufacture of refractories:
(a) chrome ore;
(b) raw boulder corundum ore; and
(c) raw magnesite ore.

Increase in duty on:

1. Filter units for the dry cleaning trade
2. Hand-operated bread and bacon slicing machines
3. (a) Metal curtain rail
   (b) Extruded sections, not worked up in any way, of brass, bronze, copper and copper alloys
4. (a) Ladies' handbags
   (b) Shopping and marketing bags
   (c) Purses, wallets and billfolds (not being of leather)

Reduction in duty on:

1. Nickel magnesium No. 1 (M) alloy
2. Stainless steel blades for bread and bacon slicing machines

Rebate of duty on:

1. Musical movements for the manufacture of musical jewel cases
2. (i) Rayon piece goods
   (ii) Rayon taffetas, satin and nylon ribbon
   (iii) Rubber-backed fabrics for the manufacture of printed labels

Withdrawal of rebate on:

2 : 4 : 5-T Ester for the manufacture of weed killer.

Canadian firms exporting these goods to South Africa may wish to have their views on these tariff inquiries placed before the Tariff Board. The most effective method of doing so is for the Canadian exporter to have his South African agents act on his behalf before the Board. Action should be taken as soon as possible because tariff inquiries normally begin in South Africa soon after the announcements are made.

Trade Commissioners on Tour

B. C. Butler

H. A. Gilbert

H. S. Hay

R. G. Woolham

The following officers of the Trade Commissioner Service are undertaking tours in Canada. Their itineraries are:

B. C. BUTLER, Minister (Commercial) in London, England:

Fredericton—Sept. 26-27
Halifax—Sept. 29-30
Saint John—Sept. 28

H. A. GILBERT, Trade Commissioner in Bombay, India:

Montreal—Sept. 19-23
Brantford—Oct. 7
Thetford Mines—Sept. 26
Winnipeg—Oct. 11-12
Toronto—Sept. 28-Oct. 4
Vancouver—Oct. 13-21
Sarnia—Oct. 6

When he completes his tour, Mr. Gilbert will be posted to Melbourne, Australia, as Commercial Counsellor.

H. S. HAY, Assistant Commercial Secretary in Sydney, Australia:

Toronto and district—Sept. 12-16, 19-20
St. Catharines—Sept. 22
Niagara Falls—Sept. 23
Hamilton—Sept. 21-22
Welland—Sept. 23
Montreal—Sept. 26-Oct. 4
Ottawa—Oct. 5-6

When he completes his tour, Mr. Hay will be posted to head office in Ottawa.

R. G. WOOLHAM, Assistant Commercial Secretary in Tokyo, Japan:

Ottawa—Sept. 12-23

When he completes his tour and leave, Mr. Woolham will be posted to Paris, France, as Assistant Commercial Secretary.

Businessmen who wish to see these officers should get in touch with the Board of Trade or Chamber of Commerce in the cities mentioned, with the following exceptions. In Toronto, Winnipeg and Edmonton, the Trade Commissioners make their headquarters at the offices of the Canadian Manufacturers Association; in Windsor, Ontario, at the offices of the Greater Windsor Industrial Commission; in St. John's, Ottawa and Vancouver, at the Department of Trade and Commerce; in Victoria at the Department of Trade and Industry, and in Fredericton at the Department of Industry and Development.

Foreign Trade Service Abroad

Territory	Officer	City Address	Mail and Cables, Office Telephone
Argentina	C. S. Bissett Commercial Counsellor G. E. Blackstock Assistant Commercial Secretary	Canadian Embassy Bartolome Mitre 478 BUENOS AIRES	*Mail:* (City Address) *Cable:* CANADIAN *Tel:* 33-8237
Australia (Capital Territory New South Wales, Queensland, Northern Territory) Dependencies	S. V. Allen Commercial Counsellor for Canada L. D. Burke Assistant Commercial Secretary	7th Floor, Berger House 82 Elizabeth Street SYDNEY	*Mail:* P.O. Box 3952 G.P.O. *Cable:* CANADIAN *Tel.:* BW 5696
Australia (Victoria, South Australia, Western Australia, Tasmania)	T. G. Major Commercial Counsellor for Canada	Mobil Centre 2 City Road SOUTH MELBOURNE	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* MU 4716
Australia	R. B. Nickson Commercial Secretary	Office of the High Commissioner for Canada State Circle CANBERRA	*Mail:* (City Address) *Cable:* DOMCAN *Tel.:* U-1304
Austria Bulgaria, Czechoslovakia, Hungary, Romania, Yugoslavia	R. K. Thomson Commercial Counsellor P. A. Freyseng Assistant Commercial Secretary	Opernringhof Opernring 1 VIENNA 1	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 57-25-97
Belgium Luxembourg, European Economic Community, European Atomic Energy Community, European Coal and Steel Community	L. H. Ausman Commercial Counsellor A. A. Lomas Assistant Commercial Secretary P. T. Eastham Assistant Commercial Secretary	Canadian Embassy 35 rue de la Science BRUSSELS 4	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 13.38.50
Brazil	Wm. Jones Commercial Counsellor	Canadian Embassy Edificio Metropole Av. Presidente Wilson 165 RIO DE JANEIRO	*Mail:* Caixa Postal 2164 *Cable:* CANADIAN *Tel.:* 42-4140
Brazil	D. M. Holton Consul and Trade Commissioner R. C. Anderson Vice Consul and Assistant Trade Commissioner	Canadian Consulate Edificio Alois Rua 7 de Abril 252 SAO PAULO	*Mail:* Caixa Postal 6034 *Cable:* CANADIAN *Tel.:* 36-6301
Ceylon	I. V. Macdonald Commercial Secretary	Office of the High Commissioner for Canada 6 Gregory's Road Cinnamon Gardens COLOMBO	*Mail:* P.O. Box 1006 *Cable:* CANADIAN *Tel.:* 91341
Chile	J. M. Knowles Acting Commercial Secretary	Canadian Embassy 6th Floor Av. General Bulnes, 129 SANTIAGO	*Mail:* Casilla 771 *Cable:* CANADIAN *Tel.:* 64189
Colombia Ecuador	J. H. Bailey Commercial Secretary and Consul	Canadian Embassy Edificio Banco de Los Andes Carrera 10, No. 16-92 BOGOTA	*Airmail:* Apartado Aereo 3562 *Surface Mail:* Apartado 1618 *Cable:* CANADIAN *Tel.:* 43-00-65
Congo Angola, Central African Republic, Chad, Congo (French Community), Gabon	R. A. Bull Acting Trade Commissioner	C.C.C.I. Building Boulevard Albert 1er LEOPOLDVILLE 1	*Mail:* Boîte Postale 8341 *Cable:* CANADIAN *Tel.:* 2706

Territory	Officer	City Address	Mail and Cables, Office Telephone
Cuba	R. R. Parlour Commercial Counsellor	Canadian Embassy Edificio Ingenieros Civiles Calle 17 y O Vedado HAVANA	*Mail:* Apartado 1945 *Cable:* CANADIAN *Tel.:* 32-3526
Denmark Greenland, Poland	Commercial Counsellor (absent)	Canadian Embassy Prinsesse Maries Allé 2 COPENHAGEN V	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* Hilda 3306
Dominican Republic Puerto Rico	W. B. McCullough Commercial Counsellor	Canadian Embassy Edificio Copello 408 Calle El Conde CIUDAD TRUJILLO	*Mail:* Apartado 1393 *Cable:* CANADIAN *Tel.:* 2-8138
France Algeria; Cameroon Republic, Dahomey, Federation of Mali, Guinea, Ivory Coast, Mauretania, Morocco, Niger, Togoland, Tunisia, Volta	A. G. Kniewasser Commercial Counsellor W. G. Brett Assistant Commercial Secretary C. T. Charland Assistant Commercial Secretary	Canadian Embassy 35 Avenue Montaigne PARIS 8e	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* BALzac 99-55
Germany Federal Republic	J. A. Stiles Commercial Counsellor G. F. Mintenko Assistant Commercial Secretary W. J. O'Connor Assistant Commercial Secretary (Agriculture)	Canadian Embassy 22 Zitelmannstrasse BONN	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 21971
Germany	E. H. Maguire Consul General J. M. T. Thomas Vice Consul (absent)	Canadian Consulate General 69 Ferdinandstrasse HAMBURG	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 326149
Ghana Gambia, Liberia, Nigeria, Sierra Leone	K. F. Osmond Commercial Secretary	Office of the High Commissioner for Canada E 115/3 Independence Ave. ACCRA	*Mail:* P.O. Box 1639 *Cable:* CANADIAN *Tel.:* 4824
Greece Cyprus, Israel, Turkey	B. A. Macdonald Commercial Counsellor L. D. R. Dyke Assistant Commercial Secretary	Canadian Embassy 31 Vassilissis Sophias Ave. ATHENS	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 74044
Guatemala Costa Rica, El Salvador, Honduras, Nicaragua, Panama and Canal Zone	H. E. Lemieux Canadian Government Trade Commissioner	5a Avenida 11-70, Zone I GUATEMALA CITY, C.A.	*Airmail:* P.O. Box 400 *Surface Mail:* P.O. Box 444 *Cable:* CANADIAN *Tel.:* 28448
Haiti	Chargé d'Affaires, a.i. and Consul	Canadian Embassy Route du Canape Vert St. Louis de Turgeau PORT AU PRINCE	*Mail:* P.O. Box 826
Hong Kong Cambodia, Communist China, Laos, Vietnam, Macao	C. M. Forsyth-Smith Canadian Government Trade Commissioner C. J. Small Trade Commissioner D. J. McEachran Assistant Trade Commissioner	Hong Kong and Shanghai Banking Corporation Bldg. HONG KONG	*Mail:* P.O. Box 126 *Cable:* CANADIAN *Tel.:* 27743

Territory	Officer	City Address	Mail and Cables, Office Telephone
India (except States of Gujerat and Maharashtra) Bhutan, Nepal, Sikkim	J. R. Midwinter Acting Commercial Secretary	Office of the High Commissioner for Canada 13 Golf Links Area NEW DELHI 1	*Mail:* P.O. Box 11 *Cable:* CANADIAN *Tel.:* 35201
India (States of Gujerat and Maharashtra), Goa	F. H. Hillhouse Canadian Government Trade Commissioner		
	G. P. Morin Assistant Trade Commissioner	Gresham Assurance House Mint Road BOMBAY	*Mail:* P.O. Box 886 *Cable:* CANADIAN *Tel.:* 255154
Indonesia	M. B. Blackwood Commercial Secretary	Canadian Embassy Djl. Budi Kemuliaan No. 6 DJAKARTA	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* Gambir 1313
Iran	A. B. Brodie Commercial Counsellor	Canadian Legation TEHRAN	*Mail:* Central P.O., Box 1610 *Cable:* CANTRACOM *Tel.:* 49291
Ireland	W. R. Van Commercial Secretary for Canada	66 Upper O'Connell St. DUBLIN	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 44251
Italy Libya, Malta	Richard Grew Commercial Counsellor M. S. Strong Commercial Secretary J. G. Ireland Assistant Commercial Secretary	Canadian Embassy Via G. B. De Rossi 27 ROME	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 861-951
Japan South Korea	J. L. Mutter Commercial Counsellor N. W. Boyd Assistant Commercial Secretary	Canadian Embassy TOKYO	*Mail:* Canadian Embassy *Cable:* CANADIAN *Tel.:* 408-2101/8
Lebanon Iraq, Jordan, Persian Gulf area, Syrian Region of United Arab Republic	C. O. R. Rousseau Commercial Secretary W. B. Walton Assistant Commercial Secretary	Canadian Embassy Alpha Building Rue Clemenceau BEIRUT	*Mail:* Boîte Postale 2300 *Cable:* CANADIAN *Tel:* 50955
Mexico	F. B. Clark Commercial Secretary W. M. Miner Assistant Commercial Secretary	Canadian Embassy Melchor Ocampo 463, 7th Floor MEXICO 5, D.F.	*Mail:* Apartado 25364 *Cable:* CANADIAN *Tel.:* 25-15-60
Netherlands	J. C. Britton Commercial Counsellor G. E. Woollam Agricultural Counsellor B. Horth Assistant Commercial Secretary	Canadian Embassy Sophialaan 5-7 THE HAGUE	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 61-41-11
New Zealand Fiji, French Oceania, Western Samoa	J. H. Stone Commercial Counsellor W. J. Collett Assistant Commercial Secretary	Office of the High Commissioner for Canada Government Life Insurance Bldg., WELLINGTON	*Mail:* P.O. Box 1660 *Cable:* CANADIAN *Tel.:* 70-644
Norway Iceland	M. B. Bursey Commercial Counsellor	Canadian Embassy Fridtjof Nansens Plass 5 OSLO	*Mail:* P.O. Box 1379—Vika *Cable:* CANADIAN *Tel.:* 33-30-80

Territory	Officer	City Address	Mail and Cables, Office Telephone
Pakistan Afghanistan	L. A. Campeau Commercial Counsellor J. B. McLaren Assistant Commercial Secretary	Office of the High Commissioner for Canada Hotel Metropole, Victoria Rd. KARACHI	*Mail:* P.O. Box 3703 *Cable:* CANADIAN *Tel.:* 50322
Peru Bolivia	W. J. Jenkins Acting Commercial Secretary	Canadian Embassy Edificio Boza, Carabaya 831 Plaza San Martin LIMA	*Mail:* Casilla 1212 *Cable:* CANADIAN *Tel.:* 72760
Philippines Republic of China (Taiwan)	R. H. Gayner Acting Consul General and Acting Trade Commissioner	Canadian Consulate General Ayala Building Juan Luna Street MANILA	*Mail:* P.O. Box 1825 *Cable:* CANADIAN *Tel.:* 3-33-35
Portugal Azores, Cape Verde Islands, Madeira, Portuguese Guinea	T. J. Monty Commercial Counsellor	Canadian Embassy Rua Marques de Fronteira No. 8—4° D° LISBON	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 53117
Rhodesia and Nyasaland Kenya, Seychelles Is., Tanganyika, Uganda, Zanzibar	L. S. Glass Canadian Government Trade Commissioner	8th Floor Grindlays Bank Chambers Baker Avenue SALISBURY	*Mail:* P.O. Box 2133 *Cable:* CANTRACOM *Tel.:* 26571
Singapore Brunei, Burma, Federation of Malaya, North Borneo, Sarawak, Thailand	M. P. Carson Canadian Government Trade Commissioner K. O. Hillyer Assistant Trade Commissioner	Rooms 4, 5 and 6 American International Building Robinson Road and Telegraph St. SINGAPORE	*Mail:* P.O. Box 845 *Cable:* CANADIAN *Tel.:* 74260
South Africa (Natal, Transvaal, Orange Free State), Malagash, Mauritius, Mozambique, Reunion	C. R. Gallow Canadian Government Trade Commissioner L. J. Taylor Assistant Trade Commissioner	Mutual Building Harrison Street JOHANNESBURG	*Mail:* P.O. Box 715 *Cable:* CANADIAN *Tel.:* 33-2628
South Africa (Cape Province), St. Helena, Southwest Africa	M. R. M. Dale Canadian Government Trade Commissioner	602 Norwich House The Foreshore CAPE TOWN	*Mail:* P.O. Box 683 *Cable:* CANTRACOM *Tel:* 2-5134/5
Spain Balearic Islands, Canary Islands, Gibraltar, Rio Muni, Rio de Oro	M. T. Stewart Commercial Counsellor	Canadian Embassy Edificio Espana Avenida de Jose Antonio 88 MADRID	*Mail:* Apartado 117 *Cable:* CANADIAN *Tel.:* 47-54-00
Sweden Finland	A. P. Bissonnet Commercial Counsellor (absent) J. M. T. Thomas Acting Commercial Secretary (temporary)	Canadian Embassy Strandvagen, 7-C STOCKHOLM	*Mail:* P.O. Box 14042 *Cable:* CANADIAN *Tel.:* 67-92-15
Switzerland	S. G. MacDonald Commercial Counsellor J. H. Nelson Assistant Commercial Secretary	Canadian Embassy Kirchenfeldstrasse 88 BERNE	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* 4-63-81
Union of Soviet Socialist Republics	W. Van Vliet Commercial Counsellor	Canadian Embassy 23 Starokonyushenny Pereulok Moscow	*Mail:* (City Address) *Cable:* CANAD *Tel.:* 415142
United Arab Republic **Egyptian Region** Aden, Sudan, Ethiopia, Saudi Arabia, Yemen	D. S. Armstrong Commercial Counsellor	Canadian Embassy 6 Sharia Rouston Pasha Garden City CAIRO	*Mail:* Kasr el Doubara Post Office *Cable:* CANADIAN *Tel.:* 23110

Territory	Officer	City Address	Mail and Cables, Office Telephone
United Kingdom	B. C. Butler Minister (Commercial) (absent)	Office of the High Commissioner for Canada Canada House Trafalgar Square LONDON, S.W.1	*Mail:* (City Address) *Cable:* SLEIGHING *Tel.:* Whitehall 8701
	S. G. Tregaskes Commercial Counsellor		
	W. Gibson-Smith Commercial Counsellor		
	D. B. Laughton Agricultural Secretary		
	E. J. White Commercial Secretary (Timber)		*Cable:* TIMCOM
	E. J. Ward Assistant Commercial Secretary (Timber)		
	W. A. Stewart Assistant Agricultural Secretary		
	S. G. Harris Assistant Commercial Secretary		
United Kingdom (Midlands, North England)	A. W. Evans Canadian Government Trade Commissioner	Martins Bank Building Water Street LIVERPOOL	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* Central 0625
United Kingdom (Scotland)	P. V. McLane Canadian Government Trade Commissioner	Cornhill House 144 West George St. GLASGOW C.2	*Mail:* (City Address) *Cable:* CANTRACOM *Tel.:* Douglas 6751
United Kingdom (Northern Ireland)	W. R. Van Canadian Government Trade Commissioner	36 Victoria Square BELFAST	*Mail:* (City Address) *Tel.:* 21867
United States Delaware, Maryland, Virginia, West Virginia	M. Schwarzmann Minister-Counsellor (Economic)	Canadian Embassy 1746 Massachusetts Ave., N.W. WASHINGTON 6, D.C.	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* DEcatur 2-1011
	D. A. B. Marshall Agricultural Counsellor		
	T. M. Burns Commercial Counsellor		
	J. D. Blackwood Assistant Commercial Secretary		
	J. MacNaught Assistant Agricultural Secretary		
United States	N. R. Chappell Counsellor (Energy)	Canadian Embassy 1746 Massachusetts Ave., N.W. WASHINGTON 6, D.C.	*Mail:* (City Address) *Cable:* BEAVER *Tel.:* HUdson 3-5505
United States (Connecticut, New Jersey, Pennsylvania, New York), Bermuda	B. I. Rankin Deputy Consul General (Commercial)	Canadian Consulate General 680 Fifth Ave. NEW YORK CITY 19	*Mail:* (City Address) *Cable:* CANTRACOM *Tel.:* JUdson 6-2400
	A. A. Caron Consul and Trade Commissioner		
	R. D. Sirrs Vice Consul and Assistant Trade Commissioner		
	F. I. Wood Vice Consul and Assistant Trade Commissioner		
United States (Massachusetts, Maine, Rhode Island, Vermont, New Hampshire)	J. C. Depocas Consul and Trade Commissioner	Canadian Consulate General 532 Little Building 80 Boylston Street BOSTON 16	*Mail:* (City Address) *Tel.:* HAncock 6-4320

Territory	Officer	City Address	Mail and Cables, Office Telephone
United States (Illinois, North Dakota, South Dakota, Minnesota, Wisconsin, Indiana, Iowa, Kansas, Nebraska, Kentucky, Missouri)	H. J. Horne Consul and Trade Commissioner N. L. Currie Vice Consul and Assistant Trade Commissioner D. A. Hilton Vice Consul and Assistant Trade Commissioner	Canadian Consulate General 111 North Wabash Avenue CHICAGO	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* RAndolph 6-6033
United States (Michigan, Ohio)	M. J. Vechsler Consul and Trade Commissioner R. V. N. Gordon Consul and Trade Commissioner	Canadian Consulate 1139 Penobscot Building DETROIT 26	*Mail:* (City Address) *Tel.:* WOodward 5-2811
United States California (the ten southern counties), Clark County in Nevada, Arizona, New Mexico	G. F. J. Osbaldeston Consul and Trade Commissioner	Canadian Consulate General 510 West Sixth Street LOS ANGELES 14	*Mail:* (City Address) *Tel.:* MAdison 2-2233
United States (Louisiana, Texas, Oklahoma, Arkansas, Mississippi, Tennessee, Alabama, North Carolina, South Carolina, Georgia, Florida)	T. F. Harris Consul and Trade Commissioner	Canadian Consulate General 215-217 International Trade Mart NEW ORLEANS 12	*Mail:* (City Address) *Cable:* CANADIAN *Tel.:* JAckson 5-2136
United States California (except the ten southern counties), Wyoming, Nevada (except Clark County), Utah, Colorado, Hawaii	Consul General	Canadian Consulate General 3rd Floor, Kohl Building 400 Montgomery Street SAN FRANCISCO 4	*Mail:* (City Address) *Tel.:* SUtter 1-3039
United States (Oregon, Idaho, Washington, Montana), Alaska	Consul General	Canadian Consulate General The Tower Building Seventh Avenue at Olive Way SEATTLE 1, Washington	*Mail:* (City Address) *Tel.:* MUtual 2-3515
Uruguay Paraguay Falkland Islands	Blair Birkett Commercial Counsellor	Canadian Embassy No. 1409 Avenida Agraciada Piso 7° MONTEVIDEO	*Mail:* Casilla Postal 852 *Cable:* CANADIAN *Tel.:* 96096
Venezuela Netherlands Antilles	W. D. Wallace Commercial Counsellor J. E. Montgomery Assistant Commercial Secretary	Canadian Embassy Avenida La Estancia No. 10 Ciudad Comercial Tamanaco CARACAS	*Mail:* Apartado 11452-Este *Cable:* CANADIAN *Tel.:* 54.34.32
West Indies (Barbados, Trinidad and Tobago, Windward and Leeward Islands) British Guiana, French Guiana, Surinam, Guadeloupe, Martinique	R. F. Renwick Commercial Secretary R. L. Richardson Assistant Commercial Secretary	Office of the Commissioner for Canada Colonial Building 72 South Quay PORT-OF-SPAIN	*Mail:* P.O. Box 125 *Cable:* CANADIAN *Tel.:* 34787
West Indies (Jamaica) Bahamas, British Honduras	H. E. Campbell Canadian Government Trade Commissioner C. G. Bullis Assistant Trade Commissioner	Barclays Bank Building King Street KINGSTON	*Mail:* P.O. Box 225 *Cable:* CANADIAN *Tel.:* 2858

The following nominal quotations may prove useful in checking prices. Canadian traders should consult their banks before making any firm commitments.

Conversion into Canadian dollar equivalent and units of foreign currency per Canadian dollar have been made at cross rates with sterling or the United States dollar on the date shown.

Except when buying and selling rates are specified, the mid rates only are quoted. The buying rate is that at which the banks purchase exchange from exporters. The selling rate is that at which banks sell exchange to importers.

When several rates are indicated, the rate applicable depends on the commodity traded. Information on the rate for any specific commodity may be obtained from the International Trade Relations Branch, Department of Trade and Commerce, Ottawa.

Rates used exclusively in non-merchandise trading are *not* included in the table.

For conversion to United States dollar equivalent multiply by 1.0315925.

Foreign Exchange Rates

Country	Unit	Type of Exchange	Can. dollar equivalent Aug. 29	Units per Canadian dollar	Notes (See below)
Argentina	Peso	Free	.01175	85.11	(1)
Austria	Schilling		.03732	26.79	
Australia	Pound		2.1802	.4587	
Bahamas	Pound		2.7252	.3669	
Belgium and Luxembourg	Franc		.01938	51.60	
Bermuda	Pound		2.7252	.3669	
Bolivia	Boliviano	Free	.00008485	11,785.50	
British Guiana	Dollar		.5677	1.76	
British Honduras	Dollar		.6813	1.47	
Brazil	Cruzeiro	General Category*	.004234	236.15	*Aug. 16 (2)
		Special Category	.001960	510.30	
		Official selling	.05122	19.52	(3)
Burma	Kyat		.2036	4.91	
Ceylon	Rupee		.2044	4.89	
Chile	Escudo	Free	.9215	1.08519	(4)
Colombia	Peso	Certificate	.1447	6.91	
Congo, Republic of	Franc		.01938	51.60	
Costa Rica	Colon	Official	.1726	5.79	
		Controlled Free	.1458	6.86	
Cuba	Peso		.9694	1.03156	tax 2%
Czechoslovakia	Koruna		.1346	7.43	
Denmark	Krone		.1407	7.11	
Dominican Republic	Peso		.9694	1.03156	
Ecuador	Sucre	Official	.06463	15.47	
		Free	.05669	17.64	
Egyptian Region, United Arab Rep.	Pound	Official	2.7836	.3592	
		Export account selling	2.4250	.4124	
El Salvador	Colon		.3878	2.58	
Fiji	Pound		2.4551	.4073	
Finland	Markka		.003029	330.14	
France, Monaco, etc.	New Franc		.1978	5.05	(5)
French Territories, Africa	Franc		.003956	252.78	(6)
French Territories, Pacific	Franc		.01088	91.91	(7)
Germany	D Mark		.2325	4.30	
Ghana	Pound		2.7252	3.669	
Greece	Drachma		.03231	30.95	
Guatemala	Quetzal		.9694	1.03156	
Haiti	Gourde		.1939	5.16	
Honduras	Lempira		.4847	2.06	
Hong Kong	Dollar	Free*	.1698	5.89	*Aug. 12
		Official	.1703	5.87	
Iceland	Krona	Official	.02551	39.20	(8)
India	Rupee		.2044	4.89	
Indonesia	Rupiah	Official	.02154	46.42	(8)
Iran	Rial		.01280	78.14	
Iraq	Dinar		2.7143	.3684	

*Latest available quotation date.

Country	Unit	Type of Exchange	Can. dollar equivalent Aug. 29	Units per Canadian dollar	Notes (See below)
Ireland	Pound		2.7252	.3669	
Israel	Pound		.5385	1.86	
Italy	Lira		.001562	640.20	
Japan	Yen		.002693	371.33	
Lebanon	Pound	Free	.3045	3.28	
Mexico	Peso		.07755	12.89	
Netherlands	Florin		.2570	3.89	
Netherlands Antilles	Florin		.5179	1.93	
New Zealand	Pound		2.7252	.3669	
Nicaragua	Cordoba	Effective buying	.1469	6.81	
		Official selling	.1375	7.27	
Norway	Krone		.1360	7.35	
Pakistan	Rupee		.2044	4.89	
Panama	Balboa		.9694	1.03136	
Paraguay	Guarani	Official	.007946	125.85	
Peru	Sol		.03610	27.70	
Philippines	Peso		.4847	2.06	
Portugal & Colonies	Escudo		.03383	29.56	(9)
Singapore and Malaya	Straits Dollar		.3179	3.14	
Spain and Dependencies	Peseta		.01616	61.89	
Sweden	Krona		.1881	5.32	
Switzerland	Franc		.2250	4.44	
Syrian Region, United Arab Rep.	Pound	Free	.2710	3.69	
Thailand	Baht	Free	.04580	21.83	(8)
Turkey	Lira		.1077	9.28	(8)
Union of South Africa	Pound		2.7252	.3669	
United Kingdom	Pound		2.7252	.3669	
United States	Dollar		.969375	1.0315925	
Uruguay	Peso	Free	.08485	11.78	(10)
Venezuela	Bolivar		.2894	3.45	
West Indies Fed.	Dollar		.5677	1.76	(11)
	Pound		2.7252	.3669	(12)
Yugoslavia	Dinar	Official	.003231	309.50	(8)
		Settlement rate	.001534	651.97	

*Latest available quotation date.

Notes

1. Argentina: effective Jan. 1, 1959, a single fluctuating exchange rate was introduced. Exports are subject to retention taxes of either 10 or 20 per cent ad valorem under this system.
2. Brazil: exporters receive cruzeiros at official buying rate of Cr.$18.36 plus (a) an exchange premium of Cr.$71.64 per U.S. dollar for coffee green, roasted or powdered and cocoa beans; (b) Cr.$81.64 per U.S. dollar for cocoa products, castor seeds, mineral crude oil and its products. Returns of all other exports may be sold on the free exchange market.
3. For imports of wheat, newsprint and petroleum, the effective rate of exchange is the official selling rate of Cr.$18.92 per U.S. dollar plus a surcharge of Cr.$81.08 per U.S. dollar.
4. Chile: free rate applies to exports and imports. Chilean importers must make prior deposits in amounts ranging from 5 to 1,500 per cent, depending on product, prior to shipment of goods. Beginning January 1, 1960, one escudo equals 1,000 pesos.
5. France: territory includes Algeria, Tunisia, Guiana, Guadeloupe, Martinique. The new heavy franc (worth 100 old francs) became effective on Jan. 1, 1960. In Tunisia the rate of the franc is reduced by 20 per cent on most foreign exchange transactions.
6. Equatorial Africa, West Africa, Cameroons, Togoland, Somaliland, Madagascar, Reunion, St. Pierre and Miquelon.
7. New Caledonia, New Hebrides, Oceania.
8. Additional rates are in effect.
9. Portugal: approximately same rate for Portuguese territories in Africa.
10. A new exchange system was introduced in December 1959 under which exchange transactions take place at free market rates.
11. Barbados, Trinidad, Tobago, Leeward and Windward Islands.
12. Jamaica.

Markets in Brief:

BELGIUM AND LUXEMBOURG (BLEU)

Area: Belgium 11,778 square miles; Luxembourg 1,000 square miles.

Population: Belgium 9,078,635 (Dec. 31, 1958); Luxembourg 313,000.

Climate: temperate.

Language: Belgium—French and Flemish (German in one small area). Advertising and sales literature should be in French and/or Dutch.

Luxembourg—French is official language. A Luxembourg dialect is often used in conversation and German is generally understood.

Currency: Belgium—one franc=Can.$0.01896; Luxembourg—one Luxembourg franc=one Belgian franc.

Weights and measures: metric system.

Capital: Belgium—Brussels, at sea level; Luxembourg—city of Luxembourg.

Chief ports: Belgium—Antwerp, Ghent, Ostend, Zeebrugge, Bruges; Luxembourg—none.

Marketing centres: Belgium—Brussels (population) 1,398,326; Antwerp 849,432; Ghent 455,022; Liège 607,117; Charleroi 469,259; Mons 270,060. Luxembourg—Luxembourg 71,612.

Economy: Belgium—a strong, free-enterprise economy based on highly developed industry and backed by a hard currency and a stable political situation. Largely dependent on exports of manufactured and semi-manufactured goods. Interested in development of new industries to take advantage of European Common Market.

Luxembourg—the steel industry is the backbone of the Luxembourg economy, and steel exports are largely responsible for the relatively high purchasing power. Also important are a wide range of small and medium-sized enterprises, plus agriculture and viticulture. Emphasis is on free enterprise.

Total BLEU imports: 1958—Can.$2,966 million; 1957—Can. $3,253 million (f.o.b. point of shipment in the country of export).

Chief imports: 1958 (in per cent)—petroleum products 8.9, machinery 7.8, transport material 7.6, textile raw materials 6.5, grains and cereals 4.2, iron ore 2.8, paper and manufactures 1.8, lumber and wood 1.5.

Chief suppliers: 1958 (in per cent)—West Germany 17.1, Netherlands 15.7, France 11.6, United States 9.9, United Kingdom 7.4, Belgian Congo 5.3, Canada 1.4.

Value of imports from Canada: 1958—Can.$48.9 million; 1957—Can.$51.8 million.

Chief imports from Canada: 1958 (in per cent)—wheat 32.8; aluminum, primary and semi-fabricated 6.3; lead, primary and semi-fabricated 4; flaxseed 3.4; asbestos 3.4.

Total BLEU exports: 1958—Can.$2,887 million; 1957—Can. $3,020 million (f.o.b. Belgian port).

Chief exports: 1958 (in per cent)—iron and steel 24.4, textiles 9.6, transport material 5.3, machinery 4.9, metal products 4, electric machinery 3.7, copper and manufactures 3.4.

Chief markets: 1958 (in per cent)—Netherlands 20.7, West Germany 11.5, France 10.8, United States 9.4, United Kingdom 5.7, Belgian Congo 3.9, Canada 1.1.

Value of Canadian purchases: 1958—Can.$36 million; 1957—Can.$44 million.

Chief Canadian purchases: 1958 (in per cent)—iron and steel rolling-mill products 28; unset diamonds 13; wool carpets 10.5; plate and sheet glass 10.5; tin blocks, pigs and bars 5.2; cotton manufactures 1.9.

Dollar exchange: freely available for all imports. Very few commodities subject to licensing or prohibited import.

Prices: quote in Canadian dollars or Belgian francs, preferably c.i.f. Belgian port.

Samples: subject to duty if of commercial value; admitted duty-free if of no commercial value or made unfit for commercial purposes.

Trade agreements: most-favoured-nation agreement with Canada; preferential tariff treatment for imports from the Netherlands, Luxembourg, West Germany, France, Italy and, in general, overseas territories of Belgium and her Common Market partners.

Import controls, documentation, customs tariffs, marking and labelling: consult the International Trade Relations Branch, Department of Trade and Commerce, Ottawa.

Canadian banks: none, but all Canadian banks have Belgian correspondents.

Correspondence: airmail recommended; letters 15 cents per half-ounce.

For detailed information on this market write to:

European Division
International Trade Relations Branch,
Department of Trade and Commerce
Ottawa

or

Commercial Counsellor
Canadian Embassy
35, rue de la Science
Brussels, Belgium

The Queen's Printer
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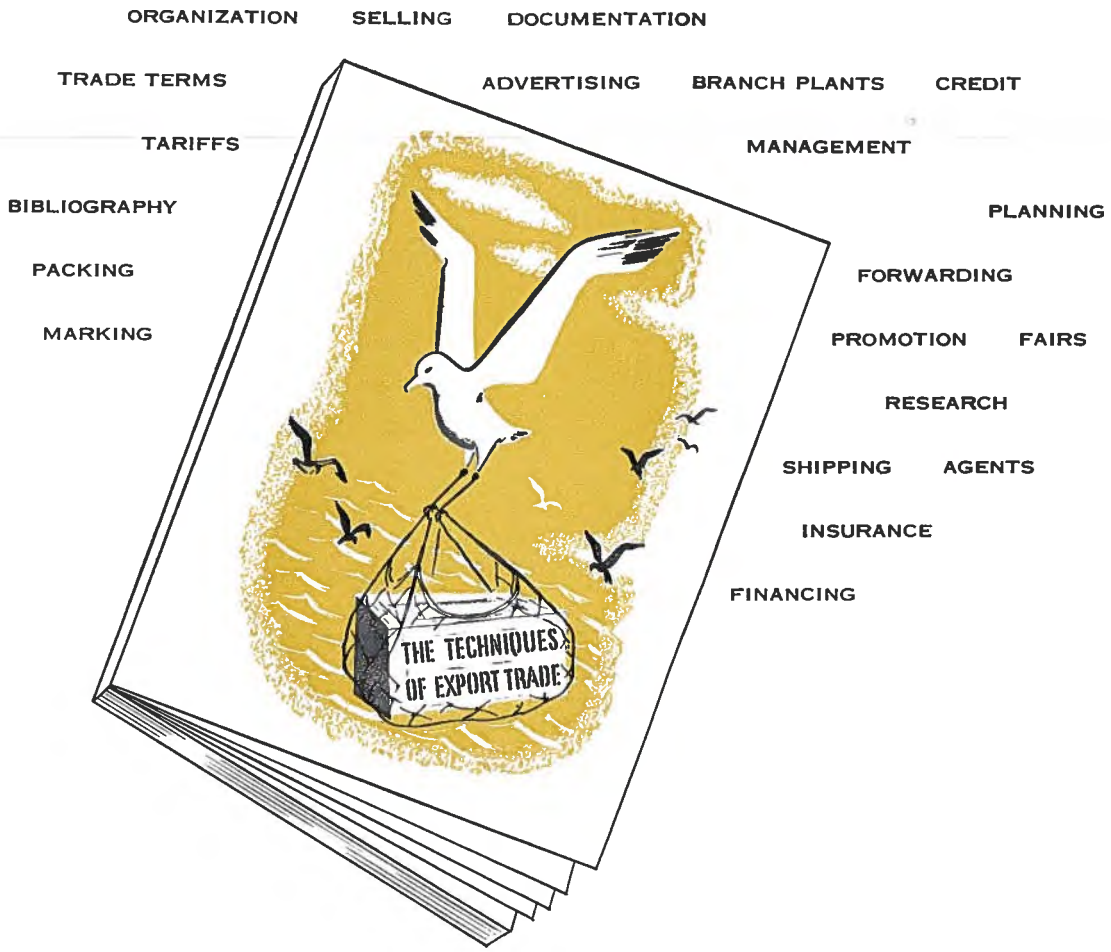

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