

Bulletin

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POSSIBILITY PROVED OF SHIPPING OIL FROM ARCTIC

The Minister of Public Works, Mr. Arthur Laing, announced on November 2 that according to a detailed report prepared by his Department, suitable sites for the construction of marine oil-shipping terminals existed at several locations on Canada's Arctic coast.

The study, known as the Herschel Island report, had been undertaken at the request of the Department of Indian Affairs and Northern Development. The Treasury Board had earlier authorized the expenditure of \$500,000 on an engineering feasibility study for a marine oil terminal in the vicinity of Herschel Island, Yukon Territory, to accommodate large tankers on a year-round schedule. The study received the full co-operation of other government departments and agencies, as well as the assistance of the oil industry.

The study took advantage of the vast store of information on the physical characteristics of the Arctic region already in the possession of government departments that included some findings of vital significance to any attempt to establish a marine oil terminal in Arctic waters. Such was the quantity and usefulness of this information that the study was completed with an expenditure of only half the allotted funds.

Four sites, two east and two west of the Mackenzie River delta, are regarded as suitable locations for marine oil terminals.

Two in the Herschel Island area are Herschel Basin, whose usefulness is limited by shallow water in the approaches, and Babbage Bight, some 20 miles to the south. The other sites discussed in the report are Horton River and Clapperton Island, both south of Amundsen Gulf.

The cost of such a terminal would be about \$80 million - about four times that of the one to be built at Come By Chance, Newfoundland, by the Department of Public Works (which also built the super-tanker terminal at Point Tupper, Nova Scotia).

CONSTRUCTION DANGERS

Some of the complicating factors that have to be taken into consideration in the construction of an offshore marine terminal in the Arctic are:

(a) The recent discovery that Arctic permafrost extends out to sea under the ocean bed, which must be taken into account in laying underwater pipelines or building foundations in offshore structures.

(b) The existence of scour trenches, caused by drifting ice islands, and old ice-pressure ridge remnants, as much as 60 feet deep and hundreds of feet wide near otherwise suitable sites for marine terminals. (Such trenches indicate that pipelines laid below the sea in these areas could be destroyed by drifting ice, even if the water were 100 feet deep. This is one of the factors militating against the construction of marine terminals on the north coast of Alaska, where large tankers would have to load a minimum of 30 miles offshore.)

(c) The fact that the area under study lies within one subject to severe earthquakes, necessitating rugged construction even beyond that suited to the difficult Arctic environment.

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(d) The protection of the delicate Arctic ecology. (The precipitation in the area is such that in the temperate zone it would produce desert conditions and is equivalent to only about seven inches of rainfall a year. Growth is slow and damage to the environment is only gradually repaired. For this reason, if oil were to be piped from Prudhoe Bay to Babbage Bight for shipment, an underwater pipeline along the Arctic coast would be preferable to one built overland. Offshore sandbars would offer protection to such a pipeline.)

(e) Essential to the success of any such operation is the ability of the shipbuilding industry to produce super tankers with ice-breaking capacity capable of operating in the Arctic the year round. (The report assumes that it would be possible to build such ships of 360,000 deadweight tons, able to carry 2 million barrels of oil on every voyage.)

The report envisages as a practical means of transferring oil from shore tank-farms to loading facilities about three miles offshore, not a conventional wharf, but two concrete mooring structures or "dolphins", spaced so that a large tanker could be secured fore and aft to the pair.

These cylindrical "breasting dolphins", as they are called, would rest on rock-fill foundations in 90 feet of water, topped by octagonal platforms 40 feet above the surface, which would provide space for helicopter platforms and oil-transfer machinery and loading arms. The helicopter platforms would enable operating personnel to be transferred to and from shore, regardless of sea conditions or foul weather.

The octagonal platforms, measuring 150 feet across, would have space for machinery, services and crew, directly below the upper deck. The substructure is two concrete caissons, each 100 feet in diameter, which would be towed to the site.

Design of the pipeline, which would extend three miles or so over the seabed from the tank-farm on shore, has to take into consideration the melting of the permafrost beneath it. It is considered that the specific gravity could be adjusted to impose very little weight on the surface carrying the pipe. There should be adequate warning of the approach of drifting ice island fragments, which might drag along the bottom and sever the pipeline. In such an emergency, the oil would be pumped back into shore tanks and the line filled with seawater.

Overland sections of pipeline would be built well above ground level except for the short section right at the shoreline, which might be damaged by ice. It would be buried, encased in a refrigerated jacket.

SITES

The sites considered as potentially useful for marine oil terminals lie south of the clockwise circulation

of heavy drift ice and ice islands or their remnants in the Beaufort Sea. The Herschel Island and Babbage Bight locations have the further advantage that the land-fast ice forming in Mackenzie Bay in early winter offers a barrier against the heavy drift ice.

The two other sites considered suitable for marine structures, at Horton River on Franklin Bay and Clapperton Island in Darnley Bay, are some 300 miles to the east of Herschel Island. Because of the intervening terrain, in particular the Mackenzie River delta, a pipeline from Prudhoe Bay would not be practical. However, such sites could usefully serve oil fields on the Tuktoyaktuk Peninsula, where a discovery has already been made and could be used to tranship oil, from the Arctic islands, where intensive exploration is underway and natural gas discovered.

HERSCHEL ISLAND

The major oil-strike at Prudhoe Bay on the north slope of Alaska, which took place towards the end of the Sixties, brought a new urgency to the problem of getting crude oil out of the Arctic to supply southern markets.

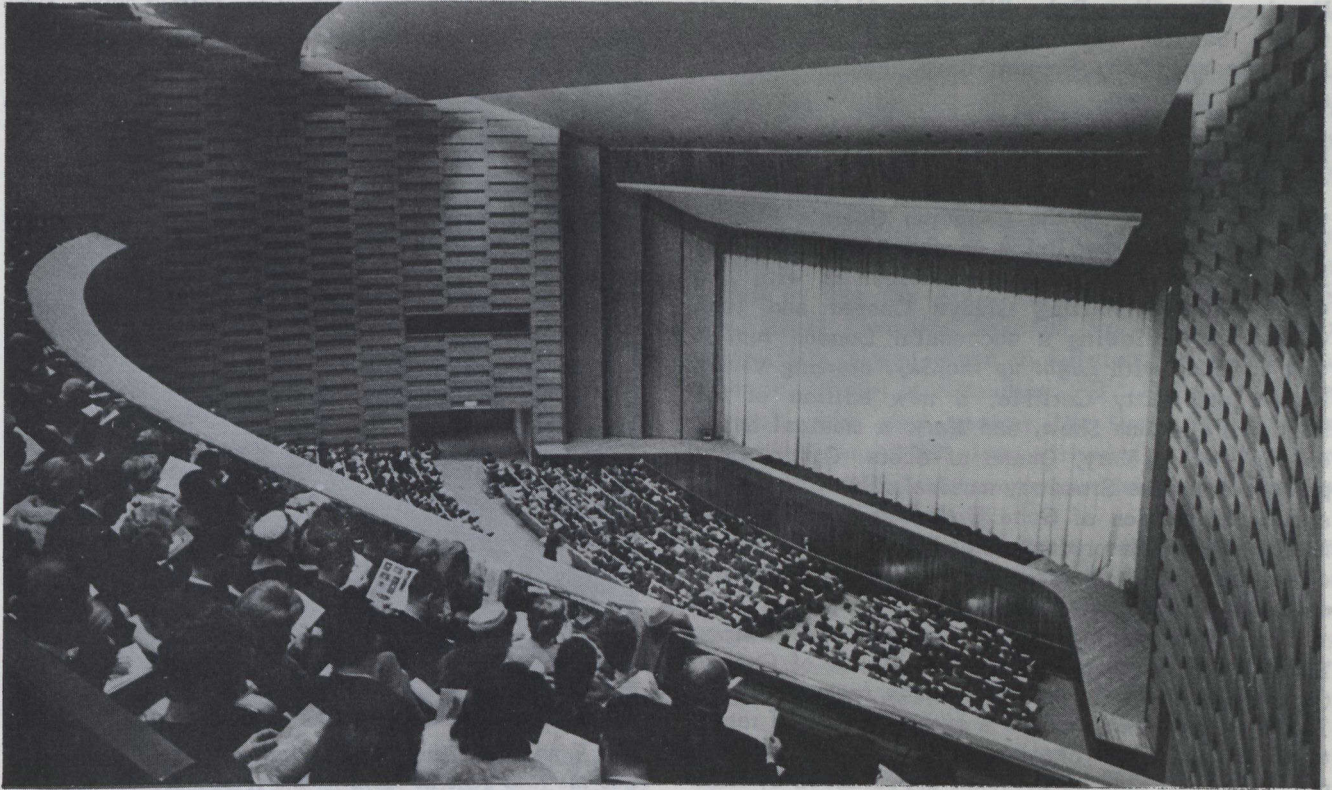
Ken A. Rowsell, project manager of the Herschel Island study conducted by the federal Department of Public Works into the practicability of establishing a marine oil terminal at the edge of the Beaufort Sea, points out that the most dramatic and exciting of the various proposed solutions to the oil transportation problem was the "Manhattan Project". This envisaged powerful icebreaking supertankers battering their way through the polar ice pack in the dead of winter on a clockwork schedule.

"Long before the *Manhattan* made her final Arctic cruise, the early optimism was clouded somewhat by the realization that the north coast of Alaska was far from being an ideal location for a deep-water terminal," Mr. Rowsell observes.

"On the shallow continental shelf fringing the north shoreline of Alaska, the required water-depth for large tankers does not exist at points closer to the shore than about 30 miles. A terminal at any location off this shoreline would therefore be in waters where vessels would be at the mercy of the permanent polar ice pack which continuously rotates in clockwise direction in the Beaufort Sea.

"No surface vessel has ever sailed these waters in the dead of winter and no structure has ever been built in them. The construction and dependable operation of an ocean terminal under these conditions is difficult to imagine, to say nothing of piping crude from the north slope some 30 miles under the ice-pack where the ocean-floor is deeply scored and gauged by drifting ice masses, whether they be ice-island fragments or pressure-ridge remnants.

"The only bright spot in this otherwise dismal



O'KEEFE CENTRE ELEVEN YEARS OLD

On its eleventh anniversary, the O'Keefe Centre in Toronto reports that the season just concluded was one of the most successful it has ever had since it first opened on October 1, 1960, with the world première of *Camelot*.

During the 46 weeks the theatre was open this season, three distinct box-office records were set. In the second week of a two-week engagement, Engelbert Humperdinck, established a new record last October with a box-office gross of \$148,927. In March, Katharine Hepburn topped the Humperdinck record with \$150,739 during the second week of her engagement in *Coco*, then promptly went on to establish another record during the third and final week, with a gross of \$171,674.

The 1970-71 season played to a capacity of 74 per cent, with such outstanding hits as the Royal Shakespeare Company's production of a *Midsummer Night's Dream*, the Pearl Bailey version of *Hello, Dolly!*, Des O'Connor in the London Palladium Show, Ruby Keeler in *No, No, Nanette*, and the New York City Ballet, as well as the regular seasons of the Canadian Opera and the National Ballet of Canada.

A total of 700,000 people, who paid out over \$3.5 million in admissions, attended the theatre between September 4, 1970, when the Canadian Opera opened its twenty-second season, and August 14, 1971, when Juliet Prowse concluded a two-week engagement in *Sweet Charity*. This is a record surpassed by only one or two theatres in North America.

A BACKWARD LOOK

In the first 11 years of its operation, O'Keefe Centre has housed more than eight million theatregoers who have paid \$32 million in admissions to see nearly 300 shows (not counting one-night rental attractions). It has presented most of the top musicals of the past decade — *Camelot*, *My Fair Lady*, *The Sound of Music*, *How to Succeed in Business*, *Illya Darling*, *Hello Dolly!* (three times), *Fiddler on the Roof* (four times), *Gypsy*, *The Unsinkable Molly Brown*, *Roar of the Greasepaint*, *Man of La Mancha*, *Cabaret*, *Coco*, *Sweet Charity*, to name just a few. It has offered Laurence Olivier in *Becket*, as well as in three plays by the National Theatre of Great Britain; John Gielgud and Ralph Richardson in *The School For Scandal*, and Gielgud again with Vivien Leigh in *Ivanov*, Alex Guinness and Kate Reid in *Dylan*; Richard Burton in the controversial *Hamlet*; Jessica Tandy and Hume Cronyn in *A Delicate Balance*.

Its stage has been filled by the Metropolitan Opera — both the big New York Company, and the smaller National Company; Britain's Royal Ballet, the Leningrad (Kirov) Ballet, the New York City Ballet, the Australian Ballet, the Ballet Folklorico of Mexico, the New York Philharmonic, the Cleveland Symphony, the Toronto Symphony, and the National Youth Orchestra.

Such international personalities as Harry Belafonte, Sammy Davis Jr., Marlene Dietrich, Judy Garland, Jack Benny, Diana Ross, Johnny Cash,

Maurice Chevalier, Duke Ellington, Al Hirt, Petula Clark, Sandler and Young, Rowan and Martin, Liberace and Tony Bennett have headlined variety shows of their own.

NEW SEASON

The 1971-72 season, which began on September 17, with the opening of the Canadian Opera's twenty-third season, is now lining up new attractions. The Subscription Series began on October 25 with *The Chalk Garden*, starring Gladys Cooper and Joan Greenwood, following a successful London run. It will continue with *Light up the Sky*, starring Vivian Blaine and Kitty Carlisle, a new edition of the London Palladium Show, and *Mary*, a musical based on the life of Mary, Queen of Scots. Other bright prospects are the Broadway musical, *The Rothschilds*; a musical version of *Gone With The Wind* (prior to New York), a new production of the *The Great Waltz*, direct from London, and a farce, also from London, called *Move Over, Mrs. Markham*.

Other attractions will include the Osipov Balalaika Orchestra, the National Ballet of Canada (presenting its traditional Christmas presentation of *The Nutcracker*, as well as a spring season of repertory), and a Brahms Festival by the Toronto Symphony. There will also be personal appearances by Liza Minelli, Charles Aznavour, Liberace, and others.

The O'Keefe Centre, built by the O'Keefe Brewing Company in 1960 at a cost of \$12 million, was presented as a gift to the Metropolitan Toronto Council during the summer of 1968. By the terms of the transaction Metro was to purchase the land on which the building stands over a ten-year period at the same price that the Brewery had paid for it ten years previously (\$2,750,000). Since then the Centre has been operated by a board of management as a public venture.

FIRST TELEPHONE OFFICE

"Canada's First Telephone Office, 1887" reads the inscription on a brand new plaque in front of the Henderson home at Tutelo Heights, Brantford, Ontario.

More than 100 persons gathered at the Bell homestead recently for the plaque unveiling by Mr. James W. Snow, Ontario minister without portfolio. "This simple frame structure, less than 100 years ago, was the cradle of our telephone business," Mr. Snow said.

The Henderson home, a two-storey white-frame building, was moved to the Bell homestead site three years ago. It was the home of the Reverend Thomas Philip Henderson, who retired from the ministry at the age of 62 in 1877 to help Professor Melville Bell establish the telephone business in Canada.

One of the first telephone men in the world, he became general agent for the Dominion of Canada; his home, a combined residence and religious library,

became Canada's first telephone office. The first telephone line was a direct connection with the Bell homestead.

The unveiling ceremony coincided with the official opening of a three-room display in the Henderson home depicting the evolution of telephone manufacture.



The Henderson home. The Reverend Thomas Henderson was the first general agent for the telephone. His home became the first telephone office in Canada.

The first two rooms of the museum house a copy of the original office and an early telephone exchange.

In the original kitchen and pantry is a display of telephone manufacturing development from the James Cowherd telephone factory (Canada's first manufacturer of telephones) to satellite communication systems. Included in this display is a section of the first wood-encased cable laid in Montreal. In the pantry is a model of the old Bell factory of 1882. There is a display of telephone sets from the original to a CONTEMPRAPHONE.

THREE GREAT TESTS

In the summer of 1876, in Brantford, young Alexander Graham Bell, inventor of the telephone, conducted three telephone tests.

In the first, on August 3, 1876, Alexander Graham Bell received the first successful telephone call between two communities, in the store of A. Wallace Ellis, Mount Pleasant, Ontario. Mr. Bell heard the words "To be or not to be", spoken by his uncle, Professor David Charles Bell, at the Brantford telegraph office.

The second test was made on August 4, 1876, when a large dinner party at the Bell homestead heard speech, recitations, songs and instrumental music from the telegraph office in Brantford over a line three and one-half miles long.

The third test is hailed as the first long-distance call ever made. The telephone inventor received it in

Robert White's boot and shoe store and telegraph office at Paris, Ontario on August 10, 1876. The eight-mile telegraph line from Brantford was extended 60 miles to make use of a battery supply in Toronto.

Many of the inventor's telephone experiments were made in Boston, which led to the claim that the telephone had been invented there. On this point there was no doubt in the mind of Alexander Graham Bell. He declared Brantford to be the telephone's birthplace and he said so publicly on many occasions. In an address before the Canadian Club in Ottawa on March 27, 1909, Bell said:

It was I who invented the telephone and it was invented wherever I happened to be at the time. Of this you may be sure, the telephone was invented in Canada. It was made in the United States. The first transmission of a human voice over a telephone wire, where the speaker and the listener were miles apart, was in Canada. The first transmission by wire in which the conversation was carried on reciprocally over the same line was in the United States....

COMMONWEALTH MEDICAL CONFERENCE

A three-man delegation, headed by Dr. Gaston Isabelle, Parliamentary Secretary to the Secretary of State for External Affairs, recently represented Canada at the Third Commonwealth Medical Conference, which opened in Mauritius on November 2 and ended on November 12. Other members of the delegation were Dr. B.D.B. Layton, Principal Medical Officer, International Health, Department of National Health and Welfare, and Dr. John Gill, Associate Director for Family Planning, Population and Health Services of the International Development Research Centre, Ottawa.

The purpose of the meeting was to extend relations and review the progress in the exchange of information between Commonwealth members in the development of their health services, especially in the case of emerging nations.

The Third Commonwealth Medical Conference was organized, in co-operation with the host country, by Commonwealth Secretary Arnold Smith of Canada. Earlier meetings of the conference were held in Edinburgh, in 1965 and in Kampala, Uganda, in 1968.

REGULARS CELEBRATE CENTENARY

Canada's regular land force observed its hundredth anniversary on October 20. On that day in 1871 the first of Canada's regular forces came into being when Militia General Order No. 24 authorized the formation of two batteries of garrison artillery to provide for the "care, protection and maintenance of forts, magazines, armaments and warlike stores recently or about to be handed over (by the British)

to the Canadian government in the provinces of Ontario and Quebec".

Under this order, "A" Battery School of Gunnery came into existence at Kingston, Ontario, with a detachment at Toronto, and "B" Battery School of Gunnery was formed at Quebec, with detachments at St. Helen's Island and Levis.

The activities of the batteries were not exclusively warlike. When in 1873 the Government decided to form the North West Mounted Police (later the Royal Canadian Mounted Police), the task of organizing it was given to Lieutenant-Colonel G.A. French, officer commanding "B" Battery. Colonel French, who also became the first commissioner, organized the NWMP along military lines, with a core of commissioned and non-commissioned officers of "A" and "B" Batteries.

Special observances were held in Canada on Armed Forces Day, last June 12, and on Dominion Day July 1, while in Europe, gala centenary celebrations were held by the First Regiment, Royal Canadian Horse Artillery, a direct descendent of "A" and "B" Batteries.

DRINKING-DRIVER SAFETY STUDY

The Minister of Transport, Mr. Don Jamieson, recently announced the awarding of a contract amounting to \$45,000 to Foundation of Canada Engineering Corporation Limited to conduct a roadside research project in New Brunswick to determine the effectiveness of safety programs aimed at "impaired" drivers.

During the next few weeks the Fredericton branch of the consulting firm will work in co-operation with the Province of New Brunswick and the Royal Canadian Mounted Police. Members of their research team will operate at locations along highways where police are stopping traffic for a routine check-up. Drivers will be invited to participate in the survey on a purely voluntary and completely anonymous basis.

The researchers will provide those participating with a list of some 40 questions concerning such things as whether they are wearing seat belts, when and where they began their trip, their destination, what type and quantity of alcoholic beverages they have consumed prior to and during their journey, and other related matters. They will be asked to take a breathalyzer test.

The police will have no involvement in the tests and the research team members will not assume any form of police duty.

The Ministry will use the findings of the survey in assessing the most effective means of reaching the motoring public with its safety programs aimed at increasing driver awareness of the dangers of combining driving with drinking alcohol.

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(Continued from P. 2)

picture was the knowledge that there was deep protected water close to shore near Herschel Island in Canada. However, the Canadian Government was fully aware of the situation in the western Arctic and, to protect the national interest, a reservation was placed on Herschel Island with the indication that any terminal there would be built by the Canadian Government.

"It was following this development that the Department of Indian Affairs and Northern Development asked DPW to investigate the feasibility of

constructing and operating a marine terminal in the Herschel Island area. At that time DPW was completing the construction of a marine terminal for supertankers at Point Tupper and was preparing to undertake the design and construction of one at Come By Chance in Newfoundland. Building such a facility in 90 feet of water under the best conditions is plagued with problems, building one in the Arctic would be just a little bit tougher."

The accompanying map shows the location of what Mr. Rowsell considers to be the four most suitable sites for location of marine oil terminal facilities: Herschel Basin, Babbage Bight, Horton River and Clapperton Island.

