

## NEW BREAKWATER DESIGN

The world's first perforated breakwater, developed by the Division of Mechanical Engineering of Canada's National Research Council, was officially opened at Baie Comeau, Quebec, in July. The inventor of the new design, which is literally as well as figuratively a breakthrough in breakwater construction, is G.L.E. Jarlan of NRC's Hydraulics Laboratory.

### ACTION OF SEAWALL

Baie Comeau, located on the north shore of the St. Lawrence River about 250 miles east of Quebec City, has a relatively rugged topography that makes it almost entirely dependent on water transportation. Such a location is greatly handicapped by the fact that a conventional breakwater under heavy wave action does not permit berthing. The new breakwater dissipates wave energy by a vertical seaward wall perforated with holes three feet in diameter backed by a "wave chamber." The wave energy entering the chamber is reduced by friction and turbulence; water spilling back out of the holes creates a counter wave that meets the next oncoming wave and reduces its force. The constant filling and emptying of the chamber reduces the wave action, providing a quiet harbour for ships berthed on the opposite side of the breakwater.

### SUITABLE FOR CARGO

Another advantage of the Jarlan breakwater is that its deck can be used for cargo handling. Decks of conventional breakwaters are often awash, since vertical run-up may reach twice wave height. The new type of breakwater reduces this run-up by almost 80 per cent, thus eliminating the "overtopping" hazard except in very severe storms.

The building-structures section of NRC's Division of Building Research is observing the behaviour of the new structure by carrying out measurements of the strains occurring inside the perforated wall that will provide information on the level and distribution of maximum stresses under wave action.

The design is being patented by Canadian Patents and Development Limited, a subsidiary of NRC, handling licensing of inventions for government departments, universities and provincial research councils. Patents have been granted in Britain and France, and are pending in several other countries.

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## FORESTRY MINISTERS CONVENE

At the first meeting of Canada's 11 forest ministers, held recently in Ottawa, it was unanimously agreed to be of the utmost urgency that Canadians become aware of the social and economic values of the forest community, so crucial to Canada's continued development.

It was the opinion of the ministers that a renewable resource supporting Canada's greatest single

free-enterprise industry, consistently accounting for almost a third of the total value of all Canada's exports, should receive, with the constitutional division of responsibilities, a much greater degree of sound attention and development at all levels of government.

### FEDERAL-PROVINCIAL AGREEMENTS

It was felt that the existing federal-provincial forestry agreements, covering inventory, reforestation, access roads, stand-improvement and forest-fire protection, had been more or less satisfactory up to the present, but that there was an urgent need for greater flexibility in their terms to permit wider provincial planning and an increase in the federal funds to be made available to the provinces.

The Minister of Lands and Forests of Quebec made it clear that, while his province was willing to consider renewal of its federal-provincial forestry agreement on the same general basis as before, any such renewal was subject to the reservation, already expressed on several occasions by Prime Minister Lesage, regarding all federal-provincial agreements.

### CO-ORDINATION OF RESEARCH

It was the opinion of the ministers that a great need existed for the co-ordination and increase of research efforts in the fields of forestry and forest products, economics, and protection against fire, disease, and insects. In the field of insecticides and biological control of harmful insects, the ministers recognized a special need and urgency for research.

More accurate inventory surveys of forest wealth are now urgently required in order to capitalize on possible future changes in world trading patterns.

It was also agreed that communication between those doing forest research and those using their results should be greatly strengthened and improved as between the federal, provincial and industrial organizations.

Recognizing that the country's forest industries were facing increasing and sophisticated competition in the markets of the world, the forest ministers agreed that forest programmes of research and management must be strengthened in support of the industry and that at all times the programmes must be related to the realities of economics.

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## GOLD PRODUCTION

Production of gold in August declined 2.7 per cent to 334,882 fine ounces from 344,097 a year earlier, reflecting decreases in four regions and increases in three. January-August output fell 4.6 per cent to 2,656,180 fine ounces from 2,784,226 in the same period of 1962.

August regional production was as follows: Atlantic Provinces, 1,512 fine ounces (2,045 in August 1962); Quebec, 77,229 (85,407); Ontario, 186,754 (193,106); Prairie Provinces, 9,663 (10,738); British Columbia, 12,138 (7,880); Yukon, 10,342 (9,830); and the Northwest Territories, 37,244 (35,091).