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Transportation on stage

The linkages of culture and commerce so important to the integrity of a nation are strained by distance, and Canada is a land of considerable distance. The area between Victoria and St. John's in which most Canadians live is a slender ribbon of water, mountain, plain and forest 8 000 km long and scarcely 300 km wide. For such a unusual national landscape, a reliable transportation system is an essential adhesive, and it is made more important by the northward path of our future, into a vast land of taiga and muskeg cut by rivers, dotted with lakes and hemmed by arctic seas.

It is fitting, then, that transportation — on land, water, and in the air — should be one of the earliest areas of research undertaken by the National Research Council, and the two Divisions set up for this work are open to the public this summer (June 21 and 22, 1981).

The Division of Mechanical Engineering (DME), located primarily in Ottawa but with an installation in Vancouver and an ambitious new Institute taking shape in St. John's, Newfoundland to ensure that we have the vessels to travel our ice-covered waters, looks into the problems of road, rail and marine transportation. The National Aeronautical Establishment (NAE), which grew out of DME two decades ago, uses its 10-odd Ottawa wind tunnels in concert with the Canadian aircraft industry to design, develop and test better, safer airplanes. Though both Divisions have other research projects, such as DME's industrial use of electron beam welding and NAE's development of a vertical axis wind turbine, transportation is a key area of endeavor, and the theme of this Open House.

For the unsuspecting visitor moving through these labs for the first time, some projects will be so abstruse that little can be learned, others will have equipment that seems out of the toyroom of some technological giant, and still others will appear, at first glance, to belong on the set of a demolition derby movie.

And all are necessary parts of these two large laboratories. If you want to find out how a new aircraft design will perform, or what effects modifications have on existing aircraft, then the best — and safest — approach is to use a wind tunnel. These instruments, ranging in size from the diameter of a waste paper basket to a truck-sized highway tunnel, blow air over an aircraft model, creating the same effect as driving it through the air. The same approach is used in the design and testing of ships and other marine vehicles, but here the models are tested in a towing tank or maneuvering pond. It all looks like good fun, these airplane, truck and ship models, but the complex array of computer-assisted control and data processing equipment that carefully record model behavior betray a much more serious end in view.

Safety and efficiency in transportation. The endeavor extends to aircraft de-icing systems, life-saving beacons that pinpoint air crash sites, and bird-proof aircraft windshields. Out at the Uplands site, full-size rail cars are squeezed, shaken and rammed to ensure that they meet exacting standards of safety. Other work involves engine performance tests, cable barriers designed to hold cars on the road, and methods of recycling expensive machine lubricants. A comprehensive list would run off this page without ever getting into the non-transportation areas of research in the Divisions.

To appreciate the full flavor of DME and NAE, this issue of Science Dimension carries two long stories which rely heavily on pictures to convey the nature and variety of the research. Each photograph tells its own story, so feel free to browse through the pages without regard to starting point. And, if in Ottawa during Open House, feel free to come in and look around. That's what Open House is all about. □

Wayne Campbell