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### LABORATORY WORK, NATIONAL RESEARCH COUNCIL

The National Research Council Laboratories (NRCL), which consists of ten laboratory divisions and the Space Research Facilities Branch, has a staff of over 2,000. The following excerpts from the report of the President for 1970-71 deal with some of the projects in which NRCL is currently engaged:

...The widespread use of snowmobiles as utilitarian and recreational vehicles has resulted in a new and significant noise problem. In an effort to determine the extent of this problem, the Division of Physics made a detailed study of the noise produced by 50 different snowmobiles.

The study showed that an average machine, when cruising, is as noisy as a dump-truck travelling at highway speeds. Many machines are as noisy as tractor-trailers or motor-cycles, yet few are as quiet as passenger-cars.

Experiments showed that a small reduction in noise occurred when the muffler supplied by the manufacturer was replaced by an efficient car-muffler. This test also showed that there are other sources of noise that become important once the

exhaust has been adequately muffled. These are the carburetor air-intake and the surface of the engine.

By attaching a car-muffler to the exhaust and an air-intake silencer to the carburetor and by extending the cowl to completely enclose the engine so as to contain the machinery noise, the loudness of the test vehicle was halved without significantly altering its mechanical performance. The noise produced at full throttle, when measured at a distance of 15 feet from the machine, was then 85dBA, which is the level recommended by NRC for legislation aimed at controlling the annoyance caused by snowmobiles in urban areas.

The study also showed that, for the average machine, the noise-level in the vicinity of the operator's ear is so high that the ability of the driver to hear warning signals such as a car horn is seriously impaired. More important, the operator of a snowmobile is exposed to noise of greater intensity than that, for example, experienced by weavers in a mill, who are known in time to develop an appreciable hearing loss.

The study recommends that regular users of snowmobiles wear ear-plugs to eliminate the risk of hearing damage, except when the machine is operated for less than ten minutes daily. For infrequent or recreational use, it is possible that substantially longer exposures to snowmobile noise could be tolerated. But, unfortunately, there can be no guarantees against noise-induced hearing loss until there is a reliable method of identifying in advance those individuals who are highly susceptible to this damage.

#### STUDY OF LUNAR MATERIAL

A new technique has been developed at the Atlantic Regional Laboratory in Halifax, Nova Scotia, for the study of glasses and metallurgical slags. The discovery of glass in the lunar material returned to earth by the *Apollo 11* astronauts in July 1969 opened a new field of study and, in September 1969, a formal

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