

agency in Ottawa with any laboratories or any personnel interested in or capable of conducting hydraulic model tests, tests of spillways, flumes, hydraulic structures, things of this kind.

Now, over the intervening years the situation has changed, but we still have a high degree of expertise in this field and we do serve to conduct experimental work where the job originates in, let us say, the Department of Public Works or the Department of Transport.

The financial arrangements for this are quite simple; we take it as a normal duty to work in this area but we cannot undertake something on a fixed budget where the cost may be proportionate to the amount of activity or the scale of the operation, so there is a procedure for using what is called a financial encumbrance whereby one department can make funds available to another department. In effect, one agency serves as a contractor to the other agency, and is reimbursed not necessarily for the whole of the cost, but for the open ended portion of the cost.

For example, we have worked with the Department of Energy, Mines and Resources and with the Department of National Defence on aero-magnetic survey work. This involved the flying of an aircraft and hence, depending on the number of miles flown by the aircraft, we would use up so much gasoline, lubricant, etc.

In such cases there is a cost that is proportional to the activity. We can be reimbursed from the financial encumbrance but not for the entire cost of the work, as we will have met a large part of it out of our own appropriation.

**Senator Robichaud:** A further question, Mr. Chairman: Now, in the case of, say where a department of the federal government or a provincial government might be involved, or even private industries like in the extraction or separation of minerals, for example, has the Council been asked in the past to take over such research?

**Dr. Tupper:** Mr. Chairman, we do undertake work for private companies or private individuals on a contract basis. This is a rather exceptional activity; it is mentioned specifically in our Act as something that we may, and perhaps should, do.

Normally we do not like to get our staff heavily involved with what you might call proprietary knowledge, that is where the cli-

ent is paying all of the cost and he gets all of the rights to use the knowledge. If a patent comes from the work, since he pays the full cost he can claim the patent.

We can therefore get ourselves in a situation where we might have let us say, engineers interested in the separation of pulp from water in the paper-making process where these engineers would find they were unable to talk to any company in Canada except the one for whom they were working and all the others would be literally fenced out of the laboratory, because the research personnel couldn't distinguish in their minds between the knowledge which their client or customer had paid for and that knowledge which you could say was the possession of the Crown by virtue of research work done which was funded by the appropriation.

We do, however, undertake work of this class, particularly where we have special facilities; for instance, the National Research Council has almost all the major wind tunnels in Canada. These have been made available since the early 1930s to the aircraft industry of Canada. The firms pay for work done in them. Had we not had these facilities there would have been a situation where every aircraft company might have had to provide its own facilities over the years. Many companies have come and gone. We have had Fairchild, Nordyne, Vickers—many aircraft companies that at one time were most prominent have subsequently disappeared from the scene, either by going out of business or through take-over and amalgamation.

Now, had it been necessary to provide with federal funds wind tunnel facilities for all of these companies we would perhaps now have a collection of obsolete wind tunnels strewn all across Canada from Vancouver to Montreal.

As it is, the federal Government has concentrated its collection of these facilities in one agency. The day may come when this is no longer wise policy; however, this is the policy at this time. Much of the work that comes to NRC from industry is due to the possession of a unique research facility, such as a wind tunnel.

**Senator Robichaud:** Thank you.

**The Chairman:** Senator MacKenzie.

**Senator MacKenzie:** Mr. Chairman, most of the questions I had in mind were covered by Senator Lang and Senator Grosart this morning, but I would just like to emphasize my