



Scientific Canadiana — At the National Museum of Science and Technology, NRC scientist Dr. Pierre Blais puts final touch on restoration of table-model transmission electron microscope.

Au Musée national des sciences et de la technologie, le Dr Pierre Blais, chercheur du CNRC, met la dernière main à la restauration du microscope électronique à faisceau transmis, modèle de table.

Preserving our scientific past Electronic microscopes find a home

When people talk about "history," they think first of the history of regions, communities, societies, organizations, people. Then most recall history in its cultural setting: history of music, history of art, literary history. Canadians have explored and documented these fields as they relate to Canada. But what about Canada's history of science? Can we afford to neglect it?

Two scientists with the National Research Council of Canada believe that science history should be recorded and are currently waging a battle to preserve some rare and valuable relics of Canada's scientific past. Helping to salvage and restore, at least in appearance, three of Canada's vintage electron microscopes are Dr. Pierre Blais and Dr. Peter Sewell of NRC's Division of Chemistry. This work is being done voluntarily, on their own time. The three scientific antiques — all donated — will probably form a display of electron microscopes to be placed in an annex to the Optical Microscopy Section of the National Museum of Science and Technology in Ottawa.

Electron microscopes come in two varieties called "transmission" and "scanning." The transmission electron microscope (TEM) depends on electrons passing through extremely thin

slices of matter and shows up the internal structure with magnifications of several thousand times and beyond. But it tells almost nothing directly about surface structure.

The scanning electron microscope (SEM) bounces a stream of electrons off the surface, as the beam sweeps up and down and from side to side. Simultaneously, electrons in the body of the object are dislodged and collected by the SEM. In this way, photographs of the surface can be obtained with up to 100,000 times magnification.

The prize catch is one of the first scanning electron microscopes ever made and the first assembled in North America. It is a 12-year-old SEM, assembled for the Pulp and Paper Research Institute of Canada and later modified and streamlined by the Institute where it did yeoman service. As its reputation spread, industries across Canada began knocking on the door of the Institute to see and use this scientific marvel.

Its demise was gradual but irrevocable. By 1968, its maintenance costs exceeded the price of commercial models. As a result, the old SEM was consigned to a storage shed and a new SEM was purchased as a replacement. Of this machine, the Museum received only the optical column and console, stripped of its electronic parapher-

nal. Dr. Blais brought it back to a "life-like" appearance — "cosmetic restoration" he calls it.

An early transmission electron microscope is another relic snatched from oblivion. Purchased by the Aluminum Company of Canada at relatively great cost in 1948, this time-honored TEM was perhaps only the fifth or sixth of its kind to be used industrially. It was in service until 1967, then stored until early 1970, when Dr. Blais requested ALCAN's Kingston Research Director, J. C. Millson, to put it on display. The TEM was supplied intact and is being restored to be potentially operable.

The third relic is a low-priced compact table model TEM meant for widespread use. It was the only one of its kind ever produced. This TEM was used by NRC for several years before being presented to Macdonald College in 1958. Dr. Sewell took charge of its almost complete restoration.

"If we neglect our scientific past, much of it that is rare and valuable quickly finds oblivion and is lost," says Dr. Blais. "Note that representatives of the British Museum were eyeing these early Canadian electron microscopes just as we became interested — and this is not an isolated case. For us, it turned into a race against time."