

A TRIUMF for the West

by Debbie Jones

Since Pierre Trudeau's official dedication ceremony for TRIUMF in February of 1976 enough time has passed for the public interest in the project to die down.

But the \$40 million Tri-University Meson Facility in Vancouver has not yet slipped into obscurity. It is still actively contributing to human knowledge of the environment, and there are presently over 125 active experimenters gleaming data from the products of TRIUMF's massive 6,000 ton cyclotron.

The research aims of the project, as outlined when it first began operating in 1974, were many and varied. One often-mentioned observation was that for the first time a facility would provide enough particles to simultaneously carry on many experiments by nuclear and solid state physicists, chemists, and medical scientists.

"The major reason for building this is man's curiosity to find out why, to delve into why things are," says Dr. Croydon Neilson, director of the Nuclear Research Centre at the U of A and an active researcher at TRIUMF.

Another general goal listed was to open up understanding of nuclear processes and contribute to long range exploitation of nuclear energy.

"People are often worried about how we are going to apply this" says Dr. Neilson. "But knowledge is the most valuable asset man has... it sets him apart from other animals."

He notes that "many people can see the medical benefits (of the research) in the short term." Short-lived isotopes of Iodine 123 can be produced within the facility, which may be of importance in safely diagnosing tumors in cancer patients. But Dr. Neilson adds, "I don't want to play up any medical aspects because I don't think it's as important as the research."

"I think most people do realize we have a choice. To make this place inhabitable we need energy... and the number of people makes it impossible to go back to the good old days and burn wood."

"There's no turning back beyond the animal world... man has to have energy."

"(Nuclear energy) is energy that can be controlled if man has the will to control it."

The notion of "TRIUMF" was conceived in the mid-1960s by scientists from three universities — the University of British Columbia (UBC), Simon Fraser, and the University of Victoria. The U of A became involved soon after the initial plans were started in 1965.

The broad definition of the facility at that time was "a new tool to provide better pictures of the microscopic world."

The "tool" works by producing mesons. It does this by letting protons collide with a block of copper. Mesons are particles with masses between protons and neutrons; and electrons, which atoms are composed of. They are often referred to as the "glue" that binds atomic nuclei together.

With beams of mesons, it is possible to explore the properties of atomic nuclei, in ways not possible using other types of beams.

TRIUMF has so far been used in experiments on nuclear forces, treatment of cancer, and the non-destructive analysis of materials — in field from en-

research improvement of nuclear power systems.

TRIUMF's five years of operation have not been entirely trouble-free. Two of its teething problems that received attention from the press occurred in 1975 and 1976.

The first one involved a stuck valve. Liquid nitrogen at -380 degrees Fahrenheit poured from the faulty valve, causing parts of the structure to crack.

The following year, the facility was closed for more than a month. Mechanical problems had caused overheating, and some components had melted.

But to date, no really major problems have come up. Dr. Neilson says TRIUMF "is not like a reactor at all. It's more like your X-ray machine."

Seventeen feet of cement shield researchers working with the machine. "They're unfriendly machines when they're turned on," says Dr. Neilson. When asked if it is dangerous, he replied "The pat answer would be 'No', but that's not correct. We don't know. Anything that generates large amounts of energy can be hazardous to your health."

He adds, "The whole universe is radioactive, whether people like it or not. From the soil to the sun."

The building of TRIUMF was funded jointly by the universities (5,650,000) and the Atomic Energy Control Board of the federal government (the rest, to total \$40 million.) UBC donated the land, which is located on campus, separate from the other buildings.

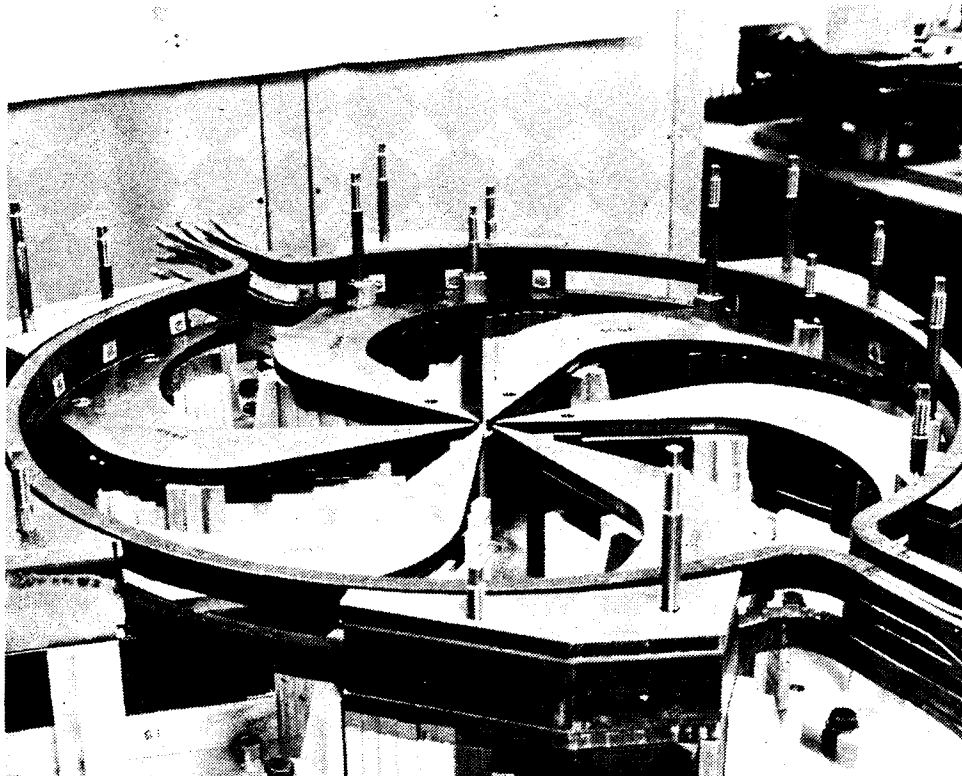
The restraint now being imposed by the federal government on many programs is making "life difficult" for

TRIUMF right now, says Dr. Neilson. In addition, inflation and the difference between the U.S. and Canadian dollar are causing some problems.

Another malady of TRIUMF right now is a shortage of new researchers. Physics students are "fewer now than a few years ago" says Dr. Neilson, attributing this at least partly to the press, which he thinks "has managed to make nuclear research symbolic with bad things."

Nuclear research is what occupies most of Dr. Neilson's time. Some days, he says cheerfully, he rises at 6 a.m. to catch a plane to Vancouver, works at TRIUMF all day, and returns to Edmonton on the 11 p.m. plane back. After finally getting to bed at 3 a.m., he has to rise again early enough to give a lecture on campus at 9 a.m. His reasons for doing it are simple enough. "I am curious — I am a curious animal" he says. "I want the answers."

He notes that Canada does not do nearly enough research for its size, and says "Research and culture are all linked together — it's a cultural thing, an extension of our daily functions into a sphere that is not essential."



The bottom half of a 1/20 scale model of the TRIUMF magnet. View shows the contours of the magnet sectors.

photo courtesy University Community Relations Office

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