

Remember When...

Connaught and the Canadian Polio Vaccine Story

Forty years ago the most eagerly anticipated event in medical history reached a climax. The 1954 field trial, culminating in the licensing of the Salk polio vaccine, was the largest medical experiment ever undertaken. Close to two million children across the United States and parts of Canada and Finland were involved in this trial, which was orchestrated by the National Foundation for Infantile Paralysis (NFIP), better known as the U.S. March of Dimes. Without Connaught's "Herculean" effort, as Salk described it, there would not have been a trial, or a practical vaccine in the first place.

Beginning in 1947, **Dr. Andrew J. Rhodes** (1911-1995) led a comprehensive polio research program at Connaught. With a research team that included long-time employees **Frank Shimada** and **Eina Clark**, along with researchers at the Hospital for Sick Children, **Rhodes** investigated the complex problems of polio's epidemiology and diagnosis. This work was funded by Canadian Life Insurance companies and Federal Public Health Research Grants, though more quietly by the U.S. March of Dimes.

Dr. Arthur E. Franklin, tried a new synthetic nutrient base known as "Medium 199," which was developed at Connaught between 1947 and 1949 by **Dr. Joseph E. Morgan** (1918-1976) and **Helen J. Morton** under the supervision of **Dr. Raymond C. Parker** (1903-1974), a leading international authority on tissue culture techniques.

Jonas Salk was confident that an inactivated vaccine could prevent polio in humans as it seemed to in monkeys. However, it was not yet safe for human trial, nor could he make enough for the millions who were clamoring for protection from the dreaded cripple. Connaught solved both problems. Medium 199 provided a chemically pure culture base, which encouraged the NFIP to finance a major pilot project at Connaught to cultivate the poliovirus in large quantities. In 1952-53, this effort led to the "Toronto Method," developed by **Dr. Leone N. Farrell** (1904-1986). It involved culturing the poliovirus in a solution of "199" and monkey kidney cells using large Povitsky bottles incubated on a special rocking machine.

In 1952, Connaught's "199" gave **Salk** confidence to finally test his vaccine on

children. By July 1953, just as Canada's worst polio epidemic began, the NFIP asked Connaught's Director, **Dr. Robert D. Defries** (1889-1975), to provide all the poliovirus fluids required for a national field trial of **Salk's** vaccine. In total Connaught produced some 3,000 litres of poliovirus fluids for the trial.

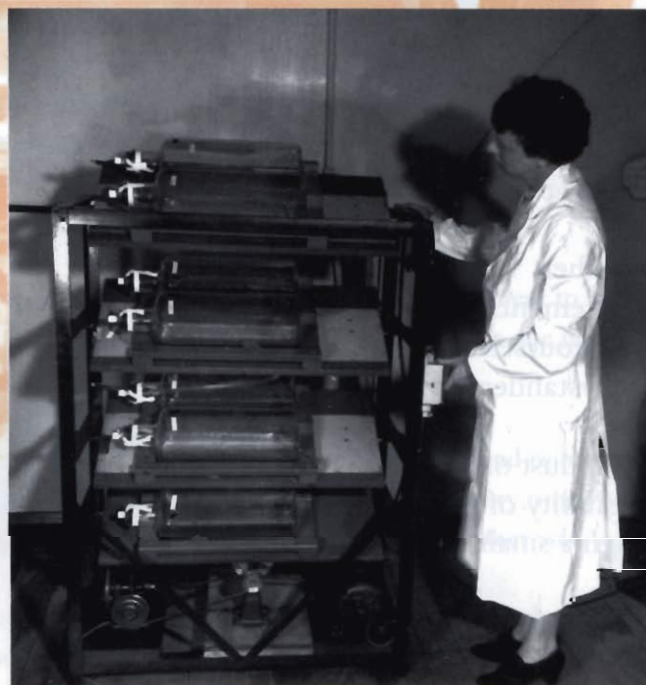
After a number of delays, the mammoth experiment began on April 26, 1954, involving some 1,800,000 children who were given the vaccine, or the harmless "199" as a placebo, and were observed to see if they contracted polio. On April 12, 1955, the announcement of the trial results became an international media event. After being immediately licensed by Washington, American commercial producers rush-released the vaccine, but with little government control.

The Canadian trial was just starting, by the end of April, however, the public euphoria over the vaccine was shattered when some 80 polio cases were directly associated with vaccine made by Cutter Laboratories in California. This forced Cutter's vaccine off the market, and then the cancellation of the entire vaccine program by the U.S. Surgeon General. In Canada, the Minister of National Health and Welfare, **Paul Martin**, faced his most difficult political decision: what should Canada do? The Prime Minister was reluctant to let the Canadian trial to continue, but based on Connaught's long experience with the vaccine, **Martin** maintained his confidence. The vaccine had not yet caused any problems in Canada and vaccinations continued without incident.

The success of the Canadian program played a major role in ensuring the future international use of the IPV vaccine in the control of polio. Subsequently, Connaught's pioneering work continued with the development of DPT-Polio and related combined antigens.

*For further details on the Canadian polio story see: **Christopher J. Rutty**, "Do Something!... Do Anything!" Poliomylitis in Canada, 1927-1962," (Ph.D. Thesis, University of Toronto, 1995), which is available in the Connaught Library (RC180.R85). This study is being revised for publication by the University of Toronto Press.*

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A key contribution to the Salk vaccine was the "Toronto Method" of large-scale poliovirus cultivation. It was devel-

oped in 1953 by Dr. Leone N. Farrell, shown here with the prototype bottle rocking machine. (Acc. No. 0438)