

**DEFENCE RESEARCH IN 1956.** A number of worthwhile accomplishments highlighted an eventful 1956 for Canada's defence research organization.

One outstanding event was the Board's participation in British-Australian atomic trials in Australia. A group of Board scientists carried out a wide range of scientific measurements and tested items of Canadian equipment.

The Hon. Ralph Campney, Minister of National Defence, announced modification of the Board's programme involving the development of an air-to-air guided missile for the RCAF. Although Velvet Glove, the weapon under development, was on schedule and up to the time of the announcement had fully attained its original specifications, the appearance of bombers with much increased performance made it appear desirable to change the production programme in favour of a more advanced missile.

Six years ago, little or no knowledge of this new weapons field existed in Canada. The Velvet Glove programme had succeeded in training several hundred scientists and engineers, Service technical officers and industrial specialists in the techniques of missile design and development, production and testing. It created permanent research and development facilities worth approximately \$7,000,000 to serve many of the requirements of advanced weapons' research for many years. Finally, the necessary tools and specialized equipment acquired now provide Canada with the basic elements of a guided missile industry.

**RADICALLY NEW METHOD**

The Naval Research Establishment (NRE), of Dartmouth, Nova Scotia, provided details of a radically new method of electroplating copper on aluminum. The technique, which promises to permit a wider use of aluminum in the electrical field, stemmed from anti-corrosion studies at the Board's Atlantic coast establishment. Copper plated aluminum wires can be soldered readily and assume copper's other favourable properties.

The scientists consider that employment of their technique will range from a wider use of aluminum in the home appliance field to copper plated aluminum wiring in aircraft, ships, automobiles and buildings.

The Radio Physics Laboratory (RPL), one of two research units comprising the Defence Research Telecommunications Establishment (DRTE) at Ottawa, released some details of a promising new communications technique which employs meteor trails to transmit radio messages over long distances. Called JANET, the development originated with an RPL team led by Dr. Peter A. Forsyth, formerly of Saskatoon.

The radio signals are reflected to a far-distant receiver from the ionized trails of the numerous tiny meteors which occur approximately 60 miles above the earth's surface.

Because each meteor, some the size of a pin-head, can be used for about a second, transmission takes place in short bursts at very high speeds. Incoming information is stored and printed at normal speeds during the intervals between transmission bursts. Experiments have proved that signals can be transmitted clearly and safely for distances of up to 1,000 miles despite the atmospheric phenomena that frequently affect normal telecommunication methods adversely.

**"DAWN CHORUS"**

The same laboratory described an intriguing research programme involving "whistlers" and the "dawn chorus", puzzling outer atmospheric phenomena. Studies of the former have led to important discoveries about the earth's upper atmosphere in the past.

It was found they are caused by lightning flashes which emit low frequency waves. The electrical waves are amplified into sound waves audible to humans which can provide science with valuable data about the upper atmosphere. These studies are particularly important in the field of communications' research.

The "dawn chorus", which sounds like the twittering of thousands of small birds, has yet to be explained.

Scientists from the same establishment assisted United Kingdom Ministry of Supply associates and RAF technical officers with trials on a new aircraft-telephony system developed in the United Kingdom.

Called the Single Side Band (SSB) system, the development permits aircraft to maintain reliable voice contact with a central control point despite distances of thousands of miles. Employing only a narrow portion of the spectrum, it permits a wider use of signal power and economies in the use of already crowded radio frequencies. The DRB-assisted trials were carried out on UK-Ottawa-Vancouver flights with the Board's Shirley Bay site near Ottawa a combination transmitter-receiving station.

The Defence Research Medical Laboratories (DRML) at Downsview, Ontario, announced the development of a new technique for dehydrating meat, fowl and fish with promising military and civil implications. The time required by conventional dehydrating methods is lessened materially by the use of heated aluminum or stainless steel spikes distributed evenly throughout the product being processed. After rehydration and cooking in the normal manner, the products are both tasty and tender.

The installation and operation of a low turbulence water tunnel, the only one of its kind in Canada and an unusually useful research facility employed to probe the movements of the sea as the latter affects ships, took place in 1956 at the Pacific Naval Laboratory (PNL) at Esquimalt, British Columbia.