Recent achievements of this important body include the development of a storage battery for starting engines in a cold climate which reduces the efficiency of lead batteries. Studies have been made to determine the behaviour of petroleum products at low temperatures and to provide protection from the ravages of biting flies. Physiological studies are being carried out also to determine the load that can be carried most effectively by a soldier or airman in the north and the amount of equipment required for survival and operations. Scientists have devised nylon "fur" for Arctic clothing and gas masks that do not fog in the cold. Every study is directed to the goal of attaining the highest efficiency possible for our defenders under winter conditions.

Effective air defence requires adequate detecting apparatus, adequate communications and adequate attacking power to seek out and destroy invading planes.

I have touched on the detection of enemy aircraft and on communication of that information to defending forces.

As for fighter aircraft to meet and destory invading planes, the United States has types suited to its needs based on operations of relatively short distances from base - interceptor fighters in the usual sense of the word. Canada, by reason of the vast distances in its northern areas, climatic conditions and other special circumstances, required an all-weather, long-range fighter with rapid climb and superior manoeuverability and an armoury of varied heavy weapons. No such aircraft existed, so we in Canada developed one - the CF 100. So far as we know, no other country in the world has an aircraft that can match it in its chosen field. It is now in steady production and dquadrons are being formed as rapidly as crews can be trained to man them.

Operations in the northern defence area pose many problems - many difficult problems. During most months the climate is terribly severe. There is the continual interference of the auroral belt with electric communications. There is the question of accessibility over the hundreds of thousands of square miles of frozen waste. Everything required for construction and operation in the area has to be brought in either by ice-breaker convoy during one - I repeat, one - month of the year, or be flown in by aircraft - or both. Construction costs are six to ten times greater than normal and maintenance costs are almost beyond comparison.

I could perhaps give you an idea of some of these problems by giving you a very brief sketch of what is involved in supplying one weather station in the Arctic - a station manned by nine men. To support one of these stations requires some 400 tons of supplies a year: aviation fuel, fuel for heating, food, and sundries. These 400 tons have to be taken from the United States or Canada by ship, accompanied by ice-breaker and tanker to arrive in the Arctic during one month of the year - mid-July to mid-August--when delivery is possible at a far northern base. Hundreds of stevedores and other workers have to be taken along to speed delivery at that base within the short time available. At the base, stone and gravel jetties have