

In this connection it might be interesting to mention something of the studies that have been made of wind chill - which results from wind carrying off body heat. In Ottawa we know what that is round about the corner of Elgin and Sparks any month of January. A method has been worked out to measure cold taking wind as well as temperature into account. A rough scale has been worked out by a U.S. scientist, Dr. Paul Siple, who determined that flesh freezes at a wind chill of 1,400. This might be arrived at by one of any number of combinations of temperature and wind. For instance, 20 above with a 20 mile-an-hour wind or 15 below with a 2 1/2 mile-an-hour wind or 40 below and a one-mile-an-hour wind. You can see from this what a tremendous difference the wind makes. Last winter's greatest wind chill at Churchill was 2,370, and it was greater than 1,400 most of the time.

Every kind of test has been made of fuels and lubricating oils and general performance of various types of planes and vehicles, particularly the development of vehicles suitable for travel over both snow and muskeg. Lubricants light enough to resist freezing or even make starting feasible, lose their lubricating usefulness once the engine reaches operating temperature. It has been determined that some sort of pre-heating is probably the best method of starting. That means a big gasoline heater to blow hot air around the engine.

A good many experiments have been made with the food used in the north. Containers, preparation, nutritive value, all present problems. It may be found as a result of experiments done last winter that extra quantities of vitamin "C" give extra resistance and fuel value in very cold climates.

Experiments are being conducted in connection with the permafrost and muskeg and conditions generally affecting building. Permafrost is a term for the permanent frozen earth. In the summertime it thaws for two to five feet on the surface, below that there is a solid freeze to an unknown depth, probably well over 200 feet. This creates difficult construction problems because the top layer heaves and cracks when it thaws. The balance is upset when warm air is introduced by sinking foundations in the permafrost. Thus telephone poles have to be built on tripods which sit on top of the ground. The best system for buildings so far found has been to put down a heavy layer of gravel on top of the muskeg and build directly on this.

A very intensive attack is being made on the mosquitoes and black flies that make life in the Arctic almost as bad in the summer as in the winter. During the months that Churchill is not frigid and windy, it is infested with 10 varieties of mosquitos, 6 of deer flies, and 15 of black flies. This year 8 Canadian and several American teams are working in conjunction to see how this scourge can best be overcome. Tests have been made to determine the habits of the insects by coloring with dyes, to study their habitat by counting their incidence in zones of different colours of vegetation, to see how wide areas have to be sprayed and what kind of material should be used, and at what time. One interesting experiment was to spray a substance like DDT from the air over the snow just before it melted. This may turn out to be more effective than creeping up on the mosquito after he has come out of winter quarters to start off again on summer operations.

Water supply problems have been studied. Most of the lakes freeze solidly to the bottom. Steam jets have been found the most effective means of cutting the ice. How do you produce the steam? The best way is with large pressure stove burning 100 octane gasoline.