boom is due to the exhaustion of this process. It is truer to say that the depression comes because consumption is too urgent than because it is not urgent enough. We do not "starve in the midst of plenty" because we do not demand enough; we starve because, having forced the tree of

prosperity, we seek to pluck its fruits before they are ripe.

It may be added that a more elaborate critique of proposals substantially similar to those of Major Douglas will be found in "The Paradox of Saving" by F. A. von Hayek in *Economica* of May, 1931.

Canadian Polar Year Expedition, 1932-33

CANADA'S part in the International Polar Year is to establish a chain of stations not more than 1400 km. apart, connecting Greenland with the United States station at Fairbanks, Alaska, and to provide special magnetic equipment at Meanook, the nearest permanent magnetic observatory to

upper air observations, with twice-daily pilot balloon ascents, will be continued throughout the year. The auroral programme will consist of visual observations at specified hours, and as opportunity occurs photographs will be taken. The station is in charge of Mr. J. E. Lilly of Acadia University,

FIG. 1.—International Polar Year stations in North America and Greenland. ○, Canadian telegraph stations; ●, Canadian Polar Year stations specially equipped and manned; ⊙, British expeditions; ⊗, United States stations specially equipped and manned; ⊠, Danish stations.

the north magnetic pole. For this purpose three expeditions have been sent out, the first to Cape Hope's Advance in Hudson Straits, 1000 km. from the nearest station in Greenland; Chesterfield Inlet on the west coast of Hudson's Bay, 1200 km. away; and finally Copper Mine on the Coronation Gulf, 1300 km. to the west, and a little more than 1500 km. from Fairbanks, Alaska. The accompanying map (Fig. 1) shows the position of these stations, as well as the regular meteorological stations in northern Canada. It may also be mentioned here that at these stations there are well-equipped wireless stations, so that communication can always be obtained with the outside world.

At Cape Hope's Advance, lat. $61^{\circ} 5' N.$, long. $69^{\circ} 33' W.$, complete surface meteorological and

assisted by the radio operators at the station. Cape Hope's Advance is situated on a fairly high promontory extending out into Hudson Straits, and at times very high wind velocities are obtained, the most notable being above one hundred and thirty miles an hour for one hour, and above one hundred miles an hour for several hours continuously. The temperature averages about fifteen below zero in January, while in the middle of summer it has exceeded 70° . Rainy days are frequent in June and August, frequently accompanied by fog with snow in any month of the year.

Chesterfield Inlet.—The principal Canadian station is at Chesterfield Inlet, lat. $63^{\circ} 45' N.$, long. $91^{\circ} 50' W.$, about four hundred and fifty miles from the north magnetic pole, this being the

nearest magnetic station to the pole that will be established in this international undertaking. The party is in charge of Mr. F. T. Davies of McGill University, who has had extensive experience in magnetic work on the Byrd expedition in the antarctic. He will be ably assisted by Prof. B. W. Currie of the University of Saskatchewan, Mr. Stuart McVeigh of Queen's University, and Mr. John Rea as assistant observer.

A complete set of Lacour self-recording magnetic instruments comprising nine variometers and three recorders will be installed, together with a Smith portable magnetometer, an earth inductor, and a Carnegie declinometer with absolute measurements. Advantage will also be taken of this to measure earth currents with a very complete earth current equipment. The auroral programme provides for two stations about 30 km. apart connected by radio, to measure the height of the aurora, and a McLennan night spectrograph to obtain photographs of the visible and infra-red portions of the spectrum. A complete log will be maintained of auroral phenomena, and its approximate intensity measurement with a pocket spectroscope.

As opportunity occurs, the atmospheric potential gradient will be measured by means of ionium collectors and the Patterson electrometer.

The meteorological equipment provides for full surface meteorological observations, pilot balloon ascents twice daily, kite flights as weather permits, and, on the international days, visual signalling meteorograph ascents. Continuous record of the difference in temperature between the top of the radio mast forty-five metres above the surface and the surface will be made with special thermocouples. At the same time an electrical resistance recording thermograph will give the temperature of the air at the four-foot level, and a Robitzsch bimetallic actinograph and a sunshine recorder will be utilised for radiation measurements. A range-finder has been included in the outfit to obtain the height of the cloud as frequently as possible, and the cloud observations will be made according to the programme of the International Cloud Commission. The radio operators at Chesterfield Inlet are entering very enthusiastically into the work also, and are lending very valuable assistance to the party. July is the warmest month at Chesterfield, with an average temperature of about 48°, while the coldest months are January and February, when the temperature goes to an average of 26° or 27° below, the lowest recorded being 55° below zero.

At Chesterfield Inlet there is a Roman Catholic mission which has a very fine hospital attached, a radio station, Hudson's Bay Mounted Police, and at times a doctor is stationed at the Inlet.

Copper Mine.—The third station in this chain is Copper Mine, lat. 67° 42' N., long. 115° 30' W., and will be in charge of Mr. R. C. Jacobsen of the University of Toronto, assisted by Mr. D. R. Kinnear and A. V. Potruiff, radio operators. It will be the most important meteorological station in the system, and situated as it is on the Arctic Ocean about midway between the Atlantic and Pacific, it gives an exceptionally good opportunity

to observe the influx of polar air from the arctic regions. At this station the same meteorological programme will be carried out as at Chesterfield, but in addition the Moltchanoff radio meteorographs will be used on international days, and besides recording the temperature at the top of the radio mast and at the four-foot level, it is hoped to make a special study of the cooling effect of the long winter nights and the temperature inversions.

The auroral programme will be the same practically as at Cape Hope's Advance. Visual observations will be made at definite hours and photographs taken as opportunity occurs. The meteorological station at Copper Mine has been in existence for about two years; during this time, average temperature in January is about 30° below zero, and on six occasions it fell below 40° below zero. The snowfall at Copper Mine is apparently very light, only two or three inches being recorded up to the end of January, while light rainfall occurs in April, and fairly heavy rain in July and August. This station is at the mouth of the Copper Mine River on Coronation Gulf, and is slightly north of Great Bear Lake.

Fort Rae.—Fort Rae is north of Great Slave Lake. It was the only continental station in Canada operated during the First International Polar Year, and is again occupied by the British. It is about three hundred miles due south of Copper Mine, and forms with the Canadian stations a most valuable link in the network of stations across the arctic this year. Through Fort Rae the Canadian stations are also connected with the permanent magnetic observatory at Meanock, lat. 54° 37' N., long. 113° 21' W., where a complete set of Lacour recording instruments have been installed. This magnetic station is the nearest permanent magnetic station to the north magnetic pole, and will be in charge of Mr. Vestine of the University of Alberta, with Mr. H. E. Cook as the magnetic observer. In addition to the magnetic work, auroral and meteorological observations will be taken as opportunity occurs.

All the Canadian stations in the arctic shown in Fig. 1 will take special meteorological and visual auroral observations. They have been furnished with a Lacour pocket spectroscope, in order that the intensity of the aurora may be estimated approximately.

It is a very great pleasure to acknowledge the loan of special equipment for this purpose from the United States Weather Bureau, the Carnegie Institution of Washington, the University of Toronto, McGill University, the Topographical Survey of Canada, the Dominion Observatory, the University of Saskatchewan, and the Department of National Defence.

The Canadian stations are among the pivotal stations envisaged in the programme of the International Polar Year Commission. The observations obtained during the present twelve months in meteorology and terrestrial magnetism at these isolated outposts in northern Canada promise to supply information long desired both by Canadian scientific services and by many investigators in geophysics.

J. PATTERSON.