

REVIEW ARTICLE

THE UPPER AIR OVER NORTHERN CANADA

AEROLOGICAL DATA FOR NORTHERN CANADA. By T. J. G. HENRY and G. R. ARMSTRONG. *Toronto: Dept. of Transport, Meteorological Division, 1949. 11 x 8½ inches; 271 pages; maps and diagrams. 75 cents.*

It is a pleasure to record the publication of a major contribution to the climatology of the Arctic. The Canadian Meteorological Division has collected and analysed the results of the first few years of upper air sounding at stations in Northern Canada. The report, 'Aerological data for northern Canada', written by T. J. G. Henry and G. R. Armstrong, is by far the most significant document yet published on the climate of the Canadian Arctic, which has been closed territory until quite recently for all but surface observation.

Henry and Armstrong have followed traditional lines in the preparation of their report. After a thorough analysis of the accuracy of their methods, they discuss at length the normal state of the atmosphere over Northern Canada. Their account is illustrated by a series of normal temperature and pressure maps for four months (January, April, July, October) and at four levels (850, 700, 500 and 300 millibars, or roughly 5, 10, 18 and 30 thousand feet). In accordance with latest aerological practice, the charts are drawn for standard isobaric surfaces, the topography being shown by contours indicating dynamic heights. In the free atmosphere, the prevailing winds blow parallel to these contours, at a speed proportional to the local gradient; the maps therefore show at a glance the normal pattern of flow up to the base of the stratosphere. They cover the whole Dominion north of 50°N.

Of special interest is the authors' review of the characteristics of the Arctic tropopause. It has been reported¹ that no clear cut division of the atmosphere into troposphere and stratosphere can be attempted for a considerable winter period in the Antarctic. Henry and Armstrong find evidence for occasional marked stability in the upper troposphere, but cannot find any true parallel for the disappearing tropopause discussed by Court. The average level and physical characteristics of the tropopause are given for all months at all the stations analysed, and the tropopause appears as definite in winter as in the other seasons.

The general discussion ends with an attempt to fit the work described into the new ideas about the atmospheric circulation recently developed in the University of Chicago by E. Palmén and others—the "jet stream" hypothesis. This attempt is the least successful part of the report, probably because the jet stream has not yet won for itself a secure enough place nor a rich enough professional vocabulary in which to discuss it easily. The authors give the impression that they would have been happy to prove a closer relationship than they could actually manage.

The tables at the end of the report occupy no less than 229 pages. They give (i) average surface conditions for each month, (ii) upper wind summaries to 8 km. (26,247 ft.) from pilot balloon observations, and (iii) monthly averages of radiosonde data, i.e. pressure, temperature and humidity, to the upper limit of ascent, tabulated in individual years, with whole period means. The radiosonde data are further illustrated by uniform temperature-height diagrams, on which extreme values as well as averages are plotted. The stations used are in part Canadian, in part U.S. operated, but most of them are Canadian operated with U.S. radiosonde equipment, a very happy team arrangement. In view of the value of the data, it is worth while listing these stations in this review.

¹Court, A., "Tropopause disappearance during the Antarctic winter," *Bull. Amer. Met. Soc.*, Vol. 23 (1942) pp. 220-238.

STATION	RADIOSONDE DATA	PILOT BALLOON DATA	OPERATED BY	TYPE OF RADIOSONDE
AKLAVIK.....	Sept. 42-Aug. 47	Jan. 44-Feb. 47	Can.	Can.
FORT NELSON.....	Mar. 42-Aug. 47	Jan. 43-Feb. 47	Can.	Can.
PORT HARRISON.....	Oct. 43-Aug. 47	Nov. 37-Aug. 47	Can.	U.S.
CLYDE RIVER.....	Jan.-Feb. 43; Apr.-Aug. 45	—	U.S.	U.S.
UPPER FROBISHER BAY....	Mar. 43-July 47	Mar. 42-Nov. 43	U.S.	U.S.
FORT CHIMO.....	Jan. 44-Dec. 45	Nov. 41-Oct. 43	U.S.	U.S.
ARCTIC BAY.....	Apr. 43-Aug. 47	Nov. 43-Aug. 46	Can./Nov. 43	U.S.
CHURCHILL.....	June 43-July 47	Sept. 45-Aug. 47	Can./Aug. 45	U.S.
CORAL HARBOUR.....	Nov. 43-Oct. 47	Oct. 45-July 47	Can./Sept. 45	U.S.
FORT SMITH.....	Dec. 43-Aug. 47	Dec. 44-Feb. 47	Can./Dec. 44	U.S.
NORMAN WELLS.....	Mar. 44-Aug. 47	Jan. 45-Oct. 46	Can./Jan. 45	U.S.
WHITEHORSE.....	July-Dec. 44; May 46-Aug. 47	Jan. 44-Jan. 47	Can./May 46	U.S.
CHESTERFIELD.....	—	Jan. 44-June 48	Can.	—
FORT SIMPSON.....	—	Jan. 45-Feb. 48	Can./Dec. 44	—
HAY RIVER.....	—	Dec. 44-Jan. 47	Can./Nov. 44	—
WATSON LAKE.....	—	Jan. 44-June 48	Can.	—
YELLOWKNIFE.....	—	Jan. 45-Nov. 47	Can.	—

This report will be of value to engineers, aviators, and the Services generally. Its greatest value, however, is scientific, and the Canadian Meteorological Division and the Defence Research Board have, by this publication, made a most valuable contribution to our knowledge. We may hope that it is only the first of a series of such studies of various aspects of the Canadian North. There is probably no region in the world so well worth studying. It is refreshing, too, to note that, in spite of the official character of the report, credit can be given to the authors by name for their distinguished work and it is to be hoped that this practice will be followed in the future.

F. KENNETH HARE

REVIEWS

FRANKLIN OF THE ARCTIC.

By RICHARD S. LAMBERT. *Toronto: McClelland and Stewart, 1949. 8 x 5½ inches; 338 pages; illustrations. \$3.50.*

I believe the publishers have done Mr. Lambert a disservice in stating that this tale is told for youngsters and "will enrich the classroom." If certain liberties with unwitnessed situations and a simplicity of style make this a children's book, then it is a pity that more biographies of adventurous men are not written in this way. 'Franklin of the Arctic' is a full and stirring story of the life of the discoverer of the Northwest Passage, from his boyhood to his death on board the imprisoned *Erebus*. Only a few errors mar the essential accuracy of the account. On page 191 for instance George Back's gallant trip to obtain extra food was not

carried out alone; on p. 308, McClure's ship did not drift right through the Passage but was abandoned on Banks Island whence he continued by sledge, and last, on the same page the British Government's expenditure on the Franklin search was a thousand-fold less than stated. This unfortunate error has been seized on as marvellous by another reviewer of this book—indeed it would be, if true. The author in an appendix gives a good bibliography concerning Franklin and has obviously studied these works with enthusiasm and care. He does not speculate on where Franklin was buried. Was it at sea or on land? The answer to this and to other mysteries of the last undocumented voyage may yet be given: this is the continuing fascination of the Franklin story.

P. D. BAIRD