

GLACIAL MAP OF NORTH AMERICA

[Review of the "Glacial Map of North America" compiled and edited for the Committee of the Division of Geology and Geography, National Research Council, Washington, D.C. In 2 sheets, each 55 × 41 in. Scale 1:4,555,000, and of "Part 2, Bibliography and Explanatory Notes", by Richard Foster Flint. *Geological Society of America, Special Papers* No. 60, 1945, viii and 37 pp.]

The publication of the "Glacial Map of North America" represents an impressive achievement of compilation and research which will be widely welcomed by geologists, glaciologists and physical geographers who are interested in the past and present glaciation of North America.

Ever since it became clear that the glaciation of North America was multiple, an immense amount of research has been devoted to distinguishing the deposits and other glacial features which could be attributed to the several glaciations which successively advanced over North America, and thus to defining the areas which each glaciation covered. The results of this extensive research have been brought together for the first time by a Committee which was appointed by the National Research Council in its Division of Geology and Geography, with Richard Foster Flint as Chairman, and are now summarised and presented with admirable clarity on a map.

The base projection selected for the map is a Lambert conformal conic projection. The maximum scale error does not exceed 5.8%. The scale of approximately 1 in. to 72 miles is adequate for showing relatively small features. The greatest care has been taken to incorporate all available information in calculating and plotting the coastline and drainage, and the changes effected by human settlement, so that, quite apart from the glacial information it contains, the finished map represents a great advance in accuracy, especially as regards the Arctic region, over any previously published map.

Furthermore, as Professor Flint points out in his explanatory notes, by the inclusion of form lines, which, so far as the Arctic is concerned, were based on extensive unpublished data, this map is the first to show the contours of the Canadian Arctic as a whole.

On this contoured base the areas believed to have been covered by the successive glaciations have been plotted, a different colour being used for each glaciation. Areas of related lake and marine sediments and outwash are shown in colour. Special symbols have been selected to indicate striae, drumlins, boulder trains, eskers, isolated erratics beyond the drift sheets, fossil-bearing interglacial and interstadial deposits, the occurrence of varved sediments, the outlets of extinct glacial lakes and the direction of glacier flow through mountain valleys. Existing glaciers have also been plotted.

There are two small inset maps—one of the Northern hemisphere to show the existing glaciers and the areas formerly covered by glaciers, and the other of the central United States to illustrate the distribution of the principal loess deposits.

The legend (which might with advantage have been printed on each of the sheets) is, in itself, of interest and value. Instead of adopting a group of legends

each applying to one region or sector of glaciation, the Committee reached sufficient agreement on the probable correlation of the drifts to adopt a single generalised legend. Although there will be differences of opinion concerning some of the correlations, and Professor Flint admits that increased knowledge may involve alterations, this bold step is welcome—particularly to the student who is anxious to obtain the best available opinion without being obliged to consult a vast literature and then, unguided, to form his own conclusions.

Professor Flint's explanatory notes provide a carefully worded and concise guide to the interpretation of the glacial features shown on the map, and to their reliability. There is, for example, a clear explanation of what may be inferred from the four grades of line which have been used to indicate the relative reliability of the boundaries between areal colours. The explanatory notes are accompanied by an extensive bibliography of those references which the Committee considered to be the most helpful and significant.

The compilation of this map has not only summarised a great amount of research, but in this very process the Committee has made significant additions to previous knowledge and has made available a great deal of information which had not been previously published. Further, the map is invaluable as a stimulus and guide for future research by indicating what is not known as well as what is known.

The inclusion of the British Isles with only the coastline plotted is surely a diplomatic invitation to British geologists and geographers to attempt a similar glacial map of their own country, but within the areas which have been covered the need for more detailed study, especially in the Canadian Arctic and in Greenland, is clearly shown by the paucity of field observations.

The Committee which has produced this map, and the National Research Council in Washington which sponsored it, are to be congratulated on an outstanding contribution to our knowledge of the glaciation of North America. The results represent most successful collaboration on the part of many organisations and scientists in the United States and Canada.

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PHOTOGRAPHS AND NOTES ON ALASKAN GLACIERS

[Note by François E. Matthes from the *Geographical Review*, Vol. 37, No. 1, January 1947, p. 159.]

The Research Committee on Glaciers of the Section of Hydrology of the American Geophysical Union, of which François E. Matthes is the chairman, has transferred its collection of photographs of Alaskan glaciers and accompanying maps and notebooks from the Library of Congress, where it has been on deposit since 1932, to the American Geographical Society of New York. This collection, which comprises more than five thousand dated photographs, has great value as a visual record of the changes in length and volume of the glaciers as the result of climatic fluctuations in the past fifty years. The material has been brought together largely through the efforts of William O. Field, Jr., a member of the staff of the American Geographical Society and the vice-chairman of the