

Churches is needed before the proposed reform can be properly effected. From a perusal of the documents contained in the report, it appears that the authorities of the Eastern and Anglican Churches have already accepted the principle of stabilisation, but require as a condition that the change should take place by general agreement of the Churches. The Roman Church admits that there is no objection to the change on *dogmatic* grounds, but asserts that such a departure from ancient tradition and custom, even if the change were demanded by the general good, could only be considered on the advice of an Ecumenical Council. The opinions expressed by the various Protestant communities are almost universally favourable to the proposal.

Taking the report as a whole, it may be said that its chief value lies in its very clear presentation both of existing defects and of the main trend of critical thought which aims at reform. The *pros* and *cons*

of the schemes submitted are fairly set forth, so that anyone interested is able to acquire a knowledge of the points at issue very quickly. But it seems important to emphasise the view of the Committee that public opinion in general is as yet nowhere sufficiently informed to press for definite action in any particular direction of general reform (that is, apart from the Easter question). For example, the replies received from the various governments show that only certain scientific bodies have as yet been consulted, and it is suggested that now the preliminary eliminations have been made, the principles underlying the main groups of proposals should be carefully studied and explained, and that to this end the investigation should be organised in each country on official or semi-official lines. It is the view of the Committee that until this is done an international conference to effect general reform could have no chance of success.

The Second Greenland Expedition of the University of Michigan.

By Prof. WILLIAM HERBERT HOBBS, Director.

THE first Greenland Expedition of the University of Michigan was carried out in the summer season of 1926 within the Holstensborg district of south-west Greenland and was preliminary only in its nature. It was to pave the way for the second expedition, that of 1927-28, the primary object of which was to be to set up upon a mountain, as near as might be practicable to the inland-ice of Greenland, a meteorological and aerological station, and to continue observations there for the period of at least a year. Some account of the first expedition appeared in the January number of 1927 of the *Geographical Review*. The second expedition left Copenhagen on June 4, 1927, by Danish Government steamer a week behind the scheduled sailing of this vessel. The expedition reached Holstensborg, south-west Greenland, on June 20, and two days later left for the Søndre Strømfjord (Kangerdlugssuak) on the *Hvalrossen*, a 22-ton motor schooner hired from the Danish Government at Holstensborg.

On the way down the coast, one of the worst summer storms for this coast in many years was encountered, and the little craft was driven for shelter to a small inlet, the Inugsugtussok, where the expedition was storm-bound for seven days. On June 27, during a temporary lull of the storm, the little craft ventured out, but after being buffeted for several hours was compelled to put back after two boats had gone adrift, but, fortunately, had been recovered.

On July 2 the expedition reached its objective at the head of the great Søndre Strømfjord, one of the longest and largest fjords in the world, and in its lower reaches probably unsurpassed for grandeur of scenery. The expedition was fortunate in finding at the head of the fjord not only a suitable landing-place and base site supplied with running water, a rare thing in Greenland, but also in the immediate neighbourhood was found a mountain 1290 feet in height, easy of ascent and dominating the entire

horizon. Only fifty feet below the summit is a lake of excellent water, and the gradients were such as to make the transport of material to the summit not too difficult. This mountain has been named Mount Evans, and upon it has been located the aerological station of the expedition.

After the first organisation of the camp and protecting the stores from the weather, the heavy task of moving the building material to Mount Evans was at once begun. Lumber, supplies and equipment, the heavy radio batteries and generator, provisions for the year, and fuel for the winter, had all to be carried up from the fjord mainly on the backs of four of the seven members of the expedition and the four Greenlanders who had been brought in from the coast.

By July 20 the central room of the hut, 9 ft. by 14 ft. on the ground, had been built and equipped, and one of the store-rooms as well. On this date Mr. Clarence R. Kallquist, the aerologist, and Mr. P. C. Oscanyan, jr., the radio operator, took up their residence in the hut, already equipped with self-recording instruments—barograph, thermohygrograph, single-register anemometer, etc.—and with the aerological equipment. Beginning on July 21, a daily pilot balloon has been sent up, and all the instruments regularly observed.

As later completed in early September, the station hut is represented in Fig. 1. It was designed and constructed very largely under the direction of Fred Herz, a member of the expedition who has for years been associated with Prof. J. E. Church, another member of the expedition, and long the director of the Mount Rose Snow Surveys of California. The design has grown out of the experience at the Mount Rose mountain station, though it has been modified to meet the extreme conditions in Greenland. Its form is that of a low flat dome banked with sod and rock in such fashion as to give the wind but slight hold upon it. The inner living room is insulated by store-rooms along

the sides which have outer walls of sod and rock, and sod walls largely cover the ends of the building as well. The side walls of the inner room are of extremely thick canvas heavily waterproofed, and the room is lined with balsam wool one inch in thickness and in part covered with canvas. The room has a floor with balsam wool beneath it. The end walls and roof are constructed in much the same manner except that here additional board walls afford rigidity and additional insulation. The two windows at the ends are of plate glass and double, with air space between. Ample ventilation is supplied at both ends of the room and at the ends of the store-rooms.

The site for the station was chosen at the head of this great fjord in south-western Greenland because a long arm from the inland-ice pushes out nearly to the sea on the south side of the fjord, and it was thought that this arm (unique in Greenland) would condense the moisture arriving in the 'lows', making their way up Baffin Bay. This judgment seems to have been confirmed by the experience of the past season, for during the months of July and August, rains were of almost daily occurrence at the Danish settlements on the west coast, though we enjoyed clear skies at

seldom calm enough for the purpose, and the temperature relationships aloft are at such times much less interesting than when the wind is blowing. Efforts will therefore be made to use kites carrying the light Fergusson meteorograph, of which the station is provided with three. The pilot

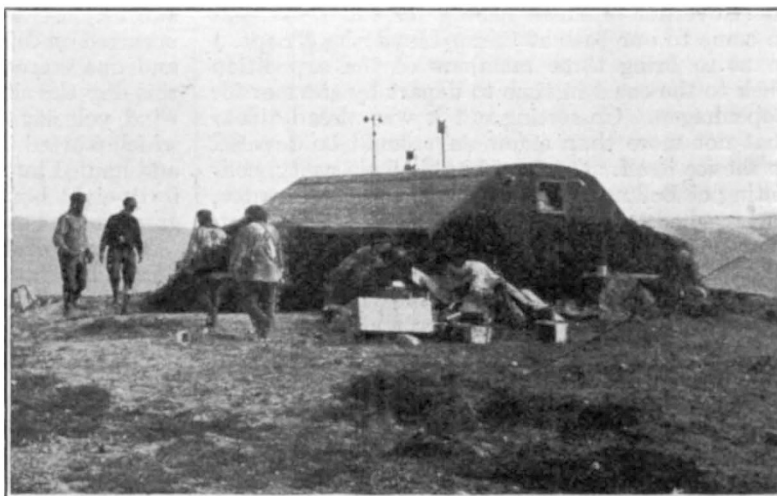


FIG. 1.—Meteorological station near the margin of the inland-ice of Greenland.

balloon work will be continued once daily so far as practicable throughout the winter, making use of small lanterns during the dark period.

The balloon studies thus far carried out already indicate that even in summer the Mount Evans station is almost entirely controlled by the inland-ice circulatory system, the northern glacial anti-cyclone. With few exceptions the surface wind has been constantly from the easterly quadrants, and these extend upward to a height of about 1000 metres, where they are replaced by currents from the west which pass in over the ice. On Aug. 4 a very remarkable condition, and thus far unique in our experience, was discovered by the pilot balloon ascent. A 73-minute run to 13,000 metres and 37,000 metres distance showed that the east wind, although weak at the surface, continued to the highest point reached. This was so remarkable that a second balloon was at once sent up and followed for 55 minutes, with the result that it checked almost exactly



FIG. 2.—Mr. Kallquist, the aerologist, following a balloon with the theodolite at the meteorological station on Mount Evans; Mr. Oscanyan is behind the instrument.

Mount Evans. The clearness of the atmosphere within this hinterland of south-west Greenland is best attested by the fact that the average run of our pilot balloons has been fifty minutes, and the average distance to which they have been followed has been thirty kilometres.

On Sept. 9, a free-rising captive balloon was sent up to a height of 1200 metres, but the days were

with the first. It will be interesting to learn what conditions were observed elsewhere on that day.

The delays at the beginning before reaching our base and the heavy labour of erecting the station on Mount Evans, left the expedition handicapped in its effort to advance over the inland-ice. Two reconnaissances had early been carried out and the inland-ice reached near the head of the great valley

which extends the present fjord to the ice margin. In this district the inland-ice pushes out two tongues, which have been named the Russell and Leverett glaciers.

It was not until Aug. 8 that it was found possible to set out upon the expedition to the inland-ice, and arrangements had already been made with the Governor of Holstensborg for the *Hvalrossen* to come to our base at Camp Lloyd about Sept. 1 so as to bring three members of the expedition back to the coast in time to depart by steamer for Copenhagen. On setting out it was already clear that not more than a few days could be devoted to the ice itself. On Aug. 19 this little party, consisting of Belknap, Church, Herz, and the director, had reached the margin of the ice and set out upon its surface with stores and equipment loaded upon an Alaskan sled with harnesses for the four members of the party. At this time of the year the ice is without any snow cover whatever, and after leaving

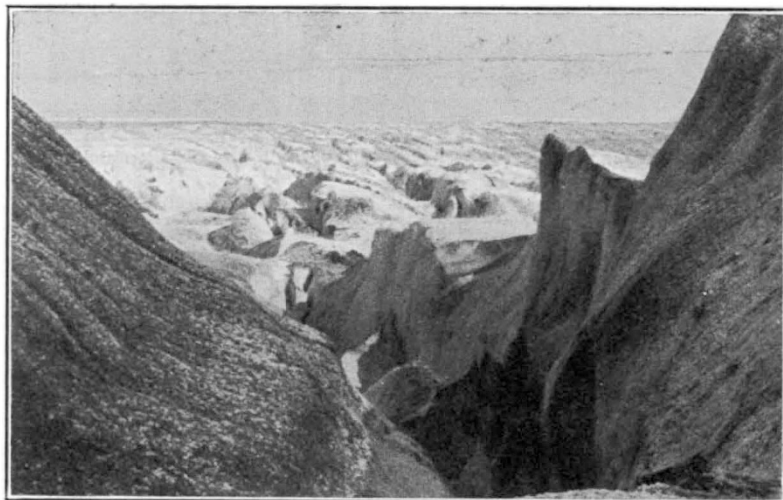


FIG. 3.—The rough surface of the inland-ice of Greenland over which the expedition had to advance.

the immediate margin its surface was found to be so rough that the sled had to be relieved of most of its load and this carried forward in relays upon the shoulders. Without the crampons or climbing-irons one could scarcely advance at all, and in the six days spent upon the ice an advance of less than eight miles was made. Pilot balloons were sent up on Aug. 23, and the party returned to its base after a 21 days' absence. Before turning back, an altitude upon the ice-surface of 2200 feet had been reached. On the return, depots of provisions and equipment were left behind for the use of a winter ice-cap party which will make the attempt to invade this region after the winter blizzards have filled the channels and packed the snow, and when the tundra surface separating Camp Lloyd from the ice margin is deep in snow and suitable for the use of dog-sleds. The winter party will consist of Mr. Helge Bangsted and Prof. J. E. Church, who have been making their preparations at Holstensborg.

The station on Mount Evans was finally com-

pleted on Sept. 3 and provisioned and fuelled for the winter. A balloon inflating shelter large enough for captive balloons has also been constructed, and this greatly facilitates the aerological work. In such a location every structure must be made low, be built around with sods and boulders, and be heavily anchored if it is to withstand the winter storms. A summer storm of hurricane force occurred on July 21, the day after the central room and one store-room had been completed, and on this day the single-register anemometer recorded a wind velocity of 81 miles per hour. This storm, which started in the south-east over the inland-ice and hauled into the south-west, preceded by about forty-eight hours, as we learned by our radio, the great storms along the whole Atlantic seaboard.

The powerful short-wave radio station on Mount Evans has taught us much concerning conditions of transmission within the district. Except during strong aurora displays, reception has been generally good, and the *New York Times* news broadcasts have been received with great regularity. On the other hand, up to late September, transmission on short-wave by our 250 watt tube transmitter has been only rarely possible to distances beyond one thousand miles. Beginning late in September, contacts were established with the *New York Times* so that news despatches could be sent out. The station is equipped with a long-wave receiver, and its signals were heard distinctly at times when short-wave signals were blanketed out.

The ice-cap has been found to act apparently like an ocean, and the long waves come across it much better than they come to the station from other quarters. The weather announcements from

long-wave stations at Angmagssalik, on the east coast of Greenland, and from Reykjavik, Iceland, have been picked up regularly. It is hoped that amateurs and others will endeavour to communicate with our station during the winter. Its call is the Denmark-Greenland call with 1XL.

Because of the dog epidemic in north Greenland, it will be necessary for Bangsted to make up a team of dogs for the winter expedition from dogs available in the Holstensborg district. The difficulties of this expedition are fully realised, but Mr. Bangsted in mid-winter of 1926-1927 spent six weeks upon the surface of the inland ice to the eastward of Umanak, pushing his way a distance of eighty miles from the margin, turning back to a point twenty miles within the margin, and there carrying out meteorological observations for eighteen days before returning to Umanak. He will spend such time upon the ice and push his way to such a distance as conditions in the winter will make possible, starting out from the Mount Evans station and returning to it from the ice.