

## CHAPTER XXV.

### METEOROLOGICAL STATIONS IN THE POLAR REGIONS.

An International Congress—Stations Recommended by the Polar Commission—The Instructions of the Officers in Command of these Expeditions—Preliminary Expedition of the schooner Florence—Valuable Scientific Observations.

IN September, 1875, the late Lieutenant Carl Weyprecht, one of the commanders of the Arctic expedition in the ill-fated Tegetthoff and the discoverer of Franz Joseph's Land, first made the proposition, that the world should unite in one uniform system of magnetic and meteorological observations at as many stations as possible, as well in the Arctic as in the Antarctic regions. These results were to be compared with those to be obtained in the temperate zones. The establishment of an official Polar Commission was the result, all the members of which were clothed with authority by their respective governments. This commission recommended that the following stations should be occupied by observers, to be appointed by the respective governments:

By the United States, Lady Franklin Bay, Grinnell Land, N. lat.  $81^{\circ} 44'$ , W. long.  $64^{\circ} 30'$ , and Ooglaamie, near Point Barrow, Alaska, N.  $71^{\circ} 18'$  lat., long. W.  $156^{\circ} 24'$ ; by Austro-Hungary, Jan Mayen, lat. N.  $70^{\circ} 58'$ , long.  $8^{\circ} 35'$ , and Pola, lat. N.  $70^{\circ} 52'$ , E. long.  $13^{\circ} 51'$ ; by Denmark, Godthaab, lat.  $64^{\circ} 10'$ , W. long.  $51^{\circ} 45'$ ; by Finland, Soudan Kyla, lat. N.  $67^{\circ} 24'$ , E. long.  $26^{\circ} 36'$ ; by France, Cape Horn, lat. S.  $56^{\circ} 00'$ , W. long.  $67^{\circ} 00'$ ; by Germany, South Georgia Island, S. lat.  $54^{\circ} 30'$ , W. long.  $38^{\circ} 00'$ , and Kingawa, N. lat.  $67^{\circ} 30'$ , W. long.  $67^{\circ} 30'$  (Hogarth Inlet, Cumberland Sound); by Great Britain and Canada, Fort Rae or Fort Simpson, on Great Slave Lake, N. lat.  $62^{\circ} 30'$ , W. long.  $115^{\circ} 40'$ , and Toronto, where observations will be made by Canada, N. lat.  $43^{\circ} 39'$ , W. long.  $79^{\circ} 23'$ ; by Holland, Dickson Haven, or Port Dickson, N. lat.  $73^{\circ} 30'$ , E. long.  $82^{\circ} 00'$ ; by Italy, Punta Arenas, Patagonia, S. lat.  $53^{\circ} 10'$ , W. long.  $70^{\circ} 55'$ ; by Russia, Nova Zembla (Karmakule Bay), N. lat.  $72^{\circ} 30'$ , E. long.  $53^{\circ} 00'$ , and

Mouth of the Lena, N. lat.  $73^{\circ} 00'$ , E. long.  $124^{\circ} 40'$ ; by Sweden, Spitzbergen, N. lat.  $79^{\circ} 53'$ , E. long.  $16^{\circ} 00'$ ; by the Argentine Republic, steps have been taken to establish a magnetic observatory at Cordoba, S. lat.  $31^{\circ} 30'$ , W. long.  $64^{\circ} 30'$ . A number of "Auxiliary Stations" were also proposed.

In addition to the two stations named above for Russia, the Geographical Society of that country proposed to maintain seven special meteorological stations in Siberia. The United States Signal Officer reported in 1882 that the following named countries were co-operating with the United States in the work of Polar research: Germany at Pendulum Island, North Atlantic, and South Georgian Island, in the Antarctic Ocean; England and Canada, Russia, Austria, France, Holland, Finland, Norway and Sweden, and Denmark.

The Bulletin of the Geographical Society of Paris (*Premier Trimestre*, 1883) reviews the proposed plan of work, and locates the observers as follows: The United States, at the points before named; England, at Fort Rae, Great Slave Lake,  $62^{\circ} 30'$  N.; Germany, on Cumberland Gulf,  $66^{\circ} 30'$  N.; Denmark, at Godhavn, Greenland,  $64^{\circ} 10'$  N.; Austria, at Jan Mayen, between Norway and Greenland,  $70^{\circ} 58'$ ; Sweden, on Mosoel Bay, Spitzbergen,  $79^{\circ} 53'$  N.; Norway, at Bossekop, the north cape of Finmark,  $69^{\circ} 56'$  N.; Holland, at Dicksonhaven, the mouth of the Yenesei,  $73^{\circ} 20'$  N.; Russia, at Sokandyla, Finland,  $67^{\circ} 24'$  N., at Karmakule Bay, north coast of Nova Zembla,  $72^{\circ} 30'$ , and at Cape Borchaya, on the east of the Lena Delta,  $73^{\circ}$  N. For these stations the following moneys have been contributed, chiefly by national appropriations: For the two parties in the United States, \$100,000; for the English, \$33,000; for the Danish, \$40,000; for the Austrians, by Count Wibczek exclusively, \$40,000; for the Swedish, \$16,000; for the Holland observations, \$13,000; for Norway, \$8,000; for Russia, \$90,000; for France, at Cape Horn, \$60,000; for the German observations at the Georgian Islands, \$36,000; for observations by Italy and the Argentine Republic at the South Shetland Islands, \$16,000.

"If we add to all these stations those already existing in Russia, Siberia, Alaska, the English Provinces of the North, etc., it will be seen that around the whole Polar Circle will be a zone of observatories, whose observations will form the study of the globe to the eightieth degree of north latitude;

while in the southern hemisphere England has a meteorological observatory in the Falkland Islands. . . . The larger number of the civilized nations are striving by scientific means to wrest the mysterious secrets of the deep from their hidden recesses of the North."

At the date of the issue by the United States Signal Service, Washington, of the "Memoranda" from which some of these notes of the stations are cited, it is stated by General Hazen, that since the organization of the International Commission other nations have enlisted in the work; the observing parties have all been despatched to their respective destinations, and they now are actually engaged in the contemplated observations. The stations will be occupied for at least one, and, in some cases, for three years, and may be divided into two classes, namely: (1.) The special polar stations within thirty degrees of the north or south pole; and, (2.) The auxiliary stations, which are spread over the rest of the habitable globe. Besides these land stations, observations made on shipboard are extensively called for, and it is hoped that enough observations will be accumulated to allow the making of a complete map of the weather, and of the magnetic disturbances throughout the whole globe, for any moment of time during the period in question. In addition to the main work of these international stations, all possible attention will be given to numerous collateral subjects. Thirteen nations have thus far entered heartily into the project; fifteen polar stations and over forty auxiliary stations have been established.

A distinction was made between the observations considered obligatory and those regarded as desirable. Those considered obligatory in the aid of meteorology are, observations on the temperature of the air and of the sea, barometric pressure, humidity, winds, clouds, rainfalls, and the weather and optical phenomena; those for magnetism are for absolute declination, inclination, and horizontal intensity; and for variations of the same.

In the Official Report of the Chief of the United States Signal Service for the year 1881, he said that "Owing to the very mobile nature of the atmosphere, the changes taking place on our portion of the globe, especially in the Arctic Zone, quickly affect regions very distant therefrom. The study of the weather in Europe and America cannot be suc-

cessfully prosecuted without a daily map of the whole northern hemisphere, and the great blank space of the Arctic region upon our simultaneous international chart has long been a subject of regret to meteorologists. . . . The general object is to accomplish by observations made in concert at numerous stations such additions to our knowledge as cannot be acquired by isolated or desultory travelling parties. No special attempt will be made at geographical exploration, and *neither expedition is in any sense an attempt to reach the North Pole.* The single object is to elucidate the phenomena of the weather and the magnetic needle, as they occur in America and Europe, by means of observations taken in the region where the most remarkable disturbances seem to have their origin."

In the expression of these sentiments and in the carrying out, as General Hazen said, the promises of his predecessor, the late General Meyer, by co-operating with the International Committee he was also furthering the objects in view by the late Professor Henry, as expressed in his letter to Hon. B. A. Willis, in which he wrote: "I am predisposed to advocate any rational plan for exploration and observation within the Arctic Circle. Much labor has been expended on this subject, especially with a view to reach the Pole; yet many problems connected with physical geography and science in general remain unsolved.

"I. With regard to a better determination of the figure of the earth, pendulum experiments are required in the region in question.

"II. The magnetism of the earth requires, for its better elucidation, a larger number and more continued observations than have yet been made.

"III. To complete our knowledge of the tides of the ocean, a series of observations should be made, at least for a year.

"IV. For completing our knowledge of the winds of the globe, the results of a larger series of observations than those we now possess are necessary, and also additional observations on temperature.

"V. The whole field of natural history could be enriched by collections in the line of botany, mineralogy, geology, etc., and facts of interest obtained with regard to the influence of extreme cold on animal and vegetable life."

The plan referred to by Professor Henry was the one em-

braced in a Memorial which had been submitted to Congress by H. W. Howgate, then on duty at the United States Signal Service Office. The efforts for this *preliminary* polar expedition resulted in the despatch to Cumberland Sound, by the aid of private subscription only, of the Florence, a fore and aft vessel of fifty-six tons, built in Wells, Maine, in 1851, for mackerel fishing; afterwards used by Williams & Haven, Hall's benefactors, as a sealer in the Southern seas. Although a staunch and fair sea-boat, she was too small for the purpose, and sailed at least two months later than was desirable, leaving New London August 3d, 1877. Her three professed objects were, to collect material, dogs and sledges; secure the help of the Esquimaux for a second steamer which it was proposed should follow; accomplish some scientific work, and repay the outlay by whaling.

The Florence, under the command of Captain George E. Tyson, the leader of the floe party from the Polaris, first anchored in Ni-an-ti-lic harbor, on the western shore of Cumberland Sound, and after securing there a number of Esquimaux and materials, anchored, October 7th, in An-naw-nac-took, in about latitude 67° N., longitude 68° 40' W. A small observatory and working-place was erected under shelter for meteorological and other observations, and as soon as the snow became compact a snow-house built over this tent, which remained as a lining. Scientific work was begun at once in the interests of meteorology and the collection of specimens in natural history. The co-laborers were Mr. Ludwig Kumlien and Mr. O. T. Sherman.

But on the return of the Florence to Godhavn, July 31st, no expedition steamer was to be seen, nor a word of news of such, or of letters from home; after three weeks of waiting, therefore, profitably employed in scientific labors, the Florence returned to Cumberland Sound and re-landed the Esquimaux and their effects. September 12th she headed for home, reaching St. John's, Newfoundland, on the 26th, from which port, after encountering a storm of unusual fury, Captain Tyson's skill brought her safely into Boston, October 30th, 1877.

The value of this expedition will thus readily appear to consist in the labors of the scientific officers who have been named.

## CHAPTER XXVI.

### LADY FRANKLIN BAY.

The Greely Expedition—The Names of the Members of the Party—The Instructions of the Chief Signal-Officer—The Proteus sets out to convey the Party to Franklin Bay—Establishing Fort Conger—Attempted Reliefs in 1882 and 1883—Expeditions of the Neptune and the Proteus—The Latter Crushed—Lieutenant Colwell's Boat-Journey South—Return of the Relief Expedition—Spicy Letter of Mr. Linden Kent to General W. B. Hazen.

THE colony at Fort Conger, in Lady Franklin Bay, lat. 81° 44' N. and long. 64° 30' W., was established under an act of Congress, appropriating the sum of \$25,000 for this purpose. First Lieutenant A. W. Greely, U. S. A., in June, 1881, was charged with the establishing of a permanent station at the most suitable point north of the 81st parallel, and contiguous to the coal vein discovered near Lady Franklin Bay in 1875. This station was to be maintained for three years at least, and an annual visit should be paid to the station to carry fresh food and supplies, and, if necessary, to bring back invalid members of the expedition and to carry out fresh men to take their places.

The party consisted of:

Lieutenant and Brevet-Major A. W. Greely; Lieutenant F. F. Kislingbury; Lieutenant James B. Lockwood; Dr. O. Pavy, Acting Assistant Surgeon and Naturalist; Sergeants Brainard, Frederics, Long, Elison, Cross, Linn, Jewell, Ralston, Israel and Rice; Corporal Saler; Hospital Steward Biederbeck; Privates Connelly, Bender, Ellis, Whistler, Henry and Schneider, and Frederick Christiansen and Jens Edwards, Esquimaux.

Lieutenant Greely received his instructions from the Chief Signal Officer, General Hazen.

The directions for the outward voyage, and the general work of the party after reaching their station, required that after leaving St. John's, Newfoundland, "except to obtain Esquimau hunters, dogs, clothing, etc., at Disco and Upernavik, only such stops will be made as the condition of the