Crossing "Greenland's Icy Mountains"

The Three Recent Expeditions Across the Great Ice-Cap

By Charles Fitzhugh Talman

Illustrated With Photographs Taken During the Danish Expedition Under Capt. Koch

THE real topography of the world's largest island is an eternal mystery. A narrow fringe of land along the coast lies bare in the brief summer, while on the slopes of the ice plateau, but not far inland, a few isolated peaks (*nunataks*) jut up through the ice and form little oases in the frozen desert, giving a foothold to a scanty flora and fauna. Aside from these insignificant patches of real *terra firma*, the whole vast land lies buried beneath a dreary waste of snow-covered ice, difficult of access on account of the deeply crevassed glaciers by which it is bordered, but not especially difficult to traverse, as Arctic wildernesses go, when once it has been fairly entered. Add to these features an intensity of cold rivaling that of the celebrated "cold pole" of northern Siberia; violent blizzards blowing down the slopes toward the coast; and in the interior, where the weather is normally calm, the rarefied atmosphere of great altitudes (ranging up to nearly 10,000 feet above sea-level) causing explorers to suffer all the distressing symptoms of mountain sickness. Such are "Greenland's icy mountains."

The first extensive journeys over the inland ice were made by Nordenskjöld and Jensen, in the '70's and '80's of the last century, and finally in 1888 Nansen accomplished the first complete crossing of the

canton, Jost, and Stolberg, and the crossing of the ice-cap by Drs. de Quervain and Hoessli, and Messrs. Fick and Gaule. The western party made numerous measurements and observations of glaciers. Two of its members, Jost and Stolberg, spent the winter of 1912-13 at the Danish scientific station on Disko Island, where pilot-balloons were sent up at frequent intervals to determine the drift of the atmosphere at various levels; one of these balloons reached the remarkable altitude of 24,200 feet. Contrary to expectation, no definite circumpolar "whirl" was found by these observations. Dr. de Quervain's party started from the west coast June 10th, and gained the inland ice June 20th. With three sledges and thirty dogs the explorers took a straight course in a southeasterly direction. Early in the journey they had the misfortune to break through the thin ice coating of a large lake, but with no worse results than a cold bath. After a march of 435 miles they arrived safely at Angmagssalik, on the east coast, August 1st. The crest of the ice was reached two thirds of the way across, with an altitude

of 8,200 feet, about 650 feet less than the altitude attained by Nansen in his crossing farther to the south. At each camping place on the journey the contours of the surrounding ice were measured in all directions with the theodolite, so that the total results constitute the survey of a zone a score of miles or more in diameter, extending across the ice-cap. Near the end of the journey a new mountain range was discovered north of the route, and quite near the east coast. The explorers named this region "Switzerland," and its highest peak (9,090 feet) Mount Forel. An entertaining popular account of this expedition has recently been published by the leader ("Quer durchs Grönlandeis," München, 1914) while the scientific results are to appear as a volume of the *Mémoires de la Société Helvétique des Sciences Naturelles*.

Early the same summer a Danish explorer, Capt. Koch, undertook the formidable task of crossing Greenland at its widest part. His companions were the well-known German meteorologist, Dr. Alfred Wegener, of the University of Marburg; a Danish sailor, Larsen; and an Icelandic peasant, Vigfus. After making a practice journey across difficult mountainous country in Iceland, the party proceeded to the northeast coast of Greenland, where they found the ice conditions so

Capt. J. P. Koch,

After a pencil drawing by Achton Friis.

Typical Greenland hummocks.

Horses used in preference to dogs for transportation.

island from coast to coast. He traveled from east to west across the tapering southern end of the island, a distance of 350 miles, after a series of delays and mishaps had prevented him from taking a longer and more northerly route. In 1892 a far more difficult journey across the northernmost part of the ice was made by Peary.

Again in 1895 Peary crossed, not far from his earlier route, and returned to his starting point on the northwest coast, a total sledge journey of 1,300 miles. The dangers and hardships with which this expedition was beset make it one of the most brilliant achievements in the whole history of Arctic travel.

De Quervain's Expedition of 1912.

After a lapse of seventeen years the exploration of the Greenland ice was again undertaken, about the same time, by three expeditions. A Swiss party, under Dr. Alfred de Quervain, landed at Holstenborg, on the southwest coast, April 27th, 1912. The programme of this expedition was twofold, comprising important scientific investigations on the west coast, by Drs. Mer-

How the horses were stabled in the ice.

Crevasse in the inland ice near the point at which ascent was made.

Iceland horses on board; photographed from mast-head.

favorable that they were able to land without difficulty in the neighborhood of Cape Bismarck on July 24th. The plan of the expedition was to winter in Queen Louise Land, or at least somewhere on the border of the inland ice, which in this part of Greenland is at a considerable distance from the coast. In order to reach winter quarters with some twenty tons of stores and equipment, over a rocky country free from snow and ice, Iceland ponies had been chosen for transport in place of dogs. This choice seems to have been inevitable under the circumstances, though dogs would undoubtedly have been more serviceable in the subsequent journey across the ice-cap; Koch's experience confirming that of Scott and Shackleton as to the unsuitability of horses for polar travel.

Great difficulty was experienced in finding a practicable route to the summit of the ice over a rugged and much-crevassed glacier front. While the ascent was in progress the explorers had the rare, and in this case very dangerous, experience of witnessing the

calving of a glacier at close range, and part of their stores were overwhelmed by the falling masses of ice. So much time was spent in scaling the glacier that the plan of wintering in Queen Louise Land had to be abandoned; a house was accordingly built on the glacier. This was named "Borg." Here the winter was spent in scientific work.

Adventures of Capt. Koch and His Party.

On the 20th of April the little party began the 700-mile march across the ice to the west coast. Day after day furious blizzards had to be faced. At times the march was suspended in the hope that the force of the wind would abate, but the explorers at length realized that violent winds blowing down the ice slope from the interior toward the coast were a normal and permanent feature of the climate; and this has been the experience of the other Greenland expeditions. These winds are analogous in character and origin to the outblowing blizzards of Antarctica, which proved fatal to Capt. Scott, and added so much to the hardships of Dr. Mawson's sojourn in Adélie Land. At the crest of the ice-cap Capt. Koch's party found light, variable winds, with frequent fog. In descending the west slope they had the wind at their backs, and, by fitting sails to their sledges, were able to make very rapid progress. The last nunatak on the east side of the ice was passed May 6th, from which time until July 2nd no land was seen. The ponies suffered with snow-blindness and exhaustion, and most of them had to be killed long before the end of the journey. The last of them was shot just before pasture land was reached on the west coast, after the explorers had actually drawn it on a sledge for several days, in the hope of saving this good comrade's life.

The greatest elevation of the ice, about 9,900 feet, was found nearer the west than the east coast; which was the reverse of de Quervain's experience. The explorers suffered from sunburn by day and intense cold by night (minimum 21 deg. below zero, Fahr., in mid-summer).

On July 2nd the monotony of the journey over snow and ice was relieved by the sight of a nunatak, and 37 miles beyond this point the western edge of the ice was reached on July 4th. Shortly afterward the party succeeded in locating a small depot of provisions which had been laid for them two years previously. On reaching the ice-free littoral they had still to travel for 11 days, part of this time being spent in crossing the Lakse (Salmon) fiord and river in a boat improvised from their sledges and sleeping-bags. The little settlement of Prøven was reached July 15th, and the journey was over.

What the Koch Expedition Accomplished.

The scientific results of this expedition, a brief account of which has been published by Dr. Wegener in the *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, and which are to be presented in full in the Danish publication *Meddelelser om Grønland*, are undoubtedly among the most interesting ever achieved in a polar expedition. Only a few details can be mentioned here.

At winter quarters measurements of the temperature in the interior of the glacier to a depth of 79 feet were made by means of a shaft and bore-hole beneath the dwelling-house. Below the level at which the seasonal fluctuation of temperature ceased, a slight but regular increase of temperature with depth was found, analogous to that which occurs in the earth. On the inland ice the stratification of the snow was observed, as seen in the walls of the pits dug at each camping-place as stables for the ponies. Each layer represents a year's snowfall, and thus an approximate idea was obtained of the precipitation of the region over which the explorers traveled. Dr. Wegener secured a great number of microphotographs of snow and frost crystals, with simultaneous observations of temperature and humidity, serving to indicate the conditions under which the various forms occur. Numerous photographs were taken of mirage; also of the aurora borealis. Observation of sky-polarization made with the Savart polariscope.

An even more remarkable journey across Greenland was made by two Danes, Knud Rasmussen and Peter Freuchen, with two Eskimos, who started from a point near Cape York, on the northwest coast, April 6th, 1912, and crossed to the northeast corner of the island, visiting *en route* the ice-free region of Peary Land. This was reported by Peary to be a separate island, and is still so shown on nearly all charts, but is now known to be merely the northernmost part of the mainland. After extensive explorations, in the course of which they discovered traces of old camps indicating that the Eskimos had preceded the white man to this remote region, the explorers retraced their steps, reaching Cape York September 15th. This journey was unique in that the party carried no regular provisions, but lived, Eskimo-fashion, on the country. Thus unencumbered, they were able to march 30 miles a day with ease.

One outstanding result of the recent campaign of explorations in Greenland is that former ideas regard-

ing the general contour of the ice-cap have been considerably modified. Instead of being a more or less symmetrical dome, with the greatest elevation at the center, it is now known to have at least two principal summits; one a little north of latitude 65, the other at about latitude 74. A journey across the island in a north-south direction—a more difficult undertaking than any of those described above—would doubtless

At the border of the inland ice.

throw much further light upon the true form of the great ice plateau under which Greenland lies forever buried from the eye of man.

Teaching the Use of Current Periodicals in Elementary Schools

WILLIAM E. GRADY, principal of Public School 64, of the Borough of Manhattan, New York city,

"Borg," the winter house of the expedition.

has been trying to secure the co-operation of some of our best magazines and weeklies in inaugurating a new and a very necessary course in school curriculum. He feels that pupils are not trained to read intelligently various types of publications, such as newspapers and magazines, from which in later life they will have to glean the bulk of their knowledge. According to his plan, the different classes

Map of Greenland, showing routes of several expeditions.

will discuss current magazines under the guidance of a teacher, which discussion will take the place of the ordinary formal lesson dealing with the so-called "masterpiece of literature." Mr. Grady's scheme is outlined in the following plan of work:

Point of View:

"A thoughtful criticism of our current literary teaching in the upper grades of our elementary schools, is to the effect that pupils are not trained to read intelligently various types of publications, such as newspapers and magazines, from which in later life they will have to glean a great part of their knowledge."

I. Material shall be stamped with school stamp and shall be filed and catalogued in a special room.

II. On request countersigned by principal or assistant, teachers of 6A, 6B, 7A, 7B, 8A, 8B group may borrow such material for purpose of actual instruction in their several subjects. Such material shall be returned to its room on same day.

III. Teachers using such material are requested to form judgments as to its value and to discuss results with the principal.

IV. General topics and controlling ideas suggested for consideration in connection with said material are the following:

(1) Pupils should be led to appreciate that the reading of such material is a real test of mental ability in general and of reading ability in particular; that many of the facts in after life, whether such facts be cultural or technical, must be gleaned from such sources.

(2) Teacher's instruction shall subordinate mere facts to methods of sound thinking. To the extent that pupils display individual taste and judgment in the selection of articles for discussion, to the extent that they distinguish the relative importance not only of articles, but also of paragraphs and statements within the limits of said article, and to the extent that they can epitomize an article in a series of concise, well-knit sentences, the work will be distinctly educational, rather than the mere employment of a leisure moment.

(3) The organization of the magazine or periodical should be discussed in terms of the following:

(a) Title, company, cost.

(b) Aim and value in terms of range of topics, reputation of contributors, point of view of editorial articles, relationship of articles in monthly or weekly publications to the current events of each month as reported in the daily papers. For example, note the different aims of such magazines as *Collier's*, *Literary Digest*, *Scientific American*, *The Survey*, *St. Nicholas*, *Good Housekeeping*, *Ladies' Home Journal*, *Review of Reviews*, *Outing*, *The Outlook*, *The World's Work*, *Scribner's*, etc.

(c) Illustrations and cartoons.

(d) Quality and range of advertisements.

(4) Test value of work with pupils in terms of particular lesson units and also more generally in terms of:

(a) Reading habit as indicated by knowledge of current events.

(b) Desire to include good current topics as basis of oral or written composition.

(c) Critical judgments as to what magazines, weeklies, etc., and article therein, interest them most.

(d) Increased appreciation of design, drawing, and lettering.

(e) Occasional purchase of or subscription for material used in classroom discussions.

(f) Increased use of facilities offered by reading rooms in Tompkins Square Library, Christadora House, Cooper Union, etc.

(g) Organization of pupil groups on club plan to purchase publications to be circulated within the limits of the group.

V. If the literary material obtained through the courtesy of the various publishers be used by the departmental teachers of literature in every 3-minute or 4-minute lesson to supplement the study of the masterpiece designated in the course of study, the work will be distinctly more practical and cultural.

Moreover, the teachers of special subjects like geography ought to find it possible really to vitalize the subject matter of the text-books by the study of current happenings. The destructive action of spring floods in the Mississippi Valley or the heroic death of Scott in the white wastes of the Antarctic should provide the initial rather than the final steps of instruction in geography and history.

Cleaning Plaster Statuettes

A SIMPLE but effective method for removing the grime which plaster statues, etc., gather in the atmosphere of cities is suggested by *Les Annales*. A thick solution of starch, such as laundresses use, is made and the object is covered with it, care being taken to have it penetrate every crevice. The starch paste is then allowed to dry, whereupon it crumbles away, carrying with it the dirt on the surface of the plaster.

A Simple Method of Erecting Tall Wireless Masts

IN the construction of the chain of world-encircling wireless stations which are being erected by the Marconi Company, the importance of a thoroughly reliable yet simple aerial support was one of the first considerations. These photographs, made at the station at Hawaii, give a very good idea of how these masts are constructed.

A concrete base was first laid and a bed plate fastened to it. The mast came in split cylindrical sections about ten feet in length. The flat sections of these semi-cylinders were placed face to face, bolted to the bed plate, and the faces bolted together. Then a man cage was constructed and rigged to a system of blocks and tackles, so that it could be raised as the mast grew. The sections were "staggered," that is, one would be placed at right angles to the one preceding. Guys were attached as the work progressed. Towers as high as 450 feet were erected in the course of a few days.

Treading on Time

VISITORS at a recently completed hotel in Worcester, Mass., are able literally to "tread time under foot."

In these days we are becoming accustomed to seeing electricity doing almost anything, from turning the turrets of a battleship to drying Milady's hair; but deliberately to walk across the face of a perfectly good clock set in the floor is a decided novelty.

The dial is of plate glass, 2 feet in diameter and 1 inch thick, the numerals and minute marks being etched on the under side. Under each hour sign is a tungsten lamp, the entire mechanism and lamps being contained in a metal box 10½ inches deep, painted white on the inside, so that the illumination is brilliantly striking, and the shadows cast by the hands exceedingly dark.

The clockwork is driven by a spring, wound every five minutes by an electric motor obtaining its current from a battery of three "dry cells," and the time is regulated automatically every hour by telegraphic connection.

In some ways it seems more convenient to "get the time" by looking down rather than up, as most of us are accustomed to do, the only drawback apparently being that it is necessary to stand in the right position with reference to the clock face, or else acquire the facility of reading the time "upside down," which to most people would be somewhat awkward at first, although the knack soon would be acquired.

Professional Snake Catchers

THE German government regularly employs men attached to the forestry service to exterminate poisonous snakes. The snakes are not found in great numbers, but are sufficiently numerous in mountainous and wooded districts to constitute a menace to women and children picking berries or collecting wood, because these people generally go barefooted. The snake-catcher wears thick cowhide boots through which the snake is unable to push its fangs.

In catching snakes the man uses a pair of hinged sticks, like pincers, which he presses against the snake's neck immediately behind the head, thus making it powerless to move its head. Some care must be taken, because the snake will sometimes eject its poison, and if this should enter a scratch or cut, it would cause the same effect as if the catcher had been bitten. While the snake is in this position, the catcher grasps its tail and throws it into a strong leathern bag with a swing, releasing the neck. The bag is securely tied and the snakes carried home, there to be disposed of.

The poisonous snakes of Germany are mostly adders, and the one most frequently met is the *Pelias Berus*, or Cross Adder, so called because its back is marked with a cross-like pattern.

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Erecting a 450-foot mast.

First mast-section being set in place.

Electric clock set in the floor of a hotel lobby.

Seizing the snake with the wooden pincers.

A professional snake catcher.

A thrilling "movie" adventure.

Twenty-four Hours in the Air

THOSE in charge of the Wanamaker transatlantic expedition must surely find encouragement in the remarkable performance of Reinhold Boehm, the German aviator who at Johannisthal on July 11th achieved the feat of flying continuously for 24 hours and 12 minutes.

His was an ordinary army Albatross biplane, fitted with six-cylinder 75 horsepower Mercedes engines, and carrying 132 gallons of gasoline. It was the same machine in which Landman's record of 21 hours and 49 minutes in the air was made on June 28th. His provisions consisted of a vacuum bottle filled with cold milk, several packets of chocolate, and a few cakes.

He ascended easily, and in order to save fuel flew slowly around the aerodrome at first, not going higher than 300 feet. As the night wore on and the signals flamed out he went higher, and for an hour or two he left Johannisthal, flying across Berlin and Potsdam.

Returning to the aerodrome at midnight, he resumed his weary circuit. How many rounds he made nobody knows.

Boehm must have covered about 1,350 miles, as his speed averaged 47¼ miles an hour throughout.

Relative Motion and the Automobile

AT a recent meeting of the session of the British Institution of Automobile Engineers Dr. A. M. Low gave a very interesting lecture on "Some Experiments and their Bearing on the Design of Automobile Parts."

The line taken by the author was to advocate the study of the motion of the different parts of the car from the point of view of the actual parts themselves. Dr. Low instanced the carbureter, which is adjusted with extreme care as to the weight of the float, etc., and is then fitted on an engine which is vibrating in such a way as to upset the accurate adjustments made. He stated that he had fitted an instrument, which he terms the "Chatter-graph," for observing the action of the brake-shoe on the drum; the instrument showed clearly that the motion of the shoe in relation to the drum is a constant series of rotations of the whole drum with the shoe, alternating with a movement of the shoe in the drum. He pointed out that there are three methods of studying motion—the rotating mirror, the alternating generator with variable period, and kinematograph. He strongly advocated the use of the kinematograph by automobile designers for the study of the motion of the various parts of a car, and exhibited some experiments indicating the results which could be obtained. One of these experiments showed the action of a valve lifted by a cam, and the lecturer pointed out the bouncing of the valve off its seat with improperly shaped cams. He also gave the results of experiments on an induction pipe fitted with a glass window with two eye-pieces and a shutter revolved by means of a cam from the engines; by this means the actual form of the globules of oil mixed with the gasoline could be traced in various positions in the pipe.

An Aerial Ride on Horseback

A GERMAN moving-picture manufacturer has turned out a film that shows a novel and very sensational feature. A bandit chased by soldiers is nearly caught when he catches sight of a balloon very opportunely tied to a post and awaiting his pleasure. He ties his horse to the balloon and unties the mooring rope. Immediately he is carried into the air, and the soldiers cannot get him. The film shows the balloon, with horse and rider fastened to it, sailing through the air, until it finally collapses and drops into a sheet of water, whereupon the bandit loosens the ropes and escapes. The remarkable feature is that this exploit was actually executed, and a live horse and rider were tied to the balloon, as is shown in the accompanying photograph.