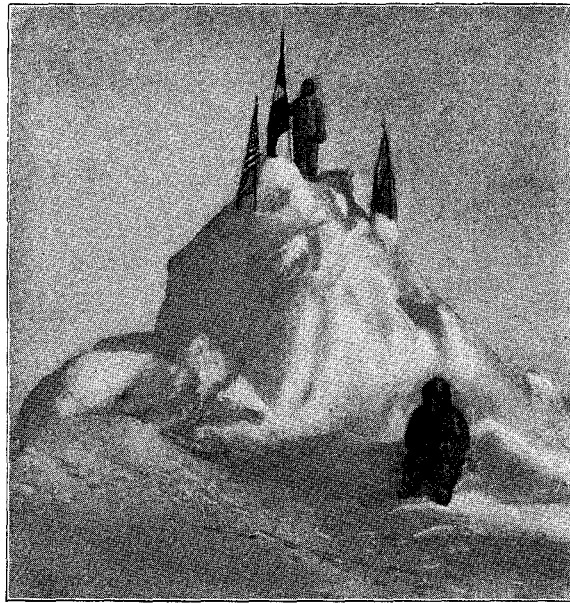


THE STARS AND
STRIPES FLYING
FROM THE
NORTH POLE



Sledge-Traveling

By ROBERT E. PEARY

THE essence of successful arctic exploration may be stated as the transformation of the minimum amount of food into the maximum number of miles. In the struggle for the north pole it means such refinement of methods and equipment as will enable the last stage of the journey over the frozen surface of the polar ocean to be made with the provisions that can be carried upon the sledges when starting from the most northern land.

The sharp difference and antithesis between the north-pole and the south-pole struggles must be borne clearly in mind. In the latter the fixed character of the surface of the antarctic continent permits the establishment of depots en route as often as may be desired, while in the former the movement of the sea ice renders impossible the establishment of depots, and compels the carrying of everything on the sledges continuously.

There are two distinct kinds of sledge-traveling in polar regions, sledging on the surface of the polar sea, and sledging over the inland ice of Greenland and the interior

of the antarctic continent, each differing widely from the other. The former has been practised for a hundred years. The latter is of much later origin, and my first experience and training in arctic sledging was in this field. My knowledge of conditions to be encountered in overland sledging was gained on numerous short trips in Greenland and two long journeys of twelve hundred miles each across northern Greenland's ice-cap—the "inland ice."

To the average reader the expression "inland ice" suggests a surface of ice. This idea is erroneous. Greenland is a great glacial country, with an area of 740,000 or 750,000 square miles, fully four fifths of which are covered by the inland ice, the only portion of it that could be called land being a ribbon of mountains, valleys, and deep fiords along the coast. This narrow strip of land is for the most part from five to twenty-five miles wide, but there are several places where it is sixty or eighty.

The interior of Greenland, or the inland ice, is so cold that it gets virtually

no rain, and the snow does not have a chance to melt in the long sunlit day. So the snow has accumulated century after century until it has filled the valleys, and not only leveled them with the tops of the mountains, but the highest of these mountain-tops have been gradually buried hundreds and even thousands of feet in ice and snow. To-day the interior of Greenland, with its fifteen hundred miles in length and its seven hundred miles in maximum width, rising from four thousand to nine thousand feet or more above sea-level, is simply an elevated and unbroken plateau of compacted snow.

On this great frozen Sahara of the North the wind never ceases to blow. It invariably radiates from the center of the ice-cap outward, blowing perpendicularly to the nearest portion of the coast land, except when storms of unusually large proportions sweep across the country. Such a regular thing are the winds of these regions, and so closely do they follow the rule of perpendicularity to the coast, that it is always easy to determine the direction of nearest land. A sudden change in the wind indicates the presence of large fiords, and the crossing of a divide can be detected by the area of calm or by the changeable winds which prevail there, which are followed by winds blowing from the opposite direction.

Sweeping along the most direct path to

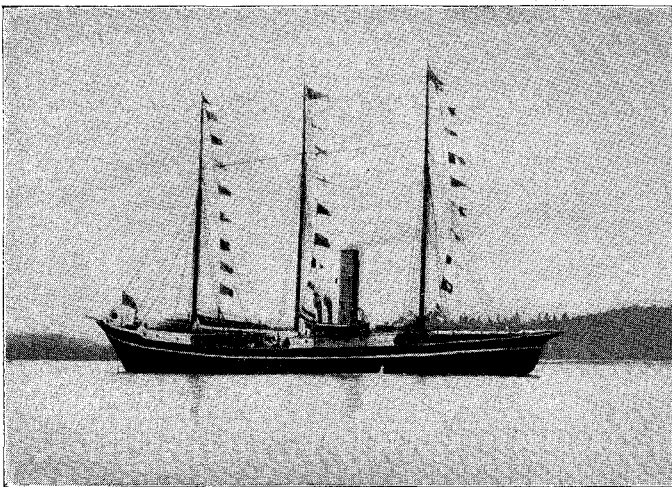
the coast and with more or less velocity, the wind always carries with it a flying mass of snow, which, on reaching the mountains, settles in the valleys or goes swirling over the cliffs into the sea. When there is only a light breeze the snow is very fine, and flies only a few feet in the air; but the stronger the wind, the coarser the whirling snow becomes, and the greater the depth of its current. In blizzards on this desert of snow this drift surpasses in fury the sand-storms of the Sahara, the snow rising in the air hundreds of feet in hissing, roaring, blinding torrents which make it almost impossible for one to breathe, and which bury anything stationary in a short time. It penetrates like water, and on stepping into the drift, its surface is very nearly as tangible and sharply defined as that of a pool of water of like depth.

The continuous transportation of vast quantities of snow by the wind is a most important factor in retarding the increase in the depth of the ice-cap, and in my opinion is a factor equaling possibly the effects of evaporation, melting, and glacial precipitation combined. Only investigations carried on for a period of years can definitely determine whether this snow deposit is increasing or decreasing as the years pass.

In the interior of this "great ice," as in the center of the antarctic continent, hundreds of miles from the oceans, elevated

a mile or two into the frigid polar air, and all appreciable terrestrial warmth cut off by the thickness of the ice-cap, there is, in the midnight of the polar nights probably the greatest degree of natural cold to be found anywhere on the globe.

During the winter months the whole surface of the inland ice is covered with a layer of fine, dry snow. The noonday sun of the late spring causes the snow



THE ROOSEVELT

along the edge of the ice to become soft, and the freezing of this at night makes a thin crust. As this layer of crust creeps into the interior with the approach of summer, the snow on the edge of the ice-cap turns to slush and finally melts, forming pools and streams which eat into the ice, opening up old crevasses and new ones as well. This condition likewise extends into the interior in the wake of the crust, and the summer heat and eroding streams working on the border of the cap make it so rough as to be in places quite impassable.

In traveling into the interior the mountains along the coast soon disappear under the landward convexity of the ice-cap, and the surface, which near the coast is composed of many hummocks, gradually changes into long, flat swells, which in turn merge into a gently rising plain and finally into a flat surface.

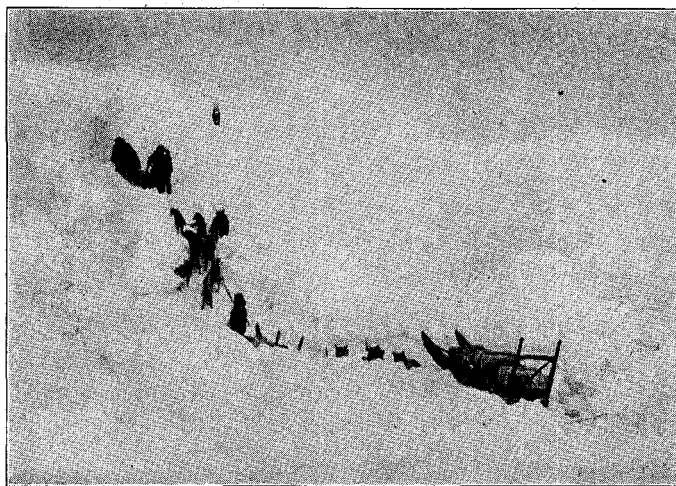
In my journey across the ice-cap of northern Greenland in 1891 I was continually turned from my course on the upward march by the numerous crevasses and steep slopes which occur along the edge of the inland ice. These crevasses sometimes cover a tract several miles wide, and are usually marked by peculiar ice-mounds several feet in height. Covered with a light crust, the crevasses are difficult to detect, and one must be constantly on the alert to avoid getting into

them. At times it is necessary to reconnoiter for hours before safe snow-bridges across these treacherous places can be found, and on several occasions I have nearly lost all our provisions and dogs when the sledges have broken through. Determined to avoid such conditions on the downward trip, I traveled well inland. Here, however, deep, soft snow makes sledge-traveling difficult; so on my second journey across Greenland in 1895 I chose an intermediate route, hoping to avoid crevasses and slopes and slippery ice as well as soft going. This route proved to be by far the best one, the snow being much firmer, and the distance a few miles less than by either of the other two routes.

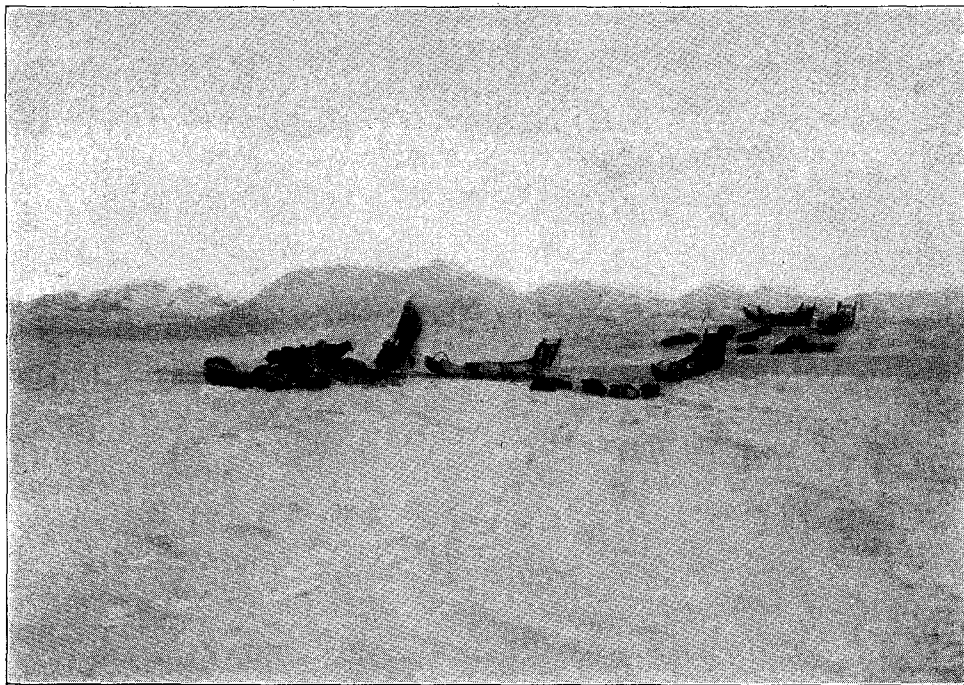
In addition to the wind, there is another peculiarity of the inland ice which adds to the difficulties to be encountered in this work. That is the extreme intensity of the continuous sunlight, which can be realized only by those who have experienced it. This continuous brilliancy is intensified a hundredfold by the reflection from endless fields of glistening, sparkling snow, unrelieved by a single object. The strongest eyes can stand such a blinding glare only a few hours without protection. We always wore heavy smoked glasses, and when in camp often found it impossible to sleep without still further protecting our eyes by tying a narrow band of fur about them to ex-

clude the light. Only when a storm is brewing does this intense light become subdued. At such times, however, the sky and snow take on a peculiar gray, opaque light which is even more trying than the sunlight.

To direct a course across unbroken fields of snow with absolutely nothing to guide or fix the eye is a task which requires experience. To force a team of dogs towing a heavy



OVER A PRESSURE RIDGE



A HALT ON THE MARCH

sledge-load into blank nothingness is still more difficult. The leader should always be in advance, setting the course and the pace, and encouraging the dogs with his presence, voice, and trail. During dull or foggy weather the work of keeping a direct course becomes particularly arduous. For days I have traveled into gray nothingness, feeling, but unable to see, the snow beneath my snow-shoes, and the long marches, when it was almost impossible to see the length of the sledge, were among the most trying experiences I had on the inland ice.

At times we raised a pennant on a bamboo staff, and used the wind as a guide, taking its compass direction at intervals, keeping the wind-vane at the proper angle, and in this way holding a fair course. The endeavor to keep a direct course for any length of time under such conditions imposes such a strain on mind and body that travel sometimes seems impossible. In addition to this, the feeling of fatigue and heaviness which is the result of the fog and altitude makes traveling still more difficult.

A severe and protracted storm is one of

the most disagreeable features of sledge-traveling over ice, and preparations should immediately be made to camp when one is seen approaching. If the equipment does not include a tent, a snow igloo should be built as quickly as possible. If there is not time for this, then a dugout can be made or a snow-wall erected as a shelter from the wind and driving snow. Everything possible should be carried inside the tent or igloo, with the dogs securely fastened outside. Storms on the ice-cap are so severe that, when possible, the dogs should be protected from them by a snow-wall.

I have been confined to tent or igloo for days at a time by these storms, but the most accursed hours I ever spent on the ice-cap were those spent in a small tent, six long days and nights, five thousand feet above sea-level, during a furious storm which I knew was destroying my last chances for finding a ton and a half of supplies, including all my pemmican and alcohol, which I had cached the year before for my spring work in 1895. Any one, seeing our camp at the end of one of these storms, would believe us buried alive,

the only signs of our presence being the snow-mounds covering us and the dogs.

One severe storm will play more havoc with the dogs and their harness than weeks of ordinary traveling. To get the sledges and the dogs and tent dug out, to say nothing of untangling and repairing the dogs' traces, which become twisted and knotted, requires hours. After almost every snowfall we had to help the dogs drag the sledges. For this purpose a long line of walrus hide was tied to the front of the sledge, running out over the dogs, so that one of us could attach it to our shoulders and pull in advance of the team. To the side of the sledge a short line was fastened to enable the other man to drive the dogs and pull at the same time.

Dragging the sledges through soft snow is very disheartening work for dogs, and every expedient that ingenuity can devise or that is known to the Eskimos must be used to urge them forward. Only one thing can make traveling harder on the inland ice, and that is a precipitation of frost, which, covering the surface, renders it so sticky that the sledges drag like so many pounds of lead. Dogs, which in ordinary going can haul two sledges at a fair rate of speed, then require the combined assistance of two men to move one. For this condition of snow even icing the runners seems to do but little, if any, good.

The process of covering sledge-runners with a coating of ice, taught me by the Eskimos, is most interesting, and wonderfully increases the tractive power of a sledge in low temperatures.

A long strip of thick walrus skin, which, when frozen, is the toughest and most unbreakable of substances, the same width as the runner and from which the hair has not been removed, is first applied to the bottom of each runner, being fastened by lashings of rawhide run through slits in the edges of the walrus hide. After this has been allowed to freeze solid, the entire length of each runner is covered with soft snow that has been dipped in warm urine. This is pressed and shaped with the hand until it is three quarters of

an inch or an inch thick. When this has been given time to freeze solid, it is chipped smooth with the aid of a knife, and rubbed over with water. As the dogs get tired and the altitude increases the sledges should be iced every day on inland-ice cap-work. The effect of high elevation is very perceptible upon men and dogs, and it is difficult to get more than from two to two and one half miles an hour out of the dogs. At times we iced the sledge-runners twice a day.

The routine on our long marches varied little. The work of caring for the dogs, harnessing them in the morning, unharnessing and tying them to stakes at night, and feeding them at the end of the day's march was my special work. During the march my companion took charge of them while I kept the course except when, to vary the monotony, we exchanged duties. My companion always built the snow-shelter that served as a kitchen, and we took turns acting as cook. The man on duty in the kitchen slept there all night, and stood ready to secure any dogs which might break away during the night.

To catch a loose dog requires more or less time and ingenuity, and frequently results in a few bites. Our usual method of capturing one of these arctic wolves was to coax him within reach by throwing out morsels of meat to him, then throwing ourselves upon him and burying his head in the snow. We soon became expert enough in this to avoid more than a few bites. Some dogs are too wily to be caught in any such way, and have to be lassoed and choked almost senseless before they can be put back into harness.

Until 1895 the basic principle of arctic sledging was that overland traveling was not practicable, that the only highway lay along the sea ice off the coast. Therefore the journey that I mapped out for this year—the crossing of the inland ice-cap of northern Greenland—was an unprecedented one in point of distance to be covered without caches, or supply-depots. The successful carrying out of this plan showed the practicability of the inland ice for a road, and since that time Green-

land has been crossed by Nansen, Koch, and Rasmussen, Spitzbergen by Conway, and the antarctic continent penetrated to its head by Amundsen, Scott, and Shackleton.

the edges of the ice floes where they meet pile up in regular series of ridges. If, however, the winds are not strong during the autumn, the ice of the polar sea may be intersected by lanes and pools of open



SLEDGE PARTY ON THE MARCH, WITH GOOD GOING

Many are under the impression that the ice of the polar sea is as smooth as glass and that explorers simply ride to their destination on dog-sledges. In summer the ice of the polar sea is constantly moving, large fields of ice, ranging from ten or fifteen to over one hundred feet in thickness, drifting under the influence of wind and tide, smashing against other fields, splitting them, crushing up their edges and forming new ridges until the surface, when it again hardens in the winter, is in many places simply a chaos of broken ice. Nine tenths or more of the distance between northern Grant Land and Greenland and the pole is composed of these floes, the rest being ice formed by the sea-water freezing during the autumn and winter months.

Continued northerly winds during the autumn, when the masses of ice are gradually freezing together, will force the ice toward the shore, while farther out

water, and on these new ice, fairly smooth, and never over eight or ten feet thick, will form. Such a condition is very favorable for sledge travel.

The difficulties and hardships of travel over ragged pressure ridges must be experienced to be appreciated. A trail oftentimes must be hewed out with pick-axes, and the heavily loaded sledges pushed, pulled, hoisted, and lowered over the hummocks and steep acclivities, and sometimes even unloaded, and the equipment carried over on one's back.

On our return from farthest north in 1906 we encountered a seemingly endless and indescribable chaos of broken and shattered ice in the region where we had been held up by the big lead on our upward march, and it took grim and exhausting work to carry us through it.

Bad as the pressure ridges are for sledge-traveling, however, they are not nearly so dangerous as the leads or lanes

of open water caused by the action of wind and tides on the ice. In some cases these are mere cracks running across the floes in almost straight lines; in other cases they take an irregular course across the ice, and are just wide enough to prevent crossing. Again they will be as large as rivers, a mile or two wide and many miles long. For a polar-sea explorer leads are an omnipresent nightmare. When or where they will occur is impossible to tell. It may be with a loud report directly ahead of a party, cutting off their advance northward or cutting off their return to land on the way back. It may be directly in the midst of camp and through an igloo. With every northward march on my last two sledge-journeys fear of impassable leads increased, and I would find myself hurrying breathlessly forward toward every pressure ridge, fearing it concealed a lead beyond it. Arriving at the summit and finding no lead ahead, I would soon find myself hurrying on in the same way to the next one.

The best way to cross wide leads is learned only by long experience. Sometimes a detour east or west will result in finding a place narrow enough to permit long sledges to be bridged across. In very cold weather it may be found practicable to wait until new ice forms thick enough to allow a sledge to be rushed across; or a lead may show signs of closing, in which case a party can wait until it is quite close together. Occasionally large pieces of floating ice are to be found in a lead, forming a sort of pontoon-bridge across it. One member of the party goes ahead to pick the

way, jumping from one cake to another, and making sure the weight of dogs and sledge will not tilt the cake, then encouraging the dogs to go forward, while the driver of the sledge steers it, and at the same time balances the cake of ice to keep it from overturning.

To make dogs leap across a widening crack is work which requires an expert dog-driver. Some can do it without any trouble by use of the whip and voice; others have to go ahead of the dogs and coax them to make the jump by holding their hands low and making a pretense of shaking a morsel of food. Leads which are too wide to jump the dogs and sledges across can be ferried by hacking out a cake of ice large enough to bear the weight of dogs and sledges. It sometimes happens that a narrow lead will open before the entire party has crossed. This occurred on my last trip north, an Eskimo with his sledge and dogs being left on the other side. An impromptu ferry-boat was cut out of the ice on our side of the lead; two coils of rope were fastened to each other and slipped around the cake. Two Eskimos boarded it; a line was thrown across

the lead to the other Eskimo, while one on our side held that end. Then the two men on the ice-cake took hold of the rope and pulled the raft across the lead. The dogs and sledge and other Eskimo were taken upon the ice-cake, and we hauled them across to our side. Leads which assume the proportions of rivers, such as the one we encountered on the way north in 1906 and on our way back the same season, are a different matter, and the only thing one can



REBUILDING A SLEDGE



APPROACHING A BIG LEAD THROUGH ROUGH ICE

do is to wait until young ice forms strong enough to afford safe passage.

With low temperatures ranging to sixty degrees below zero, the necessity of having to march all day in the face of a blinding snow-storm, with the wind piercing every opening in the clothes, and then having to build an igloo for shelter at the end of the day, are other hardships.

An ever-present danger in sea-ice work is that of breaking through young ice and getting wet. A mishap of this kind is to be dreaded, for even if a man is able to get out of the water quickly, it means some uncomfortable hours, and sometimes the delay of building an igloo in which he can get dry clothing on.

For a sledge-journey of any length across the polar sea, the method of pioneer and supporting parties has proved the most effective. A pioneer party was introduced for the first time in my work, and while supporting parties had been used in arctic work before, they had never been utilized on such a scale as on my last expedition.

The pioneer party was made up of four experienced and energetic men, with lightly loaded sledges and the best dogs in the pack. This division left Cape Columbia under the leadership of Bart-

lett twenty-four hours ahead of the main party. In all kinds of weather and regardless of every obstacle except impassable leads, a march was to be made every twenty-four hours. Later, when the sunlight was continuous during the twenty-four hours, the advance party kept only twelve hours ahead of the main division, breaking the way and, in fact, setting the pace for the main party, which, having to waste no time in choosing and breaking a trail, could cover the same distance as the reconnoitering party in less time, even with more heavily loaded sledges. Bartlett traveled ahead of his division, usually on snow-shoes, picking a trail. My main party was large enough to permit the withdrawal of the men from the advance party to the main party as they became exhausted by the hard work and lack of sleep, and the sending out of fresh men to continue the work. This enabled me to conserve the strength of those who were to make the final dash for the pole.

The advantages of supporting parties cannot be too strongly emphasized. It is impossible for a party, either large or small, to drag food and fuel enough to sustain life in themselves and their dogs for a distance of nine hundred miles across

the polar sea. Just as soon as a party consumes the provisions of one or two sledges, the drivers and dogs, being just so many superfluous mouths, should be sent back to headquarters with their empty sledges. When another sledge-load or two of provisions have been depleted, their drivers and dogs should likewise return. In all, four supporting parties were sent back one after another, the last one in command of Captain Bartlett, leaving me near the eighty-eighth parallel. Up to this point I had traveled in the rear of my party in order to see that everything was going smoothly. On sending back Bartlett's division, however, I took my place at the head of the party that was to make the final dash. This was of necessity a small group and most carefully chosen, consisting of Henson and four of my best Eskimos.

The second important duty of the supporting parties is to keep the trail open so that the main party can return rapidly. That this is no slight consideration is shown by the fact that in twenty-four hours, or sometimes in twelve hours, the fierce winds of the North will start the jamming of the ice-floes, throwing up pressure ridges and forming leads. Ordinarily, though, the ice will not change much in eight or ten days, and a party in returning follows the outward trail, patching up any faults or breaks that have occurred in it since it was broken. The next party, returning a few days later from a point still farther north, knits together the broken places in its own trail, and, coming to that of the first returning party, smooths over any breaks which may be found. The next party does the same, and so on until the main party, on its return, has simply to follow the trail of the supporting parties instead of having to reconnoiter for one. With no trail to make and the dogs eager to follow the homeward track, the speed of the main party on my last expedition was greatly increased on its return march, the upward journey having been accomplished in twenty-seven marches, while the return was made in sixteen. In addition to the

advantage of having a broken trail to return by, the returning division uses the snow igloos which were built on the way north, thus saving the time and energy which the building of a new igloo at the end of each long march would mean.

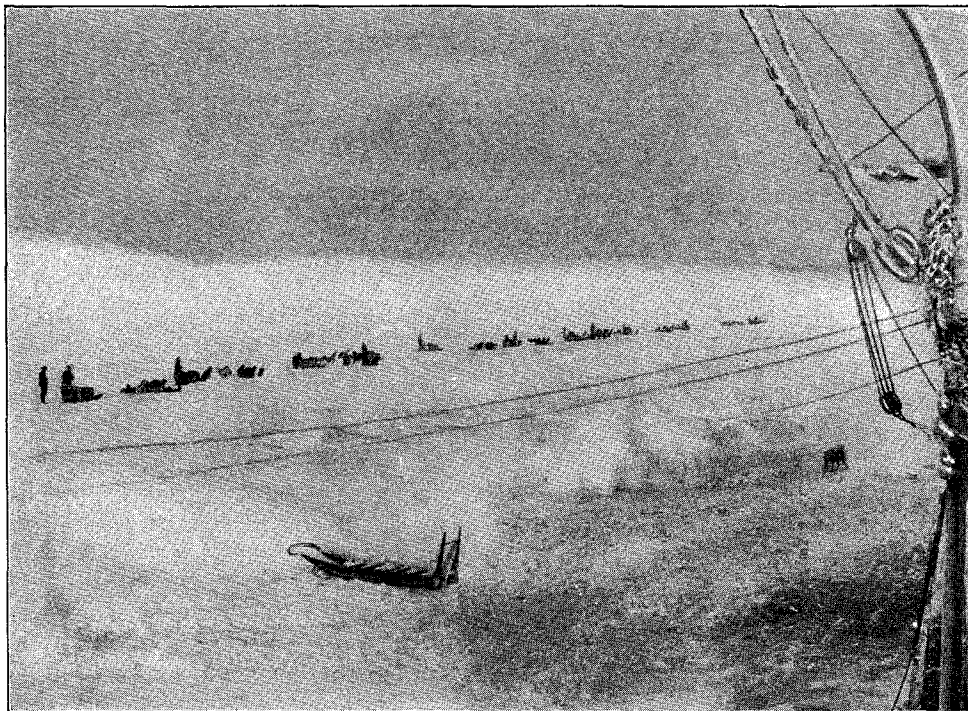
As far as the polar dash was concerned, the work of each supporting party was finished as soon as it reached land. Each of these parties, consisting of four men, was entirely independent, having its own provisions and a complete traveling outfit. With the exception of the kitchen box, containing the alcohol-stove and cooking utensils, each *sledge* was complete. In the event of a mishap and the loss of the cooking outfit, the division losing it would have to double up with another division.

The number of miles covered in each march was first estimated by dead reckoning; that is, by taking the compass course for direction and the mean estimate of Marvin, Bartlett, and myself for distance traveled. At intervals of several marches this was checked by observations for latitude, and proved to be satisfactorily approximate to the results obtained by our astronomical observations.

Thorough preparedness for a sledging-trip is of vital importance, and no time devoted to the study and perfection of the equipment for a long journey can be considered wasted. It must be devised to meet every condition and every extreme, and my sledge-trips have always been preceded by days and weeks and months of careful attention to the slightest details. To the inexperienced the amount of work thus involved, even for a small party, would be surprising.

Every precaution should be taken to render every article of equipment as impervious to the dangers of injury or breakage as possible. This not only saves the extra burden of a repair outfit, but valuable time in the field.

Next in importance comes weight. Everything should be just as light as it can possibly be made; for the number of miles a party can travel depends on the amount of food it can carry, and every pound deducted from the weight of equip-



PARTY LEAVING THE ROOSEVELT FOR CAPE COLUMBIA

ment means an extra pound added to the food-supply.

The first item of equipment to be considered is the sledge. Upon it all depends, and no detail of its construction is too small to be of the utmost importance. It must be of as easy traction as possible, and as light in weight as it can be without the sacrifice of strength for lightness. Twenty-three years of arctic sledge-traveling and experience with all types of sledges have given me clear and definite ideas as to essentials and non-essentials in the construction of sledges. Those built for my first expedition were modeled on the same general principles as the McClintock sledge, but weighing about one third as much. Each succeeding expedition has seen some improvement in our sledge designing and building, and the Peary sledge, used for the first time on my last expedition, is, in my opinion, the best type of sledge yet built for polar-sea ice-work. Because of the length and shape of this style of sledge, it proved itself more durable and much more easily

drawn than any others I have ever used.

It is two feet wide, from twelve to thirteen feet long, with a height of seven inches. The sides are of solid oak, curving up in back as well as in front. Ash runners two inches wide are attached to the sides. The runners are equipped with steel shoes two inches wide. All fastenings except of the shoes to the runners are of sealskin lashings, making a sledge which is strong enough to support from one thousand to twelve hundred pounds.

I also used on my last expedition the regular type of sledge that has been in use among the Eskimos since the early days when they had to depend on the bones of the walrus and whale and the antlers of the deer for material for building their sledges. This type of sledge has two oak runners seven inches in width and one and a quarter inch in thickness. These are steel shod, but are curved only at the front. To render them better adapted to the special work before us, I increased the length of these Eskimo sledges from six or seven feet to nine and a half feet.

Sledges intended for inland ice-work may differ from those to be used in sea ice-work. Deep, soft snow is generally prevalent in the interior regions, and to keep a sledge from sinking into it, it must be equipped with broad, flat runners. There can also be a decided gain in lightness in the sledges for this class of work, although the strong winds of the ice-cap carve portions of it into sharp, almost marble-like sastrugi, which test the powers of endurance of the best of sledges. None of those used by me in my Greenland inland-ice cap-work weighed over fifty pounds, while those used on my trip to the pole averaged ninety-five pounds.

After the matter of a suitable sledge, come questions of rations, dress, instruments, dogs, and the size of the party required for the work in hand. For any serious sledge-journey in polar regions there are four and only four food essentials, whatever the time of year, the temperature, or the length of the trip. These are pemmican, tea, ship-biscuit, and condensed milk. Long experience with these foods as staples has convinced me that nothing else is necessary either to provide heat for the body or to build muscle. The pemmican for my last expedition was a preparation of lean beef dried until it was friable, then ground fine, and mixed with beef fat, sugar, and a few raisins. No more concentrated or more satisfying meat food can be prepared, and it forms the one absolutely indispensable item of any polar sledge-ration. Our tea also was compressed in order to save bulk.

A daily ration of one pound of pemmican, one pound of biscuits, four ounces of condensed milk, and half an ounce of compressed tea, with six ounces of alcohol or oil for fuel, will keep a man in good working condition for an indefinite period even in the coldest of weather, and this has been the standard ration on all my later polar sledge-trips. I have always tried to keep my dogs as well, if not better, fed than myself, and have found one pound of pemmican per day sufficient to keep a dog healthy and strong, although, if necessary, an Eskimo dog can keep hard at

work for a considerable time on very little to eat.

In my expedition of 1891-92 I deliberately planned to use dogs for food for the first time, I believe, in the history of arctic exploration. As the dogs wore out, we fed them to those remaining, or ate them ourselves, thus making our load of provisions last much longer. This has been the principle of all my subsequent trips, and results have fully proved it to be a sound one.

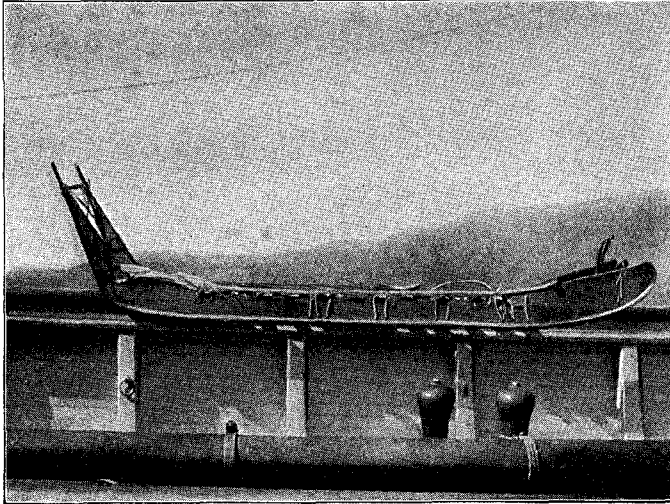
My parties in the field have had two meals a day, one before the march, the other after it. As the days shortened, and it became necessary to utilize every moment of daylight for traveling, our meals were eaten before daylight and after dark, there sometimes being a period of twenty-four hours between meals. On the polar trips the party that went ahead to break a way for the main party was allowed tea and a lunch at noon, so strenuous was the work.

The matter of suitable clothing for a sledge-journey is of the greatest importance to arctic explorers, and there is a wide difference of opinion among various authorities on this subject. I consider the impervious integument of animal skin absolutely essential, and the more fur is substituted for woolen clothing, the more comfortable the traveler will be. The clothing of the Eskimos is made entirely from the furs and skins of the various animals and birds of the North. Their patterns for clothing and the use of certain materials for certain purposes are the results of generations of experience in adapting themselves to the rigors of arctic life.

Believing their dress perfect for conditions under which they wear it, I have adopted it, with slight modifications, for my parties. The costume consists of a *kooletah*, or fur jacket; an *ahteah*, fur shirt; *nannookies*, or fur trousers; hare-skin stockings; *kamiks*, or boots of skin; and fur mittens. A light-weight union suit was worn under our fur clothing to prevent chafing.

With an outfit of this kind it is pos-

sible for a party to undertake the longest of sledge-journeys in very low temperatures, and under all conditions from sleeping in the open to the hard work of lifting and hauling the sledges over difficult places, with the minimum of discomfort.



ONE OF THE PEARY SLEDGES

The instrumental equipment for a sledge-journey of any length over the inland ice should comprise a theodolite, a sextant and artificial horizon, compasses, chronometers, thermometers, good field-glasses, cameras, and aneroids. The same instruments are required for a sledge-journey over the polar sea, and a sounding outfit should be added. Special items for sea ice-work are floats for crossing lanes of water, and coils of walrus lines for various purposes. Of course no equipment is complete which does not include firearms and snow-shoes.

Another important item of equipment on my last sledge-journey was an entirely new alcohol-stove of my own design, on which I spent days in perfecting and trying out during the long winter night. This new device worked splendidly, enabling us to melt ice and make tea in ten minutes, a process which on previous trips, with the old-style stoves, had taken a full hour or more. A saving of something over an hour and a half every day on a long sledge-journey over the sea-ice may mean

the difference between success and failure.

A sleeping-bag has always been considered an essential item of equipment for sledge-parties, but I have not used one since my expedition of 1891-92. My parties in the field, on turning in for the

night, simply place a musk-oxskin or deer-skin on the floor of the tent or snow igloo, and lie down with their clothes on. I have found this much more practicable than the bags, and much safer. In work on sea ice a man in a sleeping-bag would have virtually no chance to save himself should a lead open through his igloo.

In all winter sledge-traveling, and on my trips from Cape Columbia to farthest north in 1906 and to the pole

in 1909, we depended entirely on snow igloos for shelter. Hunting-parties on my last two expeditions and sledge-parties sent out with supplies to the various depots between Cape Sheridan and Cape Columbia used specially made tents.

These tents are absolutely snow-proof, being made of a light weight of canvas, with a floor of canvas stitched to it. The fly of each tent is sewed up, and a small opening large enough for a man to crawl through is cut in the fly. A circular flap sewed round the opening, with a draw-string, make it perfectly tight. The tents are pyramidal in shape, supported by a single pole in the middle. Sledges or snow-shoes may be used to hold the sides down. They were made large enough to accommodate four men.

In addition to being snow-proof, they were also rendered water-proof by an application of linseed-oil. The tents were colored brown by soaking in tea grounds and a little hemlock bark, suggested by the custom of Labrador and some other fishermen thus treating the sails of their

boats. It makes the canvas more durable, and is a preventive of mildew. In our case it served a twofold purpose. One was to make the tent distinctly visible at a much greater distance, and the other was to soften the intense glare of the continuous arctic day when we entered it to sleep.

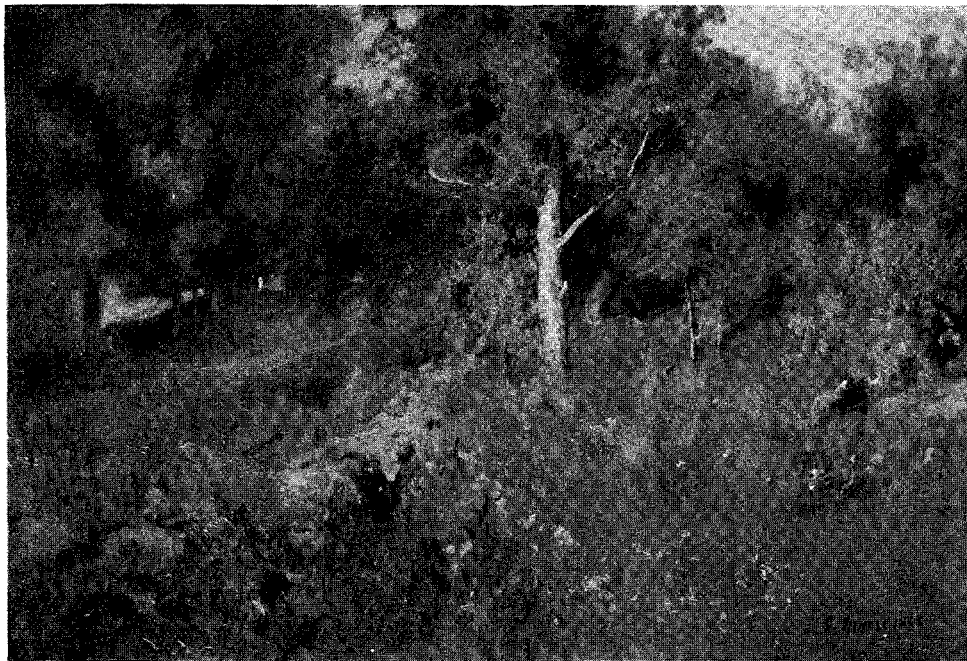
The standard sledge-load consists of supplies for dogs and driver for fifty days. In loading a sledge the main thing is to have the heavier articles as low as possible to prevent the sledge being easily upset. The pemmican for the dogs was put up in red tins, and that for the men in blue tins, the former weighing twelve pounds, the latter six. The length of these tins was exactly the same as the width of the sledge. A layer of dog pemmican covered the whole sledge, forming a floor to it. On this was placed the men's pemmican and two twenty-five-pound tins of biscuits. Next came the alcohol, put up in one gallon tins, and the cans of condensed milk. On top of this were stowed a small musk-ox rug for the driver to sleep on at night, snow-shoes and extra clothing, and a pickax and saw knife for making snow igloos. Extra *kamiks* are a necessity; for a journey of several hundred miles over rough ice and snow soon tells on one's footgear.

For tractive power I have always used the Eskimo dogs, and believe they are the

only motor for polar work. Eight dogs are required to haul the standard load, but with an extra load or for fast traveling I have sometimes used ten or twelve good dogs. The dogs are attached to the sledges fanwise, the king dog of the team taking the lead, and there is no peace among the dogs of each team until it has been definitely settled among themselves which animal is the best or strongest of the lot. The Eskimos make their harnesses of sealskin; but when the dogs are living on short rations they will eat anything made of this material, and to prevent this, I have used a special webbing, or belting, two and a half inches wide. Instead of making the traces of rawhide, as the Eskimos do, I have substituted braided linen sash-cord for it. My dog harnesses were made on the same pattern as the Eskimos': two loops of belting, through which the dog's fore legs pass, attached by cross strips under the throat and back of the neck. The ends of the loops are tied over the middle of the dog's back, and the trace fastened to it, making a flexible harness which will permit a dog to pull to the full extent of his strength without cramping or chafing him. The art of guiding a team of lively Eskimo dogs by the voice and rawhide whip twelve or eighteen feet in length is something which requires long time and great patience to master.

(This is the last of the three articles on arctic exploration by Admiral Peary.)





From the Thomas B. Clarke Collection sale of 1899

SUMMER FOLIAGE

George Inness

By ELLIOTT DAINGERFIELD

Illustrations from paintings by George Inness

WE do not know what we should have had if George Inness had written his own biography. Eccentric it certainly would have been, with slight attention paid to those externals which are of interest to the general reader; for he was the most impersonal of men. He was never interested in himself as a man, though he was interested in the artistic man. He believed in himself as an artist very profoundly, and his mind, which was most alert, was ever delving into or solving problems connected with what he called "the principles of painting." Of this sort of thing we should have had a great deal, more, indeed, than any of us could have understood, because he was not always coherent. To himself his reasoning was very clear; indeed, he valued the results of these mental debates greatly, many times writing them down. What has become of these writings I do not know, but

no doubt they were written in such a vagrant, disjointed way that they could not be pieced together by another.

In speech his vocabulary was rapid, extensive, extreme, not always well chosen as to meaning; but, when supplied with gesture and expression, words took on new meanings, and for the time were understandable. If reported verbatim, they would have failed of meaning. Just how they would have appeared in any biography I do not know, for cold type is ever a cruel critic.

He once expounded to me what he called "the ascent of a fleck of soot to the pure diamond by the vortexical progress," and proved, to himself at least, divinity. Frankly, I could not follow either the thought or the reasoning, though it seemed intensely interesting, and I begged him to write it down. He said that he had spent the night doing so, but I have never