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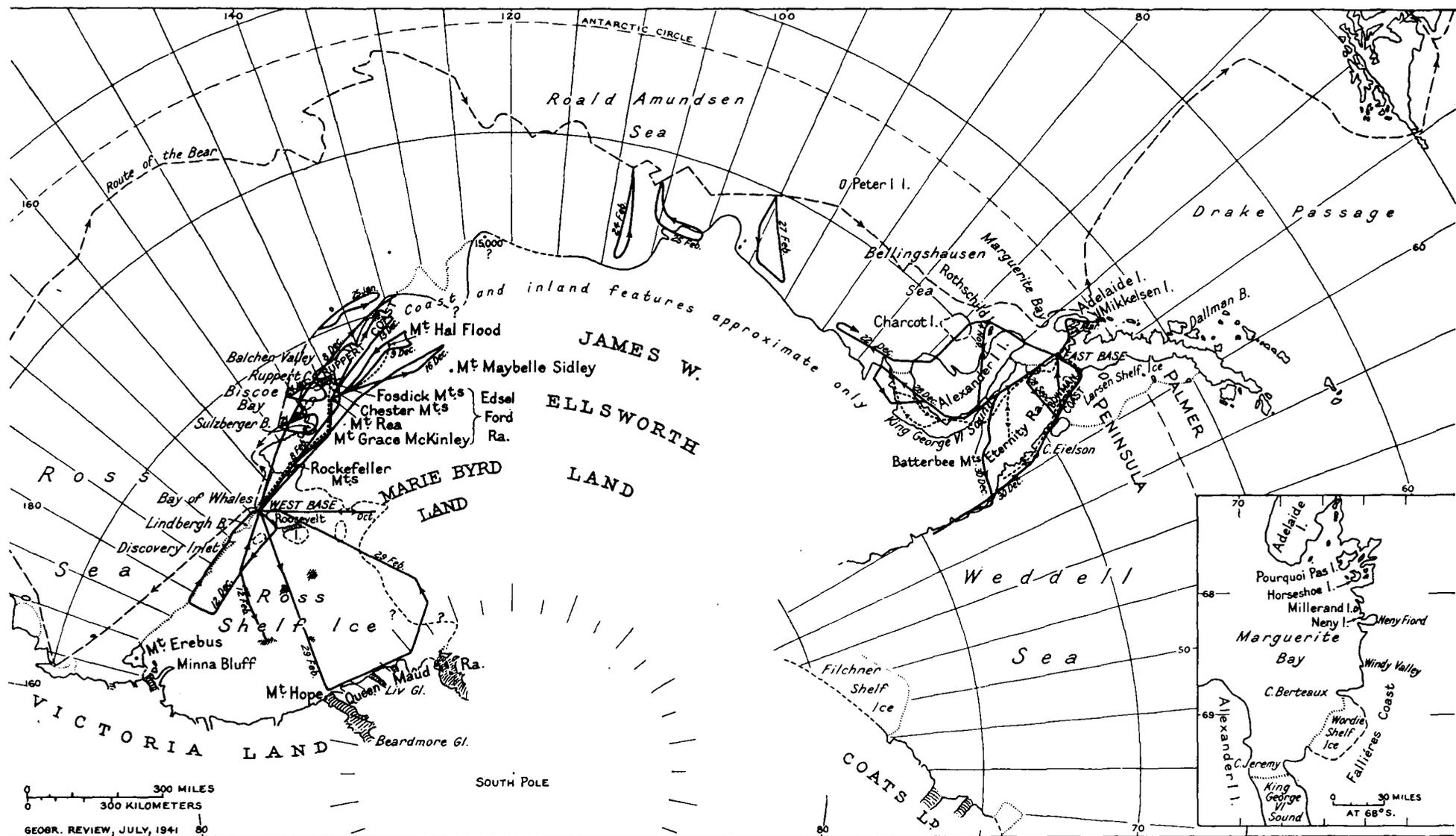


FIG. 1.—Preliminary map of the Pacific quadrant of Antarctica showing the field of operations and the approximate flight (solid line) and sledge (dotted line) tracks of the United States Antarctic Expedition, 1939-1941. Scale approximately 1 : 20,000,000. Inset of the East Base region, scale 1 : 5,500,000. Through courtesy of Captain C. S. Bryan, Hydrographer, U. S. Navy, the new discoveries are based on the forthcoming Hydrographic Office chart of the Antarctic (No. 2562, 1 : 11,250,000); the tracks are based on radio dispatches received at headquarters in Washington.

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PRELIMINARY ACCOUNT OF THE UNITED STATES ANTARCTIC EXPEDITION, 1939-1941*

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Executive Secretary, United States Antarctic Service

IN late November, 1939, the U.S.M.S. *North Star* and the U.S.S. *Bear* sailed from Atlantic ports of the United States under the command of Rear Admiral Richard E. Byrd¹ to set up two bases in the Pacific Ocean region of Antarctica. After passing through a narrow belt of loose pack ice in the Ross Sea, the vessels reached the Bay of Whales on January 11, 1940, and unloaded on the fast ice in the bay. A base site was selected on the Ross Shelf Ice about three miles northeast of the old site at Little America, and on January 24, 33 men, under the command of Dr. Paul A. Siple, occupied this camp. On the same day the *North Star* departed northward, and on February 15 it reached Valparaiso, where a Condor airplane and stores destined for the East Base to be established on the coast of Palmer Peninsula were taken aboard.

COASTAL FLIGHTS FROM THE "BEAR"

On January 19, 1940, the *Bear* left the Bay of Whales. Two days later, while the vessel remained in Biscoe Bay, the Barkley-Grow seaplane, manned by Byrd, Snow, and Perce, flew over Sulzberger Bay. On January 24 the same crew flew northeast toward the Chester Mountains and saw much open water off the coast. The *Bear* then followed the open water northeastward and on the following day reached 74° 43' S., 143° 52' W. A flight was made from this point eastward along the Ruppert Coast to about 135° W. A coastal range about 4000 feet high, snow-covered but with dark rock exposures, bordered the shore line. Far to the south the peaks of other ranges were seen. In about 74° 30' S., 141° W., a rocky, snow-covered island was observed to be separated from the mainland by a sheet of shelf ice, its northern extremity forming a steep bluff about 300 feet high that jutted into the open sea.

On January 30 the *Bear* returned to the Bay of Whales, and on February 1 it took its final departure. First the southern and west-

ern shores of the Ross Sea were followed, and then the course was set eastward from about 70° S., 179° E., until February 24, when the vessel was in 70° 43' S., 108° 25' W. Byrd, with Snow and Perce, took off in the seaplane at 12.58 p. m. local time and set his course southward. When the plane was about 190 miles from the ship, the ice cliffs that form the coast line came into view, with an extensive mountain range, which seemed to be about 7000 feet high, trending east-west at a distance of about 10 miles farther south. East of the flight track and about 80 miles north of the coast a snow-covered island was seen. The plane landed at the ship at 4.10 p. m. local time.

The following day the *Bear* reached 70° 58' S., 105° 33' W., and the seaplane again flew southward. When the plane was about 50 miles from the ship, land was raised ahead and to port. The course was changed to southeast, and the coast was observed to trend northeastward as a peninsula, with parallel snow-covered mountain ranges about 4000 feet high stretching east-west between 100° W. and 114° W. Many blue areas, which appeared to be glacier ice, were seen interspersed between the massifs. When the plane had gone about 122 miles from the ship, it turned back, taking a direct course to the vessel.

On February 27 the *Bear* had worked eastward to 70° 4' S., 95° 19' W. Byrd, with Snow and Perce, took off at 10.50 a. m. local time, circled to 6000 feet, and then headed south. In 40 minutes the eastern side of the peninsula observed two days before was seen projecting seaward for some 120 miles, with many peaks about 3000 feet high. A mountain some 4000 feet high lay at the southeastern end of the peninsula in about 96° W. In a large, ice-filled bay two large islands were seen, the easternmost one in about 71° 50' S., 96° W. Ice cliffs formed the southern shore of the bay, beyond which the coast stretched southeast to about 88° W. No rock outcrops were visible in the hinterland, which appeared to rise steeply to the south.

OPERATIONS FROM THE EAST BASE

After the flight of February 27 the *Bear* skirted the edge of the pack ice eastward. A group of six small, low, partly snow-free islands was sighted off the northwestern coast of Alexander I Island. The *North Star*, steaming south from Valparaiso, also sighted four small islands off the entrance to Marguerite Bay and fixed the position as 68° 37' S., 70° 50' W.

The two vessels met on March 3 and stood into Marguerite Bay, anchoring in a small bay between Neny Island and the mainland. Various sites for the base were investigated by the ships, and, as none of these was found suitable, two flights were made in the seaplane along Fallières Coast. The second aerial reconnaissance, made by Byrd, Black, Snow, and Perce, indicated that the most suitable site was a small islet fronting the quiescent glacier in the vicinity of Neny Island. This site, about a mile from the anchorage, was chosen as the base (approximate position, 68° 10' S., 67° W.), and unloading began at once. Winds of great velocity descending from the plateau made this anchorage untenable for the *Bear*, however, and it moved to a more protected refuge in the lee of Horseshoe Island, about 20 miles farther north.

On March 21 the ships completed the unloading and proceeded northward to American ports.

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The organization of the United States Antarctic Service, under which the expedition was carried out, and the early work of the expedition have been described briefly in the *Geographical Review*, Vol. 30, 1940, pp. 163 and 325-327. The present article and map are intended to give a summary account of the field operations of the expedition from its departure, in November, 1939, to its return, in May, 1941, based mainly on the radio dispatches from the field received at headquarters in Washington, on which dispatches were also based the 70-odd press releases issued and distributed by the Service. All data concerning geographical features, and especially their exact positions, are necessarily preliminary. Final clarification must await the preparation of the results by members of the expedition.—Edrr. Note.

¹ The members of the expedition mentioned in this paper are as follows: Rear Admiral Richard E. Byrd, U.S.N. (Ret.), commanding officer of the United States Antarctic Expedition; *East Base*: Richard B. Black, base leader; Arthur J. Carroll, U.S.N., chief photographer; Harry Darlington, 3rd, general service; J. Glenn Dyer, General Land Office, surveyor; Carl Eklund, assistant biologist; Joseph D. Healy, dog driver; Donald C. Hilton, assistant surveyor; Paul H. Knowles, geologist; Lester Lehrke, Chief Boatwain's Mate, First Class, U.S.N., sailmaker; Lytton Musselman, general duty; Robert Palmer, supplies; Earl B. Perce, Radioman First Class (N.A.P.), U.S.N., assistant pilot; Fiance Ronne, transportation engineer; Charles Sharbonneau, Corporal, U. S. Army, base carpenter; Lewis S. Sims, M.D., Lieutenant (j.g.), U.S.N. (M.C.); Ashley C. Snow, Aviation Chief Machinist's Mate (N.A.P.), U.S.N., chief aviation pilot; *West Base*: Adam Asman, Sergeant, U. S. Army, tractor driver; Clay W. Bailey, Chief Radioman, U.S.N., communication engineer; Jack Bursey, dog driver; Raymond A. Butler, cartographer; Luis Colombo, supplies; Felix L. Ferranto, Sergeant, U. S. Marine Corps, radio; Roy G. Fitzsimmons, physicist; Walter R. Giles, Master Technical Sergeant, U. S. Marine Corps, aviation pilot; Harold P. Gilmore, recorder; Orville Gray, Aviation Chief Machinist's Mate, U.S.N.; Clyde W. Griffith, Machinist's Mate, Second Class, U.S.N., engineer; Dr. Ernest Lockhart, physiologist; James C. McCoy, Aviation Chief Machinist's Mate, U.S.N., aviation pilot; Richard S. Moulton, dog driver; Charles F. Paezel, geologist; Jack E. Perkins, biologist; Theodore A. Petras, Master Technical Sergeant, U. S. Marine Corps, aviation pilot; Harrison H. Richardson, dog driver; Isaac Schloseback, Lieutenant Commander, U.S.N. (Ret.), executive officer; Charles C. Shirley, Photographer First Class, U.S.N., photographer; Dr. Paul A. Siple, base leader; Dr. F. Alton Wade, senior scientist; Lawrence A. Warner, geologist; Loren Wells, Boatwain's Mate, First Class, U.S.N., sailmaker; Murray Wiener, physicist.

Flight operations were begun on May 20, when a flight was made southward along the coast as far as Cape Jeremy, at the eastern entrance to King George the Sixth Sound, and photographs of prospective sledging routes were obtained. The next day a cache was set up on the Wordie Shelf Ice by using the plane as a transport. In July and August sledge parties led by Black ascended the plateau and searched out a safe route to Bowman Coast. On September 10 a depot-laying party crossed Palmer Peninsula and laid a cache at the head of one of the valley glaciers on the Weddell Sea coast opposite the base.

On September 21 the flight crew, consisting of Black (base leader), Snow (pilot), Perce (second pilot and radio operator), and Carroll (photographer), made a flight in the Condor plane across the peninsula, first east from the base, then south from 68° S. to 69° S. mapping Bowman Coast,² and then west and north on the return. On September 28 Black, Snow, Perce, Carroll, Ronne, and Dyer flew to the Wordie cache area, thence east to Weddell coast, north to Mobiloil Bay, and across the peninsula to the base. During the early part of October a second depot-laying party trekked to the eastern side of the peninsula and deposited stores at the cache set up the previous month.

A meteorological outpost was established on the plateau at an elevation of 5500 feet above sea level. This outpost, located at 68° 8' S., 66° 32' W., was occupied by Lehrke and Palmer on October 26, and meteorological reports were sent twice daily to the base until the outpost was abandoned on December 30. Not only did the outpost party serve as a valuable adjunct to the aviation personnel by forecasting flying weather, but the outpost observations were correlated with base observations and transmitted daily to the weather bureaus of Argentina, Chile, and Uruguay.

On November 4 the first aerial thrust southward was made, by Black, Snow, Perce, Carroll, and Ronne. After the take-off from the fast ice, a course was laid to skirt the northern end of Alexander I Island. Beyond Rothschild, which was found to be an island and not a cape, a southeasterly course permitted the photographing of much of the west coast of Alexander I Island. The fault trough, King George the Sixth Sound, was entered and was observed here to trend westward, with high land and numerous mountains forming the southern shore.

Sledging operations began on November 7. Bad weather had prevented any flying from September 28 to November 4 and a plan to carry stores for caches, and later, parties with dogs had to be abandoned and a start made on foot. The Southwestern Party, consisting of Ronne and Eklund supported by Knowles and Hilton, proceeded southward to the Wordie Shelf Ice cache. This party was accompanied by the Survey Party, made up of Dyer, Healy, and Musselman, with Ronne in charge until separation of the parties.

On the 12th a depot-laying flight was carried out to King George the Sixth Sound, where a landing was made near the Batterbee Mountains and a cache set up on the floor of the sound in 71° 45' S., 67° 50' W. The elevation here was 125 feet above sea level. On the return flight the Ronne party was sighted laboring in the crevassed area south of the Wordie Shelf Ice, and a description of the cache was dropped from the plane to the sledge party. Knowles and Hilton returned to the base on the 15th, having traveled over the sea ice from Cape Berteaux. On the 16th Black, Snow, Perce, Sims, and Sharbonneau made a flight to the Wordie cache to replenish the supplies there.

On the 22nd the two parties on the plateau separated. The Survey Party struck southeastward over the axis of Palmer Peninsula, which was found to be 7000 feet above sea level. Three days later the Eternity Mountains were reached. This range, 12,000 feet in height, is cut transversely by the major depression or rift that crosses the peninsula, which has been described by Rymill.³ Survey investigations were carried out in these mountains as far as 70° 53' S., 63° 38' W. The party returned via the Wordie cache and reached

the base on December 12, after a march of 36 miles over the sea ice on the last day.

After separating from the Survey Party on November 22, the Southwestern Party, with 15 dogs, continued southward until the Batterbee Mountains were reached, where a pass was descended to King George the Sixth Sound. The cache set up there was visited. The party then headed southwestward and on December 6, in 72° 9' S., 69° 15' W., crossed a pressure crack containing salt water. A 400-foot escarpment that rose to the west and extended due south was then climbed. Following the edge of this scarp, the party descended gradually and met pressure ice. On December 10 the southern shore of the sound was reached in about 73° 5' S., 70° W. It was followed westward for a week to 73° 6' S., 73° 18' W., where it was found that the shore began to trend northwestward. Skirting the coast, the party soon came upon open leads in the sea ice and found tabular icebergs in great numbers. On the 21st Ronne and Eklund reached 72° 32' S., 76° 42' W., where they camped on the northwestern extremity of the shelf ice which fringes the coast line. Open sea was visible to the limit of vision from northwest through north to east-southeast. The magnetic variation at this camp was determined to be 32° 26' E. The return journey was made on the floor of the sound to the Batterbee cache, beyond which the party's movements are referred to below (p. 472).

On December 22 a flight was made southwestward from the base, skirting the northern extremity of Alexander I Island and passing southwestward over Charcot Island and thence southward to the mountainous western coast of Alexander I Island until the open water reported by Ronne was sighted. From the northwestern extremity of the shelf ice the coast line was traced westward to 85° W., and photographs were taken of mountainous capes and vast parallel depressions that extended southwestward toward a high, mountainous hinterland.

On December 28 another flight was made southwestward. Following King George the Sixth Sound, the plane traced the southern coast of Alexander I Island to verify its insularity and photograph the mountain ranges on the southern shore of the sound. The western mouth of the sound was observed to have rift features similar to those near Cape Jeremy, and two large ice tongues were seen to project west-northwest from a mountainous cape of the mainland in about 77° W. A rocky island was observed, about half a mile long and a thousand feet high, lying in a bight of open water opening westward between the coastal escarpment and the nearest ice tongue. Large mountain masses were visible on the west-southwest horizon. Altering the course to easterly, Black observed the inland mountain features until clouds forced a northeasterly course. After a landing at the Batterbee cache, a direct flight was made to the base.

The Weddell Coast Party, consisting of Knowles, Hilton, and Darlington, headed eastward from the base November 18. After surveying Bowman Coast, they sledged southward over the coastal piedmont, fixed at 70° 30' S., 61° 34' W., the position of the cape interpreted as Cape Eielson on United States Hydrographic Office Chart No. 5411, and then followed the mountainous coast to 71° 51' S., 60° 47' W. It was determined that the Larsen Shelf Ice does not extend south of 69° 40' S. Return was made by the route followed on the outward trip.

On December 30 the last extended flight was undertaken. The regular crew was augmented by Dyer, since the plan included an extension of operations by the surface party under his leadership. The plane proceeded southward along King George the Sixth Sound and then turned southeastward over a pass in the eastern wall to 71° 20' S., 65° W. The Eternity Range was photographed, and the plane was then headed southward to photograph two peaks, about 13,700 feet high, in 71° 31' S., 63° 34' W. After the divide had been crossed, an extensive range of mountains was sighted trending southward and a large depression running southeastward. By following this rift, the plane reached the Weddell coast in 72° 32' S., 60° 23' W., and thence skirted along the piedmont of the coastal range to 74° 37' S., 61° 15' W. From an altitude of 8400 feet this south-trending coastal range was viewed as far as 77° S., where the summits appeared to thin out and decrease in altitude to about 7000 feet. Southeast and

² W. L. G. Joerg: The Topographical Results of Ellsworth's Trans-Antarctic Flight of 1935. *Geogr. Rev.*, Vol. 26, 1936, pp. 454-462; *idem*: The Cartographical Results of Ellsworth's Trans-Antarctic Flight of 1935. *ibid.*, Vol. 27, 1937, pp. 430-444.

³ John Rymill: *Southern Lights*, London, 1938, p. 234.

east of the turning point many patches of open water and leads were seen to the limit of vision, indicating that the Filchner Shelf Ice is restricted to the southern shore of the Weddell Sea. On the return leg of this flight the plane followed two of the valley troughs that radiate from the so-called "traffic circle" described below—the trough that connects the major transverse depression in latitude $69^{\circ} 30' S.$ with the "traffic circle" and the trough that links the "circle" to Neny Fiord, on the western coast of the peninsula.

On January 7, on the return sledge journey on the floor of King George the Sixth Sound, the radio transmitter of the Southwestern Party failed. After reaching the Batterbee cache, the party remained in camp for a week to rest the seven remaining sledge dogs. From the Wordie Shelf Ice, Ronne and Eklund followed an inland route, previously viewed by Black from the plane. This route entered a glacier valley to the north of the Wordie cache and thence followed a trough trending generally eastward into the "traffic circle." Upon reaching the "traffic circle" in $68^{\circ} 40' S., 66^{\circ} W.,$ the party sledged northwestward through Neny trough, where, on January 27, they met a relief sledge party coming southward to make contact with them.

This "traffic circle" is a basin at an elevation of about 2850 feet above sea level from which five smooth, glacier-filled valley troughs radiate like the spokes of a wheel. One descends westward to Windy Valley, another trends northwestward to Neny Fiord, a third, gradually widening, trends eastward to Bowman Coast, bordering the Weddell Sea, and a fourth extends southeastward, merging into the head of Lurabee Glacier near the major transverse rift in about $60^{\circ} 30' S.$ The fifth glacier was ascended by Ronne and Eklund in the vicinity of Cape Berteaux to the "circle."

OPERATIONS FROM THE WEST BASE

On February 8, 1940, the first flight from the West Base was undertaken—in the Condor plane northeastward to the Edsel Ford Range and Ruppert Coast, which had been reached the previous month by seaplane from the *Bear*. The flight crew consisted of Siple (base leader), McCoy (pilot), Giles (second pilot and radio operator), Shirley (photographer), and Warner (observer).

Four days later, in the Beechcraft plane, Siple, with Petras and Wade, flew southwestward over the Ross Shelf Ice to $81^{\circ} 8' S., 176^{\circ} 15' E.$ At three places along the line of flight the surface of the shelf ice was broken by wide fractures, indicating that the ice was aground.

On February 29 the Condor made an extended mapping flight to the Queen Maud Mountains. The flight crew consisted of Siple, McCoy, Giles, Shirley, and Wade. From the West Base a course 203° was taken over the shelf ice, heading for the northern portal of Beardmore Glacier. A widely crevassed area was observed en route in $82^{\circ} 20' S., 170^{\circ} W.$ Near Mt. Hope, at the entrance to Beardmore Glacier, the plane circled to 9500 feet and then steered 134° along the northern escarpment of the Queen Maud Range. Many massive peaks and glaciers were mapped as far as Liv Glacier. In about $84^{\circ} 30' S., 175^{\circ} W.,$ a massive glacier nearly as large as the Beardmore was seen extending southward to the polar plateau. At $84^{\circ} 10' S., 147^{\circ} W.,$ the plane turned northward toward the base. On the homeward flight a large, snow-covered island, about 30 miles long, was observed lying southeast of Roosevelt Island in the approximate position $81^{\circ} S., 158^{\circ} W.$

On March 9 Petras and Griffith ascended in the Beechcraft plane to an altitude of 21,050 feet to make cosmic-ray observations.

On July 9 a midwinter party, consisting of Fitzsimmons, Wiener, and Ferranto, set up a camp about 15 miles east of the West Base for the purpose of taking auroral observations and photographs. The equipment was hauled to the site by the army tank, the crew of which included Asman, Griffith, and Passel. This camp was occupied for one week. Temperatures of $-71^{\circ} F.$ were encountered.

The first spring aviation activity was a test flight made in the Beechcraft plane on August 29 by the three aviation pilots, Petras, McCoy, and Giles. The temperature was then $-52^{\circ} F.$

Spring sledge operations began in early October, when the army tank and tractor set up a cache of aviation gasoline in the Rockefeller Mountains, about 110 miles east of the West Base.

Three trail parties with dog teams set out in mid-October. The first of these, the Biological Party, consisting of Perkins, Lockhart, Colombo and Richardson, headed for the Fosdick Mountains and the eastern shore of the Ross Sea bordering Marie Byrd Land. The Pacific Coast Survey Party, consisting of Berlin, Bursey, and Moulton, left the next day to establish ground control as far as Mt. Hal Flood along the Ruppert Coast. Simultaneously two teams forming the Geological Party of Warner, Passel, Gilmour, and Wells headed for the central exposures of the Edsel Ford Range south of latitude $76^{\circ} S.$

The army tank, manned by Asman and Griffith, again returned to the Rockefeller Mountains, hauling the seismic equipment to that site, where it was operated by Schlossback, Fitzsimmons, and Butler. The tractor, driven by Boyd and Ferranto, then hauled aviation gasoline and trail provisions to Mt. Grace McKinley, about 90 miles east of the Rockefeller Mountains.

Both planes now undertook a series of flights and established distant aviation-gasoline caches. One cache was laid about 200 miles southeast of the West Base on the Ross Shelf Ice, in about $80^{\circ} 45' S., 147^{\circ} W.,$ another at Mt. Rea in the Edsel Ford Range.

In early December a series of local flights was undertaken to map the area in the vicinity of the base, and on December 9 the summer aerial-survey flights began. On that date Siple and Petras took off in the Beechcraft plane, heading eastward. They landed and refueled at the Rockefeller Mountains and at Mt. Rea. Again taking off, they set a course for Mt. Hal Flood, at the base of which the plateau surface stood at an altitude of not less than 5400 feet. Mt. Hal Flood, a conspicuous peak over 10,000 feet high at $76^{\circ} 4' S., 135^{\circ} 50' W.,$ was seen to be the highest elevation of a long, snow-capped range that ran in an east-west direction. This range, broken by many glacier passes, was followed for about 50 miles and was observed to stretch eastward to the horizon. At the 134^{th} meridian the plane turned northward at 8000 feet over one of the glacier passes to $75^{\circ} 45' S.$ Along the 75^{th} parallel the coast, with open water to the north, was seen to be bordered by numerous nearly bare coastal mountains, toward which the plateau drops from the main range near the 76^{th} parallel. To the west this main range appeared to trend toward a high, snow-covered ridge lying north of Balchen Valley and terminating in Ruppert Cape. The main range, which runs in a straight line for about 250 miles, is marked by snow-covered peaks about 7000 feet high and an abrupt, partly buried, north-facing escarpment. The coastal mountains, with many rock exposures, extended from $75^{\circ} S., 133^{\circ} W.,$ northeastward and eastward to the horizon. One unusually large mountain was observed on the horizon in the approximate position $76^{\circ} 10' S., 130^{\circ} W.,$ and other mountains were noted on the northern side of the main range east of $135^{\circ} W.,$ though in general the area between the main range and the coastal range was an uneven, snow-covered plateau surface.

On December 12, Siple, McCoy, Giles, and Shirley in the Condor attempted a flight southward but encountered fog 50 miles south of the base near the glacier saddle that crosses Roosevelt Island. They turned westward and continued to $178^{\circ} E.,$ where a large area of disturbed ice was seen about 30 miles to the southwest near the point where Royds turned back on his sledge journey on the shelf ice in 1903. An apparent rise in the surface of the ice suggested the existence in that locality of a low but large island. As Minna Bluff and Mt. Erebus came into view, the plane was turned northward to the barrier, where an eastward course was taken. At Discovery Inlet and Lindbergh Bay evidence was seen indicating that the seaward edge of the Ross Shelf Ice was aground there.

On December 13 Siple and Petras again took off in the Beechcraft, refueled at Mt. Grace McKinley and Mt. Rea, and then followed the coastal mountains to $135^{\circ} W.,$ where clouds forced a southward course to the main range, the northern side of which was photographed on the return flight. Landings were again made to refuel at Mt. Grace McKinley and Mt. Rea, and the base was reached after an absence of 13 hours.

The next day Petras and photographer Shirley took off in the Beechcraft for the purpose of mapping Ruppert Coast. They refueled at Mt. Grace McKinley, but in landing at Mt. Rea the plane ski

was damaged. They made emergency repairs but were recalled to the base by radio because of clouds descending over the base.

On December 16 Petras and Siple again flew northeastward in the Beechcraft plane. They took off from the base at 10.51 p. m. and made stops at Mt. Grace McKinley and Mt. Rea for fuel. Leaving Mt. Rea at 2.52 a. m., they laid a course midway between Mt. Hal Flood and Mt. Maybelle Sidley. The latter peak, in about $77^{\circ} 25' S.$, $129^{\circ} 45' W.$, is more than 12,000 feet high, the highest summit of a prominent range trending northeast-southwest. The surrounding plateau rises to 7000 feet. From Mt. Maybelle Sidley they steered northeastward to $76^{\circ} 45' S.$, $129^{\circ} W.$, the limit of the operating range of the plane. At this position a massive peak rises, about 12,000 feet high, beyond which the surface drops to the northeast. This peak is about 30 miles south of the eastern extremity of the range seen on the 76th parallel on December 9. The easternmost peak of the new range was plotted in $76^{\circ} 30' S.$, $127^{\circ} W.$ After refueling at the mountain caches, the plane returned to the base at 11.40 a. m.

Two days later the big Condor plane took off at 7.02 a. m. with Siple, McCoy, Giles, and Shirley. Flying direct to Ruppert Coast, the plane turned east-northeast along the coast overlooked by the Edsæl Ford Range. Near $75^{\circ} 35' S.$, $142^{\circ} W.$, open water was observed close to a rock-and-glacial embayment extending to a large mountain group about 15 miles farther south. Another large group of mountains flanks each side of an active blue-ice glacier that projects into the sea near $75^{\circ} S.$, $137^{\circ} W.$, with a small, bare island near the glacier face. This glacier drains a large basin that extends to the high mountain range along the 76th parallel. From the tongue of the glacier the rock exposures increase in size and number eastward, filling the area between the coast and the high mountains to the south. A narrow skirt of shelf ice bordered the coast line, with ice-free water to its edge. A small island, to which the shelf ice is attached, lies in $74^{\circ} 30' S.$, $133^{\circ} W.$ After completing a photographing circle in $74^{\circ} 45' S.$, $134^{\circ} 30' W.$, the plane held the easterly course for 20 more minutes to examine several distinctive features ahead. The first of these was a glacial tongue extending northward for some distance to a visible termination. Many bergs indicated calving. Beyond the ice tongue an ice-free embayment extended southeastward for many miles. Ahead of the plane, in about $73^{\circ} 15' S.$, a massive conical mountain was seen, estimated to be 15,000 feet high. This enormous mountain was flanked by open water to seaward. To the southwest toward the escarpment observed on December 16 several peaks were observed trending northeast from Mt. Maybelle Sidley. On the return westward the southern side of the coastal mountains was photographed, then a landing was made for fuel at the Rockefeller Mountains, and the base was reached at 6.25 p. m. on December 19.

On January 2, 1941, the Condor with Siple, McCoy, and Giles flew eastward to the 92-mile depot, where rendezvous was made with the returning sledge parties. Shortly after the take-off from the depot and about 80 miles from the base, the starboard engine of the huge biplane burst into flames. The fire was quickly extinguished, and the plane glided to a landing. Bailey, who maintained a continuous radio contact with all flights from the base, alertly picked up the hurried distress signals flashed out by Giles as the plane descended to the surface. Investigation disclosed derangement of the master connecting rod. Petras and Gray took off from the base in the Beechcraft plane with spare parts for the damaged engine, but it was found that the repairs were too extensive to be undertaken on the exposed

shelf ice. The Condor plane was then abandoned and the Beechcraft used to ferry the Condor crew to the base.

EVACUATION OF BASES

On October 13, 1940, the *Bear* sailed from Philadelphia for the Antarctic regions, followed on December 11 by the *North Star* from Seattle.

The evacuation of the West Base began on January 11, 1941, when the *Bear* reached the Bay of Whales after a nine-day voyage from Dunedin, New Zealand. The *North Star* arrived at the West Base on January 24. Both vessels had encountered a narrow belt of loose drift ice in the Ross Sea. The ships left the Bay of Whales on February 1, retired northward to the vicinity of Scott Island, and then headed eastward toward Palmer Peninsula. Peter I Island was sighted on February 15, and on the 24th the vessels rendezvoused off Adelaide Island. As dense pack ice in this region prevented entry into Marguerite Bay, the ships proceeded northward to Dallman Bay, where anchorage was taken pending favorable ice reports from the East Base.

On February 15 the East Base Condor plane made a flight over Marguerite Bay to examine local ice conditions; many leads and large pools of open water were found, but the sea ice was too dense to permit passage by a vessel.

Light northerly winds and temperatures as high as $52^{\circ} F.$ were recorded for the next month. The sea ice in Marguerite Bay became honeycombed, but the northerly winds held the ice locked in the bay. Water sky was observed in the northern part of the bay by base personnel ascending Millerand Island, but the waters that caused it were inaccessible to the ships. In late February the *Bear* examined the northern edge of the pack near Adelaide Island but found no open-water areas that would permit transit. In the middle of March the *Bear* again investigated the pack, skirting the edge from the western coast of Adelaide Island to longitude $73^{\circ} 8' W.$ without finding a safe passage to Marguerite Bay.

Owing to the unseasonable weather, the unusual pack-ice conditions, and the lateness of the season, emergency evacuation was then decided upon. The *Bear* proceeded northeastward to Mikkelsen Island, a small, snow-covered island about 25 miles northeast of Adelaide Island. A survey party was put ashore, a suitable area for aircraft operations located, and a landing field prepared.

At 5.30 a. m. on March 22 the East Base Condor plane took off from the quiescent glacier near the East Base. With pilots Snow and Perce at the controls, twelve men with their records and scientific specimens were crowded into the plane. After circling to gain altitude, Snow flew northward along the shore of Marguerite Bay as far as Pourquoi Pas Island, thence westward along the northern shore of the bay and over the high peaks of Adelaide Island to the coastal piedmont, and finally northward to Mikkelsen Island. A safe landing was made at 7.15 a. m., and the plane was unloaded. Snow and Perce returned to the base, and at 12.15 p. m. took off again with the twelve remaining members of the base party. The second flight to Mikkelsen Island, 112 miles north of the base, retraced the first flight, and a safe landing was made after an hour and forty minutes in the air. The *Bear* embarked the East Base personnel at once and sailed for Magallanes, Chile, where the *North Star* was met on March 29.

The two vessels sailed from Magallanes on April 2. The *North Star* reached Boston on May 5 and the *Bear* on May 18.

LIEUTENANT COMMANDER ENGLISH was Commanding Officer of the *Bear of Oakland*, during the Second Byrd Antarctic Expedition, 1933-1935. He is at present assigned to the Hydrographic Office, Navy Department, where he is engaged in writing the publication "Sailing Directions for Antarctica" (H. O. No. 138) and in the construction of several Antarctic charts, namely one of the Palmer Peninsula region (H. O. No. 5411), one of the Marie Byrd Land region (No. 5412), and one of the entire Antarctic Continent (No. 2562).

[REPRINTED FROM *The Geographical Review*, Vol. XXXI, No. 3, July, 1941.]

U. S. Polar Expedition Returns

BOSTON, May 5—

The North Star, ice-battered ship of the United States Antarctic Expedition, which left Boston in the mist of dawn on Nov. 15, 1939, docked at the Boston Army Base today with 33 returning explorers who have surveyed 1,000,000 square miles of territory and weathered temperatures of 72.6 below zero in the South Polar region.

The Government-financed expedition was cut short because of the national defense emergency and the refusal of Congress to appropriate further funds at this time for continuing the operations at Little America.

Greatest single accomplishment of the Expedition, it was said, was the charting of 1,000,000 square miles of territory in the name of the United States. The charting of this South Pacific coastline of Antarctica has been the goal of explorers for over 100 years.

The giant "Snow Cruiser," which made its overland trip to Boston to embark for the Polar regions was left behind, together with other equipment which has been left for future use when another expedition is made.

According to Dr. F. Alton Wade of Miami University, Oxford, Ohio, one of the operators of the Cruiser, if it is to be really satisfactory to polar use again it will need a gear adjustment in order to give it more power.

Natural scientists on the ship reported that during the winter there is no stratosphere whatsoever at the South Pole. They also disclosed that at nine miles above the earth in that region there is a temperature of 130 degrees below zero. This is one of the lowest natural temperatures ever recorded. It would prohibit present aircraft from flights in the polar area.

Explaining the atmospheric phenomena, the expedition's authorities said that they discovered there was no air division, or layer, which is sharply different from the lower layer of air temperature—in other words, no stratosphere.

Long-Range Forecasts

It was predicted, however, that due to the Expedition's discoveries, long-range weather forecasts could be made with much greater accuracy if a full-time weather base were to be established there. Experts thought it would be entirely practical to set up such bases.

Much valuable natural scientific data, including botanical specimens and rare birds of the Antarctic were brought back by the Expedition. It is expected that it will require three years to compile this material and get it in shape for practical study.

On board the North Star were 27 Eskimo dogs and 47 others are en route here on the "Bear." It was said the dogs would be presented to the Army.

26 BYRD AIDES FACED TRAP IN ANTARCTIC

Patched-Up Plane Saved Them From Another Winter in Ice

VALPARAISO, Chile, April 12 (AP)—Members of the Admiral Richard Byrd Antarctic Expedition, on their way to Seattle, described today the perilous emergency evacuation of twenty-six men from their east base at the bottom of the earth. Here for a "freshening-up" visit, the men told this story:

The expedition's two ships, the North Star and the Bear, took off the men assigned to the west base in Little America early in February and headed toward the east base on Palmer Peninsula.

Ice filled Margaret Bay. Winter was closing down and supplies

aboard the ships dwindled as a month was passed in Melchior Harbor, 200 miles from the base.

The ships kept in contact with the base by radio, and, when the men at the base reported that their meat was gone and they were living off penguin eggs, the North Star headed for Punta Arenas on the Strait of Magellan for fuel and supplies.

The Bear pushed ahead alone and forced a way through the ice to a point about 112 miles from the base.

There was danger that the men at the base would be ice-locked for another Winter. They repaired their damaged transport plane, fitting on a new propeller and a new ski. Ashley Snow, Navy pilot, found that he could not gain enough altitude with the patched up plane to clear mountain peaks. The twenty-six men decided to chance flights through the fog of mountain passes. In two flights Snow brought the men to Mikkelsen Island.

There was no room aboard the plane for the dogs and the men

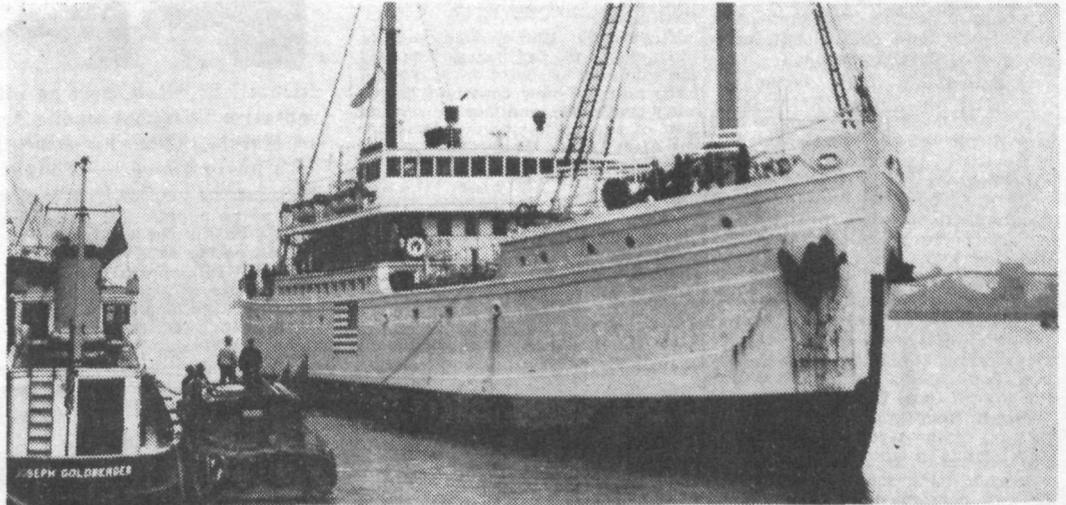
killed them rather than abandon them to starve.

The plane itself was abandoned atop the plateau on the island. With the aid of ropes the men descended 250 feet from the plateau to the edge of an ice pack. Soon they were aboard the Bear. But all danger had not yet passed. It looked for a time as though the Bear would be frozen in, but a cut was made through the ice and the ship made the open sea.

Scientists Arrive Here

Richard L. Black of the United States Department of the Interior and Herwil M. Bryant, a biologist from the National Zoological Park, Washington, D. C., who were among the twenty-six members of the United States Antarctic Expedition marooned on a small island off the Palmer Archipelago, arrived here May 5 on the Chilean liner Aconcagua.

The ship docked at the foot of Conover Street, Brooklyn with 137 passengers and a cargo including a collection of Emperor penguins, largest known species of the bird; Gentoo red-beaked penguins, two polar sea gulls and a giant fulmar, which has a wingspread of six feet and is known to attack humans when provoked.



Wide World

United States Expedition Docks at Boston

Upper: The North Star arrives at the Boston Army Base with 33 members of the expedition who have been exploring the South Polar regions. Below, left to right: Dr. Paul A. Siple, commander of the west base of the expedition; Mrs. Siple; Rear Admiral Richard E. Byrd, Commander of the expedition who returned ahead of the main party; Mrs. F. Alton Wade, and Dr. Wade, who commanded the snow cruiser and was the chief natural scientist for the group.

U. S. Claim Well Staked in Vast Potentially Useful Antarctic

Byrd Party Explorers Tell of Consolidating Results of Century of Exploration

WASHINGTON, May 17—

America's claim to a vast Western Hemisphere section of the Antarctic Continent is now pretty thoroughly staked.

The men who helped to consolidate the result of 100 years of exploration are returning to Washington to report on the 12 months they spent surveying the foggy, ice-locked land lying far south of Cape Horn and New Zealand.

They are certain that Americans have done more work than any other nationals in the area whose northern coast line stretches some 1,500 miles between Little America on the west and Palmer Land on the east.

Palmer Land, lying some 800 miles south of Cape Horn, was discovered in 1820 by Capt. Nathaniel Baker Palmer, a sealer from Massachusetts, who was at home in those waters when the first Russian explorer arrived. Capt. Palmer, it was said, guided the Russians about the vicinity and pointed out landmarks long familiar to him.

Uncertain on U. S. Claims.

Whether the United States, however, will lay formal claim to the land discovered by Capt. Palmer and surveyed by subsequent American expeditions is up to the Government.

Rear Admiral Richard E. Byrd, commander of the United States Antarctic Service, said yesterday he did not know if a formal claim would be entered.

The consensus among the returning explorers, at a press conference yesterday afternoon in the Interior Department Building was that Palmer Land and the islands extending toward Cape Horn might have a Western Hemisphere utility in the future. Both Argentina and Chile have claims to land in that vicinity.

Islands lying south of the Horn, it was pointed out, would be of strategic value to hemisphere defense should a closing of the Panama Canal force naval craft around the cape in their passage from ocean to ocean.

The explorers made aerial maps of the longest unknown coastline in the world, extending between the East and West bases, and tied them in with ground observations of surveyors traveling by dog and motor sled.

Admiral Byrd said that on the basis of this and other surveys, the United States justly could lay claim to at least a million square miles of territory, and perhaps 800,000 miles more, extending all the way to the Pole. In the area are vast coal deposits which might prove a useful fuel reservoir, Admiral Byrd said, in "40 years or more."

The admiral, who accompanied the men South and returned with a supply ship, was high in his praise of the explorers who remained through the long Antarctic winter to carry on the work he began in 1928. Dr. Paul A. Siple, veteran of two previous trips to Little America, was in command of the West Base, and Richard Black was commander of the East Base.

The admiral complimented Dr. F. Alton Wade, senior scientist of the expedition, on the work of a score of biologists, meteorologists and geographers and other scientists on his staff.

Many members of the expedition will continue their work here, classifying scientific data collected during the Antarctic winter.

Mineral Specimens Shown

Specimens of copper, molybdenum and manganese, all valuable defense minerals, and of coal of a bituminous variety, but not classed as very good, were brought back by Paul H. Knowles, geologist of the expedition, as the results of this survey of the land and sea resources of Antarctica. While no commercial deposits were discovered, the indications of mineralization were such as to encourage investigation and thorough prospecting of the area, with an eye to future needs, Mr. Knowles said.

Richard B. Black, who was in charge of the East base, reported the mapping of between 1,100 and 1,200 miles of new coastline, previously unknown, and the determination of the insularity of Alexander the First Land. This region is now defined as a pear-shaped island, 300 miles long and 120 miles wide, the entire coastline of which is now of record.

The evacuation of the East base was by air, because ships could not then get into the bay.

"We had to fly out," Mr. Black said, "and we did, in a Condor biplane, on March 22. In two flights we evacuated twenty-six of our per-



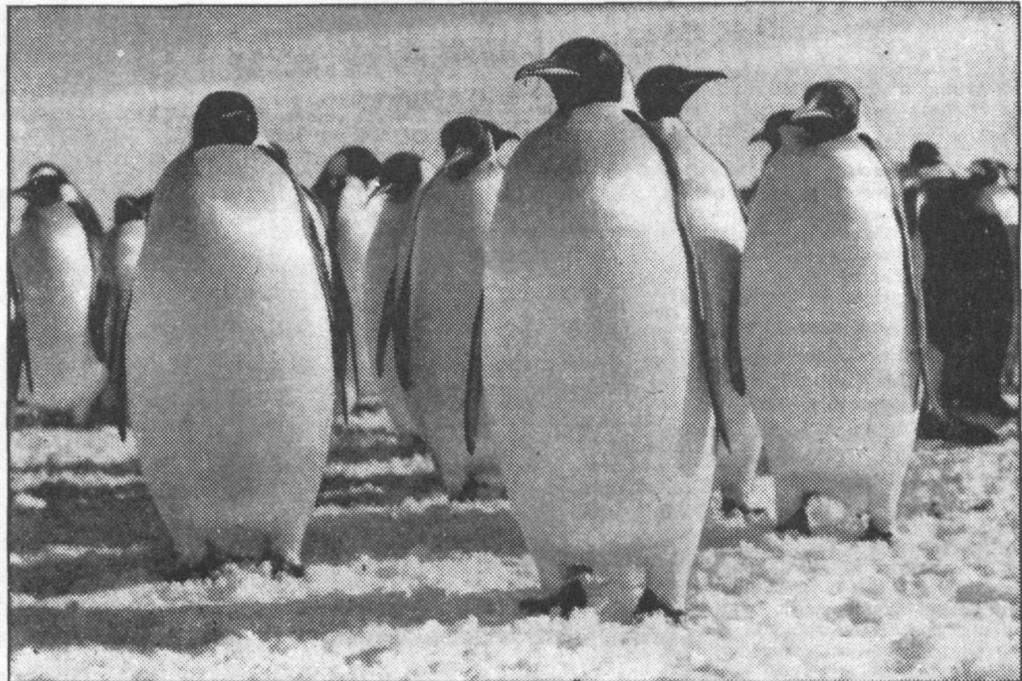
Richard B. Black, here as Interior Department field representative to report on the Antarctic expedition abandoned in March, relates his adventures to his wife with the aid of a photo album he brought back.

sonnel, seven puppies and one giant fulmar, a bird of the albatross family, about as big as a turkey."

The giant fulmar was carried out in the arms of Hirwell Bryant, whose investigations of animal life in Antarctica resulted in a collection for the Washington Zoo which

also includes seven penguins and two kelp gulls, all of which had to be kept in a special refrigerator on shipboard and are now in rooms maintained at equally frigid temperatures at the zoo.

Seven different kinds of birds, all web-footed and of the gull variety,



ANTARCTIC ROYALTY—Sleek and well fed, a group of emperor penguins pay a casual visit to West Base. Apparently unimpressed by anything they saw, they eyed all hands, including Navy Photographer Charles C. Shirley of San Diego, Calif., with complete indifference.

—Official Photograph, U. S. Antarctic Service.

were reported by Mr. Bryant in addition to the penguins.

Meteorological results of the expedition were reported by Dr. F. Alton Wade, who announced today that while the full value of the observations could not be determined pending further careful study, it was already apparent that they would mean a revision of previous atmospheric records, "and of the so-called stratosphere."

All these, and other records, and the specimens of animal and plant life and of mineral and other deposits, brought by the members of the expedition, will be made the subject of observation and study in the appropriate government departments and the Smithsonian Institution, and in laboratories in and out of Washington.

Links Cold and Sugar

Dr. Russell Frazier of Bingham Canyon, Utah, medical officer at Little America, reported that tests indicated sufferers from diabetes should avoid cold climates and seek temperate ones. Studies, he said, showed that severe cold caused a rise in the blood sugar of the body, and, therefore, he suggested that diabetics, who have an abnormal supply of sugar anyway, should avoid the cold. In normal persons, he said, nature apparently raises the blood sugar content to enable them to combat the cold.

Expedition members with their own teeth as exhibits said cold as low as 72.6 degrees below zero caused ordinary fillings to contract and fall out. Explorers used a form of unbreakable glass, "like the crystal on your wrist watch," as a substitute filling. They dissolved it with a chemical.

Captain Isaac Lystad was in charge of the North Star on her northward voyage and made stops at Punta Arenas, Valparaiso and Panama.

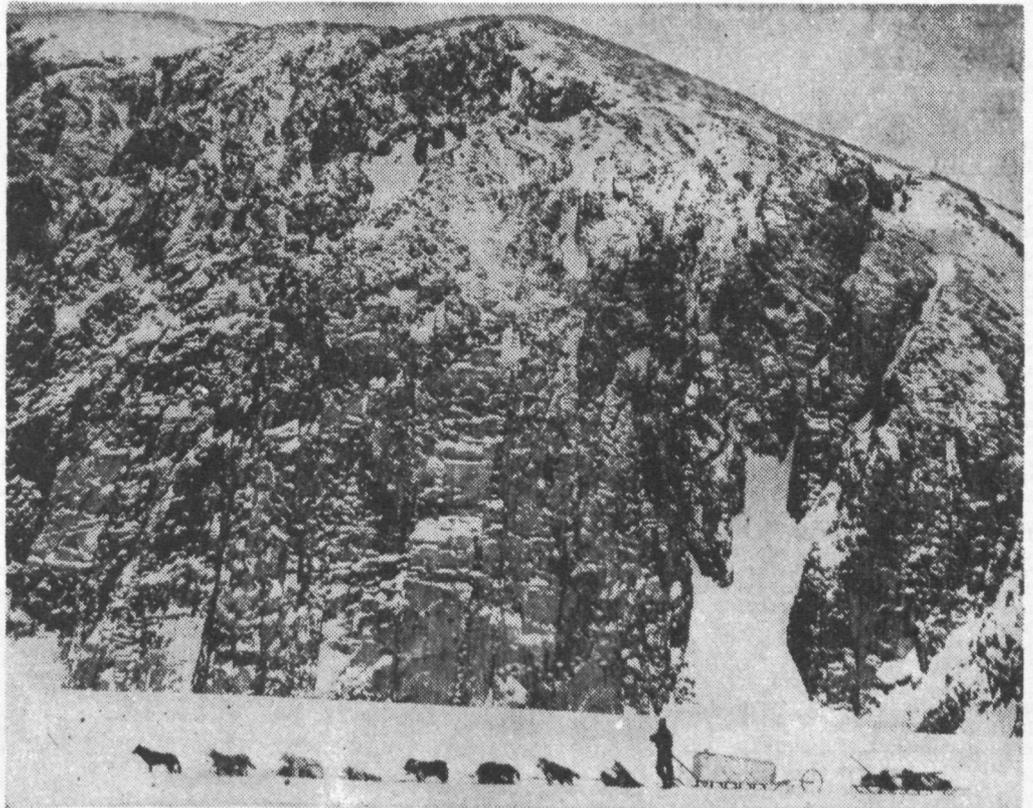
One hundred and forty-two different varieties of minerals were found and tremendous bituminous deposits covering 100,000 square miles of area within 300 miles of the Pole were discovered in a section where mountains 10,000 feet high exist. Two colonies of penguins, each numbering 1500 to 2000 birds, were located.

BALBOA, C. Z., April 24

Thirty-five members of the United States Antarctic expedition who have not seen their homes or families since November, 1939, were one step nearer home today as the motor ship "North Star" docked in Balboa en route to Boston.

One of the men aboard the North Star and two men now on the Bear en route up the East Coast of South America will meet new sons and daughters when they arrive in the United States. The North Star's proud father is Dr. Paul Siple, who is on his third antarctic expedition. He has a baby daughter, born last June 9 in Erie, Pennsylvania, the same day expedition members said as the "night of the big fire."

The "big fire", the men said started when a blubberhouse buried under the snow caught fire. A strong wind blew the smoke through the undersnow tunnels where the dogs were housed and all of the animals had to be taken out. Dogs and men suffered somewhat from smoke but were otherwise uninjured.



A dog team of the recently returned Antarctic Expedition is dwarfed by the snow-covered mountain in the background

BYRD SHIP RETURNS FROM ANTARCTICA

Barkentine Bear Lands 22 Explorers at Boston After Having 'Licked the Ice' Again

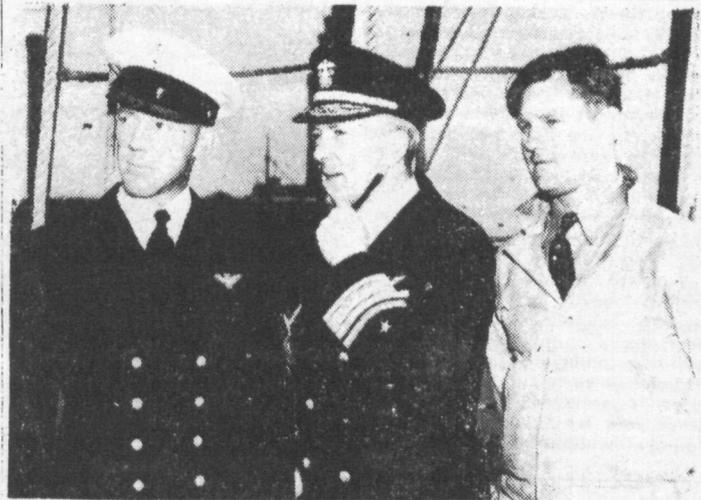
BOSTON, May 18 (AP)—The rugged old barkentine Bear, once a "forgotten ship" of the government, returned from the Antarctic today to begin, as a defense vessel, a new chapter in the adventurous, seventy-year career in which she has been a sealer, a mercy ship of Alaska's riotous days, and an exploring vessel at both the top and bottom of the world.

Flagship of the United States Antarctic Expedition, which strengthened United States claims to 1,000,000 square miles of territory, the oak-hulled square rigger brought home twenty-two explorers.

Praise was given by Rear Admiral Richard E. Byrd, commander of the expedition, to two aviators who played the leading roles in the rescue of men at the East Base, and Admiral Byrd said that he would recommend that the Navy cite them for "bravery, alertness and efficiency."

The men are Chief Petty Officer Ashley C. Snow of Meridian, Miss., and Radioman First Class Earl B. Perce of San Diego, Calif.

Yelping on the deck of the Bear as she docked were forty husky sled dogs which Admiral Byrd said had



Ashley C. Snow Admiral Byrd Earl B. Perce

been turned over to the Army for service "in Newfoundland."

He smiled as he remarked that the Bear, which was decommissioned by the Coast Guard in 1926 as apparently no longer useful, had proved once again that she could "lick the ice," and declared that she now would remain in the Navy's service "at a dollar a year" as a defense craft. Admiral Byrd bought the Bear in 1933, when she was in idleness as a museum ship, and has used her on his trips to Antarctica.

Questioned on a report that the Bear would be placed in patrol in Greenland waters, the admiral said he knew nothing of the report, but he added:

"If she were called to such service, she would be invaluable, because the present expedition—longest cruise undertaken by the Navy in a sailing vessel since the advent of steam—has shown the value of

sails as an auxiliary to engine power in rugged polar waters."

No significance was attached by Lieut. Commander Cruzen to the fact that Japanese whaling vessels were sighted on three different occasions in the Bay of hWales. The vessels were definitely engaged in fishing, he continued, for dead whales, inflated with small marker flags were sighted in the vicinity.

Lieut. Commander Cruzen stated he twice sailed the Bear around Cape Horn entirely under canvas, probably the first time in more than half a century that such a voyage has been made by a United States Navy ship.

"There is definitely a place for auxiliary vessels of this type today," he said, "particularly from the viewpoint of efficient operation, for considerable saving in fuel can be brought about by utilizing canvas when conditions permit."

U. S. Interior Department Problem: Replace North Star as Indian 'Navy'

WASHINGTON, May 23—The Department of the Interior has given the North Star, which has been to the Arctic and Antarctic, to the Coast Guard for defense purposes. Since 1932, with time out for trips to Antarctica, the North Star has served the Office of Indian Affairs of the department, which is now left without a "navy."

Ordinarily the vessel's duties have been to carry supplies, medical aid and personnel to remote and sometimes almost inaccessible Alaskan stations. Eskimos, Indians and whites looked forward to the North Star's arrival in ports located beyond private transportation lines. Merry celebrations often greeted her.

John Collier, Commissioner of Indian Affairs, said that the vessel's ice-breaking facilities and large cargo capacity would make her difficult to replace. The office's other vessel, the Boxer, is old and inferior and is now out of service because of a broken propeller.

Lieut. Commander Frank Meals has been assigned to command the North Star when she is placed in active commission as a cutter.

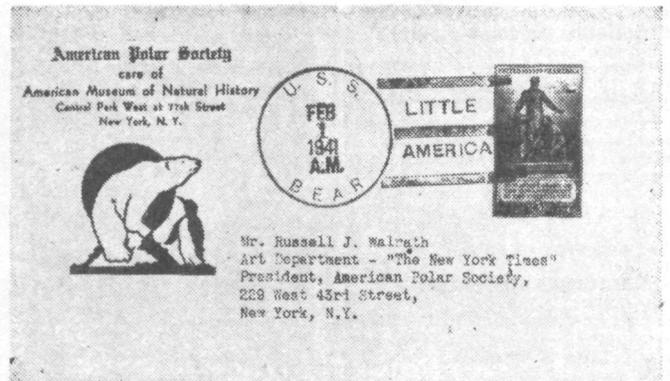
Because of the peculiar knowledge and skill required to deliver cargoes and passengers in the ports of northern Alaska, few commercial vessels can or will make the trip. For the captain of a ship must watch his opportunity to reach such ports as Point Barrow, the northernmost tip of Alaska, when the Arctic ice floes are blown off shore by a favorable wind, which is usually in late August or early September, and the southerly voyage must begin without delay to avoid danger of being crushed by those same ice floes.

Cargoes of Indian Service ships usually consist of mail, clothing, reading matter, radios, hundreds of cases of canned foodstuffs and building materials. These supplies must serve for a full year the need of four hundred Indian Service employees who maintain schools, reindeer stations and render other

assistance to the 32,000 Eskimos and Indians.

Commissioner Collier hopes they will not have to return to the perilous conditions of the old days, when the Indian Service was compelled to charter whatever sailing schooners were available with frequent loss of freight or a mixup of cargoes or a return of the vessels to Seattle without delivery of their goods, owing to continuous storms and fogs.

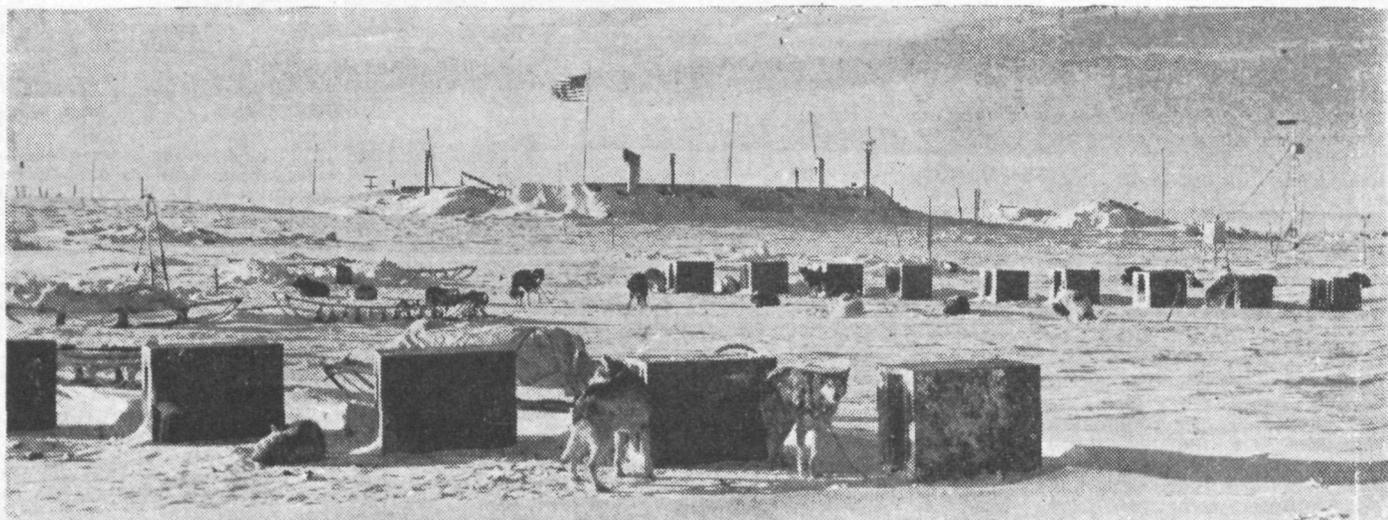
On account of mounting defense needs, and the expanded Interior Department services in Alaska, that department is making energetic attempts to provide some kind of transportation to Alaska, even though it may be necessary to depend upon airplanes to transport emergency supplies.



Our southernmost postoffice is at Little America, Antarctica, set up for the second Byrd Expedition of 1933-35. More than 110,000 covers were canceled there for collectors. Above is the cover of the first piece of mail to reach New York in more than a year, addressed to Russell J. Walrath, president of the American Polar Society.



These fresh snow blocks put in the melter chute turn into germ-free drinking water.



A view of the West Base with the kennels for the sledge dogs in the foreground

Argentina and Chile Exchange Views on Antarctic Claims

U. S., Britain Expected To Be Excluded From Formal Conversations

By the Associated Press.

BUENOS AIRES, April 28.—Argentina and Chile today completed a preliminary exchange of views leading to more formal conversations here next month on legal grounds for claims to the Antarctic.

Barred from them under the proposals would be United States, Great Britain and other countries despite more than a century of explorations.

To these South American nations the Antarctic is more than a source of adventure and imperialistic pride. Among other things, there is the prospect of coal and iron deposits known to be lying under Antarctic snows.

The two nations already are agreed in principle that at least a part of the southern extreme of the world must be divided between them and they have been conferring informally for five months in an effort to find a practical basis of agreement on the minimum region they would demand jointly in any diplomatic tussle with other countries.

Border Extension Theory Used.

Spokesman for the Argentine government say they have a good case by applying to the South Pole a theory they said had been accepted for the North Pole—that polar regions are an extension of borders from the nearest nations.

Under the latter, they said, the United States, through extension of the west and east borders of Alaska, has a zone in the Arctic and other zones are allotted to Canada, Russia, Great Britain, Norway and others.

In the Antarctic, however, application of such a principle would run into claims put forth by the great exploring nations, all of which lie in the Northern Hemisphere.

Claimants to Antarctic regions under the border extension idea would be Chile, Argentina and three members of the British Empire—Australia, New Zealand and the Union of South Africa.

Argentina and Chile have refused to recognize claims to title to Antarctic regions as a result of explorations by nationals of various countries in the past.

Aside from the border extension principle, Argentina and Chile are ready to lay claim to part of the Antarctic on the grounds that they are nearest to it.

Argentina has even a third card—occupation. She has maintained for many years a weather station south of the 60th parallel in the Southern Orkneys.

Up to now Argentina and Chile apparently have confined their action to an examination of joint legal claims to a general sector in the Antarctic, whose western and eastern limits still are to be determined.



VISITING DAY—A group of Emperor penguins pay a casual visit to the West Base and inspect the snow-cruiser used by the explorers. They eyed all hands with complete indifference

Word Battle Waged By U. S. and British Over Antarctica

By THOMAS R. HENRY.
Washington Evening Star

An old Connecticut school of geography, a Yankee sea captain's ungrammatical and unpunctuated log a signed map in London, an ice-covered desolate stretch of the Antarctic continent—such are the ingredients of a battle of words being waged across the Atlantic.

The participants—Col. Lawrence C. Martin, geographer of the Library of Congress, and the Royal Geographic Society, the bystanders—the spirits of Capt. Nathaniel Palmer, seal hunter of Stonington, Conn., and Capt. Edward Bransfield of the Royal Navy.

Until the turn of the century all maps of the world designated the coast of Antarctica directly south of Tierra del Fuego as "Palmer Land." Nathaniel Banks Palmer, captain of a sailing vessel, returned to Connecticut and told friends that he had sighted land in the ice-bound southern ocean. The story got

around and the land was mapped in a geography prepared for Connecticut schools. Before returning, Palmer said, he had reported his discoveries to Admiral Bellinghousen, commander of a Russian exploring expedition, whose ship he had encountered the next day.

Ship's Log Is Found.

A few years ago the log of Palmer's ship, the Hero, turned up at the Library of Congress and Col. Martin made an intensive study of it.

The crucial entry is for November 17, 1820:

"These 24 hours commences with fresh breeze from SWest and Pleasant at 8 P.M. got ovr under the land

"Found sea filled with immense icebergs—at 12 hove Too under the jib laid off and on until morning, at 4 A.M. made sail in shore and discovered a strait—tending SOW and NNE it was literally filled with ice and the shore inaccessible we tht it not prudent to venture in. We bore away to the Northwd and saw too small islands and the shore everywhere."

Palmer was no futuristic poet, but a practical ship captain, not interested in new continents, but in seals. He had gone out of the usual course because seals were not found at their customary haunts that year.

Discovery Accepted.

Col. Martin, after study of this

entry and those preceding and following it for two weeks, decided there was no question of the Connecticut captain's original discovery of the earth's seventh continent.

Eleven years after Palmer, some islands in the same vicinity were sighted by an English sea captain, Edward Biscoe, and duly reported to the Admiralty. British maps began showing a "Graham Land," after the hydrographer of the Royal Navy at that time. At first it formed a small part of Palmer Land. For the rest of the century Palmer Land decreased in size on British maps, and Graham Land grew bigger until finally the latter had entirely swallowed the former.

After Col. Martin presented his conclusions a few years ago the Royal Geographic Society began searching British Admiralty records and found a map of the region, dated in January, 1820, bearing the signature of Capt. Edward Bransfield, a long-forgotten navy officer, who was shown by the Admiralty records to have been in the vicinity at the time the map was made. He left no written account of his discovery.

Palmer Called "Ignorant."

After oblivion for nearly a century Bransfield has suddenly become an important figure in the history of exploration.

The Royal Geographic Society questioned the report on Palmer's log. Col. Martin sent them a photostatic copy of it.

It means nothing, says the current issue of the society's official journal. Palmer was a good sailor but ignorant.

"There is no indication in any part of his log," says the journal, "that he ever took a sight or kept up his position by dead reckoning."

Consequently, it maintains, there is no way of telling where he was when he claims to have sighted land.

In any event, it says, Bransfield had sighted six months earlier the land which has been credited to Palmer.

Col. Martin Sticks to Claim.

Col. Martin refuses to comment, other than that he stands by his first contention that an American discovered a continent.

Explorers Leave Snow Cruiser And Other Stores in Antarctic

WASHINGTON, March 28 (AP).—Leaving behind them costly stores of equipment buried indefinitely in the polar snows, the men of the United States Antarctic expedition voyaged homeward today after almost two years at the bottom of the world.

Officials in radio communication with the cutter Bear disclosed that the twenty-six men removed by plane earlier this week from the expedition's icebound east base left behind everything they could not bring out on their backs or in their pockets.

Personal effects, food sufficient for months, books and scientific equipment were included. All the supplies, however, are expected to be safe until

the next expedition arrives—possibly years hence. Prowlers are nonexistent in the Antarctic.

Also abandoned were the expedition's twenty-seven-ton "snow cruiser," buildings, cooking equipment, power tools and other bulky items, but from the outset there was no intention of bringing these back.

Although the abandoned stores were extensive, nothing has been written off the books. Some day, after passing of the defense emergency, which prompted Congress to refuse funds to finance a longer stay, virtually everything may be of use to another expedition, officials said.

Soviet Polar Plane Lands Near 'Inaccessible Pole'

Base Is Set Up on Floe at 81 Degrees North Latitude

MOSCOW, April 4 (AP).—A Soviet aerial polar expedition reported today it had landed on floe ice in the zone of the "inaccessible pole," the point in the Arctic Ocean farthest from any land.

The expedition, which began its hazardous flight by stages from Moscow on March 3, will pass several days studying ice, water and weather conditions.

The plane was piloted by I. I. Cherevichny, veteran polar flyer. He flew over the northern sea route to Wrangel Island, then proceeded 650 miles farther north.

The position of the floe base was given as 81 degrees north latitude, 180 degrees longitude, or 2 degrees of latitude and 5 degrees of longitude from the "inaccessible pole," and the point farthest north ever reached by a Soviet plane in the eastern Arctic.

Cherevichny was accompanied by six crew men and three scientists, who are preparing for the spring opening of navigation over the northern sea route.

This latest achievement credited to Soviet flyers was a sequel to their previous exploit in flying over the North Pole itself on May 21, 1937. After crossing the Pole, a Russian pilot set his plane down thirteen miles from the Pole and left a four-man expedition which was rescued nine months later after drifting to a point off Greenland.

Seal's Hegira Ends in Zoo

SAN DIEGO, Calif., Jan. 31 (AP).—An Alaska fur seal, lost on its homeward trek to the Pribilof Islands, came ashore at Ocean Beach. Dr. Charles Schroeder exclaimed: "The impossible has happened!" and placed it in the San Diego Zoo. Dr. Schroeder, head of the zoo hospital, said this was the first time in his knowledge that an Alaska fur seal had come ashore on the United States mainland. The seal, an adult female, evidently left its herd at the annual rendezvous about 500 miles off the Mexican coast and took advantage of tides to find a warm stretch of sand where she could rest.

BUILD ICE HANGAR FOR ANTARCTIC PLANE



Members of the United States antarctic expedition erect an igloo-hangar out of blocks of ice to house a small cabin plane in Antarctica. The construction work was done when the temperature was 60 degrees below zero.

Destroyer Wilkes in Service

BOSTON, April 22 (AP)—The destroyer Wilkes, named in honor of Rear Admiral Charles Wilkes, who commanded a round-the-world exploring expedition in 1838-1842, was commissioned at the Boston Navy Yard today.

MacMillan Off to Arctic June 20

BOSTON, April 9 (UP)—Commander Donald B. MacMillan, veteran Arctic explorer, will leave June 20 on his nineteenth expedition to Greenland. The expedition will be sponsored by the New England Museum of Natural History, for which he will make a collection of Arctic birds. The party will sail from Boothbay Harbor, Me., and will return Sept. 1 after an 8,000-mile voyage touching at remote Frobisher Bay on Baffin Island.

MEDICINE FOR POLAR PUP



Richard B. Moulton (left) of Meredith, N. H., and Harrison H. Richardson (right) of Beaver, Pa., give castor oil to a pup born to Dinah, one of the huskie sled dogs at the west base of the United States antarctic expedition. This picture was made by the recently returned expedition.

Arctic Museum Reopens With Many New Exhibits

LENINGRAD—The Arctic Museum here has reopened its doors after reconstruction. With a number of the departments rebuilt and enlarged, many new exhibits are displayed. On view in the section devoted to North Pole Station, for example, are 1,330 articles taken from the equipment of the wintering party led by Hero of the Soviet Union I. D. Papanin.

Other new exhibits include a large collection of medals struck in honor of famous travelers and expeditions. Among them are

medals commemorating the first Russian round-the-world voyage, made in 1803-06 by the wooden sailing ships Nadezhda and Neva under the command of Admiral I. F. Krusenstern, and also the expedition under B. A. Vilkitsky, which sailed on board the Taimyr and Vaigach from Vladivostok to Archangel in 1914-15, repeating in the opposite direction the voyage made by Adolf Nordenskjoeld, the Swedish explorer. Visitors to the museum may also see badges sold to collect funds for the polar expedition led by G. Sedov in

1912-14.

Numerous articles belonging to polar expeditions that have been found in recent years by Soviet Arctic workers are also exhibited at the museum. These include the

ship's bell of the Italian expedition led by the Duke of the Abruzzi in 1899-1900, and diaries, instruments and utensils owned by the American expedition under A. Fiala in 1903-05.

SECRETS OF RADIO SOUGHT IN ARCTIC

Expedition Sailing on Captain Bob Bartlett's Schooner is Led by Louise A. Boyd

WASHINGTON, June 11—Heading a special expedition to the coast of Greenland and other more northern Arctic waters to study the layers of rarified air at heights of from 50 to 300 miles above the earth, Miss Louise A. Boyd sailed from here today in the schooner "Effie M. Morrissey," which is commanded by Captain Bob Bartlett, leader of many exploring parties in far northern waters. Two members of the National Bureau of Standards of the Department of Commerce were assigned to make the trip.

Radio experts and other scientific experts are interested in data which the expedition will gather. Successful long distance radio transmission is dependent upon many magnetic and geophysical phenomena, some of which are not well understood, and data must be gathered at many points on the surface of the earth, not merely at places where laboratories are already located.

What takes place along the path of radio signals in the ionosphere, or Heaviside layer, from fifty to 300 miles above the earth, must be known if predictions of transmission are to be reliable. Such radio predictions are made each month by the Bureau of Standards, which designed special portable ionosphere equipment for use on this and other expeditions. The equipment was tested during special observations made last year in Texas and in Brazil.

Miss Boyd's expedition, which will observe ionosphere characteristics as determined by the special equipment, will make measurements of geomagnetism, auroral manifestations and the intensities of ultraviolet light and cosmic rays. The United States Coast Guard and the Carnegie Institution's department of terrestrial magnetism are cooperating in the expedition and will benefit by the findings.

Miss Boyd, who is from San Rafael, Calif., has herself chartered the vessel for the trip and is thus perhaps the government's first dollar-a-year woman. She has made six trips to Greenland waters and has written two books on her earlier findings.

The Polar Times

AMERICAN POLAR SOCIETY, Care American Museum of Natural History, Central Park West at 77th Street, New York, N. Y.

AUGUST HOROWITZ, Editor. HERBERT R. LOGES, Art Editor.

THE POLAR TIMES highly recommends "The Polar Record," published January and July by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

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STUDIES IN GREENLAND

University of Michigan Book Guides Placing of Airfields

ANN ARBOR, Mich.—Proof that research even in the field of pure science may be of great practical value to the country is found in the use being made by defense authorities of the scientific observations of the University of Michigan's five expeditions to Greenland.

Information contained in the two-volume report of these expeditions, the last of which has just been published by the university, together with the advice of Professor William Herbert Hobbs, director of four of the expeditions, has aided United States authorities in locating suitable naval and land bases for airplanes, and these bases are now occupied.

On the basis of many flying expeditions in Greenland and the extensive studies made of the upper air by the Michigan expeditions, Professor Hobbs has been able to lay down important rules for future flying from Greenland bases.

The Michigan expeditions, coming between the years 1926 and 1931, had for their prime objective an investigation of the nature of the air circulation of that island, although geological, botanical and glaciological investigations were also carried out from five widely separated stations.

In recommending flying bases in Greenland Professor Hobbs has taken issue with Charles A. Lindbergh, who, on the basis of studies made in 1933, announced that his flights over the island showed that no suitable landing fields existed in Greenland and that conditions for flying were among the worst to be found anywhere in the world.

GEORGE D. BUTLAND

POUGHKEEPSIE, N. Y., Jan. 9—George D. Butland, of this city, one of a searching party that found Commander Robert E. Peary, explorer, when he was isolated in the frozen wastes, died yesterday, on his fifty-seventh birthday, in Bowne Hospital, here. He had been blind for some years.

He leaves a widow, three sons and a daughter.

Mr. Rutland, who was born in Brigus, Newfoundland, and went to sea in Newfoundland ships as a boy, came to New York as a young man and shipped as a fireman aboard the Windward which left in 1900 to search for Peary. The expedition returned the next year, and Mr. Butland had been promoted to assistant engineer.

ARCHIBALD H. STEWART

TORONTO, April 29 (Canadian Press)—Archibald H. Stewart, geologist, Arctic explorer and athlete, died at his home here yesterday after a long illness at the age of 37. In 1934 and 1935 Mr. Stewart headed two Arctic expeditions, crossing from the Mackenzie River to Hudson Bay. Later he served the Ontario Government in development of the Onakawana lignite coal field in Northern Ontario. He was born in Scotland and came to Toronto with his parents at the age of 9.

Dr. Mengel Dies; With Peary on Greenland Trip

READING, Pa., Feb. 3.—Dr. Levi Walter Mengel, founder and former director of the Reading Museum and Art Gallery, died today in Reading Hospital as the result of a stroke suffered in the museum yesterday. He was seventy-two years old.

Mr. Mengel was born in Reading and for more than forty years was associated with the Reading public school system. He was an authority on visual education; as a collector of butterflies he had traded rare specimens with such notable collectors as Grand Duke Nicholas of Russia and Lord Rothschild, and he had accompanied the late Rear Admiral Robert E. Peary to the northernmost point of Greenland.

Dr. Mengel went north with Peary in 1891 as ornithologist of the expedition. The party traveled 1,300 miles across the inland ice to the northern tip of Greenland, establishing the fact that Greenland is an island.

JOHN W. VINCENT

Survivor of Trip in Open Boat With Shackleton in Antarctic

LONDON, Jan. 22—John William Vincent of Grimsby, the skipper who participated in the Antarctic expeditions of Captain Robert Scott and Sir Ernest Shackleton, died yesterday in his home. First going to sea at the age of 12, he sailed as boatswain under Scott in 1912 and two years later joined Shackleton in the same capacity.

Vincent made a spectacular trip of hundreds of miles with Sir Ernest in an open boat from Elephant Island to South Georgia Island after the loss of the ship Endurance, which was crushed among ice floes. After his return home he signed on a ship chartered by the Foreign Office during the war in 1918, only to be torpedoed in the Mediterranean.

MRS. ARCHIBALD FLEMING

Wife of 'Flying Bishop' of the Arctic Dies in Toronto

TORONTO, March 25 (Canadian Press)—Mrs. Helen Grace Fleming, wife of the Right Rev. Archibald L. Fleming, Bishop of the Arctic, died at her home here today.

Mrs. Fleming was born in Troy, N. Y., where her parents, Mr. and Mrs. Walter Gillespie, of Scotland, were visiting.

Her main interest was in missionary work.

Mrs. Fleming, the former Helen Grace Gillespie, was married in Toronto in 1913. Bishop Fleming, first Bishop of the Arctic, was born in Scotland.

He became a missionary to the Arctic soon after his marriage and in 1933 was consecrated Bishop, covering a diocese of 2,250,000 square miles largely by air, for which he was known as the "Flying Bishop." He is a popular missionary figure in Canada, England and the United States, and is widely known as an authority on Eskimo life.

KILLED IN ACTION

SERGEANT A. B. ROBINSON

Sergeant Alfred Bert Robinson, who was killed in action on February 3 while serving with the 19th Army Troop Company of the Middle East Forces, was born at Whangarei, and received his education at the Whangarei High School. On leaving school his bent was mechanical engineering, but, not being able to get a chance to serve his apprenticeship, he went to sea and sailed round the world many times in square-rigged ships. On one occasion he left his ship at Fremantle, and, wishing to get to Sydney, his mate and he purchased a motor cycle and successfully did the trip, having only a watch to aid them as a compass on the long overland route. He made three trips to the Antarctic regions, twice with the Byrd Expeditions and once with Lincoln Ellsworth. On Admiral Byrd's second expedition he was third mate on the Bear of Oakland, the vessel that is at present in the Antarctic. He sailed on a number of Union Company steamers, and, coming ashore, he assisted in the construction on the Clutha of one of the largest gold dredges on the Molyneux River. He also assisted in the building of the bridge over the Taieri carrying the City Corporation pipe line in the Deep Creek water scheme. For the Otago Harbour Board he was Mr. Fred Goodman's right-hand man in placing the explosives for the removal of the reef at Quarantine Island, Mr. Goodman being the contractor for the removal of this reef, which had been a menace to shipping for many years. Mr. Robinson then joined the Public Works Department as a bridge foreman, and was a most important officer in the construction of bridges between Milford Sound and Homer Tunnel, also the Mohaka viaduct on the Napier-Gisborne line and the bridge over the Clarence River. He also went to the Kermadec Islands in connection with the construction of a radio station, and was in charge of the whole operations, one of the most difficult jobs being the transportation of a bull-dozer through the breakers to the shore. Mr. Robinson was a man of exceptional ability, with a long and varied experience. He had a great capacity for work, and carried out all his duties with energy and despatch. He was a man of solid attainments, and in every way was competent and reliable.

Thomas McCue

Member of Arctic Expeditions and Gallipoli Campaign Dies

WORCESTER, Mass., March 5 (AP).—Thomas McCue, member of two Arctic expeditions and a veteran of the Gallipoli campaign, died today at a hospital where he had been a patient since Thursday. He was fifty-one years old.

Recently Mr. McCue had been chief rigger in charge of converting fishing boats to mine sweepers and mine layers at the East Boston Bethlehem works. In 1921-'22 he was a cook with Donald B. MacMillan's Baffin Land exploration party. The next two years he was first mate with MacMillan on a North Greenland exploration. After 1924 he operated fishing boats out of Boston.

In the World War he served with the first Newfoundland regiment in Egypt and later at Gallipoli. He was wounded and received a French decoration.

NEW HABITAT GROUP SHOWS SEALS AT "UNCLE SAM'S FUR FARM" IN ALASKA

By WILFRED H. OSGOOD
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY
Field Museum

Probably most women who wear beautiful and expensive sealskin coats have rather hazy ideas of the animal which produces them. They may think of sealskin as a very rare and unusual commodity coming from a distant and probably foreign country, perhaps from somewhere near the North Pole. Few suspect that sealskin is to a large extent an American product grown on Uncle Sam's own fur farm in Alaska.

There are many kinds of seals, but those that produce the highly prized fur all belong to one species and live in the north Pacific Ocean. Most of their time is spent on the high seas away from shore, but every summer they gather in immense numbers to rear their young on land, concentrating on a few small islands. There are three distinct herds, two relatively small ones belonging to Japan and Russia, and one very large one belonging to the United States. The summer home of the American herd is on the two small Pribilof Islands, which are only ten or twelve miles in length, and situated far out in the middle of Bering Sea west of the Alaskan mainland. The instinct of the seals to return to the same place year after year is so strong that it has never been violated and not one ever lands anywhere else. The American government, therefore, has made the islands a special reservation where the seals can be controlled almost like domestic animals. In fact, they have an advantage over domestic animals for they feed themselves without cost, living on small fishes and other marine life. Laws and regulations have been made regarding their care, and only the surplus not needed for breeding is taken for fur. Thus it is quite logical to speak of the Pribilof Islands as "Uncle Sam's Fur Farm."

The "home life" of the fur seal is illustrated in a new habitat group placed on exhibition last month in Field Museum's

Hall of Marine Mammals (Hall N). The group shows how sealskin coats were intended to be worn—by the seals themselves. And, by the way, more than 2,000,000 seals now have them, that being the size of the present-day herd, whereas only 10,000 women per year are able to obtain real seal coats under the conservation measures in force. The annual permitted kill is 60,000 fur seals, and the average number of skins required for each woman's coat is six.

Containing forty animals, including huge "bulls" as the mature males are called, the much smaller "cows" as the females are known, and young seals called "pups," the group is undoubtedly the largest fur seal exhibit in any museum of the world, as well as being one of the largest groups of any kind of animal in this institution. In addition to the seals, the group contains twenty-four birds representing five species.

Reproduced in the exhibit is a scene representing the barren rocks of the Pribilofs where these animals establish their rookeries. The seals are mounted in life-like attitudes showing them just as they were studied "on location" by Staff Taxidermist C. J. Albrecht, who in 1937 conducted a special expedition to collect them. Since that time, Mr. Albrecht has been engaged in preparation of the group. The background was painted by Staff Artist Arthur G. Rueckert. Mr. Albrecht was enabled to visit the Pribilofs and collect the seals under permits granted by the United States Department of the Interior. He obtained fresh specimens without firing a shot or lifting a harpoon, by selecting what he needed from among the carcasses of those slain through the severe strife that exists among the large bulls during the breeding season. Mr. Albrecht then made necessary plaster casts for taxidermic work, skinned the seals on the spot, and preserved the pelts for mounting.

If their fur was the only interesting thing about fur seals, their story would be a short

one. But they have many very peculiar and interesting habits. Most of these are involved in three general characteristics: that of being exceedingly gregarious and gathering in tremendous herds; that of being migratory, making a long regular journey every year; and that of being polygamous to an extremely high degree.

Their gregariousness is evident all their lives, but especially on their breeding grounds where they crowd together by tens of thousands in practically solid masses on the beaches, forming the most stupendous exhibition of mammalian life in the whole world. There is no concealment, and the observer, looking out over the vast mass of great lumbering beasts, feels as if he might have been transported back into some prehistoric age. In early days the American herd was estimated at approximately two million seals. Later there was much wasteful and unregulated killing until, in 1911, the number had dwindled to scarcely more than two hundred thousand. Since then, by means of international treaties protecting the seals on the high seas and good administration on land, the herd has steadily increased until now it again contains about two million animals, and it is steadily increasing. Today there is no waste—even the remainder of the carcasses, after the skin has been removed, furnishes by-products such as penetrating oil, and "seal-meal" used to feed the fish in trout hatcheries.

SEALS MIGRATE TO FAR SEAS

The entire herd spends the summer on the Pribilof Islands, arriving in the spring and departing in the fall on a long migration thousands of miles to the south to spend the winter at sea in the latitude of southern California and Mexico. This is the most remarkable example of migration among mammals, and has all the mystery and fascination of bird migration. The seals go out of Bering Sea past the Aleutian Islands, and then strike south across the broad



"Home Life" of the Fur Seal

Forty animals—"bulls," "cows," and "pups"—are shown in this new group in the Hall of Marine Mammals (Hall N). The seals were collected on the Pribilof Islands by Staff Taxidermist C. J. Albrecht who, together with Staff Artist Arthur G. Rueckert, prepared the exhibit. Some 2,000,000 seals come to these islands each summer to breed.

Pacific, plowing their course against wind, waves, and current with the unswerving directness of a ship guided by compass.

The male fur-seal is four or five times as large as the female, and weighs several hundred pounds. He is called a bull probably on account of his loud bellowing voice, as his size, and his shaggy silver-tipped coat, give him more resemblance to a short-legged waddling grizzly bear. On the breeding grounds his disposition is ferocious, blustering, and domineering. The female, or cow seal, on the other hand, is quite the reverse—small and slender, with a mild and gentle disposition and a manner sometimes almost coy and confiding.

Early in the spring the old bulls come to the islands and station themselves at intervals along the boulder-strewn beaches. For some days or weeks the solitary bulls wait. When the females come, a little later, they gather in groups quite appropriately called "harems," each of which is presided over by an old bull. These harems vary in size from four or five to forty or fifty and, sometimes, even seventy-five or one hundred females to one male. The average number is about forty. The bulls guard these harems most jealously and are kept busy day and night. They do not fight to get the cows, for these come to them voluntarily, but they certainly fight to keep them, and sometimes it is a struggle to the death. The bull who gets the most cows is not necessarily the best looking or strongest, but more likely the one that has the most favorable position on the beach as the cows come in. Therefore, it is the female who does the choosing among seals; but if she doesn't like her choice she is obliged to put up with it nevertheless, for if she tries to leave, the bull is instantly after her and likely to "treat her rough." The harems, when full, present a wonderful sight. Each big burly bull, thick-necked, shaggy, and defiantly dignified, sits surrounded by a company of sleek, soft-coated and liquid-eyed females, swaying their graceful bodies sinuously from side to side, slowly closing their eyes and dozing, or playfully snapping at each other. If a nearby bull sneaks in with the idea of segregating some of the cows for himself, this peaceful scene

changes and a fight is on, but possession seems to be "nine points" in most cases.

A bull dares not leave his harem unguarded for it would immediately be appropriated by another, so he is obliged to remain in his place without food and practically without rest for the long period of six to nine weeks during which more cows continue to come in, young seals are born, and domestic affairs go on. His long-continued strength and vigor without food is unparalleled among mammals. At the beginning of the season, he is in magnificent physical condition, full-bodied, thick-necked, quick-moving, arrogant, and vigorous. Little by little he becomes thinner and thinner until, at the end, he is scarcely more than a shadow of his former self. He then retires to sleep continuously for several days, after which he goes to sea to feed and recuperate.

THE "PUPS" ARE PLAYFUL

Each of the cows has one young, and one only—twins are unknown. Although its sire is called a "bull" and its mother a "cow," the young fur-seal is called a "pup." It is only necessary to see one to appreciate the appropriateness of the name. The pup's hair is short, crinkly, and glossy black, quite different from the rich warm brown of older seals. Its face is wrinkled and its expression most serious, so, altogether, it suggests the young canine very decidedly. After the early part of the season, every seal rookery includes a very large number of pups. They are everywhere from the waterfront to the caves and crevices at the extreme rear of the rookery. Like the young of most mammals, they have cute ways, running from the ludicrous to the pathetic. They remain on land some five or six weeks, nourished by their mother's milk and growing rapidly. Then they begin to take to the water to swim, and when the herd goes south in the fall they shift for themselves. At this time they are killed in large numbers by a voracious, toothed whale known as the killer. These killers have been seen to dash into a school of small seals and literally cut them to pieces, tossing them into the air, and rushing about in a frenzy.

A very important class of fur seals in-

cludes the young males from two to six years of age, called "bachelor seals." They are celibates by force rather than from choice, for they are rigidly excluded from the breeding grounds by the ferocious old bulls. True to their gregarious instinct, the bachelors gather on land adjacent to the breeding grounds and play.

It is from these adolescent seals that our sealskin comes. About as many males as females are born but, on account of the polygamous habit, a large percentage of the males are unnecessary for breeding purposes. Therefore, these superfluous males are taken for their skins, and, since females are always preserved, this has no effect on the growth and continuance of the herd. Thus it is possible to manage the seals much as a stockbreeder does a herd of cattle or sheep.

Since the purchase of Alaska by the United States in 1867, some 4,000,000 fur seals have been killed on the Pribilof Islands for their skins. From these the government has received a revenue of nearly \$15,000,000 in addition to the very large profits obtained by the private companies to whom for forty years the sealing privilege was leased.

The seals are killed in a humane manner, under supervision of government agents, by experienced "natives" (Eskimos, Indians, Scandinavians, and other inhabitants of the islands) who have grown up in the sealing business. The bachelor seals are naturally segregated in separate areas, and when they are desired for killing, the sealers simply run between them and the water. On being thus cut off from their retreat, they start up, huddle together, and then may be guided in any desired direction. Because they proceed more slowly, they are easier to manage than any domestic animal.

Removing the skin is a simple process accomplished by experienced hands in a few minutes. After cooling, the skins are taken to what is called the "salthouse," and here each is rolled in coarse salt and laid away. A week later, they are resalted, spread flat with folded edges, and packed in solid masses between thin layers of salt. In this condition they keep well indefinitely and are thus transferred to ships and sent to market in the United States and elsewhere.

ALASKAN SEA OTTERS SUBJECTS OF STUDY

Government Hopes to Revive Aleutian Islands Business

SEATTLE, Wash. (UP)—Hopes of re-establishing a large and profitable Western Alaskan industry have taken the United States motorship *Brown Bear* on a 10,000-mile cruise in the waters around the Aleutian Islands.

H. Douglas Gray, manager of the Aleutian Islands National Wild-Life Refuge, is aboard the *Brown Bear*. His mission is to study the habits of the Alaskan sea otter with regard to increasing propagation.

The Alaskan sea otters furnish precious fur. Only a comparatively small herd is left. Sea otters live principally within a 100-mile area around the center chain of islands

that extends from Alaska's Aleutian peninsula almost to the coast of Asia.

With Frank Beals and Jack Longworth, field assistants in the government wild-life service, Mr. Gray will make a thorough study of the habits of the otters and methods for assuring their increase so their furs may again be placed on the market. At present it is unlawful for either Indians or whites to kill them.

"The otters have a rich, dark brown underfur, with an outer coat of gray-tipped coarse hairs," he explained. "It is the most valuable of all furs. Smaller than fur seals, which make long migrations, sea otters rarely go more than 200 miles from their bases."

The *Brown Bear*, commanded by Captain John O. Sellevold, veteran seaman, will cruise as far as Attu, the westernmost tip of the Aleutians. The *Brown Bear* will stop at Architka Island, Umnak Island and Rat Island.

The vessel is the mother ship of a fleet of government game protection ships.

Flyers Make Polar Trip Clad in Their Underwear

Bomber Crew Tests Electric Suits Without a Shiver

FAIRBANKS, Alaska, Jan. 16 (AP).—The captain and his crew flew toward the North Pole yesterday in nothing but their underwear, and were cozy and comfortable.

It was a test of the newest wrinkle in Arctic clothing for United States Army flyers at the experimental Northern flying station here: "electric underwear."

Clad only in the new garments, except for head, hands and feet, Maj. Dale V. Gaffney, Ladd Field commander, and his crew flew a big four-motored Boeing bomber 1,500 miles through the Arctic's subzero air lanes without a shiver or a short circuit. The flight took them close to 300 miles north of the Arctic Circle, to Point Barrow and Point Hope on the circular flight.

The primary purpose of the seven-

and-one-half-hour flight, at a 200-mile-an-hour average, was to test the new clothing. The airmen also carried zipper-equipped jumper garments for external use in case of emergency. They wore felt and leather gloves, also wired.

The heat in the electric underwear is provided by tiny coils interwoven in the garments. The wearer plugs into the circuit beside his seat. Recent test flights have been at 7,000 to 10,000 feet elevation, where the temperature normally runs between 20 and 30 below zero. The officers did not report the temperature in the bomber. It was 15 below zero at the air base.

Glare Ice and Planes

Proof that large bombing planes can use frozen Arctic lakes to land on was afforded recently when a U. S. Army Flying Fortress carried 600 pounds of dried salmon to Alaskan dog teams on an Army trek, and the plane made a wheel landing on glare ice.

When Bering Found Alaska

By GEORGE RIDGELY LUCKETT

Baltimore Sun

TWO HUNDRED years ago, on July 16, 1741, a party of men aboard a small sailing ship cheered the cry of "Land, ho!" This event, the high spot of a long and hazardous voyage beset with storms, illness and death, was the discovery of Alaska, later to become the great northern possession of the United States.

The commander of the expedition was Vitus Bering, for whom the straits, island and sea in that vicinity were named. The ship, a small one, built on the shores of Siberia by the men who sailed her, was the "St. Peter," of the Imperial Russian Navy.

Vitus Bering, who was born in 1681 of a Danish family, had, while still a mere lad, joined the Russian Navy and risen through the ranks to the grade of captain. In 1724, at the age of 43, he was appointed by Czar Peter the Great to command an expedition, the duty of which was to explore and chart the coasts of Siberia and to determine whether or not Asia and America were one continent joined at some point in the far, unexplored north. As Peter instructed him, he was to follow the coast of Siberia and to "enquire where the American coast begins." He was then to "go to some European colony and when European ships were seen, ask what the coast is called, and after having charted the coast, return."

Goes Into Arctic Ocean

Bering's voyage along the Siberian coast gave him the knowledge that the coastline did not continue its northeasterly direction, but at about the sixty-sixth degree of latitude receded from that direction to lay toward the northwest. Beyond this point lay the great Arctic Ocean into which Bering traveled until he was sure that the coastline did not again turn toward the East. Having assured himself that the findings were correct, he returned to his base at Okhotsk, from which he retraced his journey by land to St. Petersburg, reaching there in March, 1730.

His report that the two continents were not connected was received by the Government, but ridiculed by some of the learned men of the day. The fact that Bering was a Dane by birth had gained him many enemies in the Russian Court, who were jealous of him because of his prominence. In every possible way they attempted to belittle his discoveries before the public, even going so far as to publish their own charts based on tales told them by seamen. In this manner they declared that Bering's voyage as shown by his chart was imaginary and his discoveries fictitious. In reply to their accusations, Bering offered to command a second expedition to prove the findings of the first. His offer included an invitation to his doubters to accompany him. This was accepted and, after winning the approval of the Government, the explorers set out from St. Petersburg toward the coast of Siberia.

Better Charts Result

From this coast, several expeditions were started. Data was collected by surveying the

coastal regions, and from this information better charts than those of the preceding expedition were prepared.

Politics, however, had played a great part in the financing of the expedition, and consequently appointments depended largely upon it. The Russian Government had assigned the position of Chief Astronomer to Louis d'Isle, a brother of the Imperial Russian Mapmaker. After having secured his appointment, d'Isle determined to have the expedition search for and explore a great land supposed to have been seen by Juan de Gama. Gamaland, as it was called, was shown on the elder d'Isle's maps to be in a southeasterly direction from the expedition's base. In this he was successful. His arguments, all based on his brother's maps, caused the Imperial Government to include the exploration of Gamaland in Bering's orders.

At the time summer approached, Bering had prepared his two ships, the St. Peter and the St. Paul, for the main voyage of his expedition. Stores of provisions and other supplies calculated to be sufficient for a five-and-a-half-month expedition had been stowed aboard them. Duties had been assigned, final adjustments made and, on June 4, 1741, the ships weighed anchor and sailed.

Find No Gamaland

In order to satisfy the Government demand regarding the mythical Gamaland, Bering sailed in a general southeasterly direction more than six hundred miles. Still no land was sighted, even though, according to d'Isle's charts, they should long since have sailed past it. When it appeared certain that the land was indeed imaginary, the ship's council decided to change their course to one toward the northeast, hoping that by sailing in this direction they would reach the shores of America.

During a storm on the night of June 20, Chirikoff, the captain of the St. Paul, changed the course of his ship, sailing nearly due east. When morning came, the two ships had separated so far that they were lost to each other's sight. Fearing disaster might have befallen the St. Paul, Bering cruised about the spot for several days, searching. When the search failed, he reluctantly decided to continue his voyage toward America.

After four weeks of continuous sailing, all the while keeping up the lookout for Gamaland, in order that their reports would convince the Government of the errors in d'Isle's maps, they sighted land.

It was about noon on July 16. Towering high above a jagged, snow-covered coastline, there appeared an exceedingly high mountain. Higher, according to their reports, than any of the peaks of Siberia. In honor of the saint of the day on which it was discovered, Bering named the peak Mount St. Elias, the name which it bears today.

Remain A Month

A small party was landed on one of the coastal islands to obtain water, and to explore it for signs of human habitation. Upon the re-

turn of the men, Captain Bering decided to journey along the coast, preparing a chart to be submitted to his Government. After a month had passed, the decision was made to start homeward. Return longer delayed might necessitate their remaining away until the following summer.

Home was more than fifteen hundred miles away, and in spite of their estimate that the journey could be made before the advent of the Arctic winter, they found themselves further delayed by adverse winds and severe weather. In addition, sickness had laid low more than half the crew, including Bering himself.

Bering had been confined to his cabin, so badly was he suffering from the scurvy, and was in no condition to exercise his command of the ship. Junior officers, lacking Bering's sternness, argued among themselves about the course to be followed. Because of this, much valuable time was lost, and it soon became apparent that it was impossible to reach their home base. (They had made errors in navigation, so did not know that they were less than a hundred miles from home.) They decided to land on some island and stay the winter there.

On November 6 the ship was anchored near the shores of a rocky island, now known as Bering Island. It was here that the commander of the expedition passed away, bringing the total number of dead to nearly thirty.

The remainder of the crew, subsisting on meat, which they found plentiful, remained on the island for more than six months. During this time they were able to salvage enough material from the now wrecked St. Peter to construct a small boat in which they returned home, arriving there in August, 1742.

Chirikoff Reaches America

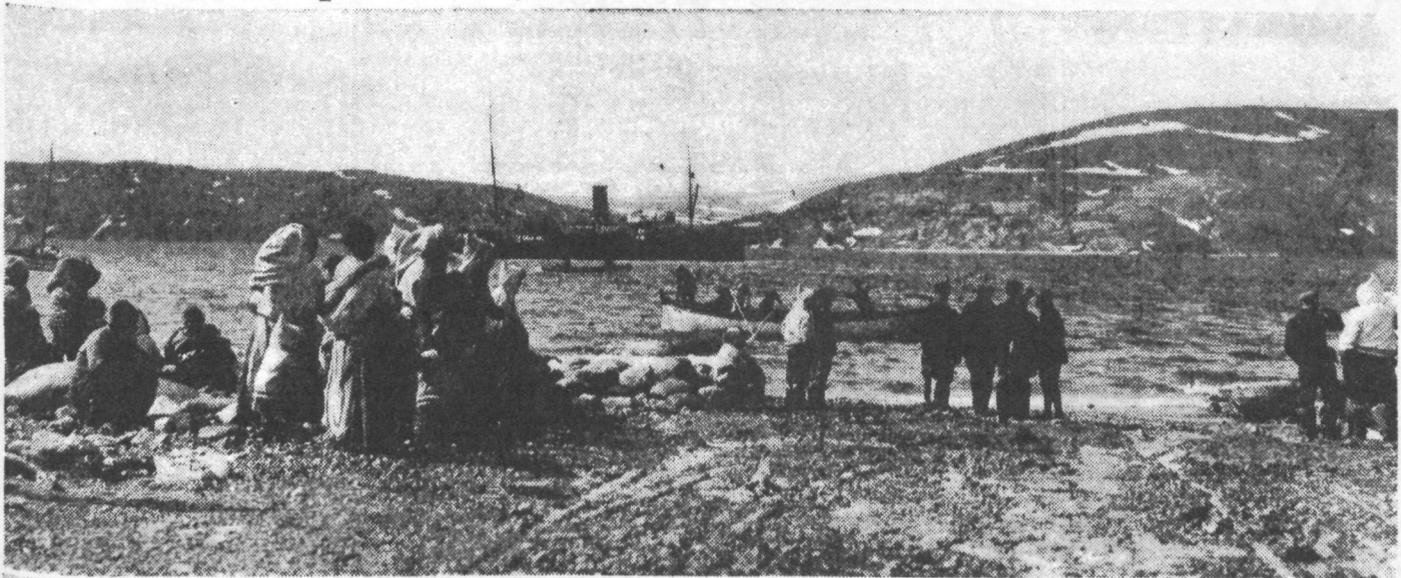
In the meantime, Chirikoff, on the St. Paul, had sighted the American coast still farther to the south, but, meeting with similar difficulties, he had been barely able to return to Siberia. Although alive, his health was so impaired that he was unable to undertake any further active work.

Thus Alaska was discovered.

In the 200 years which followed, it has had a varied history. For more than half that time it was a Russian colony. In 1867, at the time of its purchase by the United States, it was praised as a heaven on earth (by those advocating the transaction) and nicknamed "Seward's folly" (by those of the opposition). In 1898 it again was headlined in the news. The discovery of gold deposits in its mountains brought thousands of persons seeking wealth to the territory. Since then, although it has supplied an enormous amount of furs, fish and other natural products, it has remained "the attic of the United States," little known, little cared about.

Now, as it passes its two hundredth anniversary, Alaska again becomes newsworthy. In the last few years plans have been made and construction begun on the Dutch Harbor naval and airplane base, bringing it into the sphere of our national defense program.

The Nascopie—Major Canadian Link With the Arctic



Supplies From the Dominion

The Government steamship Nascopie is seen landing supplies at Wakeham Bay, an Arctic settlement at which the post boat regularly calls on its pilgrimage to the Northern Territories.



Bilingual History

The Nascopie's historian talking to young Eskimos at one of the northernmost ports of call. Government officials and Royal Canadian Mounted Police, as well as the historian, are interested in late news from the natives.

ARCTIC BISHOP TELLS OF WORK FOR ESKIMOS

Fleming Explains Aid of U. S. for British Missions

The Right Rev. Archibald Lang Fleming, Bishop of the Arctic of the Church of England in Canada, whose diocese covers 2,250,000 square miles of Arctic Canada, arrived Jan. 11 from Toronto for a four-day stay in New York.

Bishop Fleming's cathedral is All Saints' Cathedral in Aklavik, a settlement on the Mackenzie River, about fifty miles below the Arctic Ocean. Aklavik is near Alaska, the western boundary of his diocese, which extends east to Newfoundland and north to the North Pole. Its southern border is an irregular line just below Hudson Bay. The diocese is about one-third the size of the Dominion of Canada.

Bishop Fleming makes his headquarters in Toronto because it is easier to reach both sides of his dio-

cese from there than from Aklavik, situated far to the west.

Travels by Plane, Sled, Boat

Bishop Fleming is a vigorous man with greying hair, who walks with long, rapid strides. He was dressed in gaiters and apron, the traditional black costume worn by medieval Anglican bishops 400 years ago and which is still worn by English ecclesiastics of high rank when traveling. The costume consists of a long coat, reaching almost to the knees, and a shortened surplice, called the apron, of the same length.

Bishop Fleming is fifty-seven years old, but he still travels 10,000 to 16,000 miles a year by dog sled, airplane and boat to administer to his territory, where the winter temperature is usually around 50 degrees below zero.

A native of Greenock, Scotland, Bishop Fleming abandoned in 1908 a promising career in naval architecture, which he studied in Glasgow University while working in the drawing office of the shipbuilders, John Brown & Co., of Clydebank. After attending Wycliffe College he was ordained at Wycliffe in 1912, and served as a missionary in Baffinland

until 1916. From then until 1927 he held several pastorages in Canada and was chaplain and secretary of Wycliffe. He became Archdeacon of the Arctic in 1927, and, in 1933, the first Bishop of the Arctic.

Nomadic Life Hampers Work

Bishop Fleming, who signs his communications and documents "Archibald of the Arctic," considers the Eskimo a lovable person, practical, good at mechanics and in no way inferior to the white man. White persons, he said, are all too likely to consider the Eskimo inferior. His work among the 11,000 natives in his diocese of which 5,000 to 6,000 have been baptized as Christians, is mainly an attempt to build an indigenous church, for he believes that no church can be effective if it is foreign.

It was seventeen years before missionaries in the diocese first converted Eskimos, two men and seven women, Bishop Fleming said. That was in 1908. One of these converts, the Rev. Thomas Umaok, is the only ordained Eskimo in the region, and is helping Bishop Fleming in his work.

savings certificates. Good business is expected in the north, for so eager have been some Arctic residents to assist the war savings drive that they have asked that deductions for war savings stamps be made from monies due them, sending their instructions by wireless or by any other means available.

As usual, the veteran Hudson's Bay Company ship will carry Government officials and Royal Canadian Mounted Police who are interested in all the news which flows to remote harbors when natives gather.

In addition to the officials, company and government, who make the annual voyage, there will be passengers who make the trip for pleasure. The Nascopie cruise has caught the interest of many United States residents and it is expected some Americans will be among the passengers this year.

Throughout the north a constant contribution to the safety of Canada is made by the watchfulness of white men and natives alike, officials said. Should anything unusual be noted—and that might mean an airplane overhead or an unidentified ship off the coast—they know where to go so the network of wireless stations in the Arctic can flash the news to Ottawa.

At every point visited the Government officials aboard will distribute to Eskimos small identity disks, each of which will bear a number and the mark of the native, written by himself in ink. From then on that Eskimo's home locality and his name will be established by a glance at his disk. This is being undertaken as part of the decennial census.

Nascopie Carrying Borders Of Canada's Defense to Arctic

Northward Ho!

By JAMES K. PENFIELD, *Consul, Godthaab*

Photographs by the author

ABOUT noon on May 10, 1940, a slightly dazed Consul and Vice Consul watched from the deck of the Coast Guard Cutter *Comanche* as New York disappeared over the wake. A few days before Greenland to them had been nothing but a geographical extreme mentioned in a well known hymn—now it had suddenly become their destination. They were bound for Godthaab, a place name which somewhat to their surprise they were able to locate on a map, there to establish the first American Consulate (the first Consulate of any kind, in fact) ever to be set up in the land of the icy mountains.

Their dazed state was due to the suddenness with which the future had overtaken them. On May 1 the Department announced that an American Consulate would be provisionally established in Greenland, and on May 10 we left for our new post. Between those dates preparations were carried on with a speed disgracefully out of keeping with the traditional dignified tempo of the State Department, and with a thoroughness and efficiency which landed us in Greenland with a few overdoses—we found 18 rulers for the two of us, for instance—but only one lack, we were not given a single letter size envelope. Getting assembled and on board ship in ten days' time complete office equipment, from impression seal through red ribbon and consular sanitary report forms to the Lawyers Directory, plus essentials of furniture, plus six months' food supply, plus necessary arctic clothing, is, we found, enough to cause a flutter in the Department and to daze any two average consular officers.

The poor little 165 foot *Comanche* was so loaded down (thanks largely to the superhuman efforts of the Despatch Agent, Mr. Fyfe) that even the Captain's shower was stuffed with boxes of books, skis, snowshoes, rubber boots and duffle bags full of parkas, woolen underwear and heavy socks. But in spite of its load it pitched and rolled its way to St. Johns with such gusto that we thought we'd never know the meaning of the word horizontal again, except in the very unsatisfactory relative sense of a body in a bunk (when it wasn't pitched out onto the deck). But during a day's respite in St. Johns we

decided we'd live and indulged in such manifestations of what already seemed another life as an automobile ride through green and pleasant countryside, hot baths, and cocktails—all courtesy of the hospitable Consul General, Mr. Quarton.

Another few days of pitch and toss found us one morning off the west coast of Greenland. It was foggy but we stumbled onto land, identified our position and soon were entering Arsuk Fjord, on the shores of which Ivigtut is located. The fog soon lifted and the sun joyously and brilliantly exerted itself on brown gray barren mountains tastefully decorated with patches of snow. Just in time to complete the picture there suddenly appeared on the scene a genuine Eskimo—pardon me, Greenlander—in a genuine kyak. We slowed down and he paddled up alongside of us but the only comment he had to offer on the situation was a series of not very expressive grunts. At any rate he served as a tangible check on Coast Guard navigation and, confident that compass and stars had led us to Greenland rather than West Africa, we continued up the fjord.

About noon we rounded a point and there before us was a large corrugated iron building, a considerable collection of crane looking objects and a couple of dozen vari-colored houses straggling up the barren mountainside. As we drew near and tied up to a buoy off the bund at least a dozen Danish flags appeared, a siren sounded and there were suddenly people about, looking a bit incongruous to our romantic eyes, for they were apparently dressed in quite ordinary clothes rather than in sealskin pants and parkas. After a short vain wait for something to happen on shore, Captain Meals, Mr. Reddy the Red Cross representative, the doctor and the two consular officers climbed into the *Comanche's* natty boat, put-putted to the landing, and were ushered up a gangway to the shore where waiting to greet us stood the dignified figure of the chief local official, Mr. A. Fischer. We introduced ourselves; Controller (that's his title) Fischer made a little speech of welcome; I said we were glad to be in Greenland; we all held our ground a little uncertainly; numerous blonde Danes in blue or tan polo shirts

snapped innumerable shutters; and finally we all vaguely wandered off toward Controller Fischer's house. This proved to be located on the highest point in town, two or three hundred feet above the water, and once inside one might very easily think that he was in Copenhagen rather than Greenland; electricity, telephone and modern plumbing were all in evidence. Here Fru Fischer, weak on English but long on hospitality, plied us with port, gin and tonic, whisky soda, turkish cigarettes and Danish cigars.

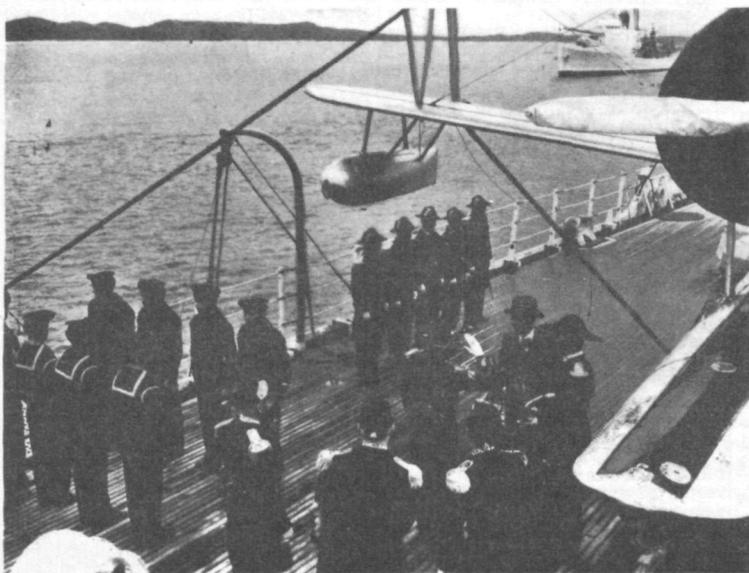
Our first impression of incongruity turned out to be not so naive after all, for Ivigtut is not Greenland; in fact, no Greenlanders are allowed to live within its sacred precincts. It is a de luxe mining camp that has an existence of itself, by itself, and for itself. Its *raison d'être* is a large oval pit at the water's edge, some 400 feet in its longest dimension and a couple of hundred feet deep. On one side of the pit are the houses of the twenty some officials (the majority with wives and children), the hospital, a mess building where they all eat and where a few of them have apartments, a radio station and miscellaneous administration buildings, storehouses, power houses, etc. On the other side are the workers' buildings, mess hall, community building and living quarters—most of them individual rooms each with its radio. The whole community of 150 or more souls lives an electrically lighted, modern plumbing, Danish food, Carlsberg beer and Aquavit existence which reduces to a minimum the usually paramount factor of geography. The map, the climate, and the treeless barrenness proclaim Ivigtut in Greenland but Ivigtut seems scarcely aware of it.

Cryolite, the substance which comes out of the pit and supplies Ivigtut with its all, is a white quartz like mineral important to the aluminum industry as a flux used in the refining of bauxite. Small quantities are also used in the enamel and glass industries. It can be manufactured synthetically but expensively and Ivigtut is the only known commercially workable deposit of natural cryolite in the world—so Ivigtut (and the shareholders in Copenhagen) sits back and enjoys the profits of monopoly.

We were the first ship to call at Ivigtut since the last ore ship had left the previous November, no word had been received from Denmark since the German occupation, and although the mine's supply ship had left Copenhagen before that event nothing had been heard from it and, so far as the Ivigtuters knew, their badly needed supplies were either at the bottom of the sea or aging in Kirkwall. So we were regarded as tangible evidence of coming salvation from another world and we were entertained as such on the evening of our arrival, the dramatic nature of which was heightened by the fact that no one knew we were coming to Ivigtut until an hour before we appeared. The party started in an atmosphere of heavy Scandinavian formality but as the last remaining bottles of Carlsberg beer and Aquavit were brought forth with the abandoned gesture of true hospitality, and had their effect, the hammered copper fittings of the mess took on a warm gleam, the most inarticulate of the Danes started talking English, and the ship models on the walls seemed to sail joyfully about in time with the singing.

We departed early the next morning and at midnight the following night we dropped anchor in the back harbor at Godthaab, the capital of South Greenland and site of the Consulate to be.

At eight o'clock daylight saving time the next morning (we could unearth no reasonable explanation of why they need to save daylight when they

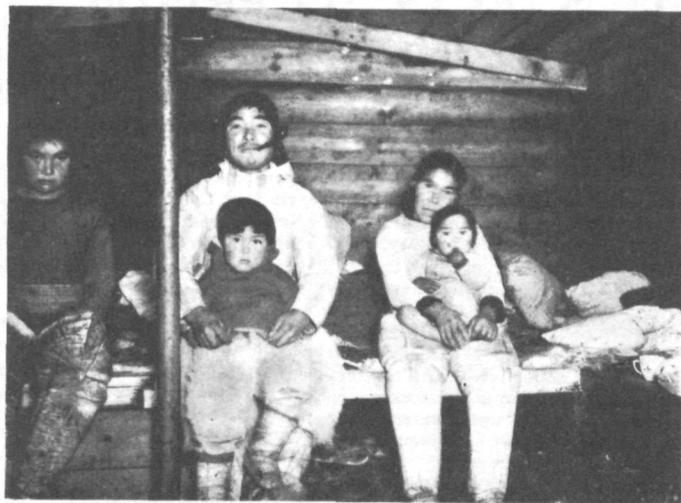


Governor Svane, of South Greenland, making a call on the Commanders of the Coast Guard Cutters in Greenland waters, on board the U. S. C. G. C. *Duane* at Godthaab, with the U. S. C. G. C. *Campbell* in the background.

have almost 24 hours a day of it at this time of year) the Kolonibestyre or Colony Leader of the Godthaab district came aboard and we returned with him in the *Comanche's* boat to call on the Governor. A twenty minute ride brought us around in front of the settlement where a hundred or more Greenlanders and Danes lined the small wharf. As we got out of the boat we were greeted by His Excellency in formal attire (the best we could do in this respect being black Homborg and gloves) and by a three gun salute—the limit of the Godthaab battery. Pushing aside the swarms of Greenlandic urchins with what we hoped were dignified gestures, we set off for the gubernatorial mansion, an attractive Danish house located a couple of hundred yards from the landing. The trek took some fifteen minutes, however, as our progress was interrupted every ten yards or so by the advent of another local official who, of course, had to be introduced all around. Fru Svane, the Governor's charming wife, met us at the door and regaled the whole party, which by that time numbered some twenty persons, with coffee, Danish pastry and liqueurs. Following this session we repaired to the Colony Leader's residence to sip port and admire his house, a rambling

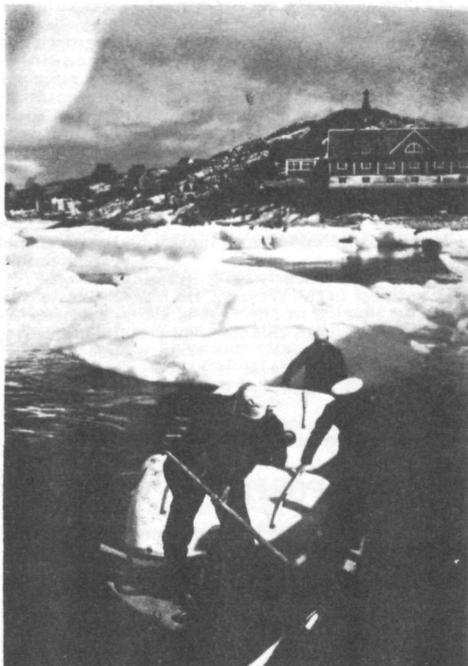


Greenland family at home in Thule.



building with steep pitched roof and stone walls two feet thick which was built by Hans Egede in 1728.

The official formalities being over, the natural first step was to look for quarters, a process which was greatly simplified by the fact that every house in Godthaab suitable for our purposes belongs to the Government. All Danes are Government employees, there are a certain number of positions and an equal number of houses for the holders of these positions—which works out very well until an alien factor, in this case a new American Consul, is injected into the picture. So the settlement doctor, having made the mistake (so far as comfort in living quarters is concerned) of remaining single, was the unlucky man who was to be exiled to meaner quarters in order



Boat from the U.S.C.G.C. *Comanche* coming to the landing at Godthaab.

that the stars and stripes might fly over something more in keeping with national dignity than an igloo (and incidentally, but only incidentally of course, more compatible with the physical comfort of the country's representatives). The house is a comfortable two story frame job with neither plumbing nor electricity but with coal stoves in each room and a big coal range and a water barrel in the kitchen—also, apotheosis of luxury, a bath tub. This fine instrument is installed in its own private salon and has built next to it a small furnace surmounted by a large enamel lined water container. When we want a bath we have water put in tub and container and have a fire built—in a few minutes boiling water is ready to be ladled into the tub and the room is as full of steam as a Turkish bath.

Bright and early the second day we came ashore with baggage, dumped it in the big bedroom and immediately set a couple of sailors to work unpacking official supplies. By what should have been nightfall we had: eaten lunch and dinner with the Svanes; unpacked our camp chairs; opened 13

boxes of official supplies and distributed most of them about the floor in not very neat piles; swung typewriters into action on the tops of packing cases; hired Elizabeth Egede to minister to our wants; and put a couple of code books well on the way to becoming dogeared. We finally, in the broad daylight of midnight, opened our suitcases on the bedroom floor, set up camp cots and turned in.

They say that Godthaab has a population of about 700 but looking at the few scattered houses one would never suspect it. At the landing there is a little shack surrounding a small winch which tugs and strains on a block and tackle arrangement for handling cargo to and from the little 50-foot schooners which ply up and down the coast. Then to one side is a

very respectably large red warehouse with a steep pitched roof which goes up to about three story height. To one side of the warehouse is a small mustard colored house the use of which is not apparent from its deserted appearance. Back of mustard is a nondescript red edifice which might be farmer Jones' chicken coop but which actually is the colony store, open (and crowded with Greenlanders) on Monday, Wednesday and Saturday mornings. There one can buy cheap cotton cloth, sugar, tin wash basins, ten cent mirrors, hard-tack, margarine and similar Eskimo necessities. The Godthaab housewife's shopping tour is completed by a trip to the bakery next door where she can buy black rye bread. Just to one side of store and bakery is the American Consulate, where we sit and contemplate the hustle and bustle of Greenland metropolitan life between spells of looking up bits of the best departmentalese in a code book. Beyond the store is the Colony Leader's house, the colony office and the Postoffice. Still further is the hospital and next to it the Governor's house and office, and

perhaps a quarter of a mile beyond that is the Seminary, the only institution of higher learning in Greenland. To the average Godthaabian this stronghold of the scholar is important principally because of its gymnasium; where once every two or three weeks the print shop generator a few hundred yards away coaxes a little tired electricity over to run a projector and anyone who has the necessary 3c to buy a ticket can see, for example, a French movie of a Russian war story with Danish subtitles. Around and about these more pretentious buildings is scattered what seems like just a handful of small square wooden residences. That, plus the suburban radio station, ship's harbor, fox farm, sheep shelters and cemetery, is Greenland's capital.

Each day Elizabeth would go out to buy us fish for our dinner and each day we would unpack a few more things. Then one day came a ship bringing furniture and no sooner were we sitting at real desks than a visa applicant showed up. So we put on our coats, got out our red ribbon and seals, and felt a bit more like consular officers and less like arctic explorers. Our graduation into a full fledged Consulate came, however, some days later when we were able to step out of the door with the arms above it and greet, as doyen of the consular body, our newly arrived Canadian colleague.

FEBRUARY, 1941

THE AMERICAN FOREIGN SERVICE JOURNAL

Battenfield for Chicago Times



MONROE DOCTRINE IN ACTION

U. S. ACTS TO PROTECT STRATEGIC GREENLAND

WASHINGTON, April 10—The United States has taken Greenland under its protection and will insure its remaining a Danish colony, President Roosevelt announced today.

An agreement signed here with the Danish Minister, Henrik de Kauffmann, gives the United States the right to establish American air bases and other naval and military facilities on Denmark's strategic island possession, which extends into the Arctic Circle between North America and Europe.

The pact was signed by the Minister "on behalf of the King of Denmark." German-occupied Denmark's government, "of course," did not participate.

The agreement was precipitated, the White House and State Department said, by recent reconnaissance flights of German war planes over Greenland. The island is a possible base for air assault on the New World and an important observation point for weather conditions over the British Isles, which Hitler may attack. The plane flights and other Nazi activities made it appear necessary to bring Greenland "within the system of hemispheric defense envisaged by the Act of Havana," the State Department said.

Provides for Fortifications

Specifically, the agreement provides that in order to protect Greenland, the United States shall have the right to construct, maintain and operate any "landing fields, seaplane facilities and radio and meteorological installations" it deems necessary. The United States also obtains the right to "improve and deepen harbors and anchorages and the approaches thereto," to install aids to navigation by air and sea and to "construct roads, communication services, fortifications . . . and housing for personnel."

Although some diplomats in Washington thought that the gigantic island, almost as large as the United States east of the Mississippi, might be used as a base for American airplane escort of British naval convoys, officials insisted that no thought had been given to this matter.

Despite denials by some officials, it was stated on good authority that a party of American Army, Navy and diplomatic agents went to Greenland on Coast Guard cutters recently to investigate establishment of bases. It was ascertained, however, that no American forces have yet been dispatched there and officials insisted that no plans for sending them had been drafted.

The State Department told of the flight of a big Nazi bomber over Greenland March 27 and of another of Hitler's war planes the following day. This, other officials said,

aroused apprehension in some quarters that Canada, which has feared Nazi occupation of Greenland since Denmark was overrun by German troops, would itself send forces to occupy the island.

Bases for American Nations

The wording of the agreement indicated that airplanes and vessels of all American nations, including Canada, a belligerent, will be able to use all bases and facilities established "for purposes connected with the common defense of the western hemisphere."

President Roosevelt, in his statement, noted that the agreement was signed yesterday "on the anniversary of the day on which German troops invaded Denmark," and he expressed the hope for "quick liberation" of Denmark.

The agreement, which, the Danish Minister emphasized, was made "after an open and friendly exchange of views," stated that it "shall remain in force until it is agreed that the present dangers to the peace and security of the American continent has passed." The agreement actually would remain operative until a year thereafter to allow return home of any forces sent, and it could be renewed on agreement of both governments.

The accord puts Greenland, with

Two Coast Guard Cutters Radio Link to Greenland

By The United Press.

WASHINGTON, March 8—Two Coast Guard cutters, the Northland and Comanche, will leave about April 1 for Godthaab, Greenland, to set up radio communication with Washington. The State Department has a consular office there.

The cutters' projected trip was revealed at hearings on the first Deficiency Appropriation Bill before the House Appropriations Committee and the purpose made known later by the State Department.

The new radio apparatus is expected to permit the American consul, James K. Penfield, to communicate at almost all times and quickly with the home office.

Mr. Penfield was named consul to Greenland soon after Germany seized Denmark.

its cold climate and long Winters, in exactly the same category as any of the islands off our coasts, including those like French Martinique, where this country has no basis, Stephen Early, White House secretary, said in issuing the President's statement.

"It will be defended if attacked," he declared.

Greenland, Mr. Early said, lies almost entirely in the Western Hemisphere, so that all of the vast island could be considered this hemisphere for practical purposes. The eastern tip of Greenland lies east of near-by Iceland, which is guarded by British troops.

The State Department in noting

that the Danish Minister signed on behalf of his King, said that "so long as Denmark remains under German occupation the Government in Denmark cannot exercise the Danish sovereign powers over Greenland and the agreement, therefore, was signed in Washington."

The Copenhagen government was not informed of the signing by the Danish Minister until noon today, when the White House announcement was made, it was learned, but the official statements issued here noted the acquiescence of the two Danish Governors of Greenland in the step.

Free Entry of Supplies Allowed

The agreement provides for free entry of American supplies, assures sympathetic United States consideration for the physical needs of the Eskimos and provides for the settlement of jurisdictional disputes.

Explaining reasons for the agreement, the State Department said:

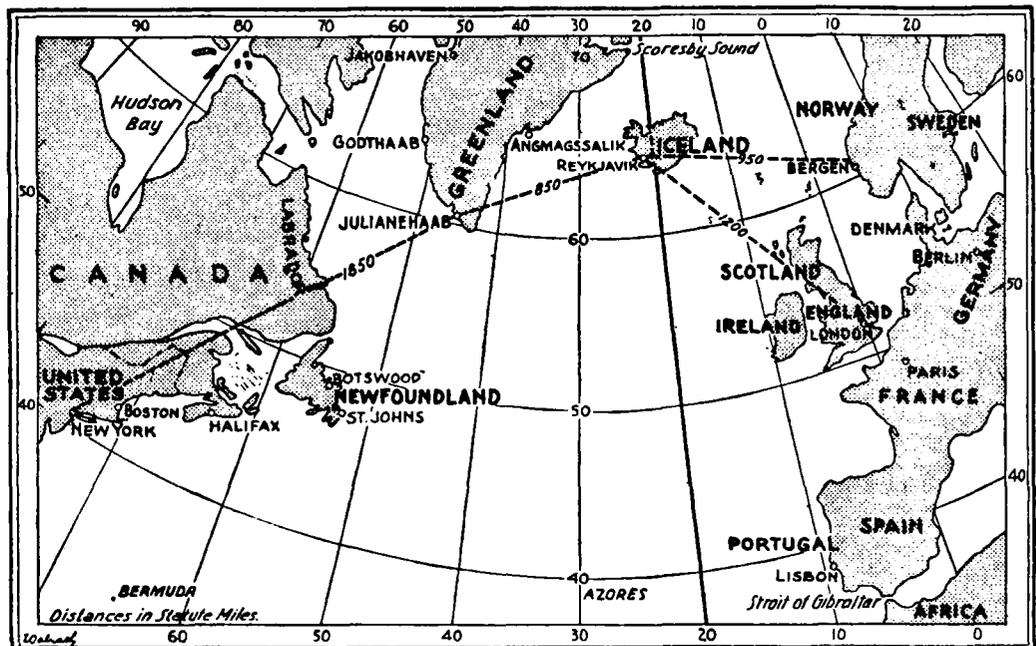
"The agreement recognizes that as a result of the present European war there is danger that Greenland may be converted into a point of aggression against nations of the American continent, and accepts the responsibility on behalf of the United States of assisting Greenland in the maintenance of its present status."

The State Department stated that, besides the recent incidents involving German planes, during the Summer of 1940 three ships from German-occupied Norway arrived off the coast of Greenland ostensibly for commercial or scientific purposes.

One of these ships, the State Department related, landed parties "nominally for scientific purposes but actually for meteorological assistance to German belligerent operations in the North Atlantic."

These parties were eventually "cleared out," but, late in the Fall

GREENLAND'S STRATEGIC POSITION IN ATLANTIC AREA



Seven hundred miles by air from Newfoundland and about 1,775 from New York City, with the mouth of the St. Lawrence little more than 1,000 miles distant, Greenland has often been urged as a place which the United States should acquire as a defense outpost and as a guarantee against its falling into hostile hands. Free from ice only in less than a twentieth of its area, the island does not afford easy access from the air. It has a population of only about 17,000.

of 1940, air reconnaissance was made over East Greenland "under circumstances making it plain that there had been continued activity in the region."

When German planes, one of them so large it could have carried a landing party or supplies, appeared again over Greenland late last month, the State Department continued, further steps for the defense of Greenland appeared necessary. Word of the activities of these planes was flashed by radio to Washington by James K. Penfield and George West, American consul and vice consul, respectively, who were sent to Greenland soon after the Nazis took Denmark.

The State Department recalled that, under the Monroe Doctrine, this government declared (with Congressional sanction) that it would countenance no transfer of Western Hemisphere possessions from one non-American power to another. The department also recalled the Havana Conference of 1940, when the American republics made a declaration that "any attempt on the part of a non-American State against the integrity of an American State should be considered an act of aggression," and further that the status of European colonies and possessions in this hemisphere was "a subject of deep concern to all the governments of the American republics."

Under U. S. Jurisdiction

In its more technical parts, the agreement provides that, in order to assure speed, if this becomes necessary, in the establishment of American bases, the United States shall utilize any areas deemed essential without reference to formal lease. Denmark will retain sovereignty over these areas but, so long as the agreement is in force, the United States will have jurisdiction over all except Danes and Eskimos who may be turned over to Danish authorities for trial and punishment if they commit an offense.

The United States may establish commissary stores and postal service for its own citizens and soldiers on duty and, on the request of local Danish authorities, will make commissary supplies available to natives.

By The United Press.

COPENHAGEN (via Berlin), April 12—The Danish Foreign Office tonight declared void the agreement between the United States and the Danish Minister at Washington placing Greenland under American protection.

At the same time, the Foreign Office announced the recall of Henrik de Kauffmann, Danish Minister to Washington.

The agreement, which gave the United States permission to establish air and naval bases and other military facilities at Greenland was said by the Foreign Office to be void under international law.

Danish Foreign Minister, Harald Scavenius, sent a note to the United States chargé d'affaires charging that the agreement had been concluded "without knowledge of the Danish King or the legal Danish Government."

Mr. Scavenius protested in advance against establishment of United States military bases at Greenland.

He named Einar Blechinberg, counselor of the Danish Legation at Washington, to be chargé d'affaires.



Henrik de Kauffmann, Danish Minister to the United States.

Mr. de Kauffmann took the position in signing the agreement, he said, that Greenland was geographically a part of the Western Hemisphere, subject to the Monroe Doctrine which Denmark has long recognized. Former treaty rights, he declared, made it obligatory on Denmark to afford to the United States the facilities for carrying out its historic obligation of keeping the Western Hemisphere free from invaders.

Before signing the agreement for the Greenland bases, however, Mr. de Kauffmann conferred with the two royal Governors of Greenland, which is divided into two provinces for administrative purposes, and secured their approval of the step he had in mind.

WASHINGTON, April 13—Danish Minister Henrik de Kauffmann, although officially recalled by the German-controlled Copenhagen government, has the complete support of the staff of the legation in his defiance of the order, a spokesman at the legation said tonight.

All members of the legation and Danish consular officers throughout the United States will back Mr. de Kauffmann's agreement with the United States to permit this country to protect Greenland during the European war.

Einar Blechinberg, counselor of the legation, who was put in charge by the Danish Foreign Office in its message to Mr. de Kauffmann relieving him of his duties, supports the Minister's attitude completely, the spokesman said.

WASHINGTON, April 14—Cordell Hull, Secretary of State, by direction of President Roosevelt, formally notified Henrik de Kauffmann in an exchange of notes today that the United States would continue to recognize him as the Danish Minister notwithstanding that Copenhagen had ordered his recall because of his negotiation of the Greenland agreement with this country.

The Minister asserted, and Mr. Hull agreed, that the Danish Government was acting under duress from Berlin and was not a free agent.

"My government," Secretary Hull said, "considers it to be the fact that the government in Denmark in this respect is acting under duress and in consequence I have the honor to advise you that it continues to recognize you as the duly authorized Minister in Washington. It renews its hope for the speedy liberation of Denmark."

WASHINGTON, April 15—

Discussing the status of Greenland, Mr. Roosevelt said that the United States was applying the Monroe Doctrine to Greenland, that we were protecting and would continue to protect Greenland from transfer to another European power and that we trusted the colony would be restored to an independent Denmark.

Mr. Roosevelt asserted that the United States had exploratory rights to a large part of Northern Greenland and that Britain and Norway also had exploratory claims. It was only because Denmark actually had colonized the island in the time of Lief Erickson and had maintained colonies that a few years ago the United States had agreed to Denmark's claim.

Clearly, he said, Greenland was in the Western Hemisphere. After Denmark was overrun the State Department and the Danish Minister in Washington held that the government of Denmark was acting under duress. This was a fact, he said, and it had been impossible to consider the Danish Government otherwise.

COPENHAGEN, April 16 (UP)—Henrik de Kauffmann, Danish Minister to Washington, was ousted from that post by a royal resolution today and the government began an inquiry to determine whether he was guilty of treason.

A statement in Washington last week revealed that the United States had reached an agreement with Mr. de Kauffmann whereby the United States would establish bases for the protection of Greenland.

Danish newspapers said that Mr. de Kauffmann negotiated the deal on his own initiative without consulting King Christian or the Copenhagen government.

Authorities said that Mr. de Kauffmann was dismissed because he "abused the King's name and caused the Danish Government severe difficulties." He was accused of violating the Danish high treason law and a new law passed in January to deal with actions violating the interests of Germany.

WASHINGTON, April 16 (UP)—Henrik de Kauffmann said tonight that an investigation by the Danish Government into possible charges of treason against him would make no difference in his attitude toward the Greenland defense pact.

He indicated that he was not surprised at the action taken in Copenhagen, asserting that he began negotiations for the agreement well aware of what his government's attitude would be "as long as it remained under duress."

By The Associated Press.

WASHINGTON, April 25—President Roosevelt spoke today of the possibility that Axis forces might be in Greenland—and answered affirmatively when asked whether the United States was doing anything about it.

Mr. Roosevelt offered no clues at his press conference as to the nature of the occupying force except to reply negatively when asked

whether fifth columnists were involved.

That produced much speculation in the capital, some defense experts suggesting that U-boat bases in the remote, almost hidden fjords, were possible. From those bases, where Axis submarines could be fueled, their crews rested and batteries recharged, sallies could be made south to the Great Circle course of Britain-bound merchantmen.

Others, recalling the need for weather information in the operation of aerial warfare, suggested that Germany might have established meteorological bases to send weather information to the Nazi Luftwaffe. In this connection, they recalled a report that last Fall a German vessel had attempted to put ashore about fifty weather men, but that a Norwegian patrol ship had captured the outfit.

Still others pointed out that Germany's long-range bombers, engaged in raids on shipping, would, like the U-boats, find the island a handy springboard for attack on ship lanes.

Coast Guard Collected Data

The United States itself has acquired substantial information about the islands. Last year three coastguard vessels conducted an informative patrol in Greenland waters, studying problems of transporting supplies, gathering hydrographic information and surveying facilities.

Subsequently, it was announced the patrol would be resumed this year. The Coast Guard survey found, among other things, that winter cruising in Greenland waters was no more hazardous than in many areas of the North Atlantic, and that from June to December ports on the southern tip and west coast of Greenland were reasonably open, but that the east coast was apt to be ice-bound.

There has been no information on what preparations, beyond a proposal to establish an air base, that the United States has been making to defend the island. Such matters come under the head of restricted military information. In announcing the signing of the agreement with the Danish Minister, Mr. Roosevelt said the United States proposed to make sure that the big island would remain a Danish colony when the war was over.

**Vital Greenland
Has Population
Of Only 16,600**

By The Associated Press.

Greenland, now a part of the Western Hemisphere defense system, is one of the largest islands in the world, and one of the least populated.

The Commerce Department says 695,000 of the 850,000 square miles in the deceptively-named land are covered by ice and at last count the population numbered about 16,200 Eskimos and 400 Danes.

Cryolite, an important mineral in the manufacture of aluminum, enamel ware, glass and pottery, is Greenland's chief resource, and is valuable in defense industries.

The United States once claimed ownership of part of the island on the basis of explorations by Admiral Robert E. Peary. However, when the United States bought the Virgin Islands from Denmark in 1916, it surrendered all its claims to Greenland.

TREATY THAT PLACES GREENLAND UNDER U. S. PROTECTION

By The Associated Press.

WASHINGTON, April 10—Following is the text of the agreement by which the United States give pledge to Protect Greenland:

AGREEMENT RELATING TO THE DEFENSE OF GREENLAND

Whereas:

1—After the invasion and occupation of Denmark on April 9, 1940, by foreign military forces, the United Greenland Councils at their meeting at Godhavn on May 3, 1940, adopted in the name of the people of Greenland a resolution reiterating their oath of allegiance to King Christian X of Denmark and expressing the hope that, for as long as Greenland remains cut off from the mother country, the Government of the United States of America will continue to hold in mind the exposed position of the Danish flag in Greenland of the native Greenland and Danish population and of established public order; and

2—The governments of all of the American republics have agreed that the status of regions in the Western Hemisphere belonging to European powers is a subject of deep concern to the American nations, and that the course of military events in Europe and the changes resulting from them may create the grave danger that European territorial possessions in America may be converted into strategic centers of aggression against nations of the American continent; and

3—Defense of Greenland against attack by a non-American power is essential to the preservation of the peace and security of the American continent and is a subject of vital concern to the United States of America and also to the Kingdom of Denmark; and

4—Although the sovereignty of Denmark over Greenland is fully recognized, the present circumstances for the time being prevent the government in Denmark from exercising its powers in respect of Greenland. Therefore,

The undersigned, to wit: Cordell Hull, Secretary of State of the United States of America, acting on behalf of the Government of the United States of America, and Henrik de Kauffmann, Envoy Extraordinary and Minister Plenipotentiary of His Majesty the King of Denmark at Washington, acting on behalf of His Majesty the King of Denmark in his capacity as sovereign of Greenland, whose authorities in Greenland have concurred herein, have agreed as follows:

Article I

The Government of the United States of America reiterates its recognition of and respect for the sovereignty of the Kingdom of Denmark over Greenland. Recognizing that as a result of the present European war there is danger that Greenland may be converted into a point of aggression against nations of the American continent, the Government of the United States of America, having in mind its obligations under the Act of Habana signed on July 30, 1940, accepts the responsibility of assisting Greenland in the maintenance of its present status.

Article II

It is agreed that the Government of the United States of



Wide World

New Wards of Uncle Sam

Eskimo children playing with Eskimo dog puppies at an Eskimo settlement in Eastern Greenland, the United States' new outpost in the North Atlantic. The children train the puppies as sledge dogs. To the Eskimos, dogs are as valuable as horses to farmers.

America shall have the right to construct, maintain and operate such landing fields, seaplane facilities and radio and meteorological installations as may be necessary for the accomplishment of the purposes set forth in Article I.

Article III

The grants of the rights specified in Article II shall also include the right to improve and deepen harbors and anchorages and the approaches thereto, to install aids to navigation by air and by water, and to construct roads, communication services, fortifications, repair and storage facilities, and housing for personnel, and, generally, the right to do any and all things necessary to insure the efficient operation, maintenance and protection of such defense facilities as may be established.

Article IV

The landing fields, seaplane, harbor and other defense facilities that may be constructed and operated by the Government of the United States of America under Articles II and III will be made available to the airplanes and vessels of all the American nations for purposes connected with the common defense of the Western Hemisphere.

Article V

It is agreed that the Government of the United States of America shall have the right to lease for such period of time as this agreement may be in force such areas of land and water as may be necessary for the construction, operation and protection of the defense facilities specified in Articles II and III. In locating the aforesaid defense areas, the fullest consideration consistent with military necessity shall be given to the welfare, health and economic needs of the native population of Greenland.

It is agreed, however, that since the paramount objective sought is the early attainment of an adequate defense establishment in Greenland, the utilization of any area deemed by the Government of the United States of America to be needed for this purpose shall not be delayed pending the reaching of an agreement upon the precise terms of a formal lease.

A description of such areas, by metes and bounds, and a statement of the purpose for which they are needed shall in each case be communicated to the Danish authorities in Greenland as soon as practicable, and the negotiation of a formal lease shall be undertaken within a reasonable period of time thereafter.

Article VI

The Kingdom of Denmark retains sovereignty over the defense areas mentioned in the preceding articles.

So long as this agreement shall remain in force, the Government of the United States of America shall have exclusive jurisdiction over such defense area in Greenland and over military and civilian personnel of the United States, and their families, as well as over all other persons within such areas except Danish citizens and native Greenlanders, it being understood, however, that the Government of the United States may turn over to the Danish authorities in Greenland for trial and punishment any person committing an offense within a defense area, if the Government of the United States shall decide not to exercise jurisdiction in such case.

The Danish authorities in Greenland will take adequate measures to insure the prosecution and punishment in case of conviction of all Danish citizens, native Greenlanders and other

persons who may be turned over to them by the authorities of the United States for offenses committed within the said defense areas.

Article VII

It is agreed that the Government of the United States of America shall have the right to establish and maintain postal facilities and commissary stores to be used solely by military and civilian personnel of the United States, and their families, maintained in Greenland in connection with the Greenland establishment. If requested by the Danish authorities in Greenland, arrangements will be made to enable persons other than those mentioned to purchase necessary supplies at such commissary stores as may be established.

Article VIII

All materials, supplies and equipment for the construction, use and operation of the defense establishment and for the personal needs of military and civilian personnel of the United States, and their families, shall be permitted entry into Greenland free of customs duties, excise taxes or other charges, and the said personnel, and their families, shall also be exempt from all forms of taxation, assessments or other levies by the Danish authorities in Greenland.

Article IX

The Government of the United States of America will respect all legitimate interests in Greenland as well as all the laws, regulations and customs pertaining to the native population and the internal administration of Greenland. In exercising the rights derived from this agreement the Government of the United States will give sympathetic consideration to all representations made by the Danish authorities in Greenland with respect to the welfare of the inhabitants of Greenland.

Article X

This agreement shall remain in force until it is agreed that the present dangers to the peace and security of the American Continent have passed. At that time the modification or termination of the agreement will be the subject of consultation between the Government of the United States of America and the Government of Denmark.

After due consultation has taken place, each party shall have the right to give the other party notice of its intention to terminate the agreement, and it is hereby agreed, that at the expiration of twelve months after such notice shall have been received by either party from the other this agreement shall cease to be in force.

Signed at Washington in duplicate, in the English and Danish languages, both texts having equal force, this 9th day of April, nineteen hundred and forty-one.

CORDELL HULL,
Secretary of State of the United States of America.

HENRIK DE KAUFFMANN,
Envoy Extraordinary and Minister Plenipotentiary of His Majesty the King of Denmark at Washington.

COMPLETES STUDY OF GREENLAND ZONE

Group of American Officials Is Returning on Cutter to Report on Defense Possibilities

WASHINGTON, May 30 (AP)—A report on Greenland's strategic role as an outpost in the defenses of the Western Hemisphere will be made early next week by American officials now on their way home in a Coast Guard cutter after an extensive survey of the island.

Aksel Svane, Governor of Southern Greenland, is also coming on the cutter for conferences with Hendrik de Kauffmann, Danish Minister, and State Department officials on the island's defense, administration and trade.

With American naval vessels patrolling between the United States and Greenland, it was pointed out, British warships would need to shepherd merchant ships only through the German-proclaimed blockade zone, recently extended to within three miles of Greenland.

Bases in Greenland, it was said, would also provide facilities for the extension of American patrols—by warships or by planes—over the North Atlantic to give warning of any German submarines or surface raiders.

Plans and details for development of the bases—as well as aerial photographs providing valuable data—are considered "restricted military information" and officials said they doubted that the State, War or Navy Departments would make public any of the information in the report to be made.

OUR PLANS TO DEFEND GREENLAND SPEEDED

House Acts as Sea Fight Is Said to Spur General Program

WASHINGTON, June 2 (UP)—The United States, spurred by the Bismarck-Hood sea battle, is understood to have hastened plans for the protection of Greenland.

While all activity concerning defenses of the huge ice-capped island are secret, the moves are presumed to include strengthening of land, air and naval defenses in view of the increasing emphasis which is being put on Greenland's strategic role as the North Atlantic gateway to the Western Hemisphere.

The United States is said to have sent troops to Greenland after it took over the responsibility of defending the island April 10. The protective agreement with the Danish Minister gave this country the right to establish air bases and other naval and military facilities on the island.

Troops are believed to be preparing air fields and naval units, it is presumed, have been strengthened.

Congress moved today to build up Greenland's defenses. The House unanimously approved and sent to the Senate legislation authorizing construction of ten new Coast Guard cutters, including three ice breakers, described as needed for purposes "which involve certain activities in Greenland."

Greenland: Its Economic Background

The Christian Science Monitor

WASHINGTON, April 12—Catalyzed into the forefront of the present world struggle by the recent American-Danish agreement providing for its protection by the United States, Greenland has a strategic position in the North Atlantic that someday may give it a decisive role in the democratic struggle against totalitarianism. The following survey of the vast predominantly Arctic region was prepared by the Division of International Economy of the Commerce Department's Bureau of Foreign and Domestic Commerce:

The Danish colony of Greenland is the largest island in the world. With a total of 850,000 square miles it is almost as large as the United States east of the Mississippi.

The distance from the southernmost part to the northernmost part

of the island is about 1,647 miles.

All Fish and Hunt

The population of Greenland is approximately 18,000 of whom some 500 are Danes and the remainder Greenlanders of predominantly Eskimo race. Approximately 25 per cent of the population is concentrated in the Julianehaab district in southwest Greenland, about 6 per cent on the east coast and in the far north, and the remainder along the west coast south of 74 degrees north latitude. A large percentage of the Danes speak English but the great majority of the Greenlanders know only Greenlandic, a dialect of the Eskimo language. The population is almost 100 per cent literate.

Fishing and hunting are the principal and almost the only occupations of most Greenlanders. Food, clothing, and export products, principally codfish and whale and seal blubber, are obtained from the sea. A coal mine on Disko Island in North Greenland produces some 8,000 tons of low grade lignite per year. Sheep raising on a small scale is carried on in the southwest. The most important industry is the mining of cryolite, a mineral used principally as a flux in the

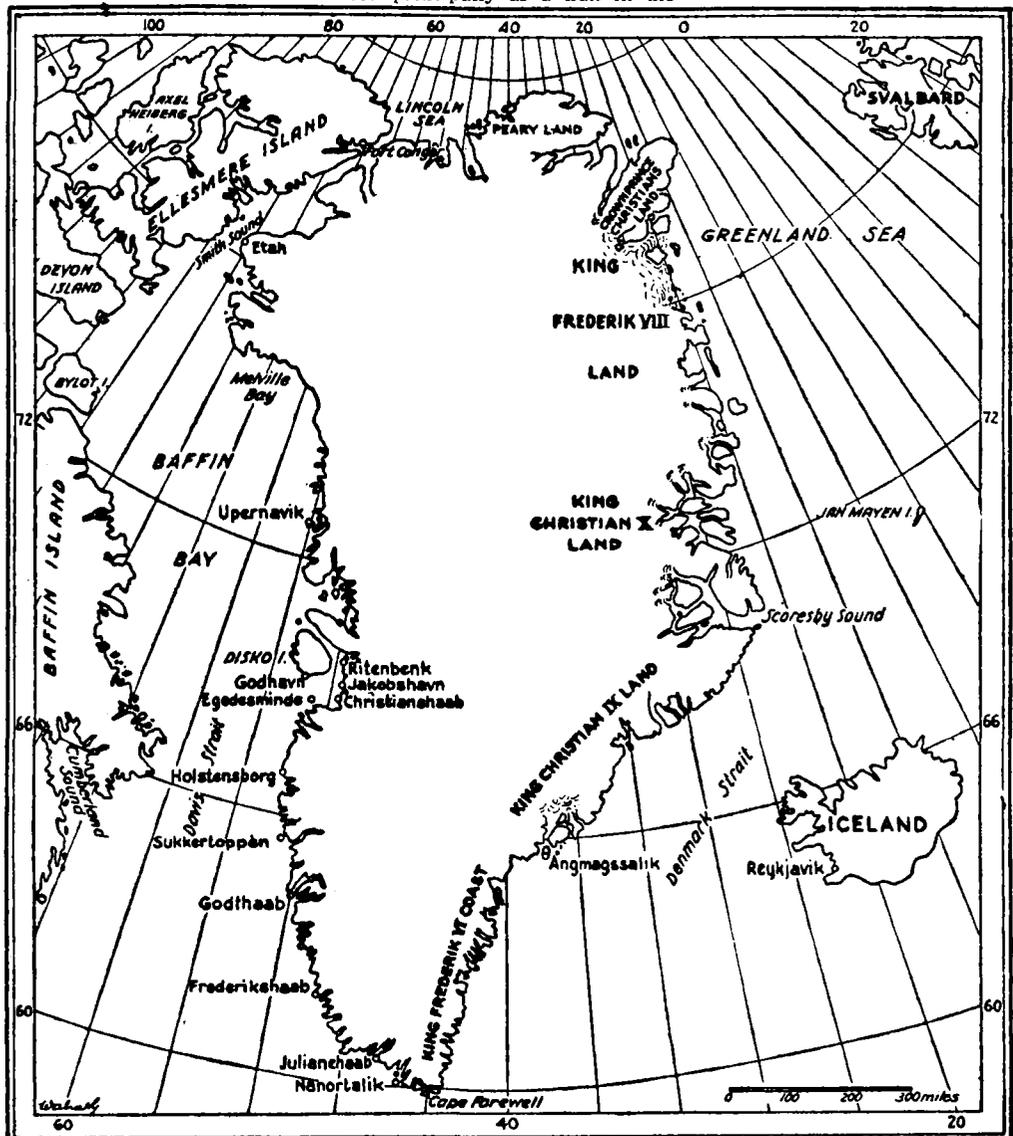
manufacture of aluminum although some is consumed by the enamel, glass and ceramics industries.

As a Market

The principal export is cryolite, annual shipments of which for the past three years have averaged in the neighborhood of 50,000 tons with a value of between \$2,000,000 and \$3,000,000. Other exports which usually total some \$500,000 in market value, include whale and seal blubber, dried and salted codfish, hides and furs, and other fish products. Imports, averaging \$1,000,000 to \$1,500,000 in value include cereals and other food products, textiles, wood and petroleum products, iron and machinery.

United States trade statistics for 1940 show imports from Greenland valued at \$1,327,500 and exports valued at \$759,500.

Trade in all leading articles of export and import is monopolized by the Government. Under normal conditions all exports (except a portion of the cryolite production) are sent to Denmark and imports are shipped exclusively from that country. However, under present abnormal conditions most of the foreign trade is being carried on with the United States.



The Island of Greenland, whose protection was recently assumed by the United States.

RECENT ADVANCES IN ANTARCTIC BIO-GEOGRAPHY

By ALTON A. LINDSEY

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Byrd Antarctic Expedition II*

IN CONSIDERING the geographic and broad ecological relations of antarctic life, we are confronted at the start with two different practices in the delimitation of the Antarctic zone by recent authors. Since the Antarctic continent at several points extends to the north of the Antarctic circle, it is obvious that the latter cannot serve as a natural zonal boundary. The parallel 60° S. Lat., which touches no land whatever, has long been used as a convenient line between the Antarctic and sub-Antarctic zones, since the lands within this parallel are subjected to the truly continental climate of Antarctica. This is the current practice of authors dealing with terrestrial plants and animals. On the other hand, students of marine life have been impressed by the powerful effect on the distribution of organisms exerted by the hydrologically determined zones of surface water. Such authors use the term "Antarctic zone" to designate a much larger area of sea and land, namely, the whole region south of the Antarctic convergence or northern limit of cold antarctic surface water. This boundary is rather irregular, paralleling neither the continental coast nor any parallel of latitude. By roughly averaging its position around the globe, one finds the average latitude of this convergence is approximately 50° S. Also, at any given longitude the position of the convergence fluctuates considerably in latitude from time to time. The marine organisms of the surface waters change their distributional boundaries accordingly, but the terrestrial floras and faunas do not.

Islands and archipelagos which are characterized throughout an extensive biological literature as typically sub-Antarctic are now found, according to other authors, in the Antarctic zone. Such islands situated south of the Antarctic convergence are Macquarie, South Georgia, and possibly Kerguelen; regarding these, as Rudmose Brown (1928) wrote, "the term 'sub-Antarctic' is justified rather by proximity to the Antarctic rather than by any real approximation to Antarctic conditions."

The difference between the two leading usages of the term "sub-Antarctic" is

even greater than that between the definitions of "Antarctic zone." Such ambiguity in bio-geographical nomenclature may be avoided by the use of the classification of life zones herein proposed. Both concepts of the Antarctic zone mentioned above are firmly entrenched in the literature, since both are biologically valid. The names, not the concepts, are at fault. Both concepts have a valid ecological basis because of the great difference in specific heat between water and air, and the recognized distinction between macroclimate and microclimate. We must recognize the disparity between terrestrial and marine habitats in the temperature and other conditions to which organisms are actually subjected during the growing season.

All terrestrial and fresh-water plants and animals which occur south of 60° S. Lat. may be referred to the *Antarctic land province*, dominated by the continental climate of Antarctica. The South Orkney Islands, for example, located just within the boundary, support no vascular plants and no liverworts. The *sub-Antarctic land province* corresponds with Skottsberg's (1905) "*sub-Antarctic vegetation province*," including the Kerguelen district, New Zealand district, sub-Antarctic South America district, and South Georgia district. Referring to the distribution of marine organisms only, the *Antarctic marine zone* is the zone of surface water bounded on the north by the Antarctic convergence, and the surface water zone next to the northward which is bounded on the north by the sub-tropical convergence constitutes the *sub-Antarctic marine zone*.

PHYTOPLANKTON

Plankton plants constitute the organic foundation of the pelagic ecology of the sea. Diatoms are the dominant constituents of the phytoplankton of the southern ocean. Two main diatom floras exist there, a warm-water and a cold-water flora, and the two are in general separated by the sub-tropical convergence. Environmental factors greatly influence the size of the diatom frustule. According to Hendeby (1937), the warm-water flora, subjected to a high hydrogen ion concen-

tration and a limited supply of silica, phosphates, and nitrates, is characterized by thin-walled individuals with relatively large cubical capacity and low surface area, tending to approach spherical form. Although in the Antarctic and sub-Antarctic marine zones nutrient salts seldom if ever fall so low as to become a limiting factor to growth, and dissolved CO₂ and O₂ are present in high concentrations, the low temperature and decreased sunlight do not favor large individuals. The size-temperature relation of marine plankton diatoms is thus the reverse of that of many classes of marine animals in which individuals of the same species reach a larger size in colder waters. The decreased size and heavier silicification produces a denser cell, one with a greater mass per unit volume, which necessitates development of a slender cylindrical form and bristly appendages to insure buoyancy. In some genera, the individuals probably have some control over their own buoyancy.

Hendeby divides the cold-water flora into an oceanic sub-flora (forms that are constantly free-floating, normally solitary individuals) and a neritic (coastal) sub-flora. Some of the neritic forms are free-floating, but most of them are bottom-dwelling or coast-line species which form groups of many attached individuals. The predominant species obtained from sea ice are truly neritic. The characteristic ice-flora of the Antarctic seems to differ entirely from that of the Arctic not only in specific composition but even in general types of species.

A peculiar diatom population is formed upon the skin of whales in Antarctic waters only. Hart (1935) states that a readily visible diatom film indicates that the whale has been within the Antarctic zone at least one month. The truly oceanic species are entirely absent from the skin flora, the predominant types being stalked and bottom-dwelling diatoms.

Nearly all southern diatom species are tolerant of considerable environmental variation, and therefore have a very wide geographic range. However, circumpolar collections by Hart (1937) have demonstrated that one species (*Rhizosolenia*

curvata) constitutes by far the best biological indicator of the southern limit of sub-antarctic surface water. This limit, the Antarctic convergence, fluctuates considerably; but whenever it was shown hydrologically that the sub-antarctic surface water had been forced southward of its average position, this readily identified diatom was found in the plankton. Its occurrence on the Antarctic side of the convergence is a good indication that mixing is in progress or has very recently taken place, since in the changed environment provided by the mixed water the diatom reproduces by vegetative division only, and cannot long persist.

Diatoms show a striking seasonal variation in abundance in southern waters, the fewest occurring in the winter months June, July, and August. A noticeable increase takes place in October, and during November most southern diatom genera reach their great maxima in the northern part of the antarctic marine zone, and in the southern part of the sub-antarctic marine zone to a less extent.

The most pronounced biological feature of cold seas is the amazing wealth of phytoplankton, as regards individuals rather than species. The numbers of some species often run into millions in a single haul. The explanation usually given is the high concentration of nutrients and gases in these waters. Experiments by Loeb (1908) on larval sea-urchins demonstrated a striking differential, at low temperatures, between the longevity of the individual and the time it requires to attain reproductive maturity. By lowering the temperature 1° C. the duration of life is about doubled, but the period of development is lengthened only very slightly. The organism's reproductive capacity is thus vastly increased, and very many more generations exist simultaneously at the lower temperature. Whether or not this principle is applicable to multicellular zooplankton generally, it cannot be extended to unicellular phytoplankton organisms, and it is the latter group which is chiefly responsible, both directly and indirectly, for the teeming life of polar waters. These plants reproduce both sexually and asexually, and in either method the parental protoplasm is used up. The individual's life span coincides with the generation which it represents, therefore no differential can exist between the pre-reproductive period and individual longevity.

There have been attempts to explain the inverse relation of temperature to plankton production, as well as the apparent effect

of melting ice in stimulating production, by reference to the "polymerization" theory of water structure. Barnes (1932), Harvey (1933), and Barnes and Jahn (1933) reported that recently melted water stimulated growth beyond that occurring in ordinary water at equivalent temperatures. This effect would depend on a lag in the attainment of equilibrium in the changed organization of water after a temperature change. Such a lag has not been convincingly demonstrated by physical methods. Moreover, recent work on the internal structure of water by Bernal and Fowler (1933) and Morgan and Warren (1938) makes it difficult to accept the scanty biological evidence for this lag. The problem of the physiological effect of the thermal history of water is reviewed by Barnes (1937). A clear non-technical summary of the theoretical structure of water is presented by Gibson (1938).

With the lowering of the temperature of sea water, its density increases right to the freezing point (about -1.9° C.). Unless the above-mentioned lag can be proven, it would seem impossible to separate experimentally the effect on marine plankton of temperature, density, and molecular orientation of water.

LICHENS

The southernmost known plants are four species of lichens found at the Queen Maud Range in 1934 at $86^{\circ} 03' S. Lat.$, within 237 geographical miles of the pole. Only 32 miles farther north the same party collected six lichen species, and one imperfect fungus. All seven lichen species represented are new to science; four of them are apparently restricted to this Queen Maud locality, but the other three were found also by Siple's (1938) sledging party of the second Byrd Antarctic Expedition. In Marie Byrd Land and King Edward VII Land this party encountered a truly surprising amount of plant life. From the collection, seventy-seven additional new species of lichens were described by Dodge and Baker (1938). The lichens now known from the Antarctic land province number 293 species.

It is significant that all eighty-nine lichen species found by this expedition are endemic to this province. Moreover, Dodge and Baker regard supposed identity of Antarctic species with northern ones as based on uncritical taxonomic work, which would mean that about forty new unnamed species may exist in material already collected.

Although the paucity of endemic genera opposes the view that Antarctic lichens represent an ancient pre-glacial flora, evidence from the composition of the lichen body favors this conclusion. The algae found associated with the fungi in all lichens from continental Antarctica are green algae resembling the familiar *Protococcus*. Such lichens form a much older plant group than those with blue-green algae as symbionts. It is clear that blue-greens can withstand antarctic conditions, since algae of this group were found living independently in the same locality. It is therefore considered possible that an antarctic lichen flora has survived the present glacial period on the continent, the more recently evolved lichens which contain blue-green algae having failed to penetrate there as yet.

Noteworthy differences are found between temperate zone lichens and Antarctic species of the same genera. In the latter the algal cells are much less abundant, and often occur more or less scattered throughout the medulla rather than organized in a definite layer below the cortex. Also the whole thallus, according to Siple (1938) is greatly reduced in proportion to the fruiting structures, and the plants are usually dark colored, resulting in readier absorption of the sun's heat.

Evidence from the work of Stuckey and Curtis (1938) and others on higher plants indicates that freezing temperatures cause the death of plant tissues by mechanical injury resulting from ice formation within the cytoplasm, rather than by desiccation or other causes. Anything that will decrease the amount of free water within the cell at the time of freezing seems to lessen the possibilities of ice formation. Physiological studies of Antarctic lichens in their resistance to freezing would be of much interest. Pending such work, we may speculate on their remarkable resistance by analogy with other plants. It is known that only free water freezes in plants; bound water can not form ice. When lichens are not snow-covered, the very low absolute humidity of cold antarctic winds may cause rather thorough drying of the plants, plasmolyzing the cells and reducing the free water to a minimum. Lichens contain large amounts of lichenin and other dextrosans. These colloidal hemicelluloses swell readily in water, so that by imbibing and binding the free water and thus greatly increasing the osmotic concentration in the vacuole these substances may prevent the forma-

tion of ice within the cells.

As evidence of the extreme slowness of lichen growth at Graham Land, Bertram (1938) points out that the lichens on the stones of a cairn built by Charcot in 1909 still retained their original orientation in 1935.

Much more collecting must be carried on by trail parties before a satisfactory understanding of plant distribution on the Antarctic continent can be gained. In the past nearly all sledging parties have missed all but the most conspicuous plants. Most lichens masquerade as minute crumbs of dirt on rocks. Many tiny forms are bud-like in shape, resembling succulents; others, almost microscopic in size, are wedged in the intercrystal cracks of rocks. The fact that most of the mountains Siple studied had species apparently restricted to them strongly suggests that many more new species await discovery by careful search of the hundreds of coastal peaks as yet unvisited. Even the Queen Maud Range fringing the polar plateau, practically untouched by lichen-conscious sledgers, may be expected to yield new species and extension of range of known forms.

BRYOPHYTES

Seventy-three species of mosses occur in the Antarctic land province, thirty of them being endemic there. Mosses have been found only to 78° S. Lat., and at this latitude only in South Victoria Land. Graham Land supports a much richer bryophyte flora. Between these regions, in Marie Byrd Land, five species have recently been collected. Two of these extend to both Graham Land and South Victoria Land, but the dominant moss of Marie Byrd Land is found in Graham Land and not South Victoria Land. The two remaining mosses were described by Bartram (1938) as new species.

The Argentine Islands off Graham Land constitute the richest area botanically in the Antarctic land province. On sheltered inshore islands at about 68° S. Lat., Bertram (1938) studied patches of a closed moss association up to an acre in extent which had produced a peat as much as three feet in thickness.

Six species of hepatics grow south of the sixtieth parallel.

VASCULAR PLANTS

The New Zealand Sub-Antarctic Islands possess 88 genera of vascular plants, 56 of which are represented in Fuegia also. Such striking floristic affinities between

sub-Antarctic America and the New Zealand region have led botanists to support the idea of a former Antarctic center of plant distribution. They picture an early Tertiary Antarctic flora pushing northward along both sides of the Pacific, utilizing on the east a land bridge or chain of islands between Graham Land and Fuegia, and on the west a hypothetical "Greater New Zealand" which approached Antarctica sufficiently for ready transfer. Subsequent glacierization destroyed all the higher vegetation of the continent, and that of the sub-Antarctic land province except for a few species. The sources of repopulation were Fuegia and New Zealand. The latter supplied the major part of the flora now found in the New Zealand Sub-Antarctic Islands, which in turn largely restocked Macquarie Island. About 18 species are to-day more or less circumpolar in the sub-Antarctic land province, and three of these are truly circumpolar, occurring on almost all the sub-Antarctic islands. Only two flowering plants grow within the Antarctic Circle (or even south of 60° S. Lat.), whereas Hooker (1861) listed 762 species within the Arctic Circle.

Skottsberg (1936) has called attention to the striking distribution of a few genera from the original Antarctic center which are now represented by geographically isolated species in Polynesia. The affinities of such species in Hawaii are not with south-western Pacific plants, but with those of sub-Antarctic and temperate South America.

The plant geography of the south-western Pacific in relation to the theory of continental drift is discussed by Diels (1936), who finds several genera and species of relatively recent Antarctic origin occurring in the south-eastern part of Australia. A more important element in Australia's flora is of much older standing there, comprising ancient types lacking Antarctic affinities. A third element is so related to Malaysia that interchange from early times is apparent. These facts are all contrary to the principal assumption of Wegener's hypothesis: that Australia drifted to the north quite recently and approached south-eastern Asia.

MARINE INVERTEBRATES

The main features of Antarctic zooplankton are summarized by Hardy and Gunther (1935) as follows: (1) the small number of species inhabiting the surface layer, i.e., the top 150 meters, the species

which do so being very prolific; (2) the lack of pelagic larval stages of benthic animals; (3) the absence of a daylight surface fauna; (4) the importance of vertical migration.

The latter point requires some explanation. Since plankton organisms are unable to control their distribution by actively swimming against ocean currents, how do species characterizing different regions maintain their normal ranges in spite of constantly changing waters? During two years on the ship *Discovery II*, Mackintosh (1937) investigated this question in the eastern Pacific. He learned that the three most important zooplankton species perform an annual vertical migration, drifting northward in the surface water in summer, and descending to very deep southward-flowing water in winter. The vertical range is from 400 to 600 meters and the horizontal range some hundreds of miles. This is held to be the normal and general means by which ranges are maintained in the higher latitudes of the southern ocean.

Ecologically the most important animal in the Antarctic marine zone is an opossum shrimp, *Euphausia superba*. Its food consists very largely if not entirely of diatoms and other plankton plants. In contrast to a one-year period in other euphausians whose life history is known, the developmental period in this species is two years. The wide range of time within which older forms are found is important, Fraser (1936) points out, in insuring a constant supply of food for whale-bone whales in the south. Continued abundance of the species in the far south is attributed to a rotary movement resulting from the concentration of the earlier developmental stages in the southward-flowing warm deep water, and that of the later stages in the northward-flowing Antarctic surface water. Thus the stock of adolescents at the edge of the fast ice is constantly replenished.

The Antarctic and sub-Antarctic Echinoderm fauna is extremely rich, far exceeding that of the Arctic and sub-Arctic regions. We are still far from a satisfactory knowledge of the species, much less their biology and distribution. Investigation of the almost unknown ocean floor of the far southern Pacific is particularly needed.

Burton (1932) refers to the belief among geologists that the growth of sponges is most prolific in warm seas, and that a deposit rich in sponge remains must therefore have been laid down in a warm sea. He proves by the present abundance of

living sponges in Antarctic waters that this is not the case in recent times. Sponges are at least as abundant, and probably more so, in the Antarctic as in the West Indies, Australia, or the Indian Ocean. Even more important geologically is the fact that sponges of colder waters are almost exclusively siliceous and hence favorable for fossil formation, while the soft spongin material of a large percentage of warm-sea sponges is unlikely to be preserved.

That sponges reached their maximum development in the Cretaceous period is another belief for which evidence is lacking. Neither in the complexity of the skeleton, the size of the spicules, the size of individual sponges, nor in the diversity of species did the Cretaceous fauna surpass the development of present Antarctic sponges or those of any other quarter of the globe.

Turning to the unicellular forms, one finds the Antarctic Foraminifera limited in both genera and species and primitive in character. Earland (1934) stresses the similarity of this fauna to that of the deep sea in all latitudes. Many species in the Antarctic are truly cosmopolitan; others are closely allied to deep-sea forms, having probably migrated from the depths of the adjacent oceans.

After reviewing the evidence bearing on the theory of bipolarity, Murphy (1928) concludes that the theory can no longer be accepted in its broad and naïve sense. He raises the question whether the inconclusive data may not support equally well the converse theory of an earlier universal cold sea rather than a universal warm one that has since cooled at the poles.

TERRESTRIAL INVERTEBRATES

The largest permanent inhabitant of the Antarctic land province is the wingless fly *Belgica*, about five millimeters in length. Several protozoans, sixteen species of rotifers and the same number of tardigrades, two fresh-water crustaceans, mites, and at least 18 species of insects comprise the known fauna. The insect orders represented are the Collembola, Corrodentia, Mallophaga, Anoplura, and Diptera.

A sledging party sent by Byrd into Marie Byrd Land found that the distinct pink color of a mucky pond bottom was due to a profusion of brilliantly red rotifers. Upon thawing of ice in which tardigrades and rotifers had been frozen, probably for some years, these creatures suddenly resumed activity.

The recent British Graham Land Expedition reports (Bertram, 1938) the first species of copepod (water flea) discovered in Antarctica.

Davies (1935) maintains that the Collembola, being primitively wingless insects, constitute better material for the study of geographic distribution than any other insect order, because migration by flight is impossible and the delicate integument makes it very unlikely that they could be carried any appreciable distance by the sea. There are at least 11 species in the Antarctic land province, representing 9 genera. The genus *Cryptopygus* includes only three species; one is Fuegian, a second is Antarctic and sub-Antarctic in the Scotia Arc, and a new species has been described from New Zealand. This genus thus furnishes probably valid evidence of former land connections. However, since Collembola are usually associated with penguin rookeries and beaches frequented by penguins, it is at least conceivable that the insects may be transported beneath the waterproof feather coat of these widely wandering birds.

VERTEBRATES

Five families of Antarctic and sub-Antarctic fishes are important in the Patagonian region, together constituting one of three categories of Patagonian coastal fishes (Norman, 1937). One species of the family Nototheniidae ranges from Graham Land northward up the coast of Argentina to the Rio Plata. However, the characteristic Antarctic genera, *Pleuragramma* and *Trematomus*, do not reach Patagonia.

In defining the austral fish regions, Regan (1914) added confusion to zonal concepts by adoption of the mean annual surface isotherm of 6° C. as the northern limit of the Antarctic zone, thus including the Kerguelen district (the Kerguelen, Prince Edward, Crozet, Marion, and Heard Island groups) within this zone. Norman (1937) has shown that the dissimilarity between the Patagonian region and the Kerguelen district is less marked than Regan believed, and has pointed out several features which the areas have in common. It should be remembered that most islands of the Kerguelen district are well to the north of the Antarctic convergence, and all of them are a considerable distance north of the sixtieth parallel. The Kerguelen district should be considered sub-Antarctic not only regarding the land biota, but those of its islands lying between the Antarctic and

sub-tropical convergences must also be washed by waters of the *sub-Antarctic* marine zone.

Although Macquarie Island lies south of the surface isotherm of 6° C., Regan admits it to the sub-Antarctic zone on evidence from fish distribution. This island is decidedly sub-Antarctic in its terrestrial aspects, although it lies a little to the south of the Antarctic convergence. Since the 6° C. isotherm as the northward boundary of the zone of Antarctic coastal fishes breaks down in the important instances of Macquarie Island and the Kerguelen district, it is unsatisfactory as a zonal boundary.

Murphy (1936) has amassed abundant evidence in support of the thesis that ecologically oceanic birds are primarily aquatic rather than aerial organisms, and that their distribution is controlled by oceanographic factors. The birds of the southern oceans, therefore, can be understood only in relation to the zones of surface water. They must be considered, together with other marine organisms, as subject to the zonal bounds of the convergences rather than to the control of the climate of continental Antarctica, and consequently belong in the marine zones rather than the land provinces.

Few Antarctic birds are even reasonably well known from the standpoint of detailed life-history and behavior. The Adelie Penguin remains the best known scientifically as well as popularly. The four birds that breed farthest south are the Emperor Penguin, Adelie Penguin, MacCormack's Skua, and Snow Petrel. The Skua wanders farthest inland; the southernmost record was an individual that visited Captain Scott during his last journey, at a point on the polar plateau 560 geographical miles from the sea and only 160 miles from the pole, at an elevation of 9,980 feet. Murphy lists fifteen birds as typical of the Antarctic (marine) zone: four penguins, two albatrosses, eight petrels, and one skua. A Snow Petrel rookery reported by Siple and Lindsey (1937) from King Edward VII Land advanced the known breeding range of this species 400 geographical miles to the south.

Murphy (1936) casts serious doubt on the oft-cited 22,000 mile annual migration of the Arctic Tern, which is supposed to regularly cross the Antarctic Circle and sometimes reach 74° S. Lat. A few specimens have been taken near the Antarctic Circle in the Weddell Sea and Pacific, but the normal winter range appears to be the Pacific off the coasts of Peru and

Chile, and similar latitudes in the Atlantic. Most alleged Antarctic occurrences of the Arctic Tern are based on sight records, which are valueless because this bird is not distinguishable in the field from the Antarctic Tern (*Sterna vittata*). The suggestion that the latter bird is masquerading generally in ornithological literature as the Arctic Tern may well prove correct when adequate bird collections from Antarctic waters have ultimately been built up.

Four species of seals have a circumpolar distribution in the Antarctic marine zone. The Ross seal is so rare that probably fewer than fifty individuals have ever been seen. The sea leopard is a solitary wanderer that feeds largely on penguins. In this species the females attain a larger size than the males, which seems to be true, although to a less degree, of the Weddell seal also. The crab-eater is a slender, agile seal inhabiting the pack ice

chiefly. Lindsey (1938) found that a female of this species when barely two years old may give birth to its first young. In locomotion on snow-covered sea ice, crab-eaters about four months old show remarkable speed and endurance. Often a man running at top speed cannot keep pace with the seal as it strikes the hard-packed snow with tremendous blows of the hind flippers held together vertically like a caudal fin.

Of the four Antarctic seals, only the Weddell is well known as regards habits and life history (Lindsey, 1937). When a female has just turned three years of age her first pup may be born. The average pup is 34 days old when the full set of teeth appears, and it depends on the mother's milk for 48 days after birth. This offers a marked contrast to the crab-eater seal, which has been reported to possess perfectly functional teeth at birth and to separate from the mother two or

three days after birth. Young Weddell seals average 64 pounds at birth, and feeding exclusively on mother's milk several averaged seven pounds gain in weight daily for seven consecutive days or longer. This is the southernmost mammal, and is found throughout the year at the extreme southern limits of its range. In winter its layer of blubber reaches four inches in thickness. The animal remains at this season beneath the new ice, through which it maintains breathing holes by sawing ice by means of the strong canine teeth. In this process the head is swung from side to side with the mouth opened to a 150 degree angle. Feeding on fish secured in the water in darkness beneath eight or ten feet of ice, this seal, alone among mammals, withstands the rigors of the four sunless months at 78° S. Lat.

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An "Ocean" That Happens to Be a Continent

Russell Owen's Thoroughgoing History of the Land of Ice and Great Explorers

By LEWIS GANNETT

New York Herald Tribune

THESE "series" are running into difficulties. Russell Owen's "The Antarctic Ocean" (Whittlesey, \$3), second in the Oceans of the World series, begins with the disillusioning remark that "there is no Antarctic Ocean on the maps."

If the Antarctic Melts . . .

Since there is no true Antarctic Ocean, Mr. Owen writes chiefly about the continent which sits so stormily in the spot where early explorers expected to find an ocean. It isn't tiny; you could tuck all of the United States and Mexico inside its boundaries and still have room for part of Canada. It averages higher than any of the other continents—a mile, at least. On top of its land it has a sheet of ice so thick that if it melted—I am quoting Mr. Owen—it would raise the level of all the seas (presumably including the non-existent Antarctic Ocean) sufficiently to drown out most of New York and other seacoast cities.

It is persistently cold down there—Antarctic explorers reckon zero temperatures as nice, warm, sun-bathing weather; but it used to be, a few million years ago, warm enough for tree ferns (the Antarctic Continent has its coal beds), and, alarmingly, it seems to be getting warmer. Not very rapidly, however; New York City can count on several millenniums before the melting Antarctic ice cap will drown it out. On the other hand, the Antarctic has a perfectly good live volcano. The volcano is real, but Mr. Owen cast doubt on the story that in the neighborhood of Mt. Erebus it is possible to stand on an ice cake and fry penguin eggs in the boiling water.

Polar Beauty

Russell Owen "covered" the first Byrd expedition to "Little America" as a reporter of the Antarctic, and bits of personal experience light up his history of the exploration of the stormy bottom of the earth. "There is nothing quite so eerie as a South Polar fog over a sea filled with ice," he says. He remembers moving slowly for hours through the pack ice that guards the continent, in the half-light of an Antarctic night, with huge pieces of drift ice looming up on either side. He knows the unique suddenness of the terrible Antarctic gales and the strangeness of the solid ice wall, 200 feet high, quite different from the pack, that guards the approach to the continent in the Ross Sea. He also knows the beauty of the Antarctic sunset and the strange colors of that silent continent. "The ice tugs at one's heartstrings," he says, "whatever those who have not seen it may say; men return because they want to be there. Its beauty, its aloofness, its weird isolation are compelling."

Cook Was First, Shackleton Greatest

Capt. Cook, 165 years ago, was first to circumnavigate the Antarctic, proving that the Greeks were wrong in believing that there was a land connection between the greater continents. An Englishman and an American both sighted Antarctica in 1819, and there still is some dispute as to who saw it first; Mr. Owen, patriotically and scientifically, gives the American, Nathaniel Palmer, of Stonington, more credit. Controversy rages about most of the great Antarctic discoveries. Another American, Charles Wilkes, who sighted another portion of the continent in 1840, was long believed a liar, because he plotted land where later sailors found open sea. They did not know about Antarctic mirages, which deceived even so experienced and scientific an explorer as Mawson as late as 1929.

Shackleton, who failed in the objectives of both his great Antarctic expeditions, nevertheless seems to Mr. Owen "the greatest of all Antarctic leaders." He had the courage to turn back from the Pole when he knew he could have made it but was not sure he could get back, and the epic of his rescue of his men after the *Endurance* sank, in 1916, is one of the great sea sagas. Shackleton left part of his group on a barren island and sailed 1,000 miles to the South Georgia whaling station, in the worst ocean in the world, in a twenty-two-foot open boat. Bligh's journey, after the mutiny on the *Bounty*, says Mr. Owen, was longer, but Shackleton's was "probably the greatest small-boat journey in marine history."

The Antarctic remains the last continent of mystery. Dogs are still better than tractors in that turbulent region; airplanes have been of

value for scouting, but they have not touched regions which ships or dog sleds have been unable to reach. Such is the variability of the Antarctic that within a few months after Byrd's last daring flights south from his ship other ships were able to sail in a suddenly ice-free sea. The Antarctic, Mr. Owen thinks, is not likely ever to be useful as an airport, nor is its coal likely to serve mankind. Some time permanent weather stations may be established there and may learn how weather breeds. But international rivalry for possession of this forbidding territory seems to Russell Owen even more idiotic than other patterns of international competition. Whoever wants the Antarctic, he says, let him have it—and freeze!



Russell Owen

Stories and Legends of the Bering Strait Eskimos. By Clark M. Garber. (Boston, Christopher Publishing House, 1940. 26op., 37 illus.)

The legends and stories of a people have a double appeal, for they are not only interesting in themselves but also often contain hints of origins and migrations. Those who are concerned with the origin of the American Indian are especially interested in the Bering Straits region for it was by this route that the New World was populated.

Mr. Garber spent eight years among the Bering Strait Eskimo as superintendent of Eskimo education, medical relief and reindeer in Alaska for the United States Bureau of Education. Realizing that the native Eskimo culture was rapidly disappearing he decided to record their stories and legends before it was too late. In this book he has selected thirty-one of the tales as being representative of the many which he secured from native informants. As pointed out in the Foreword by Dr. John P. Harrington, the legends may be grouped under seven major headings: Cosmology, Magic, Personal Adventure, Marriage Customs, Individual Prowess, Murder and Cannibalism, and Warfare.

The Eskimo live along the coast on both sides of the Bering Straits, in the Canadian Arctic and as far east as Greenland. While there are many diverse colonies speaking separate dialects they all apparently stem from one parental group, hence, it is to be expected that certain stories would have a wide distribution among them. One of the wide-spread legends is the story of "How the Raven Brought Daylight to the Innuits (Eskimo)." Other tales are restricted to specific localities or colonies.

Mr. Garber uses certain common Eskimo terms in the stories to retain as much as possible of the native atmosphere. The meanings of the words and terms are explained in a Glossary and their sparing use does not detract from the smooth flow of the text. There are numerous photographs of Eskimo life and several maps pertaining to the Bering Straits area. This collection of tales is a distinct contribution to native American folk-lore and should be of interest to both the student and the general reader.

Far North Residents Donate \$1,000 For London War Relief

CHURCHILL, Man., June 4 (CP) —R. B. Urquhart, Hudson's Bay Company Post Manager at this northern inland ocean port 700 miles north of Winnipeg, is to forward to the Lord Mayor's fund for embattled London \$1,000 donated by the traders, trappers and missionaries of the vast Arctic wastes north of Churchill.

With the help of a little five-watt

shortwave sending and receiving set, Mr. Urquhart radiocast appeals to far north residents for donations to the Lord Mayor's fund.

The inhabitants of the north responded eagerly to the chance to help Londoners who have been blasted and burned out of their homes.

Because the only methods of travel in the north at this time of year are by dog team, on foot or by airplane, it was a month before the donations which trickled into Churchill, on the shores of Hudson Bay, piled high enough to reach the \$1,000 objective.

In Greenland

GREENLAND LIES NORTH
By William S. Carlson. With drawings by Phyllis Wesley and three maps. 306 pp. New York: The Macmillan Company. \$3.

A SCIENTIFIC expedition prepares and publishes its scientific findings in due course and with due weight and coherence; a process which need not deter the young members of such an expedition from also seeking, and bestowing, as much exhilaration as is to be set forth in a purely personal record. When the expedition consists of two friendly and wide-awake young men who are spending a Winter with only native company in Northern Greenland, a good deal of exhilaration and real interest may be anticipated. Such, in brief, is a summary of "Greenland Lies North," a personal notebook, so to speak, from an expedition of four years ago, the scientific report of which has been published elsewhere.

After a pause at the North Greenland colonial center of Godhavn (where they found "a bit of Denmark") William S. Carlson and Max Demorest journeyed into the icy wilderness and engaged an Eskimo family—father, mother, son, daughter, grandmother—with two kayaks, a dory, two dogsleds and fourteen dogs, to give them complete service and assistance in their Winter camp in the Upernivik district, far north on Baffin Bay. Their work was to study the northland Winter air currents, and their expedition was the last of five sent to Greenland for that purpose from the University of Michigan. They renamed their dogs for members of the university faculty—Hobbs, Case and so forth. As they made friends with Danes in Godhavn, so now they made friends with Eskimos. Somewhat to the reader's surprise they seem to have suffered more from rain than cold at their camp; toward the end of January they calculated the average temperature and found it slightly over 10 above zero. But when Carlson made a long trip north he ran into real subzero weather and also some serious adventure, when it seemed that Andreus and Axel, the native helpers, must have been lost in breaking ice. Meanwhile, Carlson would tell Demorest stories, when they had nothing else to do, about former Greenland experiences, especially with the Eskimos. Carlson also kept a diary. And both diary and earlier reminiscences are drawn upon for his book.

Some Famous Explorers of Antarctica

EXPLORERS OF THE ANT-ARCTIC. By William Herbert Hobbs. With photographs and two maps. 334 pp. New York: The House of Field. \$3.

NATHANIEL BROWN PALMER was born in 1799 at Stonington, Conn., and he celebrated his coming-of-age by the discovery of the Antarctic Continent. After an adventurous career as a South Sea sailing captain (he also carried supplies to South American ports for the revolutionist Bolivar) he settled into an allied profession at home, as designer and builder of clipper ships, and one of the famous clipper commanders, Arthur H. Clark, has called him the "father of American clipper-ship captains." His entire career is outlined in Professor Hobbs's book, where he has chronologically the first place. Thirteen explorers of the Antarctic people this volume's record of personal adventure, and Palmer is certainly not the least interesting.

The subject of the second chapter was another man whose later life brought a different fame.

This was Rear Admiral Charles Wilkes, U. S. N., the discoverer of Wilkes Land, who "brought back proof of the continental character of Antarctica," and also "took a large part in the founding of the 'Depot of Charts and Instruments,' which later became the Hydrographic Office of the United States Navy Department." A scientist of distinction, Wilkes was also a very active and well-known naval officer, and it was he who stopped the British mail steamer Trent, in a famous Civil War incident, and removed the Confederate Commissioners' Mason and Slidell.

After these two biographies from an earlier day, Professor Hobbs steps directly into our own century. The third life story here presented is that of Robert Falcon Scott. And later we follow also the staunch, if checkered, career of that great Norwegian explorer whose mark of discovery greeted Scott at the South Pole, and who was himself also to die—it seemed—vainly. Amundsen is,

of course, one of the best-known heroes whose stories are told here. Others in that group are Byrd, Ellsworth, of course Scott himself, and Shackleton. But the book has an even greater value, needless to say, in its less familiar biographies.

Antarctic exploration "has offered no finer type of the knightly gentleman," for example, than Dr. Jean Charcot, son of the great French neurologist, and himself a "yachtsman explorer in both polar realms" for more than a third of a century. Australia's "grand old man of science," Sir Edgeworth David, began his polar exploration at the age of 50, and discovered the South Magnetic Pole, "in one of the most arduous of all sledge journeys," the next year. The German Antarctic leader von Drygalski, the Swedish explorer Nordenfjöld, and the two British veterans Priestley and Mawson complete the roll of the Antarctic's heroes brought clearly within our knowledge in a very readably informative book.

Father Schulte's Arctic Missions

THE FLYING PRIEST OVER THE ARCTIC. By Paul Schulte. With photographs and map. 268 pp. New York: Harper & Brothers. \$2.75.

THE Eskimos call Paul Schulte "The Father who has wings," which is a soundly descriptive title. He has been flying for twenty years, and in 1927 he founded an organization known as the MIVA—the Missionary International Vehicular Association. In 1930 he was commissioned by Pope Pius XI to take the work of the association to the Catholic missions in the Arctic, for whatever aid his airplane could give to those "poorest and most isolated of all mission-aries." In this book he tells something of his own work,

something of the Eskimos who inhabit the far-flung field of his labors, something of the priests who live in the Arctic all the time. It is thus an Arctic adventure book with a difference. But adventure looms large nevertheless.

The first of the adventures recorded came with an S O S call from the northernmost mission station of Arctic Bay, which lies above the 72d parallel and has a Winter night of more than three months. Fortunately it was Summer when word came that a priest there was desperately ill; but Father Schulte had to circumvent a gasoline shortage before he could go to his assistance. The sick man was taken in the

plane to the far-away hospital, and his life was saved. And high in the clouds the priest-aviator "not only prayed but lived" the beautiful Benedicite whose sonorous phrases he quotes with impressive Arctic interpolations here.

His plane was called the Flying Cross, and any errand of mercy was its mission. Once he hurried to the aid of a 4-day-old Eskimo baby who was thought to be dying, and saved the life of another child on the same trip. Once he was called by the missions' freight ship in the ice.

The chapter in which he pays tribute to the other priests of the Arctic is one of the best in Father Schulte's inspiring book.

In this cheerful miscellany the most interesting items are more or less unrelated details. There is, for example, the shooting (or stoning) of the dull-witted ptarmigan and also the quality of their meat—of other meats, too, such as seal, caribou and the delicacy called *matak*, whale hide. There is Carlson's comment on the Eskimo cycle of hunting as

base not merely for subsistence but for contentment and variety of life. There are vivid reactions, ever and anon, to the northern scene, as when Carlson wrote in his diary in November: "The air is full of shadow. We live in a sea of twilight, all colors—purple, lavender, rose and tints of blue." What the author has to say of his Eskimo neighbors has more

cogency as individual commentary and chronicle of neighborliness than as sustained study or generalization, but the strangers' interest in their native friends is lively and sincere.

In other words, this book sets down the content of the passing day with an easy spontaneity, and thus makes an entertaining chronicle.

Among the Eskimos

By LEWIS GANNETT

New York Herald Tribune

GONTRAN DE PONCINS—who can call himself "Count" if he wishes and also use his ancestral middle name of Montaigne—went up into the remotest Arctic in the autumn of 1938, seeking to understand the Eskimo mind. What he learned he tells in "Kabloona" (Reynal and Hitchcock, \$3), which is the Book-of-the-Month Club's April selection; and since De Poncins is a remarkable man, with a mind sometimes reminiscent of his countryman's Antoine de Saint Exupery's, "Kabloona" is a remarkable book.

North to the Stone Age

For this is not merely a story of adventure, though it includes adventure; or a description of Eskimo life in the frozen North, though it is that also. This is the record of an ultra-civilized metropolitan man's adjustment to life in the raw, of his discovery of what Eskimos might call, if they were given to such generalizations, the durable satisfactions of life.

De Poncins got about as far from civilization as a man can. From the railroad north of Edmonton, Alta., he flew to what his translator-colaborator, Lewis Galantiere, somewhat romantically calls the "Glacial Ocean" at Coppermine. Thence he sailed seven hundred miles east through Coronation Gulf and Queen Maude Gulf to the desolate region where Sir John Franklin's expedition perished almost ninety years ago and watched the ocean freeze from King William Island, an island larger than many states, which harbors a total population of twenty-five. The two whites among these Eskimos were "Paddy" Gibson, the Hudson's Bay Company trader, and De Poncins. He sledged across the island with Eskimos who were still,



Gontran de Poncins

for the most part, Stone Age people. Not content with that, he made another midwinter journey across the Boothia Peninsula to the lonely outpost of a Catholic missionary who lives alone among still more primitive Eskimos, and had lived there so long that he had lost his taste for any food but raw fish. These were the most unspoiled Eskimos on earth; but even they used primus stoves and coal oil in their igloos.

Dinner in the Igloo

Life in the igloo is as you take it. De Poncins was at first revolted by its filth and its total lack of privacy. A new igloo is pretty and snow-white; in a day the Eskimos make it seem cozy, with the debris of their fish, seal blood, puppy droppings, human refuse. It can be warmer than the white man's shelters; it can never be very light. These Eskimos heat and light with seal oil in a stone or bone lamp; they are likely to cook with coal oil, and still more likely not to cook at all. They eat like wild animals, ravenously, or go hungry for days. "No one spoke, no one laughed, every one gnawed and swallowed and gulped with a kind of gloomy haste, a dark gluttony, which I thought would never end and which ended so suddenly I was amazed. Abruptly the sound of the grip-ping jaws and smacking lips was gone." The Eskimos dozed. Fish and seal were the major items on the menu; smoked caribou was a luxury; so, to the Eskimos, was musk ox, though not to De Poncins. He tried to eat as an Eskimo, even to tasting the fat worms that infest caribou skins; but he could not like musk ox.

Eskimo teeth impressed this Frenchman enormously. His Arctic friends used no forks or knives; their teeth served as a third and stronger hand. When the cover of a gasoline drum could not be pried off with the fingers, an Eskimo would pull it off with his teeth. "If I were to fight with an Eskimo," De Poncins says, "my greatest fear would be lest he crack my skull with his teeth."

Happiness

But these people were happy. It was hard to reach their minds, for they were without the habit of generalization. But their good spirits were infectious. De Poncins had seen South Sea Islanders, easy-going children of the sun; they were not happier than these shivering residents of the dark North, huddling through the long nights in their igloos, and laughing as they cracked their whips in the face of the blizzard.

"Kabloona" is an Eskimo word meaning white man. At first the Eskimos laughed at this kabloona. He must have converted them, sharing their trail life and their food. When, returning in the early spring, he met a Hudson's Bay apprentice, he found that he felt closer to his Eskimo companions than to this nervous white man. He had surmounted his

On Arctic Ice. By Frederick Machetanz. (New York, Charles Scribner's Sons, 1940. 105p. Illus. by the author. \$1.50.)

This is the story of an Alaskan Eskimo boy who, with his father and other companions, goes to the Arctic on the annual hunt for seal, walrus and whale. It is an independent sequel to *Panuck, Eskimo Sled Dog*, which Machetanz published in 1939

He writes of first-hand knowledge of Alaska, and his descriptions of life and methods of hunting are interesting and authentic. Although primarily an artist, he writes a good adventure story, making the book absorbing to adults as well as to children.

The author was elected to the Explorer's Club in New York in recognition of his knowledge and writing of the North, and a fellow member, an arctic explorer, said of *Panuck*, that it was the next best thing to a visit to the North that he had seen. *On Arctic Ice* should be recognized as an important contribution to our knowledge of life in Arctic Alaska. The volume has 38 illustrations, four of which are in color.

Land of the Good Shadows: The Life Story of Anauta, an Eskimo Woman

By Heluiz Chandler Washburne and Anauta. New York: John Day Co.

Anauta, an Eskimo woman from Baffin Island, above the Arctic Circle, is now reported to be traveling the United States, telling the story, which she tells in this book through Heluiz Washburne. Briefly, it is the story of the life of an Eskimo in the far North, without benefit of what we choose to call civilization, and of her unhappiness in this civilization to which she came after the death of her husband.

The book is full of vivid descriptions of Eskimo living—how they build igloos, catch seal, etc. Anauta herself was named for an Eskimo hunter who died the night she was born, in accordance with an Eskimo belief of continuance of soul by continuing name. She was brought up during her early years as a boy.

The book is interesting but would have been improved with the introduction of a little more conversation into the narration. The purpose of Anauta's lecture trip, and perhaps even of the book, is to correct some of the misconceptions that have grown up about the Eskimo.

initial annoyances when the Eskimos appropriated his private stocks of food; he had accepted their un-Marxian pattern of Communism. His days among the remotest Eskimos, when he had proved himself among them, were, De Poncins says, the "warmest in human companionship" in his life. There was an oldtime existence, where all men and women were busy and all content, such as he did not see closer to the white men's outposts. It made the life of the semi-civilized seem "like a dulled and smuted painting." Nothing outside mattered.

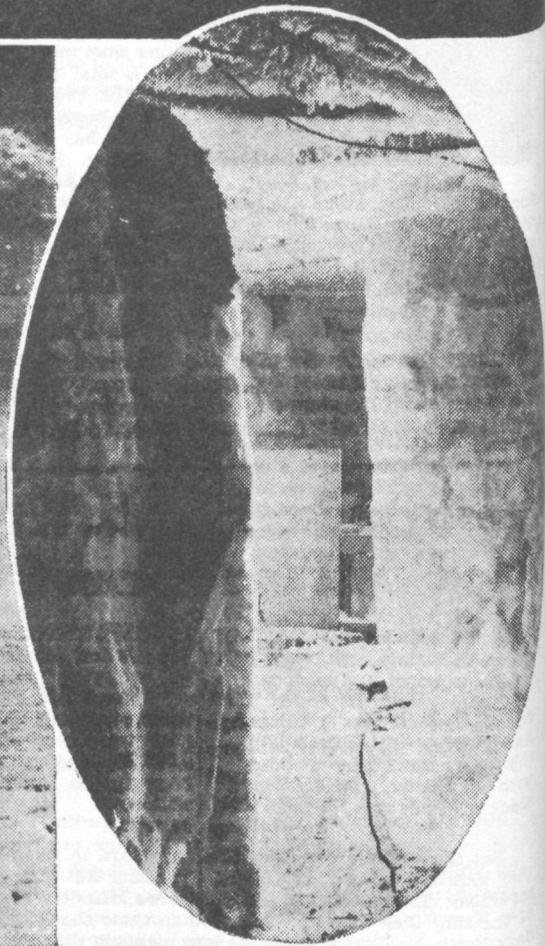
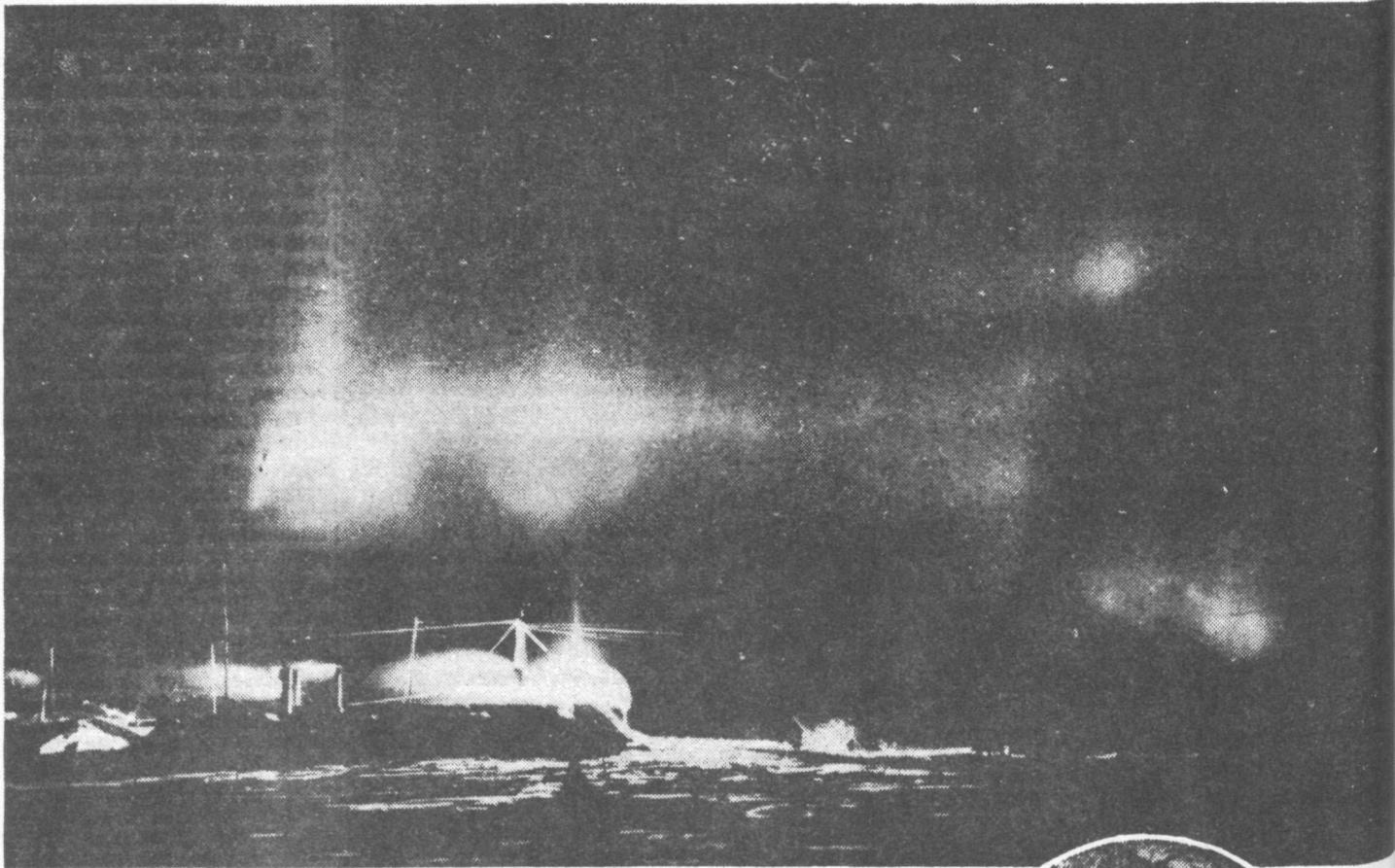
Gontran de Poncins, Writer

De Poncins froze the tips of eight fingers. He was lost in a blizzard within half a mile of "Paddy" Gibson's house. He fished, hunted seals and, in the spring, watched the Eskimo camp stir with a strange spring madness that seemed, in part, like religious ecstasy, and more like a sexual explosion; he saw the coming of the great caribou herds. He thought he did not want to leave; he discovered that he was not Eskimo, but French. He is in France today.

This is more than a travel book; "Kabloona," for all its precise recordings of the Eskimo way of life, its sometimes horrible literal descriptions, is a work of creative imagination. It leaves you eager to hear more from its author; this man, surely, would write as well and as freshly about France or America as about King William Island. The little that the publishers tell of him whets the appetite for more. A descendant of the great Montaigne, he was christened "Mike" by a mule-driving American sergeant in the Rhineland in 1920—and he was known as "Ma-i-ke" to the Eskimos. He was in business in Italy and in England; he went to the New Hebrides Islands as a "scientist." There is more to be told.

Stefansson Says 'Best'

Vilhjalmur Stefansson, who visited the same Eskimo regions a quarter century ago, wrote me some time ago that "the best thing that has appeared on northern Canada for many years" was Richard Finnie's "Lure of the North" (David McKay, \$3.50). Finnie, whose father used to be director of the Northwest Territory, visited King William Island in 1930, searching for relics of the Franklin Expedition—and found them. By plane, by sledge, by boat, he has visited as much of the Far North as any man in recent years. "Lure of the North" deals chiefly with his Arctic winter in 1930-'31, passed mostly at Coppermine. He knew "Paddy" Gibson and many of De Poncins's Eskimo friends, intimately; he tells of them and other colorful veterans of the Arctic, straightforwardly and well. His book is interesting and informed throughout; his photographs are even better than De Poncins's. Both the ego and the magic that give "Kabloona" its distinction, however, are unique.



Official Photographs United States Antarctic Service, from Wide World

With the Stars and Stripes in an Unfamiliar, Frozen Land

Top: Winter night in the Antarctic. A brilliant display of Aurora Australis illumines the West Base of the United States Antarctic Expedition near the end of the long winter night. This phenomenon was captured by a photographer of the expedition, members of which

have returned to the United States. Lower left: A blizzard piled snowdrifts over the West Base. The United States Flag is seen in the distance. Lower right: Snow tunnel leading from the main portico of the West Base to Dog Town, where dogs of the expedition were quartered.