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RONNE ANTARCTIC RESEARCH EXPEDITION*

1946-1948

COMMANDER FINN RONNE, U.S.N.R.

MY INTEREST in polar exploration dates from 1909, when my father, Martin Ronne, was selected to accompany Captain Roald Amundsen to the Antarctic, on the memorable expedition on which the South Pole was first reached. That association continued until the great explorer's untimely death, after which my father went with Admiral Byrd on his First Antarctic Expedition, 1928-1930. During all this time I had closely followed the detailed work involved in the planning and successful execution of polar expeditions. Martin Ronne died suddenly in Norway in 1932, in his 71st year. On Byrd's Second Antarctic Expedition, 1933-1935, I had the good fortune to follow in my father's steps as ski expert.

Upon my return to the United States in 1935, I began to plan for a small Antarctic expedition of my own, on which we would sledge and map the coast line from the Palmer Peninsula to the Ross Sea area. I planned to be set ashore, with four men and sufficient dog power, in the Charcot Island area by a Norwegian whaler and to be picked up by the whaler several months later on the Ross Sea side. However, an independent expedition did not prove possible at the time, and my modest plans eventually were merged into the United States Antarctic Service Expedition,¹ on which I acted as second-in-command of the East Base, on Stonington Island, in Marguerite Bay, Palmer Land.

EXPEDITION PLANS

In May, 1941, I obtained a commission in the United States Navy, in which I served until the end of hostilities. Off and on in my spare time I began formulating plans for an expedition to the old base of the United States Antarctic Service Expedition on Stonington Island, a location I considered well suited to geographical exploration, since within flying range lay the unexplored Weddell Sea coast line and perhaps the termination of the mountain axis of the Palmer Peninsula. I also planned to carry on an exten-

* See the report on the welcome given to the expedition on its return in the section on the American Geographical Society.

¹ R. A. J. English: Preliminary Account of the United States Antarctic Expedition, 1939-1941, *Geogr. Rev.*, Vol. 31, 1941, pp. 466-478. The operations from the East Base are described on pp. 469-473.

► COMMANDER RONNE, geographer, is Norwegian by birth and was trained as a mechanical and marine engineer. During the war he was on active duty with the Bureau of Ships of the U. S. Navy.

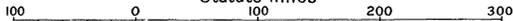
RONNE ANTARCTIC RESEARCH EXPEDITION 1947-1948

PROVISIONAL SKETCH MAP

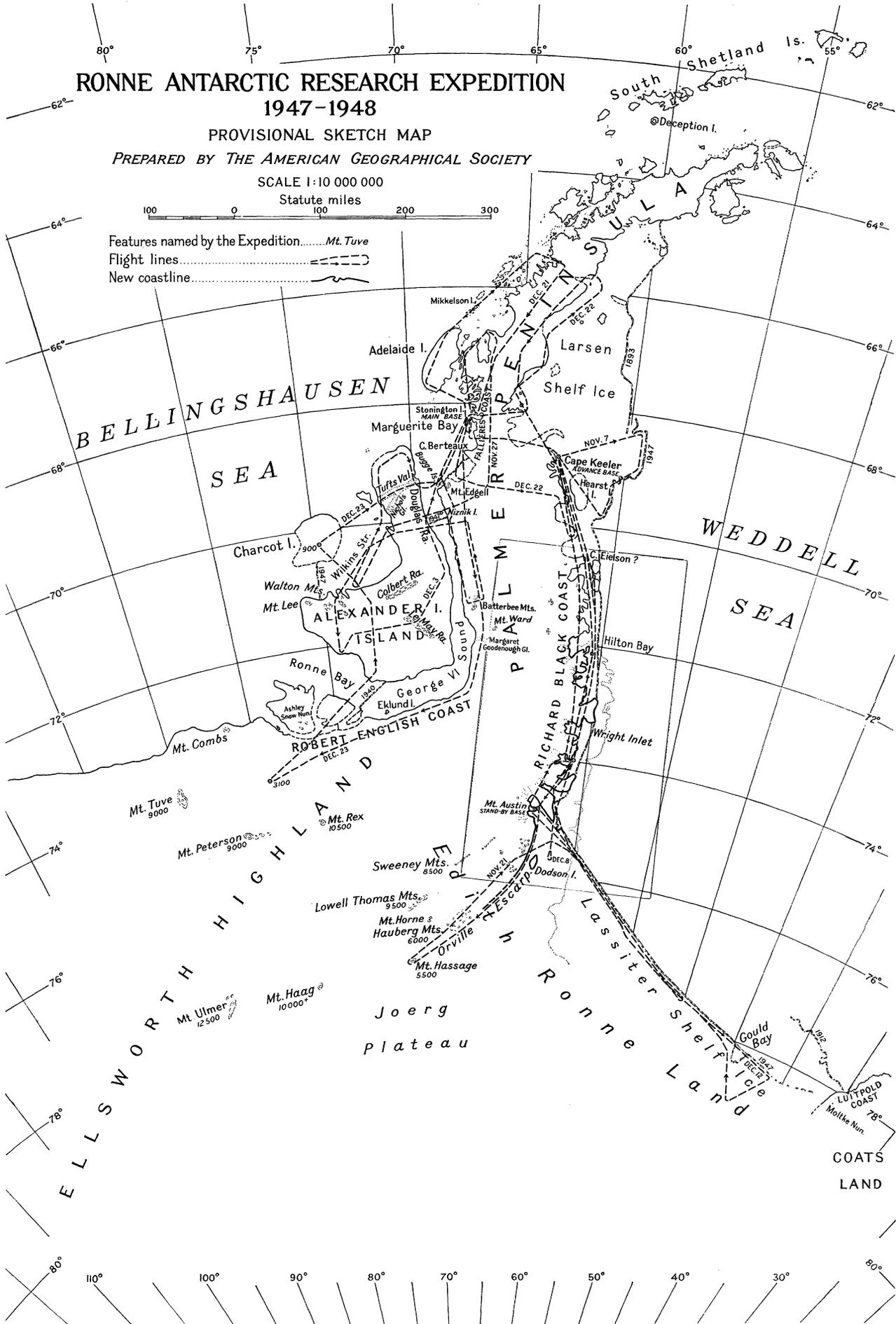
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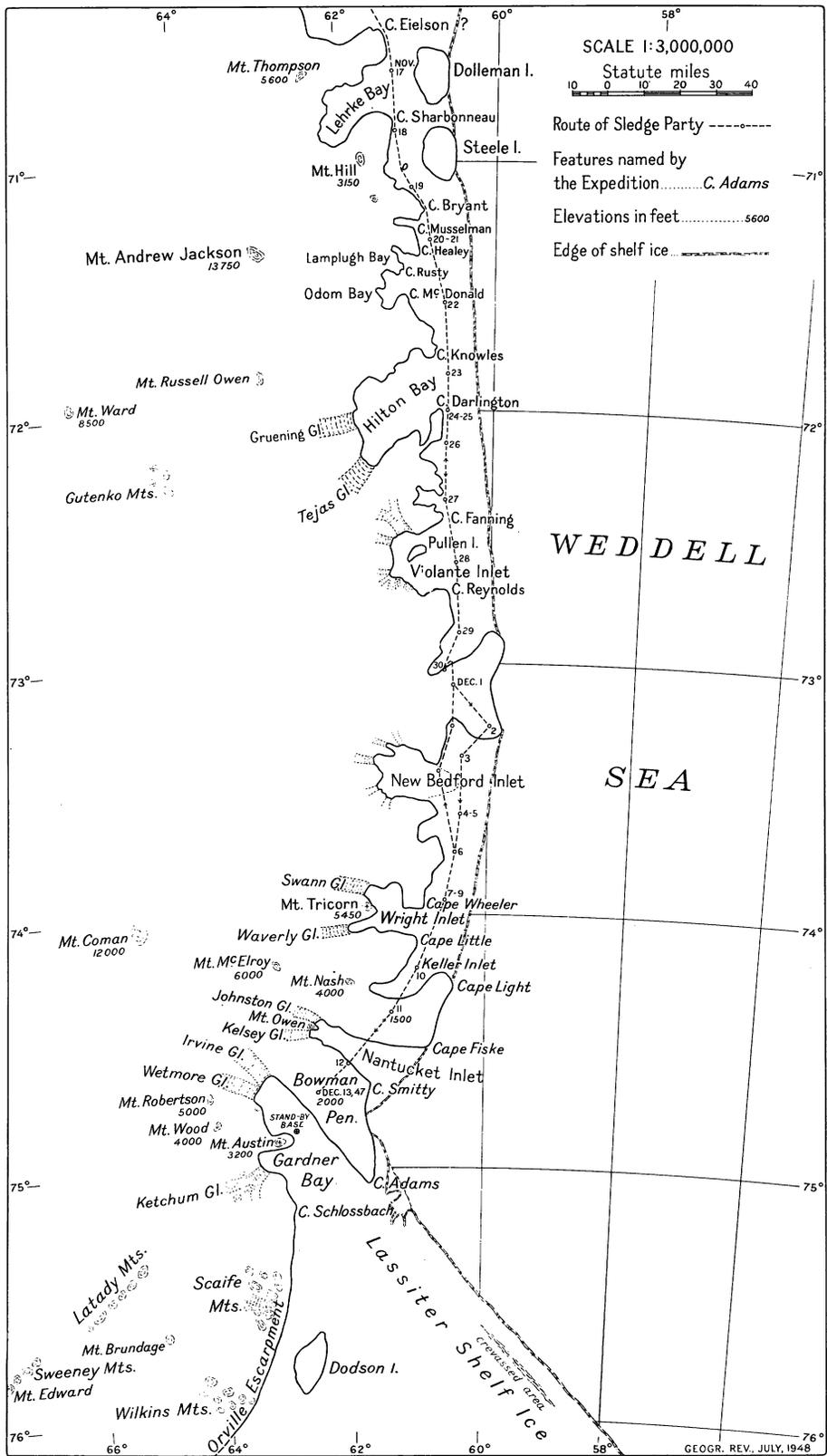
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Statute miles



Features named by the Expedition.....Mt. Tuve
Flight lines.....
New coastline.....





FIGS. 1 and 2—Sketch maps illustrating the principal explorations of the Ronne Antarctic Research Expedition. Figure 1, general map (for the relation to the Antarctic as a whole see the map illustrating the note on recent Antarctic expeditions elsewhere in this number of the *Geogr. Rev.*). Figure 2, detailed route of the Weddell Coast sledge party, comprising British and Americans (see pp. 363 and 378).

sive scientific program of at least a year's duration with a small group of competent men. To eliminate the necessity of sending the expedition ship back to civilization, I decided to let it freeze in at a small cove close to the base; the expedition members themselves would man it. Through Congressional action I was able to obtain from the Navy Department, on a loan basis, a sturdily constructed ocean-going wooden tug (Fig. 3). From the Army Air Forces, Office of Research and Development, many articles of equipment were obtained for testing, including three airplanes, two snow-mobiles ("weasels"), camping equipment, and numerous types of clothing.

Only those who have had the experience of planning and organizing an expedition can fully appreciate the enormous amount of work involved, especially in the matter of financial backing. I contacted many scientific organizations and foundations interested in Antarctic research, but with few concrete results. Under the auspices extended by the American Geographical Society of New York, and by selling the exclusive news rights of the expedition to the North American Newspaper Alliance, Inc., and with a few subscriptions from interested friends and a contract with the Office of Naval Research for the scientific results to be obtained, I was finally able to get the expedition under way. It was not before December 8, 1946, however, that I was definitely assured of the minimum required financial support. Through continuous hard work day and night, and spurred on by a strong determination to sail, we were ultimately able to assemble the thousands of needed articles of equipment essential for a polar expedition.

UNDER WAY

On the afternoon of January 25, 1947, we threw the mooring lines off our ship, christened *The Port of Beaumont, Texas*. The road had been long and rough, and many obstacles lay ahead, but we were on our way at last. Brief stopovers were made at Balboa, Canal Zone, and Valparaiso and Punta Arenas, Chile. To avoid the dangerous roaring forties with our topside weight, which included three airplanes, 112 drums of gasoline and lubricating oil, and 43 northern sledge dogs we sailed in the sheltered waters of southern Chile's inland passage. On board ship much work was done to the three airplanes, particularly the Beechcraft C-45 exploratory plane, in which a complete electrically operated trimetrogon camera unit was installed, and also a radio altimeter and extra transmitters and receivers for long-range communication. Two additional gas tanks were placed in the fuselage, so that the plane now had a maximum cruising time of nine hours.

Our passage between Cape Horn and Marguerite Bay was fortunately

very smooth, and we encountered only a relatively small amount of pack ice and bergs. We anchored off our main base on Stonington Island on March 12, 1947 (Fig. 8). Shortly before my departure from the United States, I had learned through the Department of State that, two years before, the British government had established a permanent base on the island in continuance of a program begun in 1943 under wartime secrecy.² It had also established and was maintaining other bases on the Palmer Peninsula. Great Britain, through the Falkland Islands, has long laid claim to this sector of Antarctica, and these five bases were under the administration of the Falkland Islands Dependencies Survey. However, it has been the policy of the United States not to recognize the claim of any government in the Antarctic, nor has the United States government made any claims of its own.

I had knowledge that in the six years since the departure of the United States Antarctic Service Expedition in 1941 ships from several other countries had visited the American campsite. In 1943 the Argentine gunboat *Primero de Mayo* had visited the American base, and an Argentine ship and two Chilean vessels had been there shortly before we arrived in 1947. Upon our arrival we were greeted by the British leader, Major K. S. Pierce Butler, commander of the Falkland Islands Dependencies Survey, 1947-1948, and later we became acquainted with the other 10 men, who were occupying their own quarters constructed about 200 yards from the American campsite. As I investigated, I was appalled at the amount of wanton damage that had been done to the three large and three small buildings constituting the American base. After much hard work the base was made livable again and occupied by our expedition (Fig. 4).

GEORGE VI SOUND TRIP

I decided to attempt to establish an operational base at the southeast corner of George VI Sound, 300 miles to the south, before we anchored the ship in its final position for the winter freeze-in. I hoped to be able to set up a cache of gasoline, stores, and one of our two weasels at this halfway point and thus facilitate the transportation of such heavy equipment into the field at a later date. The attempt did not prove successful, and we later abandoned this location in favor of Cape Keeler, on the Weddell Coast. However, the journey did reveal some new features.

At 5 a. m. on March 23, after riding out a number of strong southeasterly gales with velocities of as much as 60 miles an hour, we hoisted anchor and

² See note on recent Antarctic expeditions elsewhere in this number of the *Geographical Review*.



FIG. 3

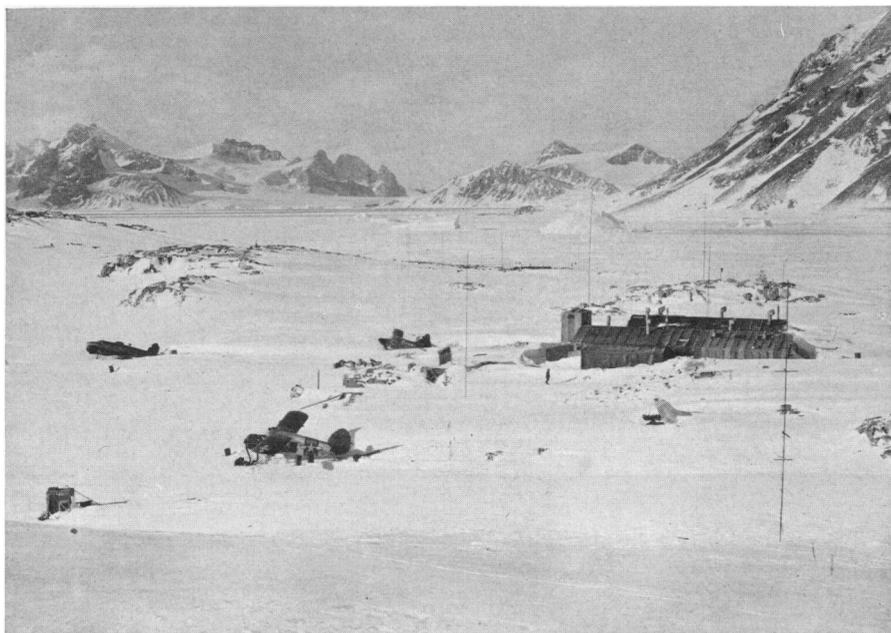


FIG. 4

FIG. 3—*The Port of Beaumont, Texas*, at anchor off the Main Base, Stonington Island, March 12, 1947.
FIG. 4—The Main Base on Stonington Island. Neny Island on right.



FIG. 5



FIG. 6

FIG. 5—Weasel hauling the Beechcraft into position for flight at the Main Base.

FIG. 6—The ice-locked vessel seen from the glacier next the base. Red Rock Ridge in background.

steamed south along the Fallières Coast, past Cape Berteaux, to the entrance of George VI Sound. A group of islands, which I named the Bugge Islands, were found in approximately $69^{\circ} 10' S.$, $68^{\circ} 55' W.$ Three large islands, the largest about a mile and a half long, stretched for some five miles in a north-easterly direction. Numerous small islands were 15 to 20 feet high, and most of them were bare. The larger islands, however, were covered with snowcaps more than a hundred feet high, though bedrock was exposed at the water's edge.

Thanks to the skillful piloting of our skipper, Commander Isaac Schlossbach, U.S.N. (Ret.), who was also second-in-command of the expedition, the vessel moved steadily among the huge shelf-ice and glacier-formed bergs that blocked the entrance to the sound. At four o'clock in the afternoon we reached $69^{\circ} 20' S.$, our farthest point, a new record for ships navigating in this region of the Antarctic. To make a landing anywhere was virtually impossible. I was unable to see the 150-foot ice wall which marks the entrance to the sound and over which I had traveled in 1940, but it was obvious that these tabular bergs had recently broken off from the shelf ice of the sound itself.³ (Our plane flights several months later revealed that the shelf edge was discharging bergs such as those among which we were now sailing and that the face of the shelf had moved back 35 miles in seven years.) Not only did the conditions ahead offer an immediate danger to our only means of transportation back to the civilized world, but had we continued to search for a suitable landing place farther south, a sudden change in the weather so late in the season might have blown these huge bergs in upon us and blocked exit for another year. The risk was too great, so I gave orders to return to the open Marguerite Bay.

Our ship was moored in Back Bay, a cove a third of a mile from the base. As temperatures fell during the first week of May, it became safely frozen in the bay ice, and it remained so until the summer thaw of the following year partly released it from the icy grip (Fig. 6).

WINTER PREPARATION AND TRAIL PLANS

The winter passed rapidly, and an immense amount of preparatory work had been accomplished by the time we were ready to start the field program. On July 15, I led a sledge party up to the plateau, 6000 feet high, 17 miles east of our base to establish a meteorological station. This station was manned

³ Finn Ronne: The Main Southern Sledge Journey from East Base, Palmer Land, Antarctica, in Reports on Scientific Results of the United States Antarctic Service Expedition, 1939-1941, *Proc. Amer. Philos. Soc.*, Vol. 89, No. 1, 1945, pp. 13-22. This journey confirmed the insularity of Alexander I Island.

and operated during the entire flying season and, in conjunction with a station later established at Cape Keeler, 125 miles to the south on the Weddell Sea side, made it possible for H. C. Peterson, our meteorologist, to forecast the highly variable weather with good accuracy.

By August all three planes had been unloaded from the ship, assembled, and made ready. I intended to use the single-engine, 650-horsepower Norseman plane, which had been especially designed for cold-weather work, for flying gasoline caches to various points along the Weddell Coast. Weeks of continuous overcast, however, prevented us from completing this program. In November, by the time the weather had improved sufficiently for the southern exploratory flights, we had deposited 28 drums of high-octane gasoline at the Cape Keeler Advance Base.

During the winter Major Butler and I had decided to cooperate in a surface field program. A joint British-American Weddell Coast Sledge Party consisting of four men, Major Butler and surveyor Douglas Mason of the F.I.D.S., and two members of my expedition, Walter Smith, navigator, and Arthur Owen, dog driver, were to cross the plateau by dog team to the eastern side of the Palmer Peninsula. They would sledge south along the Weddell Coast to Cape Knowles, beyond which the territory was virgin so far as surface travel was concerned, though the United States Antarctic Service Expedition had made an exploratory flight as far south as Mt. Tricorn. When the surface party reached Mt. Tricorn, the two Americans, now forming the Ronne Weddell Coast Party, would continue southward into the unknown as far as supplies would permit, in order to establish ground control points for our aerial mapping. So long a sledge trip without the aid of supporting dog-team parties would be possible because our Norseman plane was to deposit several caches of man and dog food along the route of travel (Fig. 2).

RESCUE OF BRITISH AIRMEN

As a first step the small British Auster plane took off for Cape Keeler on September 15, followed by the larger Norseman plane loaded with 3000 pounds of trail supplies. The smaller plane was to make the initial landing in the field and pick out a suitable landing area for the heavily loaded Norseman. The Auster did not have adequate radio communication and in flight unfortunately became separated from the other plane. When the Norseman did not sight the Auster at the Cape Keeler rendezvous, a search was made, but darkness and bad weather were approaching, and Captain James W. Lassiter had to turn back. By 10 o'clock that evening a storm had set in,



FIG. 7—South of Red Rock Ridge, southern part of Neny Fiord, along the Fallières Coast.



FIG. 8—The Main Base (left foreground), Stonington Island; ship at anchor near ice cliff.



FIG. 9—South of Neny Fiord; Windy Valley in the foreground.

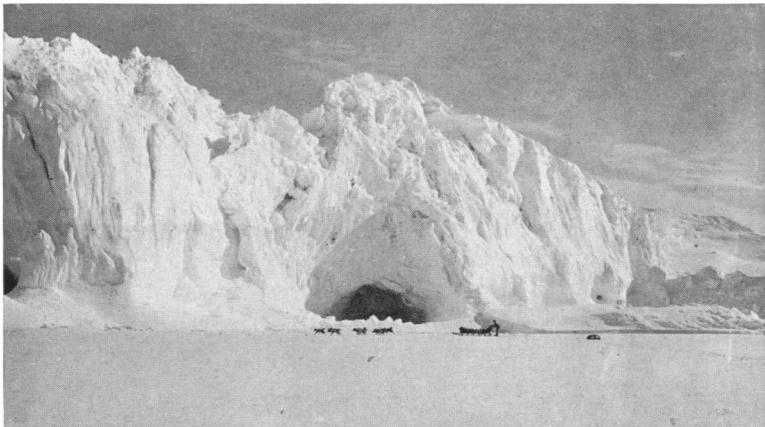


FIG. 10—Dog team near the terminal cliffs of one of the big glaciers, near the base.

and the British plane was still missing and unreported. Accordingly, I made all the facilities of my expedition available to Major Butler for his use in searching for the missing plane. Captain Lassiter and Lieutenant Charles J. Adams made numerous unsuccessful searching flights in the overcast weather during the next eight days. On the ninth day, when hope was dwindling rapidly, Captain Lassiter located the three lost Britishers walking back on the sea ice 40 miles south of our base. We learned that they had actually landed at Cape Keeler on the day of the outward flight and, when they were not sighted by the Norseman, had attempted to return to their base, lost their way in the bad weather, and crash-landed on the sea ice in Marguerite Bay. The three men were uninjured but were extremely weak from a diet of only 630 calories a day each.

FIELD PROGRAM BEGINS

Bad overcast weather continued. On September 29 a short break permitted Lassiter to fly Walter Smith and C. O. Fiske to Cape Keeler to establish our second weather station and Advance Base (Fig. 12).

On September 28 the Geological Party, consisting of Dr. Robert L. Nichols and Robert H. T. Dodson, departed for George VI Sound and the Alexander I Island area. On October 9 the Joint British-American Weddell Coast Sledge Party left the Main Base for their long southern journey, with Smith joining them at Keeler operational base.

During October the weather continued to be unsuitable for flying, though occasional breaks of a few hours enabled the two pilots to make quick gasoline-hauling trips to Cape Keeler. Often they had to remain there for days at a time because the rapidly deteriorating weather at the Main Base made the return trip impossible. Finally, on November 4, I flew over to the Cape Keeler base with Captain Lassiter as pilot (Fig. 11).

EXISTENCE OF ISLANDS OFF CAPE KEELER DISPROVED

On the morning of November 7, with Lieutenant Adams as pilot, I took off in the L-5 airplane on a short exploratory flight eastward over the Weddell Sea. After his flight from Deception Island along the Weddell Coast in 1928, Sir Hubert Wilkins reported the appearance of islands due east of Cape Keeler. On a flight from the United States Antarctic Service East Base in 1940, I also had the impression of seeing islands through clouds in this same general area. We now flew due east from Cape Keeler for 100 miles, to the edge of the Larsen Shelf Ice, with its sheer cliff disappearing into the blue water. The width of this open water was about two miles, and beyond it,



FIG. 11—At the entrance to Neny Trough; heavily crevassed glacier front.



FIG. 12—The planes at the advance base at Cape Keeler. Heavy snow drifts soon covered the tents, making it necessary to dig interconnecting tunnels.

since visibility was perfect, we could see at least a hundred miles of heavy pack ice covering the Weddell Sea to the horizon. At the barrier edge we turned due south and followed the ice cliff until we sighted Cape Eielson. At the south end of Hearst Island the barrier became lower and joined the sea ice without break. At no time during our $3\frac{1}{2}$ -hour flight did we see signs of the reported islands. This flight coupled with my observations of the cloud formations while we laid over at the Cape Keeler base convinced me that on certain days clouds are formed over the open water to the east in such a way that they at times give the appearance of mountainous islands.

ACTIVITIES AT THE ADVANCE BASE

By this time the complement of the Cape Keeler base had increased to eight men: the two permanent residents, Fiske and E. A. Wood, and the six in the aviation group—Lassiter, Adams, William R. Latady, Commander Schlossbach, James B. Robertson, and myself. The tents had originally been pitched on the surface, but heavy drifts soon snowed them over. A series of interconnecting tunnels were dug to facilitate our life underground.

On their way south the four men of the Joint British-American Weddell Coast Sledge Party stayed at Cape Keeler for two days to rest their dogs. In two weeks they had sledged 150 miles over the plateau.

The heavy overcast weather still continued. It seemed as if we should be marooned forever in this "hellhole" of the Antarctic. Our camp was just three miles north of Cape Keeler, first sighted by Sir Hubert Wilkins in 1928 on his flight southward. The shelf ice extending seaward from the cape, on which our base was located, had an elevation of about 65 feet above sea level. To the south of the cape, heavy pressure areas caused by moving glaciers flowing eastward from the high plateau extended five miles seaward. On my flight eastward on November 7, I had observed a number of lenticular holes in the shelf ice and a deep trough running seaward in an east-northeasterly direction. The elevation of the bottom of this trough was close to sea level, though no sea leads could be seen in it.

On November 20, Adams, who had just flown over from the Main Base, considered that the weather was good enough for the laying of a much-needed cache for the southward-traveling sledge party. Piloting the L-5, he flew ahead to pick out a landing field for Lassiter, who piloted the larger Norseman, heavily loaded with supplies. After Adams passed Cape Eielson, he could easily identify several of the islands shown on the United States Hydrographic Office charts. They were all snow-covered except the one charted as Sharbonneau Island. A closer investigation disclosed that this

extremely black rock outcrop was actually a cape, being connected with the mainland by a high snow-covered ridge. Following the map closely, Adams continued south and began searching for Darlington Island. It also proved to be a cape. At the same time, he discovered that Hilton Bay was at least 20 miles deeper than had previously been thought. Gruening Glacier flows eastward into it from the high plateau; to the south a new glacier was seen, which I named Tejas Glacier. The sledge party was located at Cape Knowles, and supplies were deposited for their use on the return journey. In overcast weather the pilots brought the planes in for a safe landing at the Advance Base.

FIRST LONG SOUTHERN FLIGHT

On November 21 rifts began to appear in the overcast to the southeast, and by 9 a. m. we were delighted with a cloudless sky. Weather reports radioed from the Main Base, the plateau weather station, and the sledge party, now 200 miles to the south of us, indicated that this was a perfect day for a long southern flight. The twin-engine, trimetrogon-equipped Beechcraft, *Ed Sweeney*, and the single-engine, cargo-carrying Norseman, *Nana*, had been ready for many days. By 9:20 a. m. the Norseman, with Adams as pilot and Schlossbach as copilot, was heading south, carrying five drums of gasoline as cargo. The heavily overloaded plane required a long run to get off the well-packed surface. Joyously I watched it head south with its precious cargo for the rendezvous in the Mt. Tricorn area. Our attention was now turned to the Beechcraft.

The surface temperature was -15° F. As the engines of the Beechcraft were being warmed up, the fuel pressure lines from the carburetors to the instruments on the dashboard were found to be frozen solid. Robertson was able, however, to fix them without much delay, and with Lassiter as pilot, Latady as aerial photographer, and myself as navigator the faster Beechcraft took off from Cape Keeler, an hour and a half after the Norseman.

The visibility was perfect. Seaward I could see a 20-mile-wide strip of sea ice attached to the land, then a stretch of open water, and beyond that a belt of heavy pack ice which extended to the horizon. Mt. Thompson, 5600 feet high, was sighted close to Cape Eielson. To the west of our flight track, in the center of the Palmer Peninsula plateau, I saw several high, well-defined mountains south of the previously discovered Mt. Andrew Jackson. These new mountains I named Mt. Russell Owen, the Vincent Gutenko Mountains, and Mt. Coman. They rose high above the plateau, and I estimated their heights to be more than 10,000 feet. Continuous radio contact was



FIG. 13—The Weddell Coast, near New Bedford Inlet.



FIG. 14—The Norseman, seen from the Beechcraft near Gardner Bay.



FIG. 15—The Weddell Coast at Nantucket Inlet.



FIG. 16—Mt. Austin, used as a flight stand-by base on the long southern flights.

maintained between the two planes. Our rendezvous was 3000 feet above Mt. Tricorn at the head of Wright Inlet (Fig. 17). The Norseman reached there after a flight of 3 hours and 15 minutes; the Beechcraft took only 2 hours and 30 minutes. We had no difficulty in spotting the Norseman, and together the two planes flew south along the coast line at 4000 feet (Fig. 14). In a few minutes we were 15 miles south of Mt. Tricorn. Beneath us lay a snowy inlet, extending about 10 miles in a southwesterly direction, with rock exposures at the head. This inlet, which I named Keller Inlet, could not be seen until we were directly over it. About 30 miles south of Mt. Tricorn was another inlet, which, upon examination, proved to be Nantucket Inlet (Fig. 15). Its northernmost headland I named Cape Fiske, its southernmost Cape Smitty and two glaciers flowing into the inlet from the west Johnston Glacier and Kelsey Glacier. These glaciers showed only a very few crevasses where they met the inlet. Incased on both sides by mountains, they appeared like smooth, wide thoroughfares leading to the elevated land to the west.

About 50 miles south of Mt. Tricorn we suddenly came upon a large bay, some 55 miles deep and 25 miles wide, Gardner Bay (Fig. 20). Almost in the center, and connected with the head by a low-lying peninsula, was a striking snow-covered dome mountain with rock outcrops on the sides, Mt. Austin (Fig. 16). Three glaciers flowed into the bay from the high mountainous land to the west. Those coming in from the north I named Irvine and Wetmore Glaciers, and the one on the south side Ketchum Glacier. Ketchum Glacier was heavily crevassed. It was about five miles wide where it entered the bay, and it was joined by a tributary glacier from the southeast. The headland on the north side of the entrance to Gardner Bay I named Cape Adams, and the headland on the south side Cape Schlossbach. Rock outcropped on the east and south sides of Cape Adams and on the east side of Cape Schlossbach. Twenty-five miles to the northwest of Mt. Austin was another mountain, its black, vertical cliff facing east, Mt. Robertson.

LANDING IN THE FIELD

I decided to land both planes next to Mt. Austin (3200 ft.), since it was easily recognizable from the air and could serve excellently as a flight standby base. Also, Adams had just reported from the Norseman that half the gasoline supply in his fuselage tanks had been used and the remainder would be needed for the return flight to Cape Keeler. Both planes came in for a landing less than three miles away from the sloping mountainside. The surface was so smooth and soft that we could not tell the exact moment



FIG. 17



FIG. 18

FIG. 17—Wright Inlet, east coast of Palmer Peninsula. At the head is Mt. Tricorn (5450 ft.).
FIG. 18—Ground fog along the east coast of Palmer Peninsula that necessitated an emergency landing on the sea ice at Steele Island.

when the skis touched. Once on the ground, I began making calculations. From the speed of our plane and the length of time the flight had taken it was immediately evident that Mt. Tricorn had not been correctly located on the maps—according to my rough calculations it was about 50 miles farther to the north.

While the men were fueling the Beechcraft, I took sights with a bubble sextant to determine our exact location. Upon our return $6\frac{3}{4}$ hours later, I took another series of sights, which gave me an accurate fix and established our plane base at Mt. Austin as being in $74^{\circ} 48' S.$, $62^{\circ} 50' W.$ Our position proved that Mt. Tricorn was 55 miles farther northwest than had previously been thought, and it revealed another interesting fact. Southward from Cape Knowles, in $71^{\circ} 45' S.$, the entire coast line was about 30 miles farther to the west than it had previously been plotted, and its configuration was considerably different.

We were now 250 miles farther south on the Weddell Coast than any human foot had ever trod before. The Beechcraft's altimeter indicated the elevation to be 300 feet above sea level. When $2\frac{1}{2}$ drums of gasoline had been transferred from the Norseman's cargo into the Beechcraft's wing tanks, we were ready to take off on the long flight. The time was 4:10 p. m. Adams and Schlossbach, with the Norseman plane and a trail radio, were left to stand by as an additional safety and emergency precaution.

UNEXPECTED TREND OF COAST LINE

As we headed for Cape Schlossbach, we started to climb to 10,000 feet, so that the trimetrogon cameras could photograph the terrain from one horizon to the other. Visibility was unlimited as we passed the cape and headed due south to follow the trend of the mountainous coast line. A huge ice barrier could be seen disappearing over the horizon in a southeasterly direction. To the north of the barrier open water extended for 20 miles, and beyond was loose pack ice. Shortly after we rounded Cape Schlossbach, an island was sighted some five miles from the mainland, completely snow-covered except on its southwest side; Dodson Island is about 12 miles in length and half as much in width. It was the southernmost island that we discovered. The opposite coast I called Orville Escarpment.

Unexpectedly the mountainous coast line turned westward until its trend became 245° true. To the right, numerous mountains of various heights came into view (Fig. 22). As we continued southwestward, the mountains were spaced farther apart. More readily definable groups took form, sharply etched against a cloudless background of white. The height of the land

beneath us seemed to be gradually increasing, and at the same time the height of the rock exposures was gradually decreasing, until at our southernmost point only a gradually rising snow-covered plateau was seen. I named the mountains and groups of mountains as discovered: Sweeney Mountains with Mt. Edward in the center, Scaife Mountains, Wilkins Mountains (Fig. 19), Latady Mountains, Lowell Thomas Mountains, Mt. Horne, Mt. Brundage, and Mt. Hassage. Mt. Haag, estimated to be 11,000 feet high, was the last newly discovered mountain peak seen; beyond it, in the distance, Mt. Ulmer, discovered by Lincoln Ellsworth in 1935, loomed above the horizon.

Our flight so far had proved that the mountain axis of the Palmer Peninsula gradually swings southwestward to $77^{\circ} 30' S.$, $72^{\circ} W.$, where it dies out or merges into a higher plateau that stretches southward as Joerg Plateau. The elevation of this plateau was found to be approximately 5000 feet, and it stretched to the limit of our visibility, which at our 10,000 foot-altitude, I estimated to be at least two hundred miles. This meant that we actually saw the terrain as far as $81^{\circ} S.$ It is my opinion that this plateau gradually rises until it connects with the South Polar Plateau or terminates in a range which might be a continuation of the Queen Maud Range, to the south of the Ross Shelf Ice. This was the first of two major discoveries that together seem to eliminate the possibility of any connection between the Ross Sea and the Weddell Sea.

RETURN FLIGHT

As we turned to head back to Mt. Austin, Latady dropped the American flag in the name of the United States. Our flight back paralleled the outward course 20 miles to the west, and an overlapping set of continuous photographs was taken.

When we were within 30 miles of Mt. Austin, we turned southeast to follow the ice barrier. An altitude of more than 10,000 feet was maintained throughout the flight (Fig. 21). About 50 miles from Cape Adams, five miles inland from the edge of the shelf ice, we passed over a highly crevassed area, 100 feet in width, which extended parallel to the edge for a distance of 30 miles. The southern side we later found to be 200 feet higher than the outer side. Similar disturbances were sighted farther inland. When we had reached approximately $77^{\circ} S.$, $50^{\circ} W.$, Lassiter informed me that the gasoline supply was getting low and that he felt we should return to our stand-by base (Fig. 16). As we turned back, I noticed that the shelf ice seemed to continue on in the same southeasterly direction. There was much open water near the edge,

and loose pack ice farther out. It seemed to me that a vessel could easily penetrate as far as the shelf ice itself if conditions were no worse to the north. We sighted Mt. Austin without difficulty and landed alongside Adams and Schlossbach $6\frac{3}{4}$ hours after taking off. Sun and moon sights were taken to fix our position.

I realized then that another flight would be necessary to determine the extension of the shelf ice to the east and its connection with Coats Land, as explored by the German Filchner expedition in 1912. To accomplish this, more gasoline would be needed for refueling the Beechcraft. So far, the weather had provided us with few suitable flying days such as the one we were just finishing. I therefore decided that, instead of waiting in the field while the Norseman brought several loads of gasoline to us, it would be more efficient for both planes to return to Cape Keeler, refuel, and make a second trip to the south. Half an hour after we had landed at Mt. Austin we were again in the air, headed north. The Beechcraft climbed to 11,000 feet, in order that Latady might photograph the coast line with the trimetrogon cameras, since he had not done so on the outward trip in order to save gasoline. Although it was 10 p. m. when we took off, the 24 hours of polar daylight made it possible for him to get good results.

We did not see the Norseman during the return, but constant radio communication was maintained between the two planes. By the time we had reached Cape Knowles, 250 miles to the north, ground fog covered the entire area ahead (Fig. 18). Close to Steele Island, Lassiter found an opening in the fog and quickly dove through to make an emergency landing on the smooth, hard sea ice, and within 30 minutes Adams in the Norseman had been guided in by radio. We camped here until three o'clock in the afternoon of November 22, at which time the meteorologist at Cape Keeler informed us that Keeler weather was suitable for flying. After a brief stop at Keeler, we returned to the Main Base, landing at 6 p. m., just 31 hours after we had left Cape Keeler for the southern flight.

That evening Adams in the Norseman left again for the Keeler base, carrying another load of gasoline. With Fiske, Robertson, Wood, and Schlossbach, he was forced to remain there for several weeks because of continued overcast.

SECOND LONG SOUTHERN FLIGHT

The second long flight south was still foremost in my mind, but the weather reported on the daily schedules from Cape Keeler had been most discouraging—"snowed in," "blizzards with strong winds," or "overcast



FIG. 19—Above the Wilkins Mts.; Sweeney Mts. in background.

with ceiling zero." Finally, on the morning of December 8, Keeler reported the same good weather that prevailed at the Main Base. Within an hour, Lassiter, Latady, and I were in the Beechcraft headed for Keeler. Adams and Schlossbach had the Norseman loaded with a cargo of five gasoline drums and their emergency equipment and were ready to take off. The temperature was 0° F. and the air dead calm. The condition of the surface snow was very different from that on November 21, and the first three attempts to take off were unsuccessful. Finally, Schlossbach and all his emergency gear and two of the five drums had to be left behind. Even then, without the



FIG. 20—Gardner Bay on the southeast coast of the Palmer Peninsula; Mt Austin in center, Cape Schlossbach in foreground.



FIG. 21—Lassiter Shelf Ice, separated by open water from loose pack ice in the Weddell Sea.



FIG. 22—Along the southeast coast of Palmer Peninsula; Scaife Mts. in center.



FIG. 23—View southeastward along Lassiter Shelf Ice.

aid of any wind Adams was barely able to lift the plane into the air. It was the first time that the Norseman's plastic-shod skis had stuck to the snow. We all agreed, however, that the plastic-shod skis were far superior to metal-shod skis under most snow conditions.

The reduced load of gas made it impossible to undertake as long a flight as I had intended. My original plan had been to fly due south from Mt. Tricorn for about three hours, then head northeast to Moltke Nunatak and the shelf ice, which we would follow back to the Norseman stand-by base. Adams had previously established a cache of 138 gallons of gasoline at Gruening Glacier for our return.

Unlike the Norseman, the Beechcraft had no difficulty in getting into the air. We climbed to 10,000 feet immediately, and by the time we passed the south end of Hearst Island, Latady had the trimetrogon cameras systematically photographing the terrain below. Our flight track was farther inland than before, in order that he might obtain an additional set of overlapping pictures. The terrain beneath us was highly mountainous, and in places the sea ice came close to its rugged side. The 20-mile-wide belt of sea ice stretched south along the coast for 350 miles, to the great shelf ice. Numerous sea leads ran from the open water toward the mountainous coast, and frequently I detected seals sunning themselves on the ice.

After a 2½-hour flight from Keeler, the Beechcraft landed at 2:55 p. m. off the northernmost headland of Wright Inlet, which I designated Cape Wheeler. About 20 minutes later Adams circled overhead for a landing. The Joint British-American Weddell Coast Sledge Party had reached Wright Inlet and re-formed as the Ronne Weddell Coast Party. My intention was to have them stand by with Adams in the Norseman to guard our flight.

Two drums of gasoline were pumped into the Beechcraft's tanks, our emergency gear was checked, and the trimetrogon film was made ready for reloading the three cameras at intervals during the flight. As the weather ahead looked perfect, I decided to start at once. We experienced no difficulty in taking off from the sea ice where the sledge party had made their camp. Our course was laid due south.

We were steadily gaining altitude as we passed over Nantucket Inlet. Gardner Bay, with Mt. Austin in the center, appeared to be about 30 miles to the west. An hour after the take-off, as we were flying slightly away from the coastal trend, we suddenly saw a heavy overcast obscuring the horizon to the south and southeast. We continued south for another 15 minutes in the hope that the visibility would improve, but instead it became much worse. Disappointing as it was, the only thing to do was to turn back

to Wright Inlet and wait for more favorable weather, and two hours later we again landed alongside the sledge party.

The overcast that we had met to the south moved slowly northward, and by morning the visibility was less than five miles. That day, the 9th, the Ronne Weddell Coast Party departed for the south. Their work was to obtain fixes of geographical features for correlation with the aerial photographs we had taken. The temperature remained about 0° F., and for two days a 40-mile wind swept over our small camp. We spent most of our restless time in sleeping bags, though we tried to take some soundings in a sea lead about three miles from the coast. Bottom was not reached with a 75-fathom line. On the evening of December 11 we saw that the southern horizon was beginning to clear.

THE FINAL ATTEMPT

At three o'clock the next morning, December 12, Adams, who had volunteered to keep an all-night weather watch, called Lassiter, Latady, and me. He had pumped the last drum of gasoline and 30 extra gallons of gas from the Norseman's tanks into the Beechcraft and already had breakfast waiting. At 5:20 a. m. we took off, with a clear blue sky overhead. This time, however, we were unable to leave with full fuel tanks, and consequently my plan for the flight had to be slightly modified. Instead of flying due south for some distance, I decided to follow the shelf ice southeast to Moltke Nunatak and Coats Land, and then go south as far as our gas supply would permit.

Twenty minutes after the take-off we flew over the dog-team party, still sledging south. They were taking advantage of the better snow surfaces during the hours when the sun was lowest. From time to time we passed through patches of overcast, which made us lose altitude. I noticed that the area of open water to the north had increased considerably since our flight of November 21. The looseness of the pack ice as seen through my field glasses confirmed my belief that a sturdy vessel could have sailed right up to the shelf ice if conditions to the north were similar. In 78° 25' S., 44° W., we crossed a deeply indented bay, about 20 miles by 20 miles, which I named Gould Bay. At the head of the bay was an ice fall, heavily crevassed for a width of about a mile or more inland. Tongues of ice protruded into the head of the bay and the bay itself was partly filled with small tabular bergs, cemented together with sea ice. It reminded me very much of the Bay of Whales, in the Ross Shelf Ice in approximately the same latitude on the opposite side of the continent. Gould Bay would seem to offer a suitable

place for landing a wintering party. Shortly after we had crossed the bay, overcast skies appeared straight ahead. To the north and northeast, practically ice-free water could be seen to the horizon. There was, however, some loose pack ice next to the shelf ice. By taking a sun sight to obtain a line of position, and by dead reckoning, I estimated that we were in $78^{\circ} 40'$ S., 40° W., and about 50 miles west of Moltke Nunatak. Through a light haze we could see the easterly trend of the shelf ice.

LAND BENEATH ICE SHEET

Three hours and seven minutes after we had taken off, black clouds covered the surface beneath, and we were forced to change our course to 218° true. Through a distant clearing beyond the clouds we could see a snowy surface without visible rock outcrops. From our elevation we were unable to see either Moltke Nunatak or other mountains, and if any exist, they either are small in size or were obscured by the clouds. Our new course took us along the edge of the overcast. As this was a most important leg of our flight, I scanned the horizon with field glasses, for a break of surface, but none was visible. At 8:50 a. m. Lassiter informed me that one of the fuselage tanks might run dry at any minute, and I knew, to my sorrow, that we should have to return soon. Just then the engines missed for an instant, and Lassiter switched to a full fuel tank. Latady again dropped the American flag in the name of the United States, and I made this area part of Edith Ronne Land, which name I have given to all the newly discovered land from the farthest west seen on the November 21 flight to the farthest east seen on this flight.

I obtained a sight with the bubble sextant, which gave me the approximate position of our turning point. About 12 miles from the edge of the shelf ice Latady obtained a reading from the radio altimeter, which indicated that the surface beneath us was 700 feet above sea level; a few minutes later another reading from the radio altimeter indicated that the surface was now 300 feet above sea level; and a final reading, at the edge, showed only 100 feet. The gradual southward increase in elevation of this huge ice mass was our second important discovery. These observations, together with the observations made on the November 21 flight, the obvious obstruction which accounts for the indentation named Gould Bay, the lines of crevasses which we saw at some points extending parallel with the Lassiter Shelf Ice fringe over a width of 15 to 20 miles inland, and the fact that as seen from our most southerly position, the surface of the ice seemed to rise steadily, leads me to believe that the Antarctic continent is a single unit and is not

divided by a frozen body of water extending from the Ross Sea to the Weddell Sea. The whole area had now been covered where a possible strait might exist. The line of position that I obtained at the barrier when the sun was 90° off the plane's heading fixed its location precisely.

RETURN TO MAIN BASE

While speeding over the shelf ice more than 900 miles away from our Main Base, we heard Kelsey come in on the radio stronger than ever. We also maintained contact from time to time with Cape Keeler and with Adams at Cape Wheeler. As we approached Mt. Austin, the mountainous coast line loomed ahead once more, and Mt. McElroy and Mt. Nash stood well above the horizon south of Mt. Tricorn. Latady was eager to obtain a second set of trimetrogon photographs of the coast line as we continued northward, so we radioed Adams to take off at once for Cape Keeler. Through my field glasses I was able to see him taxi for a take-off as we flew over Mt. Tricorn at 10,000 feet. Soon afterward he was lost to sight.

When I looked southeast for the last time, I saw the 100-foot barrier disappear over the horizon. Behind us lay our most important discovery. We had followed for 450 miles the ice barrier that bounds the Weddell Sea on the south and had found that it connects with Coats Land at some distance south of $77^\circ 50' S.$, $36^\circ W.$, where Filchner found an ice wall in 1912. From the trend of the shelf ice as we saw it, I conclude that Filchner saw the north side of either a huge tabular iceberg or an ice tongue that has broken off 60 miles since 1912, to its present position. Filchner reported that he built a camp on the shelf ice, which he was forced to abandon less than a month later because it had calved and was drifting northward. I named the extent of the shelf ice that we had seen in honor of my pilot Captain James W. Lassiter.

After some difficulty, because of the large patches of overcast beneath us, we located and landed at Gruening Glacier, where we pumped the 138 gallons of gasoline into the Beechcraft's fuel tanks. Meanwhile, Adams in the Norseman had gone directly to Cape Keeler and had landed, refueled, and taken all the personnel there back to the Main Base. We ourselves landed at the Main Base at 6:05 that same evening. We had been in the air $12\frac{3}{4}$ hours, and in that time we had covered 1700 miles of terrain.

THE SLEDGE PARTIES

On December 13 the Ronne Weddell Coast Party reached the top of Bowman Peninsula, forming the north side of Gardner Bay. Here they veri-

fied my observations on the location of the bay and Mt. Austin and made a general survey of the area. Upon their return to Mt. Tricorn, this party again formed the Joint British-American Weddell Coast Sledge Party. By utilizing the caches laid by the Norseman plane, they had no difficulty in making a good distance daily on their way back to Stonington Island. They reached the base on January 22, 1948, having covered 1180 statute miles in 105 days on the trail.

The Geological Party, consisting of Nichols and Dodson with their 13-dog team, sledged southward over the sea ice of Marguerite Bay to the head of George VI Sound. Cape Nicholas on Alexander I Island was visited, and sedimentary rocks were found and studied there. On the return journey geological studies were made on Mushroom Island, Terra Firma Island, and the coast line northward to Neny Island. The men reached the Main Base on December 26. They had been in the field for 90 days and had covered 450 miles. After a few days in camp, Nichols, accompanied by Dodson and Latady, made a detailed geological study of Red Rock Ridge and the Neny Fiord area.

MAPPING FLIGHTS ON THE WEST SIDE OF PALMER PENINSULA

Trimetrogon flights were made on November 27 and December 3, 21, and 22, over the west and east sides of Palmer Peninsula both north and south of the Main Base. On the December 3 flight, over George VI Sound, cloudy weather prevented us from photographing south of the Batterbee Mountains. I still considered it would be well worth while to tie in Alexander I Island with the area south of the Batterbee Mountains and then connect this with the Robert English Coast. These areas had not been previously photographed with trimetrogon cameras, though Eklund and I had established the ground control points in 1940. In spite of the fuel shortage, which was now becoming acute, we managed to fill the Beechcraft's fuel tanks with high-octane gasoline for a last flight.

On December 23, for the third consecutive day, the weather was excellent, with ceiling and visibility unlimited. We flew south past Mt. Edgell, at the entrance to George VI Sound, and followed the sound to the Batterbee Mountains, where I saw and named the 8500-foot Mt. Ward. Mt. Russell Owen, Gutenko Mountains, and Mt. Coman were well defined above the Palmer Peninsula plateau. As we passed Margaret Goodenough Glacier, we changed course to 250° true, to follow the trend of the Robert English Coast westward. We passed slightly south of Eklund Island, and farther to the northwest we could see where the Sound ice terminated in Ronne Bay

(named in 1940 for my father, Martin Ronne). Isolated mountain peaks lay to the south. Had the weather been more favorable at the time of his flight in 1935, Lincoln Ellsworth would certainly have seen them. Beyond Ashley Snow Nunataks (three) we flew over an escarpment with exposed rock facing the northeast. Fifty miles to the south a snow-covered mountain rose to about 10,500 feet, Mt. Rex; some 60 miles west of it was Mt. Peterson, tabular and about 9000 feet, with six smaller peaks nearby.

Due west of our turning point, 74° S., $79^{\circ} 35'$ W., was a partly snow-covered mountain of more than 9000 feet, which I named Mt. Tuve (approximately $74^{\circ} 30'$ S., 88° W.), another, to the northwest, Mt. Combs. At the turning point the radio altimeter recorded a surface elevation of 3100 feet above sea level, which was later checked on the ground. The surface appeared level and uncrevassed, and we decided to land. The plane taxied smoothly along the soft snow. The line of position I obtained from sun shots upon landing, when correlated with the fixes I obtained on my 1940 sledge journey over some of this area, will provide ground control for the photographs we took. Twelve minutes later we were again in the air, following a course directly toward the Main Base. We reached Alexander I Island 20 miles to the west of the termination of the shelf ice of George VI Sound in Ronne Bay. In 71° S., 70° W., an impressive snow-covered range stretched in an east-west direction for about 40 miles. Sixty miles to the south a dark, massive range loomed majestically above the surrounding terrain. These two newly discovered mountain ranges I named respectively Colbert Range and Le May Range.

We changed our course almost to due north, then northwestward across Wilkins Strait to Charcot Island. In our flight track straight ahead we saw the Walton Mts., about 4000 feet, and Mt. Paul Lee loomed high above the terrain looking westward to the extreme western cape of Alexander I Island. In approximately 71° S., 75° W., I observed an ice cliff extending south from Charcot Island to the north coast of Alexander I Island. It appeared to be a connecting link between the two islands. I hope that the trimetrogon photographs will further clarify this interesting matter. Over Charcot Island our radio altimeter indicated that the surface beneath was 900 feet above sea level.

On the smooth snow surface 20 miles to the south of the three small peaks of Charcot Island we made our second landing on this flight—the first persons to set foot on that much-discussed and elusive island. The stop was just long enough for me to take a few sights. The sun was due west, and I was able to obtain a good longitudinal line of position. The sloping terrain

to the south made it easy for the lightly loaded plane to take off on the last leg of our return flight. When we were in the air again, I observed much open water to the west and north of Charcot Island. It would have been possible but difficult for a ship to force its way to the island. To the east I saw many sea leads, though huge tabular bergs were still frozen in the sea's icy grip.

As we flew over the north end of Alexander I Island to cross the 10,000-foot Douglas Range, the sun still shone brightly in all directions except the east, the direction of our flight, where there was a heavy overcast. At the same time Kelsey at the Main Base gave us the first of a series of warnings on the sudden and rapid approach of bad weather. We crossed the island in $69^{\circ} 30' S.$, by following a deep and wide valley for 40 miles. Tufts Valley, as I named it, contained a crevassed glacier that terminated on the Marguerite Bay side of the island. A twenty-mile-long glacier, Nichols Glacier, is a northern branch or tributary. By the time we reached the entrance to George VI Sound we were flying in overcast. Lassiter descended below the heaviest cloud formations to an altitude of 3000 feet, and we managed to continue northward. At Red Rock Ridge, 10 miles from the base, the weather had completely closed in around us. Fortunately, Lassiter was familiar with the terrain, and he guided the plane around the barely visible outlines of the high cliffs. At 200 feet we skimmed over icebergs floating in the open water off the ridge. Once a sudden downdraft caught the plane and forced it violently within 50 feet of the icy water beneath. Lassiter maintained his usual steady control, and a few minutes later we landed safely on the bay ice in Neny Fiord, four miles from base. The weasel, summoned by radio before landing, helped to bring the plane to its mooring. Gusts of wind of as much as 70 miles an hour made taxiing the plane extremely difficult. However, with two men riding on each wing to break the wind stream, we managed to get the Beechcraft moored in its usual position. I know of three men who were mighty happy to be on the ground that night! The contrast between the weather at our departure and that on our return after more than eight and a half hours of flight was striking. Once again I was deeply aware of the respect one must always hold for the sudden dangers mercilessly lurking behind the white veil that wraps this vast continent.

EVACUATION AND RETURN OF EXPEDITION

During the first week of January, 1948, the three planes were dismantled and loaded aboard the ship from the bay ice. This four-foot-thick ice, which had been used extensively as the runway for the planes, was already begin-

ning to show signs of deterioration as a result of the summer thaw. Day by day it slowly rotted and weakened. In February strong winds with swells from the northwest broke up some of the ice, but on February 11 four miles of solid ice still separated the ship from the open water.

It had been my original plan to remain at the base until the middle of March, at which time I anticipated that the ice would have cleared from the Bay sufficiently to permit our return without hindrance. However, on February 12, I was informed by radio that the two Navy ice breakers then operating in Antarctic waters would visit our base. By the time they arrived, on February 19, our ship, which for some time had been surrounded by open water was again frozen in. Although winds had been blowing almost continuously for more than a week, the freezing temperatures led me to believe that the cold weather of an early fall had already overtaken the summer thaw. I remembered only too well that in 1941 this same bay ice was not gone by March 22 and we were forced to evacuate the base by two hazardous airplane flights. The risk of having to remain another year in the Antarctic, if the bay ice did not go out was too great.

I accordingly decided to utilize the excellent opportunity offered by the presence of the ice breakers and to follow in their wake to the open sea. In this connection it is interesting to note that on April 9, 1948, I received a communication from the Governor of the Falkland Islands that stated:

Sea ice in Marguerite Bay broke up February 28, but navigation only became possible March 13. Sea freezing periodically maximum thickness one inch. Two hundred yards strip old ice still fast between Roman figure four and Neny Island.

Had I remained therefore, it would have been possible to have completed a full year of observations in the Antarctic, and to have returned without assistance, but this could not have been foreseen at the time of the ice breakers' visit.

With no difficulty whatever, they broke through to our ship. We spent all that day and the following one hurriedly completing the loading of our equipment. One of the vessels, the *USS Edisto*, went ahead to clear a wide path. The second ice breaker, the *USS Burton Island*, maneuvered into position ahead of our ship and steamed into open water, and we followed in its wake.

At four o'clock on the afternoon of February 20, 1948, *The Port of Beaumont, Texas* rounded the stretch of ice-enclosed Stonington Island, Neny Island, and Red Rock Ridge and finally sailed into the open sea of Marguerite Bay to the west of Adelaide Island. Our year's work at this lonely outpost was now a part of history. For the third time I left the snow-covered moun-

tains of the Antarctic Continent behind me and turned my eyes northward to greener shores.

SUMMARY OF ACCOMPLISHMENTS

The accomplishments of the expedition were greater than I had hoped for. In a total flying time of 346 hours the three planes had covered 39,000 air miles of Antarctic terrain. No fewer than 86 landings had been made in the field. The planes had made extensive reconnaissances, laid caches for aviation and dog-team parties, searched for the lost British fliers, transported personnel and equipment to advanced field bases, and carried on geographical exploration and trimetrogon mapping. The program had netted a conservative total of some 250,000 square miles of terrain explored for the first time and a total of some 450,000 square miles of territory covered by 14,000 trimetrogon photographs. The photographs are now being developed, and they will be used to make new maps.

Data were obtained in various branches of science. Dr. Robert L. Nichols, head of the geology department of Tufts College, spent a total of 154 days in the field, making geological studies in the Marguerite Bay area, with the competent assistance of Robert H. T. Dodson, graduate student at Harvard, who sledged with him during the entire geological field season. Physicist Harries-Clichy Peterson's work in meteorology, cosmic rays, solar radiation, dew point, refraction, and surface radiation kept him busy for many hours of the day. He was ably assisted by Climatologist C. O. Fiske, both at the Main Base and when Fiske was operating the Cape Keeler Advance Base. Geophysicist Andrew A. Thompson made continuous comprehensive seismographic recordings with his two sensitive instruments and also carried on tidal observations and investigations in terrestrial magnetism. He spent a little more than two weeks at Cape Keeler taking magnetic readings; and Lieutenant Charles J. Adams, when in the field guarding our plane flights, was able to obtain magnetic readings from the Mt. Tricorn area. These men also gave any help needed for the maintenance of the planes or the camp. Results of the geological and geophysical investigations will be available in due course.

E. A. Wood, Walter Smith, and Fiske operated the plateau weather station and the Cape Keeler Advance Base. Smith and Arthur Owen were the American members of the Joint British-American Weddell Coast Sledge Party and at Wright Inlet, with the two British members, formed the Ronne Weddell Coast Party, which sledged to Gardner Bay and back to Wright Inlet. James B. Robertson, aviation mechanic, was at Cape Keeler during

the flights, and Commander Isaac Schlossbach, second-in-command, when not flying as copilot with Adams, also manned the Cape Keeler base. Lawrence Kelsey was untiring at the Main Base radio, which was the central point for correlating information from all field units. Charles Hassage, chief engineer of our ship *The Port of Beaumont, Texas*, in addition to running the camp during my absence, was always ready to help with the maintenance of the planes and the numerous camp chores. Mrs. Ronne assisted in the organization of the camp during my absences and acted as recorder. Nelson McClary served as ship's mate, and Dr. Donald McLean as medical officer. Chief Commissary Steward Sigmund Gutenko, U.S.N., on leave of absence with the expedition, procured and prepared all expedition food and assembled all trail and emergency food; he also gave a hand in servicing the planes when time allowed him a spare moment from the galley.

The pilots were Captain James W. Lassiter and Lieutenant Adams, both assigned to the expedition on active duty by the Army Air Forces. Adams, as pilot of the Norseman and the L-5, hauled tons of essential equipment into the field and conscientiously and dependably backed up and stood by the Beechcraft's exploratory and photographic flights. Lassiter, in addition to piloting the Beechcraft, when flying communicated by radio with our auxiliary bases on the Weddell Coast and the Main Base on Stonington Island. During all the Beechcraft's flights William R. Latady checked the plane's drift meter and passed the information on to me. As aerial photographer, he was fully occupied with the operation of the trimetrogon and hand cameras and the changing of film. When not in the air, he was base photographer and machinist. The navigation end of the flights I took care of from my vantage point in the copilot's seat, which gave me a splendid view of the terrain beneath and ahead. Harry Darlington, who was accompanied by his wife, and Jorge di Georgio, Chilean, completed the personnel.

Beside carrying out the extensive program of the expedition while in the Antarctic, these volunteers manned and operated our sturdy 1200-ton wooden vessel to and from the Antarctic, a distance of more than 14,000 miles.

To the men, whose initiative, cooperation, and loyalty contributed so greatly to the successful accomplishment of the expedition's large program, I give my sincere appreciation and gratitude.

APPENDIX

The Ronne Antarctic Research Expedition was organized with the support and good will of many individuals and organizations throughout the United States. I can mention

only a few: Mr. and Mrs. Edward L. Sweeney of Evanston, Ill., and Washington, D. C., Mr. and Mrs. Allan Scaife of Pittsburgh, Pa., and Mr. John Hauberg of Rock Island, Ill., who because of their interest in exploration and science provided the necessary support. Without the sale of news rights to the North American Newspaper Alliance, Inc., a contract with the Navy Department for the results of research in various branches of science, and the many articles given me by the Research and Development Section of the Army Air Forces, the expedition would not have materialized. Representative J. M. Combs of Beaumont, Tex., was one of our strongest and staunchest supporters, and Sir Hubert Wilkins gave me many helpful ideas and suggestions. Of inestimable help, too, were Dr. Isaiah Bowman, President of The Johns Hopkins University, and Dr. Lawrence McKinley Gould, President of Carleton College. The American Geographical Society of New York, through its Director, Dr. John K. Wright, extended its auspices during the days when I was planning the expedition. In addition, there are others, far too numerous to mention, who helped me in many ways. For their help I am grateful. To Captain Harry L. Dodson, U.S.N., Dr. Dana Coman, and Dr. I. C. Gardner I am indebted for their untiring efforts to further the aims and purposes of the expedition.

NAMES OF NEW FEATURES

The new names given by me and applied to the map are: *Cape Wheeler*, after John N. Wheeler of New York; *Kelsey Glacier*, after the Kelsey family, Sacramento, Cal.; *Swann Glacier*, after W. F. G. Swann of Swarthmore, Pa.; *Mt. Coman*, after Dr. Dana Coman, The Johns Hopkins University School of Medicine; *Waverly Glacier*, after the seat of the Kasco Dog Food Company's mills; *Keller Inlet*, after Louis Keller of Beaumont, Tex.; *Cape Fiske*, after the Fiske family of Buffalo, N. Y.; *Cape Smitty*, after Walter Smith, expedition mate and navigator; *Cape Little*, after D. M. Little of Washington, D. C.; *Johnston Glacier*, after Freeborn Johnston of Washington, D. C.; *Mt. McElroy*, after M. C. McElroy of Boston, Mass.; *Mt. Nash*, after H. R. Nash of Pittsburgh, Pa.; *Mt. Owen*, after the Owen family of Beaumont, Tex.; *Cape Adams*, after Lieutenant Charles J. Adams, expedition pilot; *Cape Schlossbach*, after Commander Isaac Schlossbach, second-in-command of the expedition; *Gardner Bay*, after Dr. I. C. Gardner of Washington, D. C.; *Wetmore Glacier*, after Dr. Alexander Wetmore of Washington, D. C.; *Wright Inlet*, after Dr. John K. Wright, Director of the American Geographical Society of New York; *Mt. Austin*, after the Texas hero; *Mt. Robertson*, after James B. Robertson, expedition aviation mechanic; *Mt. Wood*, after E. A. Wood, ship's engineer; *Dodson Island*, after Captain Harry L. Dodson, U.S.N.; *Lassiter Shelf Ice*, after Captain James W. Lassiter, expedition pilot; *Mt. Russell Owen*, after Russell Owen of the *New York Times*; *Mt. Haag*, after Joseph Haag of Todd Ship Yards, N. Y.; *Gutenko Mountains*, after the Gutenko family of Baltimore, Md.; *Latady Mountains*, after William Latady, expedition aerial photographer; *Sweeney Mountains* and *Mt. Edward*, after the Sweeney family of Evanston, Ill., and Washington, D. C.; *Hauberg Mountains*, after John Hauberg of Rock Island, Ill.; *Wilkins Mountains*, after Sir Hubert Wilkins; *Scaife Mountains*, after Mr. and Mrs. Allan Scaife of Pittsburgh, Pa.; *Mt. Brundage*, after Burr Brundage of Cedar Crest College, Allentown, Pa.; *Mt. Horne*, after Bernhard Horne of Pittsburgh, Pa.; *Mt. Hassage*, after Charles Hassage, expedition chief engineer; *Gould Bay*, after Dr. Laurence McKinley Gould, President of Carleton College; *Edith Ronne Land*, after Mrs. Ronne, expedition recorder and expedition participant; *Mt. Ward*, after W.

W. Ward of Beaumont, Tex.; *Mt. Tuve*, after Dr. M. A. Tuve of Washington, D. C.; *Tufts Valley*, after Tufts College, Mass.; *Nichols Glacier*, after Dr. Robert Nichols' daughter, Medford, Mass.; *Niznik Island*, after the Niznik family of Baltimore, Md.; *Bugge Islands*, after the Bugge family, Molde, Norway; *Mt. Thompson*, after the Thompson family of Friendship Hill Farm, Pa.; *Mt. Peterson*, after Dr. Edwin Peterson of Belmont, Mass.; *Mt. Rex*, after Commander Daniel Rex of Washington, D. C.; *Bowman Peninsula*, after Dr. Isaiah Bowman, President of The Johns Hopkins University, Baltimore, Md.; *Ketchum Glacier*, after Commander Gerald Ketchum, U.S.N.; *Tejas Glacier*, after the Daughters of the Republic of Texas, Beaumont, Tex.; *Cape Light*, after Dr. Richard Upjohn Light, President of the American Geographical Society; *Irvine Glacier*, after George J. Irvine, Washington, D. C.; *Orville Escarpment*, after Captain H. T. Orville, U.S.N., Washington, D. C.; *Mt. Lee*, after Admiral Paul Lee, U.S.N.; *Walton Mountains*, after Colonel R. C. Walton, U.S. Marine Corps., Washington, D. C.; *Colbert Range*, after Admiral Leo Otis Colbert, Coast and Geodetic Survey, Washington, D. C.; *Le May Range*, after General Curtis Le May, A.A.F.

These names have received the approval of the United States Board on Geographic Names. To the Board's Advisory Committee on Antarctic Names I am particularly indebted for promptness of consideration.