

MCMURDO-POLE TRAVERSE

(See Bulletin, Volume II, Number 4, pages 21-22; Number 5, pages 24-25)

On the afternoon of 12 February, Dr. Albert P. Crary and Sveneld Evteev drove their 743 Sno-Cat up to the Amundsen-Scott South Pole Station. This first vehicle of the 1230-mile traverse had arrived early, and none of the station personnel were out in the -45° weather to greet the overland party. The two other Sno-Cats arrived at the station several hours later.

This seventh overland party to arrive at the Pole had taken 64 days to cover their route. After abandoning the plotted track up the west side of the Skelton Glacier and following the route up the east side used in previous years, the party renewed their supplies from the cache at the head of the glacier. Leaving Plateau Depot on 26 December, the party was self-sufficient during the remainder of its trip to the Pole except for resupplying their Rolli-tankers with fuel from a cache dropped at $85^{\circ}07'$ South, $144^{\circ}50'$ East by an Air Force C-124 in November.

Short of time, the three-vehicle party (a 743 navigation-drill Sno-Cat and two 843 Sno-Cats used for living and laboratory work) did not travel as close to the mountain areas as had been planned. Instead their track carried them between their 14 major stations as quickly as time would allow.

These major stations, which included one at the South Pole, were between 60 and 70 miles apart and required at least a full day's work each. Between these were 250 minor stations, from three to five miles apart, at which observations were made which required only a few minutes to an hour's study.

At these stations, measurements were made of the surface elevation, using multiple altimetry methods (single altimetric readings were made every half-mile). Ice thickness studies were made using seismic reflection methods at the fourteen major stations. Magnetic field measurements included reading of declination angle, horizontal and vertical intensity, and total field strength at all major and at many minor stations; total field strength was measured every half-mile.

Glaciological studies were made in 50 centimeter pits at all minor stations. Here a study of snow character was made, including density, temperature and rammsonde-hardness. At major stations a two meter pit was dug in which density, grain size, temperature, and stratigraphy were studied to obtain annual snow accumulation. Crystal size and characteristics were studied from hand-augered ten meter cores and from the shallow pits. Temperatures were measured in the ten meter and 40 meter holes (the 40 meter temperature was taken overnight).

In addition to these studies, gravity readings were taken at all major and minor stations; the surface characteristics of the snow was logged; and surface meteorological observations were made.

◎ SOUTH POLE
12 FEB

McMurdo - Pole Traverse

4 Feb

15 Jan

■ FUEL CACHE, 23 Jan

Domation
Range

Commonwealth
Range

Beardmore
Glacier

Queen Alexandra
Range

Nimrod
Glacier

Britannia
Range

130°E

80°S

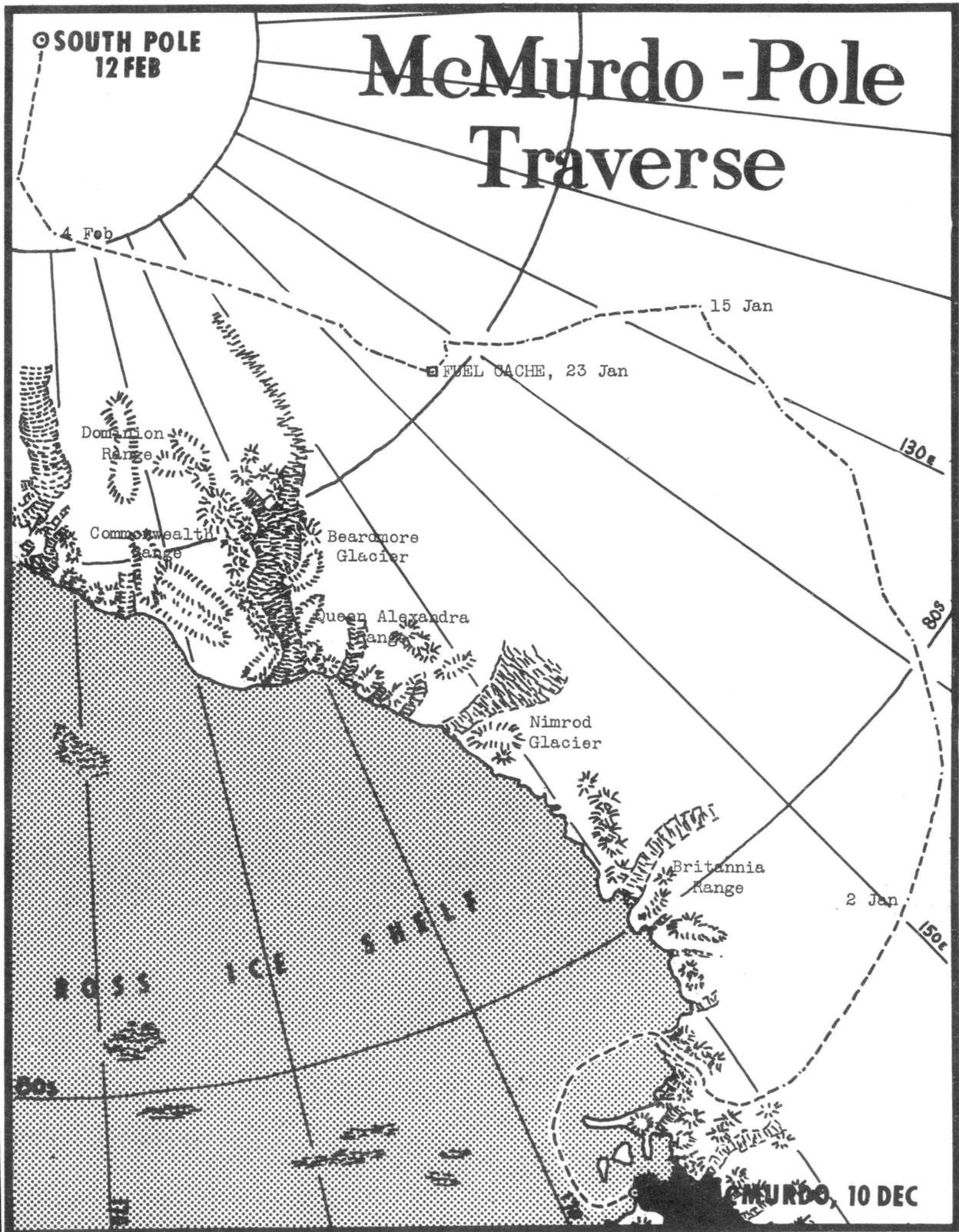
2 Jan

150°E

ROSS ICE SHELF

60°S

MC MURDO, 10 DEC



The party traveled from about 0800 to 1900 each day, driving about 40 minutes out of the hour. The best mileage in a single day was approximately 40 miles, while the shortest mileage - ten miles - was made through heavy sastrugi under whiteout conditions. Only two days were lost - one during a whiteout on the Skelton Glacier, the second in a blizzard on the plateau.

The party found the icecap along their route to vary in thickness from 2300 to 3400 meters. The land beneath the icecap was a few hundred meters above or below sea level.

Studies of snow stakes set out by Dr. Crary on his 1958-59 traverse showed a two-year snow accumulation of 73 centimeters at the Plateau Depot, while those at Station 84 (60 miles west of the depot) showed a 9 centimeter accumulation.

The members of the party left the Pole on 17 February. Their vehicles and equipment were stored at the station in anticipation of an effort next year which would carry a party from the Pole toward Queen Maud Land or elsewhere across the polar plateau.

ELLSWORTH HIGHLAND TRAVERSE

(See Bulletin, Volume II, Number 4, page 21; Number 5, pages 23-24)

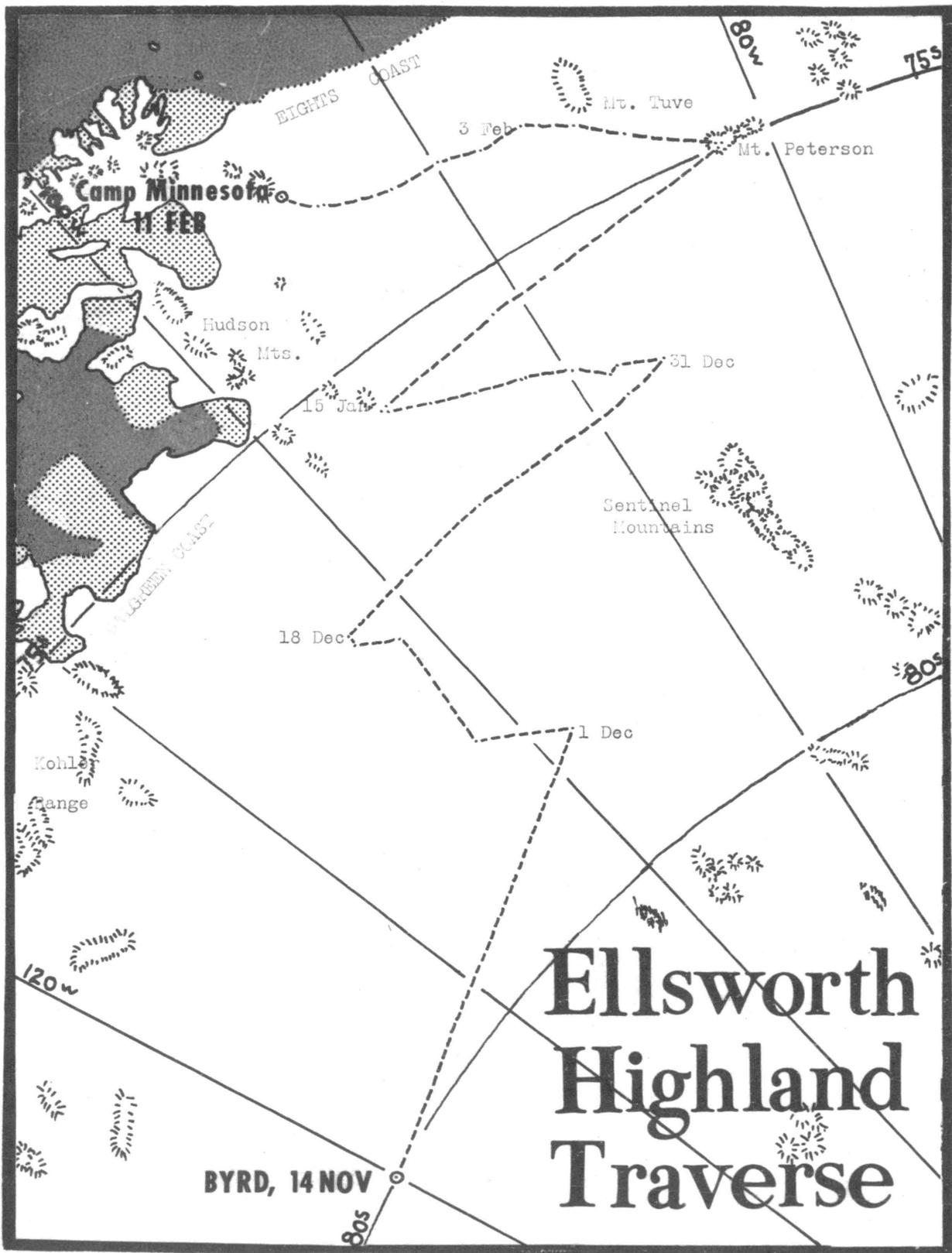
On 11 February, the Ellsworth Highland Traverse party completed their 1,215-mile journey from Byrd Station to the Eights Coast of the Bellingshausen Sea. The six-man party arrived at Camp Minnesota, bringing their three vehicles and five sleds to the end of a period of extensive scientific study. The party, led by Dr. Charles R. Bentley, had found that the surface and sub-surface topography of the previously unexplored region of the Ellsworth Highland was much more complicated than had been thought.

The party made 22 full day and 28 overnight stops to conduct scientific investigations. They would travel 24 miles, then stop overnight; travel 24 miles the following day and then pause for a full day of scientific work. Travel was at five miles an hour and on travel days took eight hours, with short stops for scientific measurements.

Altimetry readings were made at one-third mile intervals. Temperature, wind velocity and direction, gravity, magnetic, and slope shots (determination of the direction and amount of surface slope) were measured every 3 miles. Every six miles, ramsonde and sastrugi measurements were taken, while sun shots were taken every twelve miles.

The following observations were carried out:

- 2,800 surface elevations
- 405 gravity determinations of ice thickness



Ellsworth Highland Traverse

BYRD, 14 NOV

Camp Minnesota
11 FEB

3 Feb

Mt. Tuve

Mt. Peterson

Hudson
Mts.

15 Jan

31 Dec

Sentinel
Mountains

18 Dec

1 Dec

Kohle
Range

EIGHTS
COAST

KOHLER COAST

80°

75°

80°

120°

85°

203 ramsondes (snow hardness measurements)
51 seismic determinations of ice thickness
45 measurements of the vertical component of the magnetic field
30 two-meter glaciological pits
25 pibals
22 three-meter glaciological pits
10 wide angle seismic reflection profiles
4 seismic short refraction profiles
4 seismic long refraction profiles

The overnight stops included seismographic reflection observations; a two-meter pit study of snow, density, temperature, and stratigraphy; a ten-meter measurement of snow temperature; determination of magnetic components; a six-hourly observation of the weather; and conditions permitting, a pibal sounding.

A full day period of investigation included seismographic reflection observations, and at some stations, wide angle reflection shots (to study near-surface wave velocity in detail) or reflection shots to study shear wave velocity. In addition to these ice-thickness measurements, a three-meter pit would be dug for glaciological studies and a 10-meter hole drilled with a mobile rig for density and temperature measurements. Magnetic components would be measured throughout the day to eliminate diurnal variations and weather observations would be taken every six hours with pibals sent aloft at midnight (Greenwich Mean Time).

The party drove three 743 Model Sno-Cats, which consumed 5,500 gallons of gasoline. These pulled two sled-mounted wannigans, and three one-ton sleds of food and equipment. They were re-supplied by four flights early in December and four in mid-January. Two R4D flights evacuated the party on 12 February.

At the end of the traverse, helicopters from USS GLACIER and USS STATEN ISLAND, operating with the Amundsen Sea expedition, carried Dr. Bentley and his altimeters from Camp Minnesota to sea level, providing data for calibration of the instruments.

The party had hoped to establish the existence of a Ross Sea-Bellingshausen Sea trough. Previous work showed portions of the area under study to be 2,000 meters below sea level, but the hypothesis has been complicated by the finding of two sub-glacial areas along the route near and above sea level. The party found no crevassed areas and sighted no mountains until they reached the vicinity of Camp Minnesota. Mt. Tuve and Mt. Peterson were found to be nowhere the locations presently plotted on the map. Observations show that snow accumulation was extremely high near the coast. It was found that the plateau ice is dammed up behind coastal mountains; over the last 25 miles of its route the party found that the ice cap dropped 100 meters in elevation.

The Sno-Cats and equipment were left at Camp Minnesota where much of the equipment will be fitted out again late in 1961 for another traverse in this unexplored region.