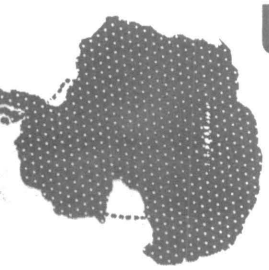

UNITED STATES ANTARCTIC RESEARCH PROGRAM

Administered by the National Science Foundation

NSF 63-13

Antarctic Status Report No. 49, for January 1963

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CONTENTS

GENERAL

Eights Station: The new Eights Station was constructed between the 6th and 27th of January by the U.S. Naval Mobile Construction Battalion 8 with a total of 206 man-days, 3 days being lost during the period because of bad weather. Eleven prefabricated trail complexes (25' x 7') were flown into the station in C-130 cargo planes, then pulled off the ramps of the C-130s and located in position over foundation timbers with a D-4 Caterpillar. Of the 11 buildings, 8 were joined in one complex constituting the main camp while 3 others, 2 for geomagnetics and 1 for VLF work, were located a few hundred yards away in accordance with scientific requirements.

The station, located near last summer's temporary Ski-Hi site at 75°15'S, 77°15'W, is planned especially for upper atmosphere studies in connection with the coming International Year of the Quiet Sun period, 1964-65. The magnetically conjugate area to Eights Station is about 100 miles north of Quebec City, Canada, in the Laurentide Park and similar types of observations are planned at that site. Eleven personnel will occupy Eights Station during the winter; 5 scientists operating auroral, geomagnetic, ionospheric, meteorological and VLF equipment, and 6 U.S. Navy support personnel.

The Sno-cats, Rolli-trailer, and other traverse equipment used in the 1961-62 summer and left at the Ski-Hi Station have been dug out and repaired as necessary for return to Byrd Station on the cargo C-130 planes. One Sno-cat and a Rolli-tralier were backloaded January 27th and two of the remaining Sno-cats and one ton of miscellaneous equipment will be taken out at the first opportunity.

USNS Eltanin: The ship left Valparaiso on November 24, 1962, to begin Cruise 6. After a stop at Punta Arenas where cameramen from the "Chet Huntley Reporting" TV show boarded, the first part of the cruise was conducted in the northern part of the Drake Passage. On December 10th the Eltanin returned to Punta Arenas to disembark the cameramen, then continued the cruise between 56° and 59°W Long. At the southern end of the trip considerable work was done in Bransfield Strait with stops made at Deception Island where geological samples were obtained. The farthest south position reached was near the Melchior Islands, 64.3°S, 63°W, just north of Anvers Island. The ship returned to Punta Arenas, completing the cruise, on January 23rd. The routing is shown on the map, page 26.

As on earlier cruises, deck equipment was handled by representatives from Texas Instruments, Inc. Although most of the operations involved specific agencies, programs such as the bottom camera and the precision depth recorder for bathymetry were carried out for general use of all agencies.

Cruise 7 began on February 4th and is expected to be completed on or about March 19th. It will be conducted between 48°S Lat. and the edge of the ice pack, and 45° and 50°W Long., in the general vicinity of the South Orkney Islands.

Hallett Station: The icebreaker Eastwind arrived January 1st with a year's supply of fuel oil. On January 24th the icebreaker Glacier stopped by and picked up some of the summer personnel.

Re-roofing of the station building has been completed and the Jamesway hut lost in the fire in December has been replaced. Space is being planned in the old seismic recording building for a USARP library.

McMurdo Station: Interior partitioning of the USARP warehouse has been completed. The "elephant" quonset hut has been emptied and will be used for winter storage of cargo and vehicles. The power wagons and one RN-50 are in use at present and a second Sno-cat has been put into working condition.

The cosmic ray building extension, the addition to the biolab and the new living quarters have been completed, and the old cosmic ray building dismantled. Construction required for the meteorological rocket program is in progress.

Palmer Peninsula: The USS Staten Island left New Zealand in early January on an expedition into the Palmer Peninsula region to survey potential station sites. After visiting land areas in the general vicinity of Adelaide Island and Marguerite Bay, the Staten Island proceeded north towards de Gerlache Strait. The scientific base that is planned will be principally for land and marine biological studies.

South Pole Station: Bulk resupply has been completed and all material stowed away. Camp construction, which includes new USARP barracks, continued throughout the month.

Wilkes Station: The new wintering-over party arrived on the Thala Dan January 10th together with new supplies including two years' requirements of diesel fuel. The ship left the base on the 24th. Rubber tanks are being installed for the storage of 30,000 gallons of bulk fuel which will be filled from the ship Nella Dan, due to arrive in late February.

The Australian over-snow traverse party to Vostok, that left Wilkes Station on the 17th of September, returned on the 23rd of January, having covered nearly 1800 miles. One of the U.S. Weather Bureau observers accompanied the traverse, acting as weather observer, navigator and cook.

BIOLOGY

Bird Island, South Georgia:

Johns Hopkins University and Bernice P. Bishop Museum: The R.R.S. Shackleton stopped by on the 20th of January, offloading the remaining cargo. The base hut and generator shed have been erected, and the engine foundation installed. Meanwhile, routine meteorological observations are under way, and studies continued in the Wanderer and Mollymauk areas, on bird census and chick weighings.

Ellsworth Station (October): Field biological studies are being conducted on the glaciological trip along the edge of the ice shelf to Moltke Nunatak.

Blood and urine analyses were continued in the human physiology program, and a complete series of spirometry measurements carried out.

USNS Eltanin:

Bernice P. Bishop Museum: For entomological studies, six insect nets were kept aloft on each side of the ship except during the days in port and storms. A few minor problems were encountered with entanglement of ropes used to hoist the nets but generally operations caused little trouble. Although a great number of discernible insects were collected, all were taken within 2 or 3 days of Valparaiso or Punta Arenas. The six orders represented by the insects are the diptera, hymenoptera, lepidoptera, hemiptera, coleoptera, and neuroptera. All material collected, including the debris and microscopic particles, has been saved and put in procaine tubes for later study.

Columbia University (LGO): Microbiological samplings were made at 51 stations, 17 of these being closely spaced in Bransfield Strait and along the western coast of the Peninsula. Over 330 Van Dorn bottles of sea water collections were made at 8 levels, with analysis for chlorophyll made at each station. Some chemical determinations of reactive phosphates, silicates, nitrates and other micro-nutrients were also made.

Bacteriological collections were taken with aseptic samplers of the Zobell type. These were made at 4 or more levels from intermediate aphotic down to the benthic zone. Approximately 86 marine sediment samples of bottom ooze were collected from various bottom grab devices for bacterial and chemical analysis. Ice collections were obtained as close to land as possible in Bransfield Strait. Subsequent microscopic examination of the thawed ice samples

showed phytoplankton with Coscinodiscus sp., Charcotia sp., and Corethron sp. being predominant forms.

For the phytoplankton collections, 44 samplings were made, some of these in the Strait of Magellan. No distribution pattern was evident for any given species of phytoplankton although in general both phytoplankton and zooplankton were found in abundance, particularly at depths of 25, 50 and 100 fathoms.

During the cruise, 261 Carbon-14 studies were made at 7 pelagic levels. These samples will be analyzed at the Lamont laboratories.

De Paul University: In this program a study is being made of the metabolism and intermolt cycle of crustaceans in relation to temperature and temperature acclimatization. During the early part of the cruise some studies were initiated with pelagic branchiopod crustaceans. However, the numbers of these crustaceans collected decreased south of the Drake Passage, where euphausid shrimp occurred in extremely large numbers. Consequently, studies were diverted to these shrimp and 200 individual animals were studied microrespirometrically with respect to previous temperature history and metabolic adaptation to temperature, as well as with respect to substrate utilization and metabolic inhibition. In addition, animal samples for glycogen, lipid and shell calcium have been frozen or dried to be weighed in port and analyzed later. The lipid analysis cannot be completed with available equipment and these will be returned to the university laboratory for study.

Although accurate weighing of specimens is not possible aboard the ship and the data is therefore preliminary, it is believed that temperature adaptation in these two crustacean groups probably correlates closely with the metabolic capabilities.

University of Southern California: From a biological standpoint, Cruise 6 was extremely interesting. The areas worked included the shallow shelf east of Patagonia, the Burdwood Bank south of Falkland Islands, the deep waters of Drake Passage, the shallow shelf areas of the South Shetland Islands and the somewhat deeper waters of Bransfield Strait. Sub-antarctic and antarctic regions were thus covered in a wide variety of habitats, particularly in the Bransfield Strait where collections from 34 stations, made with a variety of instruments, should give a very clear picture of the distribution of antarctic benthic organisms.

During the cruise a total of 126 sample collections were preserved, amounting to approximately 400 gallons of material, which included about 1000 specimens of bottom fishes. The collections were obtained as follows:

One-half meter plankton nets	4 tows
10-foot Isaacs-Kidd mid-water trawls	31 tows
Menzies small biological trawl	15 tows
Campbell grab	1 sample
10-foot Blake trawl	4 hauls
5-foot Blake trawl	20 hauls
40-foot Otter trawl	7 hauls
Phleger corer	13 cores
Rock dredge	17 samples
Petersen grab	6 samples
Miscellaneous methods	8 samples

The trawling gear generally worked better than during the last cruise and, except for the Isaacs-Kidd trawl, losses were fewer. Part of the success was due to the area surveyed and part to changes made in the gear and in the manner of operation. The Otter trawl was entirely successful and was undoubtedly the most efficient device for collecting bottom organisms as it brought up not only sessile invertebrates but also numerous specimens of the more active forms such as fishes and crustaceans. In one haul there were several hundred fish of about 7 species.

Based on cursory examinations of some of the fishes and invertebrates in Bransfield Strait, it appears that a high proportion of the species represent distinct antarctic fauna. Sufficient hauls were made to indicate certain changes in species with depth. Of the fishes, harpagiferids and bathydroconids were taken in the deeper hauls, nototheniids at all depths but mostly at the shallower stations, and the chaenichthyids at all the shallower stations. This work in Bransfield Strait has made available a very good representative collection of the true antarctic groups of fishes, which are poorly represented in U.S. museums at present.

Hallett Station:

Ohio State University: Microbiological sampling of viability on fertilized plots continued on a weekly basis. A pond was selected in the Hallett skuary for weekly bacterial analysis and quantitative determinations of ammonia and nitrate while the pond across the Edisto Inlet was sampled twice, with bacteria and algae isolated for later study in the U.S.

Ohio State University: Most of the month was occupied with accumulation and processing of microclimate information for lichen ecology and isolation of lichen and soil algae and fungi for moisture content determination. The final series of photographs of the select quadrants has been made for growth rate measurements of lichens.

New Zealand Program: Studies of the Adélie and skua colonies continued until the departure of the investigators January 24th on the icebreaker Glacier.

McMurdo Station:

Biolab, Stanford University: General maintenance and repairs of the biolab, including shelf construction and space heater installation in the storage Jamesway have been completed. A new compressor has been installed in the laboratory. Most of the supply items have been received and inventoried.

Bernice P. Bishop Museum: Two-day visits were made to Lake Penney and Lake Rivard on Marble Point for microclimatological observations. During the visits, skuas were collected for study of nasal passage mites. Four days were spent in the Upper Wright Valley obtaining meteorological and soil temperatures, and a one-day trip was made to Cape Evans for collections of mites, both free-living and in skua nasal passages. Additional collection trips were made on Observation Hill and the rock outcrops on the south end of Ross Island for insects and mites. In the laboratory, work continued on insect feeding preferences and the measurements of salinity, moisture and acidity of soils where the insects and mites were found.

University of California at Davis: Three field trips were made to the Cape Evans ponds which were completely free of ice and offered excellent sampling opportunities for the first time in two years. Routine measurements were made on Carbon-14 primary productivity, temperatures, alkilinity, phosphates, chlorinities and light penetration. In two of the lakes, over a period of twenty-four hours, samples were collected and incubated every three hours. The radiation, insolation, water temperatures and heat loss from the bottoms of the lakes were also measured, and short-term studies made of the relationship of photosynthesis to light and temperature.

Three additional trips, made to Lake Vanda and Lake Bonney by helicopter, allowed experiments in primary productivity, light penetration with different filters, radiation, insolation, temperature and conductivity measurements. Analysis of the results of light penetration in Lake Vanda indicate that this may be one of the clearest lakes in the world with 20 per cent of the light penetrating the ice and 1 percent of the surface light level obtained at a depth of 55 m.

Johns Hopkins University: Bird-banding programs and other ornithological studies continued at the Cape Crozier camp on the eastern side of Ross Island. This program is expected to continue until about the first of March.

Ohio State University: In order to determine the factors of physical and chemical environment important to microbial ecology, over 200 samples have been collected and analyzed from Wright Dry Valley, Taylor Dry Valley, Marble Point and the Stranded Moraines. In each case the microbial populations are being determined and physical and chemical analyses made.

Stanford University (Australian observer): Work continued on the sea surface plankton populations, including those attached to the under surface of the sea ice. In early January the phytoplankton populations were dominated by phaeocystis. There appears to be a marked difference between the floras in the ice and water in terms of photosynthetic activity with varying light intensity and salinity. Compared with the 1961-62 season, the phaeocystis bloom has been slight and already concentrations have started to decrease. The under-ice population reached a peak between the 4th and 9th of January and disappeared with the loss of the lower porous layers of sea ice between the 9th and the 19th of January. There is some evidence that a further phytoplankton population was being introduced at the end of the month. These organisms are largely pennate diatoms and appear to require relatively high levels of illumination for maximum photosynthetic activity.

Stanford University: Age and growth studies continue on specimens of T. hansoni, T. centronotus and T. leonnbergi. Some specimens of T. bernacchii were collected during a reconnaissance made of various sites for potential fishing locations. An iron grate was tried out in some of the fishing holes in an effort to keep out the seals.

Two dives were made at one of the fishing stations and another under the pressure ridges of the ice front to collect diatoms and observe melting processes. The total ice thickness including the ice flakes was 20 to 25 feet on January 7th but by the 19th the flake ice had gone, leaving 9 to 10 feet of solid ice with the under surface hard and smooth but with shallow depressions. Although the Weddell seals were present at times during the dives, they were not troublesome.

University of Wisconsin: Although several flights were planned, and two actually made to the Ross Ice Shelf area for penguin navigation experiments, continued overcast and bad weather prevented these experiments from being successful. Finally, two flights were made to the Victoria Land Plateau where, despite the low temperatures, navigation experiments were carried out successfully.

CARTOGRAPHY

U.S. Geological Survey: The Topo East operation to obtain surface control in the mountains southeast of the Beardmore Glacier was completed through the Ohio Range of the Horlick Mountains. Further operations to the east and southeast, which would require closure over large distances of snow surface to the Thiel or Whitmore Mountains, were canceled because of adverse conditions of refraction and weather.

GEOLOGY

University of Alaska: Study of the volcanic rocks of Ross Island was terminated early in the month.

U.S. Geological Survey: In the Patuxent Mountains the folded sandstones, siltstones and shales were found to have been intruded in many places by basic dikes up to 2 feet wide, some appearing megascopically to be lamprophyres. These dikes intrude along joints which cut across the regional fold structures and only locally parallel the well-developed axial plane cleavage. Intrusion at shallow depths is suggested by the lack of contact metamorphic effects. Bulk samples of basic dike rocks rich in biotite have been collected for radioactive age analysis. These dikes are post-orogenic and may be related to the ultrabasic intrusives found in the northern part of the Pensacola Mountains by the 1957-58 Ellsworth Station traverse party.

A previously unknown group of small nunataks about 50 miles south of the Patuxent Mountains was visited and found to be made up of sandstones and siltstones of the Beacon formation containing abundant leaf flora. At least two diabase sills, one of which is more than 120 feet thick, intrude the exposed Beacon formation.

Glaciological investigations included firn density and temperature in a 30-m drill hole, ice movement by resurvey of 3 sets of stakes, annual accumulation and density in shallow pits, ramsonde studies, and accumulation from a stake network north of the Patuxent Mountains.

University of Minnesota: The University of Minnesota geologist continued operations in the Ellsworth Mountains from central and southern stations during the month of January. The completion of the program is expected in early February with the evacuation of the party and location of fuel and rations for subsequent work in the area.

Rutgers University: Stations in the Victoria Land Mountains were occupied in Olympic Range, Taylor Glacier, Beacon Valley, Blue Glacier and Lower Wright Valley for the continued soil studies. At each site soil samples and soil temperature measurements were obtained, comparing the moisture and salinity with the degree of weathering of the soils and glacier deposits. Some soil lichens were collected in Lower Wright Valley, at an altitude of 4600 feet, for a study of the influence of living plants on mineral alteration.

University of Wisconsin: Studies of the patterned ground were concentrated in the Mt. Nussbaum and Hobbs Glacier moraines where stakes were remeasured and ground temperatures studied. These latter observations are obtained continuously using battery-operated recorders, the batteries being kept charged by generators operated by wind vanes.

GLACIOLOGY

Byrd Station:

Cold Regions Research and Engineering Laboratory (CRREL): Snow accumulation for the past year has been determined by measurements of 42 snow stakes over a 11-mile line. The average was 30.9 cm with minimum of 12 and maximum of 55 cm. Temperatures and hole diameters were remeasured in the 300-m hole drilled at old Byrd Station in 1957-58. From an initial diameter of 5.8 inches a reduction has occurred to 3.0 inches at 786 feet, 1.5 inches at 829 feet and 1.0 inches at 845 feet. Thirteen cross sections through the trenches at the new Byrd Station were remeasured for additional deformation information.

Ohio State University: The photogrammetric ice movement study installations between Byrd Station and Whitmore Mountain were completed with 178 photo markers, 7 base arrays for local strain studies and ground control for the photogrammetry. Several points on Mt. Chapman were selected for horizontal and vertical control points. Between the base arrays photo markers were located at intervals of 2 to 4 miles and azimuth obtained throughout by thedolite measurements. Altimetry measurements for elevations were conducted both on the outgoing and return trips. Several rock specimens were obtained and extensive glaciological pit studies made.

Ellsworth Station (October): A glaciological traverse left the station on October 23rd with 2 Sno-cats, 1 weasel and 2 wannigans. Movement stakes will be surveyed along the Filchner Ice Shelf between the Moltke Nunataks and the Ellsworth Station.

Hallett Station:

U.S. Weather Bureau: The average net change on 15 snow stakes was - 1.0 cm.

Eights Station:

U.S. Weather Bureau: Since the summer operation of the Ski-Hi Station a year ago, there has been over 125 cm (50 inches) of snow accumulation.

McMurdo Station:

University of Michigan: The Ross Ice Shelf survey team completed operations in January, averaging about 20 miles per day during the working period since November 6th. Two lines of stakes have been set out and distances measured by tellurometers and angles by theodolites over 497 miles along the old east-west Dawson trail from McMurdo to Camp Michigan, and 379 miles along a north-south line between a point near the edge of the shelf to 81.5°S, 167°W. The average separation of the stakes was about 5 to 6 miles. Of the total of 86 days' work, 32 were lost due to fog or high refraction which make accurate surveying impossible.

The 20 triangular strain patterns set out in 1959-60 at the 20-mile cairns of the original trail were remeasured. Some remeasurements over 1 to 2 months were also made of the distances observed with the tellurometer, giving preliminary values of strain in the order of 100×10^{-5} per year, equivalent to a creep of 1 m per km per year.

Accumulation measurements were made on about 2000 bamboo accumulation poles which were installed in 1959-60. Density and stratigraphy of the upper 2 meters of snow and firn layers were determined in 25 snow pits.

South Pole Station:

Ohio State University: (See Traverse Operations.)

U.S. Weather Bureau: The average net snow accumulation at 50 snow stakes during January was 0.8 cm.

Wilkes Station:

U.S. Weather Bureau: A snowfall of over 11 inches during January was the highest recorded precipitation for a single month yet recorded at Wilkes.

GRAVITY AND MAGNETICS

USNS Eltanin:

University of Wisconsin: The nuclear resonance magnetometer was in continuous operation about 90 percent of the cruising time between 24 November and 17 January and good magnetic data was obtained over an estimated 85 percent of the track. Eight complete traverses were made across Bransfield Strait.

On 17 January magnetometer operation was suspended due to the loss of the cable and sensing head, the cable apparently being severed by the ship's screws in heavy seas. A new plexiglass fish is being fabricated on the ship and the program will be operational again for Cruise 7.

South Pole Station:

University of Wisconsin and Coast and Geodetic Survey: (See Traverse Operations.)

METEOROLOGY

Byrd Station: A good radiosonde average height of 31,182 m was obtained for January, using only the 600-gram balloons. The experimental iron inflation pipe for transfer of the hydrogen gas continues to work well. Two weather forecasts per day have been made throughout the month.

Six inches of new snow fell during January.

Eights Station: Work is progressing satisfactorily on the establishment of the new meteorological facilities with surface and pibal observations being taken while new instruments are installed. The wind mast has been erected and a new snow stake field laid out. Present indications are that prevailing winds at this station come from the southeast.

USNS Eltanin:

U.S. Weather Bureau: Upper air observations were obtained during 78 successful balloon releases with an average terminating height of 27,390 meters, the maximum height being 36,668 m. Ten releases were unsuccessful. The AN/SPS radar with which the radio balloons are tracked to determine winds

aloft has been inoperative since July 1962. Although there were some problems originally in the electronics of the unit, the main difficulty has been with the mounting on the forward mast. The housing that had previously cracked was repaired by welding, but these welds also failed. A complete replacement antenna is planned at an early date.

Surface synoptic observations were made throughout the cruise, a total of 212 being obtained.

The surface ozone equipment was out of operation at the beginning of the cruise but was repaired and readings began on December 9th. Satisfactory operations continued until January 3rd when a breakage occurred in the recorder that could not be repaired. Air samples were taken at five sites spaced between the Falkland Islands and the Peninsula. These will be forwarded to Scripps Oceanographic Institute for carbon dioxide analysis.

From coded information received aboard from the Argentine Navy Meteorological Service, synoptic weather analysis maps were prepared on 36 days and used to forecast weather in the Eltanin operating areas.

Ellsworth Station (October): During the month, 27 radiosonde balloons were released and averaged 18,494 geopotential meters in height. The hydrogen generator was out of order for two days, resulting in loss of four radiosondes. The average characteristics of the atmosphere for October were as follows:

Level (mb)	Height (geop. m.)	Temperature (°C)
850	1101	-17.9
700	2545	-21.7
500	4954	-37.3
400	6461	-48.2
300	8300	-51.7
200	10735	-72.4
150	12425	-71.9
100	14820	-70.0
50	18993	-64.9

The average height of the tropopause was 219 mb, or 10,130 geopotential meters and the average temperature at this level was -72.2°C.

Eight determinations of carbon dioxide were made with melted snow water

with the following results:

Date	Percentage	Date	Percentage
Oct. 13	.0207	Oct. 23	.0222
17	.0205	24	.0200
18	.0203	27	.0233
20	.0200	31	.0206

Hallett Station: The precipitation and snowfall were the lowest yet recorded for Hallett Station during January. There has been no snow at the accumulation stakes since the middle of the month. The average height of 58 radiosondes was 25,788 meters. No radiometersondes were scheduled and the ozonesondes have not yet arrived. The surface ozone programs operated normally but total ozone programs have been suspended until the spectrophotometer could be calibrated.

Average temperatures recorded at Hallett during January were as follows, all taken on 1200 local time:

10 meters above surface	-0.6°C
2 meters above surface	0.0
10 cm below surface in soil	-2.8
20 cm below surface in soil	-0.6
50 cm below surface in soil	-5.6

McMurdo Station:

U.S. Navy: (For standard surface and upper air observations see Climat.)

Texas Western College: Rocket firings continued on a weekly schedule.

Construction work which includes space for the new GMD, a radome vestibule between the radar vans, and installation of on-site power is progressing rapidly and should be completed by mid-February. All resupply items have arrived and change-over to the new wintering personnel completed.

South Pole Station: Fifty-eight radiosonde flights reached 32,878 m, considerably higher than any previous January average. Four runs were lost due to pylon trouble which has not yet been completely eliminated. Of the flights,

2 runs reached 2 mb, 7 reached 4 or less and 69 percent of the flights reached 10 mb or less. The Baker generator parts have been installed but some difficulties remain to make this equipment operational. The new Gill generator was placed in operation on the 27th with the old unit retained as standby.

Radiation programs were terminated on the first of January and the building is now in use for the surface ozone program. A separate building constructed for the NRL radioactive fallout program will be operational in February. All supplies have been moved to an inside cache. The Regener automatic surface ozone equipment started operation again on January 11 and now gives nearly the same amount of ozone as the chemical type. This is probably due to the uncontaminated samples obtained at the new collecting site.

The first gammasonde flight flown in Antarctica was made during the month and indicated no significant changes in radioactivity with altitude.

Wilkes Station: The raob hut has been completely renovated and rewired to accommodate the ozonesonde ground equipment. The recorder for the radiometersonde program is being repaired and overhauled.

The sferics set operated smoothly but radio communications were not completely satisfactory. Lack of spare parts for this program leaves the future work somewhat in doubt.

The ozone operations using the Dobson equipment have not been entirely satisfactory as the calibration results are not repeatable. The instrument is presently down for overhauling and further calibration. Ozonesonde flights were not possible due to damage and other problems presently under investigation.

OCEANOGRAPHY

USNS Eltanin:

Columbia University (LGO): During Cruise 6, 39 hydrographic stations were obtained, 17 being taken in Bransfield Strait. These latter stations are in close proximity to ones taken by William Scoresby about 30 years ago. All samples obtained were analyzed for salinity, dissolved oxygen, pH, nitrate, phosphate and silicate. Some difficulties were encountered in the pH analysis and this information is lacking in the first 7 stations. Contamination of the synthetic sea water used for the analysis of the phosphate ion is resulting in an unknown error in the phosphate calculation. There have also been some problems with malfunction of the unprotected reversing thermometers.

In addition to hydrographic stations, bathythermograph recordings were obtained every hour for most of the cruise and every half-hour during the four crossings of the Antarctic Convergence.

Columbia University (LGO): A heat flow program was initiated on Cruise 6, and 10 usable temperature gradients were obtained in the bottom sediments. Preliminary calculations indicate some latitude dependence of the heat gradient but final verification will depend upon better determinations of core conductivity.

There was considerable difficulty with the use of the thermograd with the piston corer and many of the core pipes were bent badly due to the waiting time necessary to establish thermal equilibrium in the sediments. Although various methods were tried to overcome this problem, it has not been completely resolved and it may be necessary to obtain this information separate from the main coring program.

Florida State University: In the marine geology program, bottom samples were taken from 51 different stations during the cruise as follows:

Piston core	32
Phleger core	35
Rock dredge	24
Petersen grab	42
Samples from USC trawls	28
Total	161

The bottom sediments in the area investigated may be divided into three types. In the vicinity of Burdwood Bank, a coarse sediment of broken shell and sand predominates. To the south of the bank globigerina ooze was found to extend to the Antarctic Convergence. South of the convergence glacial marine and diatomaceous sediment prevailed with results in Bransfield Strait showing a distinct change in sedimentary environment.

Bottom photographs were obtained at 42 of the major stations.

National Institute of Oceanography: During the cruise, 6 water samples were obtained for personnel of the National Institute of Oceanography at Wormley, England, for their investigation of the chemical and physical properties of sea water from all the major oceans.

Texas A & M: The partial pressure of carbon dioxide in the air and surface water was determined continuously until December 9th at which time the infrared gas analyzer became inoperative. It was necessary to ship parts of this instrument back to the factory for repairs, but it is expected that the analyzer will be in working order for the next cruise.

Six trace element stations were obtained during the cruise. Difficulties were experienced with the water samplers and some depths of sampling were lost on the first stations. Ten calcium carbonate stations were taken and no difficulties were encountered with this operation. The carbonate saturation level decreased steadily from moderately super-saturated at the surface to slightly under-saturated at the bottom with no pronounced maxima or minima in the open ocean waters. Erratic saturation levels at depth were noted in Bransfield Strait.

STATION SEISMOLOGY

Byrd Station: The standard seismic equipment was in continual use throughout January, but the long period seismometers still require some final adjustment before satisfactory operations can be maintained.

Hallett Station: Thirty-two earthquakes were recorded and 11 of these reported. There have been exceptionally high-amplitude microseisms during the month due to heavy wave action in the bay and many of the records are not readable.

The new seismic hut has been built on the southeastern end of the hook and the concrete base poured. The recording equipment will soon be moved into the biolab annex.

South Pole Station: During the month 169 earthquake phases were reported, though considerable time was lost due to lack of regulated power, and from loss of a power line that was cut during station construction. The free period of the vertical seismometer is 0.74 seconds.

An 8 x 20 ft. recording buiding has been constructed for the new long period seismograph equipment. This is now being installed and should be in use some time in February.

Wilkes Station: Some recordings were lost when the heaters failed in the long period seismograph vault and the units became unstable. These are presently under repair. Records were also lost on the 21st when the shutter of the long period seismograph did not open, and on the 25th when leakage developed in the vault of the Grenet unit.

TRAVERSE OPERATIONS

South Pole Station:

University of Wisconsin: The second phase of the oversnow traverse lasted from January 1st to 22nd. The route was from the Pole Station to 88°S, 83°W, then to 88°S, 56°W and return to the Pole. A 21 km seismic refraction profile was made near 88°S on the 15th of January. Nine seismic stations were occupied with seismic reflections obtained at each site.

Surface elevations were determined by altimetry, and gravity and magnetic readings taken at regular intervals. Absolute values of the various magnetic components were obtained by Coast and Geodetic Survey personnel.

Studies were made of the surface snow density, stratigraphy and temperature in shallow surface pits by Ohio State University glaciologists.

UPPER ATMOSPHERIC PHYSICS

Byrd Station:

Aurora and Airglow, Arctic Institute of North America: Preparations for the coming winter continued at the auroral substation. On January 9th, during work on the diesel generator, a flash fire occurred with some of the substation personnel sustaining minor burns. They were temporarily evacuated to the Byrd Station.

Geomagnetism, Coast and Geodetic Survey: The timbers above the absolute and variation buildings were replaced during January with aluminum beams. During the 6-day construction, recordings were maintained with only minor disturbances. Absolute observations were taken 18 different times with the QHM and proton magnetometer, giving the monthly means as follows:

declination	70°26.4'
horizontal field	16,308 g.
vertical field	58,059 g.

Ionospheric Absorption, National Bureau of Standards: Equipment noise affecting the riometer records was found to be caused by interaction between the 60-cycle standard power and the noise diode control units. This trouble has been temporarily eliminated and the riometer data quality is now good with little local interference other than from the ionosonde. The absorption at 30 mc was

nearly absent except during two periods of activity, the 13th to 20th of January and again the last two days of the month.

Ionospheric Soundings, National Bureau of Standards: The C-3 ionosonde equipment was closed down for nearly half of the month for modification, and during the period the complete transmitter was overhauled and aligned. Values computed for the first 16 days of the month showed that f_oF2 was recorded 24 percent of the time, with spread echoes accounting for 10 percent of the missing values. Blanketing by sporadic E and blackout obscured the F region 8 percent of the time. The maximum median value for f_oF2 was 6.3 mc at 1700 local time and the minimum at 4.6 mc at 0700.

Radio Noise, National Bureau of Standards: This program remained inoperative during the month for lack of power. Necessary generator parts arrived at the end of the month and the equipment should be operational within a few weeks.

VLF and ELF, Stanford University and Pacific Naval Laboratory: Although there was some chorus and hiss observed near the end of the month, January was rather quiet with very little whistler activity. For conjugate studies, 6 hours of continuous recordings were started on the 1st of January. Recordings for the scheduled Pole-to-Pole experiments with the Alouette satellite were conducted.

A representative from the Pacific Naval Laboratory has completed overhauling and modifying the micropulsation equipment and three orthogonal components of ELF have been installed. One of the ELF components showed considerable activity during the Special World Intervals.

VLF and Micropulation Studies, National Bureau of Standards: The supplies and equipment for this new program arrived in January and most of them are now unpacked ready for installation. Minor damage to the equipment is being repaired.

Eights Station:

Aurora, Arctic Institute of North America: The auroral observer for the coming winter arrived during the last part of January and is proceeding with the installations of the auroral equipment.

Geomagnetism, Coast and Geodetic Survey: All geomagnetic building installations have been completed and the pier tops will be located early in February. All equipment has arrived in excellent condition. The old geomagnetic buildings used last summer for the Ski-Hi program will be installed as

weather vestibules on the new buildings. The geomagnetic equipment from Ski-Hi will be returned to the United States for repair.

Ionospheric Soundings, National Bureau of Standards: Relocation of the equipment from the Ski-Hi camp and installation of new equipment are proceeding.

VLF, Stanford University: All equipment was received in good condition, the antenna has been installed and the cables laid. Recordings should start by mid-February.

Ellsworth Station (October):

Aurora, Arctic Institute of North America: The all-sky camera work was terminated on the 5th of October, with 47 film spools of 100 feet each taken during the winter.

Visual auroral observations were completed on the 7th. A total of 139 cards were filled out during October, all with negative results. The total of visual observations taken during the winter was 11,902.

Cosmic Rays, University of California (Argentine observer): Recording of the intensity of the neutron components continued with only brief losses due to power line failure.

Ionospheric Absorption (Argentine Program): After repeated failures to obtain successful results with the riometer, this program has been abandoned and it is planned to transfer the equipment to Buenos Aires.

Ionospheric Soundings, National Bureau of Standards (Argentine observers): There were no difficulties during the month with the vertical soundings programs other than a 5-hour interruption on the 1st.

VLF, Dartmouth College (Argentine observers): Whistler recordings continued with some losses on the 8th and 18th. Unfortunately, the notification of the Pacific test, scheduled for the 26th, arrived too late to make special observations.

USNS Eltanin:

University of Alaska: Due to the long twilight period the airglow

program was active on only two occasions on Cruise 6. No time was lost due to malfunction of the equipment.

Bartol Research Foundation: The cosmic ray meson telescope performed satisfactorily. This program is operated by Stanford University personnel and no analysis is done aboard ship.

Ionospheric Absorption, University of Alaska: Riometer observations were taken continuously without equipment trouble. Interference from the radio transmitter aboard the ship, however, still remains a problem.

Radio Noise, National Bureau of Standards: There were a few maintenance problems with the radio noise equipment during the cruise. The frequency converters for the 160 kc unit failed due to a bad resistor. Internal noise level of the 2.5 mc converter was too high and was not corrected by repair of the coil. Spare converters are in use at present. The November noise analysis has been made and forwarded to the Boulder Laboratories.

Antenna stub factors have required close attention and readings were taken about every other day instead of the normal 4 or 5 times per month.

Radio Science, Stanford University: Whistler activity was low during Cruise 6 in comparison with earlier cruises, although several days of high activity were observed below 60°S. Aside from a few problems with the electronic counter, causing several hours of lost data, no major problems occurred.

The Navy Transmitter NAA continued to be monitored and echoes were obtained on over one-half of the days. Preamplifier failures have occurred but very little data was lost.

The high frequency experiments operated without trouble and gave good data which is being shipped back to Stanford University for analysis. During the cruise a control system, which maintained constant HF antenna heading despite variation in ship's course was constructed and installed. Tests were conducted through a prescribed course allowing checks of the triggering level and selsyn control. The system was found to be functioning satisfactorily within the prescribed tolerance of 8°.

Hallett Station:

Aurora, Arctic Institute of North America: General repairs were made on the auroral tower in preparation for the winter program. The all-sky

camera and airglow photometer were being repaired while the infrared spectrograph has been dismantled and will be returned to New Zealand.

Cosmic Rays, University of Maryland (Arctic Institute of North America observer): The program operated throughout the month with no unusual events.

Geomagnetism, Coast and Geodetic Survey (New Zealand observer): Operation of this equipment was routine.

Ionospheric Absorption, Arctic Institute of North America: The riometer was in use continually except for one day when the regulated power supply failed. Absorption was noted on the six days of Special World Intervals.

Ionospheric Soundings, National Bureau of Standards (New Zealand observers): Normal disturbed conditions prevailed in January. The f_oF2 had an average value of 4.9 mc, and the f_oF1 gave full weight values between approximately 0800 and 1900 local time. Sporadic E was present 50 percent of the time with C-type being predominant. A new program of data presentation and transmission similar to that used at Scott Base was instituted on the 1st of the month.

From an analysis of the December ionosphere data, the total loss was 25 hours, with total absorption accounting for 5 hours. Spread echoes were present 81 percent of the time and sporadic E present 46 percent of the time. The average f_oF2 was 4.6 mc while the mean F_{min} was below 1 mc on 19 percent of the records.

VLF, Stanford University (New Zealand observers): This program was in routine operation except for the continuous runs that were made in connection with the Aloutte experiments.

McMurdo Station:

Cosmic Rays, Bartol Research Foundation: Dismantling of the old cosmic ray building is complete, the electronics and pile components being ready for shipment to the Pole Station.

Ionospheric Absorption, Douglas Aircraft Co. The buildings have been completed for winter occupancy. The 30-mc riometer is in normal operation with several auroral absorptions observed. The dopplometer has been installed and is in trial operation, monitoring WWV signals.

South Pole Station:

Aurora, Arctic Institute of North America: Bulk supplies for the auroral program arrived in excellent condition. The tower is being rehabilitated with new heaters and new wiring.

Geomagnetism, Coast and Geodetic Survey: With the installation of new cables, complete adjustment of all magnetic equipment has been undertaken with new orientation tests.

Fourteen sets of absolute values of the declinations, 18 sets of horizontal, and 16 sets of total field intensities were obtained during the month but computations have not been completed. From the magnetographs, monthly mean values have been computed as follows:

declination	$27^{\circ}42.7'$
horizontal intensity	15,914 g.
total field	56,789 g.

Ionospheric Absorption, National Bureau of Standards: January was a routine month with the riometer equipment and there were very few absorption events. Some time was lost due to relocation of equipment.

Ionospheric Soundings, National Bureau of Standards: Unusual ionospheric activity was observed during the period of the Quadrantids meteor shower of January 3rd and 4th. A stratified layer appeared between 200 and 1000 kcs from 200 to 300 km high, the height varying somewhat during the period. Although the layer first appeared intermittently on the 3rd, it became very pronounced on January 4th at approximately 1800 GMT.

VLF, Stanford University (National Bureau of Standard observers): Recordings of whistlers were stopped on the 14th while the move was made into the new buildings and new antennas and cables installed. The equipment has now been completely overhauled and the hum problems have been eliminated. It is expected that the program will be under way again early in February.

Wilkes Station:

Geomagnetism, Coast and Geodetic Survey (Australian observer): Except for some minor equipment problems which were soon remedied, the magnetic program was operational throughout the month.

Ionospheric Soundings, National Bureau of Standards (Australian observer): The C-4 ionospheric sounder was shut down during the change-over

of personnel in order to carry out a series of modifications to the equipment and the installation of a new antenna system.

U.S. SCIENTISTS AT FOREIGN STATIONS

USSR Research Vessel Ob: Dr. Francischini, meteorologist-oceanographer from Texas A & M, is presently aboard the Ob undertaking radiation studies.

FOREIGN SCIENTISTS AT U.S. STATION

USNS Eltanin: Dr. Nicholas Kudrysvtsev, USSR physical oceanographer, joined the Eltanin late in January and will be aboard for Cruises 7 and 8.

McMurdo Station: The USSR meteorologist, Dr. Tarakanov, arrived at Christchurch in mid-January and was en route to McMurdo at the end of the month aboard a Navy Task Force vessel. He plans to do atmospheric research for comparison with findings in the northern hemisphere.

REGISTER OF AVAILABLE FOREIGN SCIENTISTS

Below is listed information received from scientists of other nations who wish to participate in the U.S. Antarctic Research Program. The information on these persons is presented as follows:

a. Name
b. Date of Birth and Nationality
c. Present Place of Employment
d. Occupation and Desired Area of Investigation
e. Polar Experience
f. References

1. a. Polian, Georges
   b. July 30, 1932; French
   c. Laboratorie des Faioles Radioactivities for Administration des Terres Australes et Antarctiques Francaises (TAAF, Paris)
   d. Specialist in radioactivity; South Pole or Byrd Station, U.S.
   e.
   f. M. Jacques Labeyrie, Che/du service de'Electronique Physique, Centre de'Etude Nucleanes de Sacley, (Cen-S-C.E.A.), BP No. 2 Gilsfrette, France
   M. J. M. Roly - Consciller du affaires administatures - Terres Australes et Antarctiques Francaises

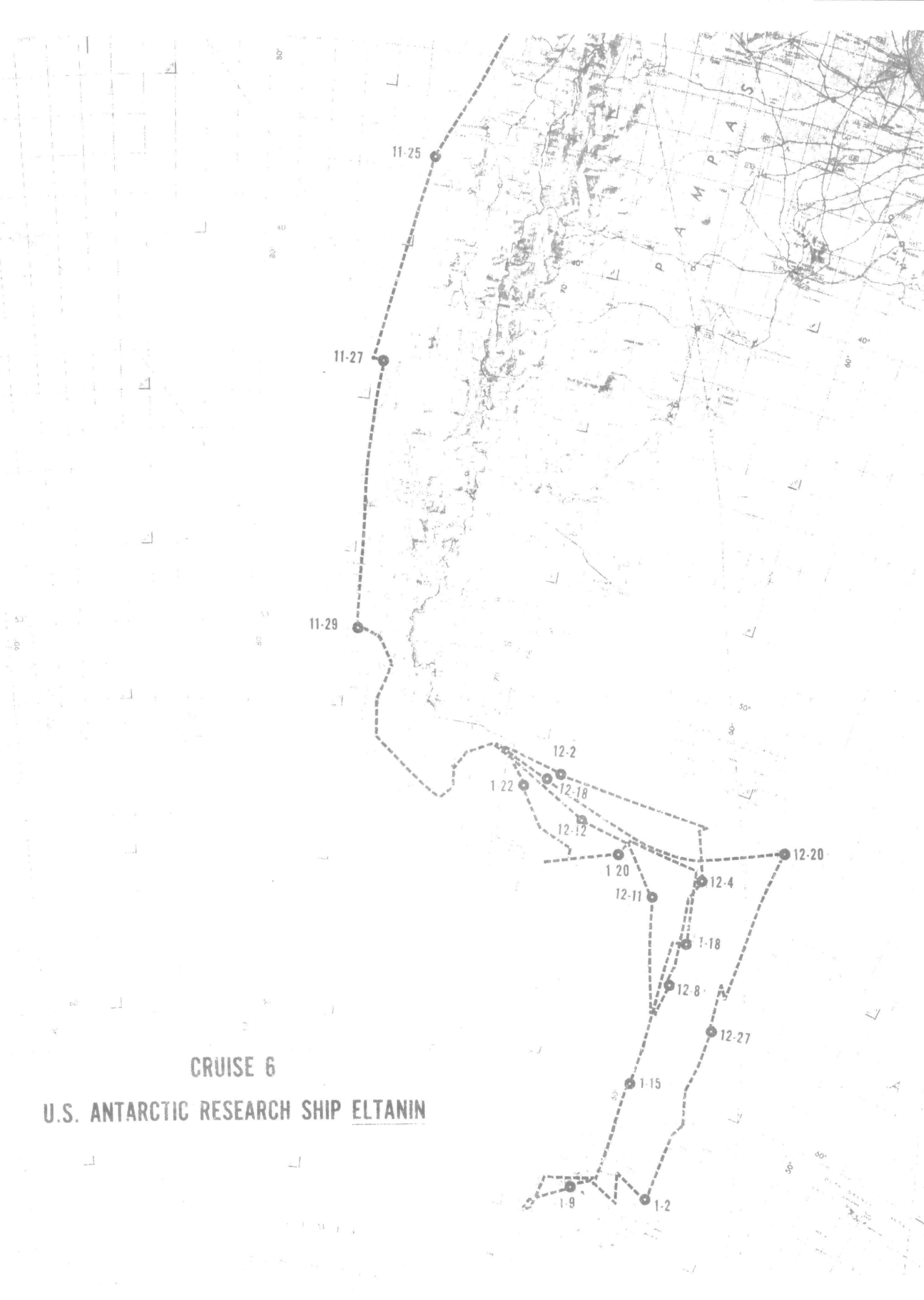
TABLE I - CLIMAT FOR JANUARY, 1963

	Byrd Station	Hallett Station	McMurdo Station	South Pole Station	Wilkes Station
Temperature, °C					
Average	-15.3	- 1.3	- 4.1	-28.9	- 0.4
Highest	- 4.8	+ 4.6	+ 1.1	-22.2	+ 7.2
Lowest	-28.8	- 8.3	-11.1	-39.4	- 6.6
Station Pressure (inches)					
Average	23.906	29.070	29.100	20.185	28.944
Highest	24.395	29.60*	29.570*	20.490	29.308*
Lowest	23.500	28.66*	28.550*	19.870	28.488*
Precipitation (inches)	---	0.11	Tr.	Tr.	1.1
Snowfall (inches)	6.0	1.3	Tr.	Tr.	11.0
Wind					
Prevailing Direction	N	SW	SSE	N**	NNE
Average Speed (knots)	12.2	3.0	11.0	7.7	9.3
Fastest Mile (MPH)	29.91	---	---	22	60
Peak Gust (MPH)	33.4	39	37	---	---
Average Sky Cover	7.3	6.5	5.9	6.5	8.2
No. clear days	4	7	4	7	2
No. partially cloudy	9	10	25	9	7
No. cloudy	18	14	2	15	22
No Days with visibility less than 1/4 mile	7	0	0	0	0
No. Radiosondes	62	59	61	58	30
Average height of Radiosondes (meters)	31,182	25,788	17,645	32,878	29,134

All figures above have been taken from radio messages and are unconfirmed.

* Sea-level pressure

** North defined along 0° Greenwich



CRUISE 6

U.S. ANTARCTIC RESEARCH SHIP ELTANIN