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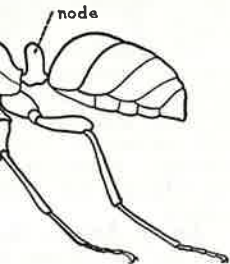
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VOLUME II
ANNUITY—AZZUBEYDI

There are two main in the United States. *guinea*, can live either. The other, *Polyergus*, survive without slaves curved jaws, so well-iless in feeding them-

Both types use as *fusca* or its close rela- as originally to have in which the more



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(usually red in color) of the timid *Formica* in pupae chanced to they were eaten, they captors. Some *san-* or four slaves to each *Polyergus* colonies each Amazon. Slaves which hundreds of ants may result in which e slain.

F. M., *Ants* (New York *World of the Ants*, vols. 1-3); Wheeler, W. M., *The Maeterlinck, M., The Life askins, C. P., Of Ants and ton, W. S., "The Ants of the Museum of Compara- Mass., 1950); Michener, Social Insects* (New York

RLES D. MICHENER, and Y H. MICHENER, *American Social Insects.*"

which correct abnormal such as milk of mag- ce, and limewater, act the stomach and intest- act by being changed rease the alkalinity of acidity of the urine.

the giant son of Nep- (Gaea [earth]), a er in Libya, whose long as he remained earth. The strangers y were compelled to quered were slain, and a house to Neptune. source of his strength, and crushed him in the (*Antoei collis*) which the shape of a man a was shown near the angier) in Mauretania

f Turnus, king of the s.

ANTALCIDAS, ăn-tăl'si-däs, Spartan diplomat: fl. 4th century B.C. He is known chiefly for the Peace of Antalcidas, whereby Athens was forced (386 B.C.) to recognize Persian sovereignty over Asia Minor. Later missions to Persia failed, and he is said to have died a suicide.

ANTALYA, ăn-tăl-yă' (formerly ADALIA; ancient ATTALEIA or ATTALIA), city, Turkey, capital of a vilayet of the same name, situated on the Gulf of Antalya. It is a port and grain market. Founded by Attalus II of Pergamum about 150 B.C., it was St. Paul's point of departure for Antioch on his first mission. Pop. (1950) 27,478.

ANTARCTIC REGIONS, the name given to that part of the earth's surface surrounding the South Pole. The area is defined to include the outer limits of ice drifting offshore to about 50° south latitude. It is entirely surrounded by water, which to the north is divided by continental lands into the Atlantic, Pacific, and Indian oceans. The land area inside the Antarctic Circle covers 5,100,000 square miles, or about one tenth of the world's land surface.

Exploration.—Early voyages into the regions south of the equator gave rise to the belief that a land mass existed around the geographical South Pole. The first voyage of Capt. James Cook (1768-1771) showed New Zealand as an island; his second, in 1772-1775, proved that an Antarctic continent, if it existed, did not extend beyond the Antarctic Circle. In 1773, Cook circumnavigated the entire south polar area, and, on Jan. 30, 1774, reached latitude 71°10' S., longitude 106°54' W., where huge ice floes prevented further advance. No land was seen on these voyages. In October 1819, Capt. William Smith sighted the South Shetland Islands, and on Jan. 30, 1820, Edward Bransfield sighted what he called Trinity Land (probably the South Shetlands). The American Nathaniel Brown Palmer was the first to sight the Antarctic continent, on Nov. 18, 1820. In the sloop *Hero* he discovered Orléans Channel at latitude 63°45' S., and the northwest coast of what is now named Palmer Peninsula. Capt. Fabian Gottlieb von Bellingshausen discovered Alexander I Land (later proved an island) and Peter I Island in January 1821. Benjamin Morrell, in January 1823, visited Bouvet Island and Kerguelen Island, and in March reached latitude 70°14' S., longitude 40° 11' W. James Weddell, on Feb. 20, 1823, allegedly sailed south to 74°15' S., longitude 34°17' W. The ice-filled sea which he discovered now bears his name. Capt. John Biscoe circumsailed the continent in 1831-1832, penetrated the pack ice to latitude 69°03' S., and discovered Enderby Land. The Balleny Islands were discovered by Capt. John Balleny in 1839; and Capt. Jules Sébastien César Dumont d'Urville, in 1839-1840, discovered Adélie Coast, south of Australia. The voyages of Lieut. Charles Wilkes of the United States Navy, in 1838-1842, were of great importance. Wilkes Land was discovered, and the existence of Antarctica as a continent became known and is credited to him.

Sir James Clark Ross, in 1839-1843, was the first to point the way for attainment of the South Pole. While earlier explorers had avoided the ice, Ross worked the pack ice for weeks and was rewarded by finding an ice-free body of water, now named the Ross Sea. Thinking the door to

the South Pole was open, he continued southward. A steep, rocky coastline loomed over the horizon in latitude 70°41' S., longitude 172°30' E., later named Cape Adare. Farther south a huge ice barrier blocked advance in latitude 77°32' S., and an active volcano, which Ross named Mount Erebus, was sighted rising 13,200 feet above the sea. A nearby inactive volcano he called Mount Terror. For 450 miles he now sailed eastward along an ice barrier which averaged 150 feet above the water. Ross made no landing on the continent. The Ross Sea and the Ross Ice Shelf were the greatest discoveries thus far made in the Antarctic. Eduard Dallman, in 1873-1874, discovered new islands on the west coast of Palmer Peninsula. The Challenger Expedition, in 1874-1875, accomplished oceanographic work between longitudes 78°E. and 109°E. Carl Anton Larsen in 1892 discovered Oscar II Coast and Foyn Coast along the east coast of Palmer Peninsula, and he found the first fossils on Seymour Island. The recent finding of the ship's log has revealed that the American sealer captain John Davis of the ship *Huron* was the first person known to set foot on the Antarctic continent. He landed on the Palmer Peninsula on Feb. 7, 1821 from the schooner *Cecilia*. The next to land were Capt. Leonard Kristensen of the vessel *Antarctic* and Carsten Egeberg Borchgrevinck, in January 1895. Borchgrevinck, as Norwegian leader of the Scottish expedition on the *Southern Cross*, was also the first to spend an Antarctic winter on the continent, in 1898-1900, and the first to sledge into the interior, reaching latitude 78°50' S., the farthest south then attained. In 1898, Lieut. Adrien de Gerlache in the *Belgica* led an expedition which penetrated the pack ice to latitude 71°30' S., was frozen in—wintered on the ship and under Henryk Arctowski produced noteworthy scientific results. Beset for over a year, their vessel drifted between longitudes 80°W. and 102°W.

From 1901 to 1916, Antarctic exploration was very active. One expedition, under Capt. Robert Falcon Scott, in 1901 sledged to latitude 82°17' S., longitude 163°30' E. A vast amount of scientific work was also achieved. The Swedish expedition under Dr. Nils Otto Gustaf Nordenskjöld, in 1901-1904, made geographical discoveries on the east coast of Palmer Peninsula and brought back much scientific data. His ship, the *Antarctic*, was lost in the ice; the crew was rescued the next season. Other expeditions were those of Erich von Drygalski (1901-1903); William S. Bruce, who in 1904 sailed into the Weddell Sea and discovered Coats Land; Dr. Jean Charcot (1904); and Ernest Henry Shackleton (1907-1909). Shackleton wintered at Ross Island in the Ross Sea with easy access to the Ross Ice Shelf. With three companions, he started south in early spring, using Siberian ponies. These were soon lost, forcing the party to man-haul their supplies. Their turning point, at latitude 88°23' S., longitude 162° E., within 97 nautical miles of the South Pole, was reached on Jan. 9, 1909, passing all previous records by 366 miles. This feat resulted in Shackleton's being knighted in 1909. A second party under Sir T. W. Edgeworth David sledged along the coast of Victoria Land and reached the vicinity of the South Magnetic Pole. In 1909-1910, Charcot in his vessel *Pourquoi-Pas?* successfully explored the west coast of Palmer Peninsula and discovered Charcot Island.



The Bettmann Archive

Amundsen taking observations at the South Pole, 1911.

In 1911 five expeditions—Norwegian, Roald Amundsen; German, Wilhelm Filchner; British, Robert Scott; Australian, Dr. Douglas Mawson; and Japanese, Lieut. Choku Shirase—were in the field, having the South Pole as their goal. Amundsen was the first to reach the pole. He left Norway aboard the *Fram* in July 1910, having previously announced that he was headed for the North Pole via Cape Horn and Bering Strait. Meanwhile, Robert E. Peary's attainment of the North Pole (April 6, 1909) had electrified the world, and Amundsen altered the goal of his expedition to the South Pole. Scott, who was ready to sail on the *Terra Nova* from New Zealand for an intended wintering base on McMurdo Sound, received a cablegram from Amundsen regarding his change in plans. Scott arrived at the sound on Jan. 3, 1911. Amundsen reached the Bay of Whales, an inlet in the Ross Ice Shelf, 400 miles farther east and 60 miles farther south, on Jan. 14, 1911, and set up his base, Framheim. There he was visited by the *Terra Nova*, which had deposited Scott's wintering party and was now on a survey trip to King Edward VII Land (now Edward VII Peninsula). Before the Antarctic winter set in, Amundsen built caches of food to latitude 82°S. He started for the pole on Oct. 20, 1911, with four companions, 52 dogs, four sledges, and a four months' food supply. At 85°S., where the Ross Ice Shelf joins land, the party had to climb glaciers to an elevation of 10,600 feet. The highest altitude, 10,750 feet, was reached on December 6, at 87°40'S., in the Queen Maud Range, discovered by Amundsen. On smooth King Haakon VII Plateau the South Pole was located by celestial observations on Dec. 14, 1911. The Norwegian flag was unfurled, and the party remained at the pole taking sun sights until December 17. All five men reached their wintering base, Framheim, on Jan. 25, 1912.

The most dramatic story in Antarctic polar exploration began when Scott's party of five, accompanied by supporting groups, left McMurdo Sound on Nov. 1, 1911. Their Siberian ponies proved ill adapted to the snowy surface, and they had to man-haul their supplies on sledges. Exhausted, they reached the pole 35 days after Amundsen, and finding Amundsen's caches there disheartened them further. Scott determined the pole to be less than half a mile from Amundsen's tent. On their return journey,

weakened by shortage of food, man-hauling, and low temperatures, Scott's party was beset by mishaps with the result that the entire group perished. The last entry in Scott's journal was dated March 29, 1912. Not until the following Antarctic spring, on Nov. 12, 1912, did a rescue party succeed in reaching the tent of the dead. A cairn was built over it with a cross on top to mark the icy rendezvous.

In 1911, Wilhelm Filchner's ship, the *Deutschland*, was the first to reach the head of the Weddell Sea by an approach from its eastern side. The expedition was erecting its base huts on the ice in Vahsel Bay when the ice shelf suddenly broke loose and drifted northward, in March 1912. The men were rescued, but the ship, beset, encountered the full fury of the ice pressures in the central portion of the Weddell Sea. It was ten and one-half months later, after drifting about 1,100 miles, before open water was reached. Shirase visited the Bay of Whales in 1912 and made a short sledge trip on the Ross Ice Shelf. From 1911 to 1914, Mawson commanded an expedition to the Australian sector, made geographical discoveries, and gathered extensive scientific data. In recognition of his work he was knighted in 1914.

Shackleton, in August 1914, launched a daring Antarctic project, to sledge across the continent from Coats Land at the Weddell Sea to McMurdo Sound in the Ross Sea. He employed two ships: one for a party headed by himself to make the transpolar sledge trip with dogs, the other to meet him at the Ross Sea side of the continent. Shackleton's ship, the *Endurance*, was within a few miles of its destination, Vahsel Bay, when it was beset in the heavy pack ice and began a drift northward in the Weddell Sea. It was subjected to such intense pressure that it eventually sank near latitude 69°S., longitude 52°W. The men, after a perilous journey drifting on the ice floes, reached Elephant Island. There 22 of them remained behind while Shackleton, with 5 companions in a small whaleboat, made a hazardous crossing of treacherous waters to South Georgia Island, 800 miles northeast. All of the men were rescued by the end of 1916. In 1921, Shackleton again sailed south, this time aboard the *Quest* to explore the Enderby Land quadrant. In 1922 he died aboard his ship at South Georgia, where he was buried.

The advent of the airplane brought a new era to exploration. First to utilize a plane in the Antarctic was Sir Hubert Wilkins, knighted in 1928 for 15 years' conspicuous service culminating in his trans-Arctic flight. In the same year he completed a daring flight from Deception Island in the South Shetlands along the east coast of Palmer Peninsula to latitude 70°S., and added thousands of square miles to the known Antarctic. Wilkins led a second expedition in 1929, established the outlines of Charcot Island, and flew southward over the pack ice to the west. In 1928-1930, then Commander Richard E. Byrd, U.S.N. (Ret.) established Little America I, close to Amundsen's old base "Framheim" in the Bay of Whales. On Nov. 28-29, 1929, with pilot Bernt Balchen, air photo reconnaissance mapping was performed by the first flight to penetrate the interior, when the King Haakon Polar Plateau was attained and the South Pole encircled. Many fields of science were pursued under Dr. Laurence M. Gould. Byrd returned to the same base in 1934, and from here set up the southernmost

ANTARCTICA

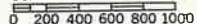
ANTARCTICA

AZIMUTHAL EQUIDISTANT PROJECTION

SCALE OF MILES



SCALE OF KILOMETRES



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EXPLORERS' ROUTES

- Palmer 1820
 - Amundsen 1910-12
 - Scott 1910-13
 - Byrd 1928-30
 - Fuchs 1957-58
- By ship By sledge By airplane
- By snow tractor

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ANTARCTICA

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| Adare (cape)..... | B 9 | Edward VII (pen.)..... | B11 | Little America..... | B10 | Riiser-Larsen (pen.)..... | C 2 |
| Adelaide (isl.)..... | C15 | Edward VIII (bay)..... | C4 | Luitpold Coast (reg.)..... | B17 | Robert English Coast (reg.)..... | B15 |
| Adélie Land (reg.)..... | C 7 | Eights Coast (reg.)..... | B14 | Lützow-Holm (bay)..... | C 2 | Ronne (entrance)..... | B15 |
| Alexander I (isl.)..... | B15 | Elephant (isl.)..... | D16 | MacKenzie (bay)..... | C 4 | Roosevelt (isl.)..... | A10 |
| American Highland..... | B 4 | Ellsworth Highland..... | A14 | MacRobertson Coast | | Ross (isl.)..... | B 9 |
| Amery Ice Shelf..... | C 4 | Enderby Land (reg.)..... | C 3 | (reg.)..... | B 4 | Ross (sea)..... | B10 |
| Amundsen (bay)..... | C 3 | Executive Committee Range | | Marguerite (bay)..... | C15 | Ross, James (isl.)..... | C16 |
| Amundsen (sea)..... | B13 | (mts.)..... | B12 | Marie Byrd Land (reg.)..... | B13 | Ross Dependency..... | C10 |
| Antarctic Circle..... | C 1 | Falkland Islands | | Markham (mt.)..... | A 8 | Ross Ice Shelf..... | A10 |
| Argentine Sector (terr.)..... | D15 | Dependencies..... | D16 | Mawson..... | C 4 | Sabine (mt.)..... | B 9 |
| Australian Antarctic | | Farr (bay)..... | C 5 | McMurdo (sound)..... | B 9 | Sabrina Coast (reg.)..... | C 6 |
| (terr.)..... | C 4, C 8 | Filchner Ice Shelf..... | B17 | Mertz Glacier Tongue..... | C 8 | Scotia (sea)..... | D16 |
| Balleny (isls.)..... | C 9 | French Sector (terr.)..... | C 7 | Mirnyy..... | C 5 | Scott..... | B 9 |
| Banzare Coast (reg.)..... | C 7 | George V Coast (reg.)..... | C 8 | Nansen (mt.)..... | B 8 | Scott (isl.)..... | C10 |
| Barr Smith (mt.)..... | C 5 | Getz Ice Shelf..... | B12 | New Schwabenland (reg.)..... | B 1 | Sentinel (mts.)..... | B14 |
| Batterbee (cape)..... | C 3 | Goodenough (cape)..... | C 7 | Ninnis Glacier Tongue..... | C 8 | Shackleton Ice Shelf..... | C 5 |
| Beardmore (glacier)..... | A 8 | Grytviken..... | D17 | Norvegia (cape)..... | B18 | Sidley (mt.)..... | B12 |
| Bellingshausen (sea)..... | C14 | Hearst (isl.)..... | B16 | Norway Station..... | B18 | Siple (mt.)..... | B12 |
| Biscoe (isls.)..... | C15 | Hilton (inlet)..... | B16 | Norwegian Sector (terr.)..... | B18 | South Georgia (isl.)..... | D17 |
| Bouvet (isl.)..... | D 1 | Hobbs Coast (reg.)..... | B12 | Palmer (arch.)..... | C15 | South Magnetic Polar Area..... | B 8 |
| Bransfield (strait)..... | C16 | Hollick-Kenyon (plateau)..... | B13 | Palmer (pen.)..... | C15 | South Orkney (isls.)..... | C16 |
| Budd Coast (reg.)..... | C 6 | Hope (bay)..... | C16 | Peter I (isl.)..... | B14 | South Polar (plateau)..... | A 4 |
| Caird Coast (reg.)..... | B18 | Indian (ocean)..... | C 3 | Pine Island (bay)..... | B13 | South Pole..... | A 5 |
| Charcot (isl.)..... | C15 | James Ross (isl.)..... | C16 | Port-Martin..... | C 7 | South Sandwich (isls.)..... | D17 |
| Chilean Sector (terr.)..... | C14 | Joinville (isl.)..... | C16 | Prince Olav Coast (reg.)..... | C 3 | South Shetland (isls.)..... | C15 |
| Coats Land (reg.)..... | A17 | Kainan (bay)..... | B10 | Princess Astrid Coast (reg.)..... | B 1 | Sulzberger (bay)..... | B11 |
| Colbeck (cape)..... | B10 | Keltie (cape)..... | C 7 | Princess Martha Coast (reg.)..... | B18 | Thurston (pen.)..... | B14 |
| Coronation (isl.)..... | C16 | Kemp Coast (reg.)..... | C 3 | Princess Ragnhild Coast | | Ulmer (mt.)..... | B14 |
| Daly (cape)..... | C 4 | King George (isl.)..... | D16 | (reg.)..... | B 2 | Victoria Land (reg.)..... | B 8 |
| Darnley (cape)..... | C 4 | Kirkpatrick (mt.)..... | A 8 | Prydz (bay)..... | C 4 | Vincennes (bay)..... | C 6 |
| Dart (cape)..... | B12 | Knox Coast (reg.)..... | C 6 | Queen Mary Coast (reg.)..... | C 5 | Walgreen Coast (reg.)..... | B13 |
| Davis (sea)..... | C5 | Larsen Ice Shelf..... | C16 | Queen Maud Land (reg.)..... | B 1 | Weddell (sea)..... | C16 |
| Drake (passage)..... | C15 | Lillie Glacier Tongue..... | C 9 | Queen Maud Range | | West Ice Shelf..... | C 5 |
| Edith Ronne Land..... | B16 | Lister (mt.)..... | B 8 | (mts.)..... | A11 | Wilhelm II Coast..... | C 5 |
| Edsel Ford Range (mts.)..... | B11 | | | Richard Black Coast (reg.)..... | B15 | Wilkes Land (reg.)..... | B 7 |

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outpost 120 miles south where he wintered alone. His scientists discovered and explored much of Marie Byrd Land to the east. At various times from 1928 to 1937 the Norwegian Lars Christensen, in conjunction with his whaling operations, conducted exploratory mapping flights in the Norwegian- and Australian-claimed sectors. Detailed mapping was done of Queen Maud Land, and ice-free lakes were found along the rocky coastline. (These lakes are caused by melting water running into depressions along the coast, where the summer sun is strong enough to keep them free of ice.) Lincoln Ellsworth's four American expeditions (organized with the aid of Sir Hubert Wilkins), from 1933 to 1939, discovered large areas of new land. His trans-Antarctic flight in 1935 from Dundee Island, off the east coast of Palmer Peninsula, to the Bay of Whales, was most daring. In a single-engine plane with four landings en route, he took 22 days to cover the distance. The newly discovered area he named James W. Ellsworth Land (now Ellsworth Highland). In 1938-1939 he penetrated the continent for 300 miles in longitude 80°E., in an area now called American Highland. Capt. Alfred Ritscher's German expedition to the Queen Maud Land sector in 1939 mapped new land between longitudes 21°E. and 12°W.

The British Graham Land Expedition 1934-1937, led by John Rymill, was based on the Debenham Islands in Marguerite Bay. Their scientific staff was excellent and their various sledge journeys resulted in discovering that Palmer Land was a peninsula jutting out from the mainland and that George VI Sound separated Palmer Peninsula from Alexander I Land.

The United States Antarctic Service Expedition 1939-1941 of the Department of the Interior and headed by Rear Admiral R. E. Byrd, established "West Base" (under P. A. Siple) at the Bay of Whales and "East Base" in Marguerite Bay, on Palmer Peninsula. Previous scientific programs and aerial reconnaissance were continued and a 1,264 mile sledge party under Finn Ronne proved that Alexander I Land was an island and surveyed 450 miles of new continental coastline. The Weddell Sea coastline was extended 250 miles beyond the southern limit of Wilkins' flight in 1928.

Because of World War II, Antarctic exploration was at a standstill until 1946, when the United States Antarctic Development Project under Admiral Byrd with United States Navy task force 68, Operation Highjump, under Rear Admiral Richard H. Cruzen sailed south with 13 ships, 21 aircraft, and 4,000 men to train navy personnel in cold-climate operations. During its five weeks' stay in Antarctic waters, when Little America was reoccupied, flights were made south and east from the base in the Bay of Whales, and aerial mapping flights made from two seaplane tenders operating along the periphery of the continent, covered essentially all of the Antarctic coasts other than those of the Palmer Peninsula and Weddell Sea areas.

The Ronne Antarctic Research Expedition (1946-1948) wintered on Palmer Peninsula at Marguerite Bay, where its ship was intentionally frozen into the ice near the base camp. To explore the world's last unknown coastline and prove the Antarctic was one continent, its three airplanes flew 346 hours and made 86 landings in the field. This program obtained 14,000



Official U.S. Navy Photograph

United States base being constructed at Hut Point.

trimetrogon aerial photographs, complete with surface geodetic control points over an area of more than 700,000 square miles. One third of this area was newly discovered and named Edith Ronne Land for the wife of the leader, who was one of the first two women to spend a year in the Antarctic. Ronne's discoveries of high land south of the Weddell Sea eliminated the possibility of a strait dividing the continent. Studies in 11 branches of science, which included work by survey and geological sledge parties, brought a rich harvest of results.

A Norwegian-Swedish-British expedition (1949-1952) under John Gjaever wintered on Queen Maud Land in longitude 10°W., doing scientific research. Seismic soundings made from their base, Maudheim, for a distance of 300 miles southward determined the icecap to vary from 900 to 7,450 feet in thickness, and their aircraft delineated 500 miles of coastline. The expedition was directed by the Swedish glaciologist Hans Wilson Ahlmann and the Norwegian geophysicist Harald Ulrik Sverdrup. In January 1950, the French, under Paul Émile Victor set up Port Martin Base on Adélie Coast for meteorological and other studies. Abandoned in 1952, the base was reoccupied in 1956 to continue science studies as part of the International Geophysical Year, 1957-1958. The Australian government early in 1954 set up its first permanent base, Mawson Base, at latitude 67°36'S., longitude 62°55'E., on Mac-Robertson Coast, so as to "establish beyond dispute" its territorial claims. There the Australians have explored unknown land and made meteorological and other studies. The Argentine icebreaker *General San Martin* penetrated the Weddell Sea pack ice in January 1955 and set up a base less than 800 miles from the South Pole. In the same month, the United States icebreaker *Atka* reconnoitered the Ross Sea area to select a base for United States participation in the International Geophysical Year. It was found that a huge segment of the Ross Ice Shelf had sloughed off at the Bay of Whales, making it no longer suitable for a landing.

Fifty nations are participating in the International Geophysical Year, 1957-1958. Eleven of these nations are setting up bases on the Antarctic continent and offshore islands. United States participation was sponsored by the National Science Foundation and the National Research Council, with Task Force 43 of the United States Navy being set up under Rear Admiral George J. Dufek to provide logistic support. Admiral Byrd was appointed senior

United States representative "charged with maintaining effective monitorship over those political, scientific, legislative and operational activities which comprise the total United States Antarctic program." In December 1955 the task force left New Zealand to set up two base stations in the Ross Sea area. Little America V was established at Kainan Bay, about 30 miles east along the Ross Ice Shelf from the Bay of Whales, and an air operations base was constructed at Hut Point on Ross Island in McMurdo Sound. Four United States planes flew from New Zealand to McMurdo Sound on Dec. 20, 1955, and made exploratory flights over unknown parts of the continent until Jan. 18, 1956, when they returned to New Zealand. These flights proved the inland areas to be featureless in character, with a dome 13,000 feet high at about latitude 80°S., longitude 90°E. New mountain ranges were located at about latitude 85°S., longitude 50°W., reaffirming the observation made by Ronne in 1947 that the Antarctic continent is a single unit. Leaving 73 men to winter at Kainan Bay and 93 men at Hut Point, all vessels of the task force departed from the Antarctic by the end of March 1956. The last to leave was the U.S.S. *Glacier*, the navy's newest icebreaker, which visited a possible site for an International Geophysical Year station on Knox Coast.

Two British ships, the *Tottan* and the *Theron*, reached the head of the Weddell Sea in January 1956 and set up bases where their expeditions wintered. One group planned to operate there, while another, under Dr. Vivian E. Fuchs and Sir Edmund Hillary, planned a trans-Antarctic tractor trip to McMurdo Sound via the South Pole. On Jan. 6, 1956, the Russian flagship *Ob* reached Farr Bay on Queen Mary Coast, where they established Mirny station as part of the network of bases making scientific observations during the International Geophysical Year.

Antarctic Waters.—The depth of the waters off the Antarctic coast varies greatly. Ross sounded 4,000 fathoms in the vicinity of South

Georgia Island without reaching bottom. The *Challenger* found depths from 1,300 to 1,950 fathoms near the Antarctic Circle south of Australia. A gradual shoaling has been found toward the continent. Wilkes sounded 500 fathoms off Adélie Coast, and Thomas Poulter in 1934 sounded 300 fathoms at the Bay of Whales in the Ross Sea. De Gerlache sounded less than 200 fathoms west of Palmer Peninsula. The bottom in the extreme south is covered with a layer of diatomaceous ooze; in deeper water red clay is found at great depths in all oceans. The temperature of the water ranges from a few degrees below freezing to a few degrees above.

Antarctic Continent.—Of the continent's 5,100,000 square miles of land area, one third was still unexplored by 1956. The explored area has an elevation of about 5,000 feet; the South Pole's elevation is about 9,500 feet. Nine tenths of the known portion is snow covered, with mountain ranges and peaks protruding through the ice sheet. These mountains are composed of gneiss, granite, mica schist, sandstone, basalt, diorite, sedimentary rocks, and other formations. Fossils and traces of various minerals have been found, and petrified wood on Alexander I Island.

Argentina, Chile, France, Norway, Australia, and Great Britain claim large sectors of the Antarctic continent. In the disputed Palmer Peninsula sector the British with 12 bases, the Chileans with 6, and the Argentinians with 8, maintain continuous occupation to strengthen their rights for sovereignty. The United States does not recognize any national claims to Antarctic territory, but reserves all its rights of whatever character that have accrued to the United States and its citizens. The USSR has announced its interest in participating in any conference dealing with Antarctic claims, basing its intention on Bellingshausen's voyage in 1819-1821.

Climate.—Antarctica's coasts are far colder than those of the Arctic Ocean, which are in



U.S. Coast Guard Photograph

At McMurdo Sound, the U.S.S. *Glacier* unloads cargo for International Geophysical Year stations.

reaching bottom. The from 1,300 to 1,950 c Circle south of Aus- has been found toward 500 fathoms off mas Poulter in 1934 the Bay of Whales' in e sounded less than 200 Peninsula. The bottom covered with a layer of per water red clay is l oceans. The tempera- s from a few degrees egress above.

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U.S. Coast Guard Photograph
Annual Year stations.

about the equivalent latitude. Except for islands near the Palmer Peninsula, the mean annual temperatures are colder than 12°F. The mean temperature of the warmest month, January, is below freezing, and that of the coldest months—July, August, and September—is below 0°F. At the edge of the Ross Ice Shelf values are even lower—the average temperature for the year is -13°F., and expeditions which have wintered near the Bay of Whales have all observed temperatures colder than -70°F. The lowest temperature recorded during five winters on McMurdo Sound, 400 miles to the west, however, was only -59°F., although a reading of -77°F. was measured by a winter sledging party in 1911. Ninety-four miles south of the Bay of Whales, Antarctica's lowest temperature, -78°F., was observed on July 21-22, 1934 (the thermograph indication of -83°F. was corrected to this value based on the thermometer reading). These temperatures at places on or near the coasts are not as cold as the lowest readings in the Northern Hemisphere, at places far inland: -81°F. at Snag, Yukon Territory, Canada; -86°F. in the center of the Greenland icecap; and -90°F. at Verkhoyansk, in the Yakutsk Autonomous Soviet Socialist Republic, Siberia. In Antarctica's interior, however, temperatures probably go well below -100°F.

Wind conditions vary in Antarctica. In general, the coasts are rather windy. Mawson named Cape Denison, Commonwealth Bay, south of Australia, the Home of the Blizzard because of the almost continual gales pouring out from the continent. There the average wind speed for 22 months in 1911-1914 was 44 miles per hour, with one 12-hour period averaging 89 miles per hour. At the Bay of Whales, on the other hand, the average speed during four years was only 11 miles per hour, less than at Springfield, Ill. (11.2), or Wichita, Kans. (12.6), and the strongest wind was only 62 miles per hour. In Antarctica's interior, except around the mountains, winds probably are even weaker, but blizzards occur everywhere, including the pole itself.

Except for hoarfrost deposition and occasional rains or drizzles at the north end of Palmer Peninsula, precipitation consists almost entirely of snow. It totals 10 to 20 inches of water around the coasts, more in the coastal mountains, and much less in the interior. At the South Pole it is estimated at only 1 or 2 inches of water, and the average for the continent is presumed to be between 2 and 4 inches. Less snow falls on Antarctica than evaporates and flows into the oceans as icebergs, so that the total ice and snow cover of the continent is steadily decreasing.



Official U.S. Air Force Photograph
A C-124 being loaded for an airdrop at the South Pole.

Fauna and Flora.—Marine animals, particularly whales and seals, abound in Antarctic seas. Some of the species are peculiar to the Antarctic regions; others, specifically the large whales, are related to those inhabiting the Arctic. Blue whales and finbacks outnumber other species. Fur-bearing seals are extinct, and only five species of hair seals, including elephant seals and sea leopards, are found. Seven species of penguins inhabit the borders of lands adjacent to ice-free waters. The emperor penguin, about three and one-half feet tall and weighing 55 to 80 pounds, is the largest; the king penguin, weighing about 40 pounds, is second. Numerous species of petrels, albatrosses, gulls, skuas, and terns breed on many of the islands close to the continent and always near open water. Both mammals and birds obtain their food in the water, since the Antarctic Ocean has an abundance of plant and invertebrate life. The invertebrate forms serve as the principal food for whales, seals, and penguins. A few species of insects were seen by Borchgrevink, Arctowski, and Wilkins. In contrast to the Arctic region, no land animals exist on the Antarctic continent or on adjacent islands. About 300 species of lichen and 50 species of moss have been found, and these constitute the typical form of Antarctic vegetation. About one fourth of the mosses are common to the Arctic region.

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Expedition, 1956-1959.

ANTARES, ăn-târ'ez, a double star of the constellation Scorpio. It has a magnitude of 1.22 and is 250 light years from the Sun. Navigators use it in ascertaining longitude.

ANTEATER, the name given to several quite different mammals, but particularly to the Myrmecophagidae, a South American family of the order Edentata. They have long heads, slender snouts, toothless jaws, and wormlike tongues. The great anteater or ant bear (*Myrmecophaga jubata*) grows to a height of two feet and a length of four feet, not including its shaggy tail. The collared anteater (*Tamandua tetradactyla*), about the size of a cat, is arboreal and has a prehensile tail. The little or two-toed anteater (*Cyclopes didactylus*) is also arboreal. Besides these true anteaters there are the scaly anteaters (see MANIS) and spiny anteaters (see ECHIDNA).