

THE
ENCYCLOPEDIA
AMERICANA

THE INTERNATIONAL REFERENCE WORK



COMPLETE IN THIRTY VOLUMES

AMERICANA CORPORATION

NEW YORK CHICAGO WASHINGTON, D.C.



1958 EDITION

COPYRIGHT © 1958

IN THE UNITED STATES OF AMERICA

BY AMERICANA CORPORATION

AE5
E333
1958
copy 2
P. 87

COPYRIGHT 1958, 1957, 1956,
1955, 1954, 1953, 1952, 1951,
1950, 1949, 1948, 1947, 1946,
1945, 1944, 1943, 1942, 1941,
1940, 1939, 1938, 1937, 1936,
1932, 1931, 1929, 1927

BY AMERICANA CORPORATION

COPYRIGHT 1924, 1922, 1920, 1918

BY ENCYCLOPEDIA AMERICANA CORPORATION

COPYRIGHT UNDER INTERNATIONAL COPYRIGHT
CONVENTION AND UNDER PAN AMERICAN COPYRIGHT
CONVENTIONS

ALL RIGHTS RESERVED UNDER INTER-AMERICAN
COPYRIGHT UNION (1910) BY AMERICANA CORPORATION

PRINTED IN THE U.S.A.

Library of Congress Catalog Card number: 58-6264

PRINTED AND BOUND BY



CONKEY DIVISION



3
12
8P

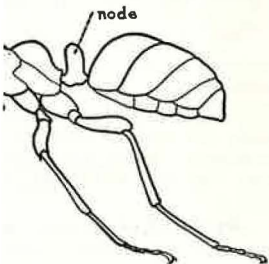
VOLUME II
ANNUITY—AZZUBEYDI

T
GHT
N
RATION

5264



s.—There are two main ants in the United States. *sanguinea*, can live either . The other, *Polyergus*, of survive without slaves .p, curved jaws, so well-useless in feeding them-ng. Both types use as *ica fusca* or its close rela-emns originally to have tism in which the more



making ant (*Polyergus*) show-characteristic of all ants.

ies (usually red in color) nies of the timid *Formica* :olen pupae chanced to e they were eaten, they heir captors. Some *sam*-ree or four slaves to each some *Polyergus* colonies to each Amazon. Slaves which hundreds of ants ttles may result in which e are slain.

, W. M., *Ants* (New York al World of the Ants, vols. 1 1928); Wheeler, W. M., *The* 8); Maeterlinck, M., *The Life* ; Haskins, C. P., *Of Ants and* ighton, W. S., "The Ants of of the Museum of Compara-idge, Mass., 1950); Michener, an Social Insects (New York

CHARLES D. MICHENER, and MARY H. MICHENER, *American Social Insects.*"

s which correct abnormal s, such as milk of mag-onate, and limewater, act n the stomach and intes- s act by being changed ncrease the alkalinity of the acidity of the urine.

s, the giant son of Nep- Ge (Gaea [earth]), a restler in Libya, whose so long as he remained her earth. The strangers ntry were compelled to conquered were slain, and built a house to Neptune. the source of his strength, h and crushed him in the us (*Antoei collis*) which in the shape of a man ngth was shown near the a Tangier) in Mauretania

n of Turnus, king of the neas.

ANTALCIDAS, än-täl'si-däs, Spartan statesman, known chiefly for the Peace of Antalcidas, which he concluded with Persia in 387-386 B.C., after the Corinthian War, and forced Athens to accept.

ANTALYA, än-täl-yä', the Biblical ATTALIA, seaport and capital of a like named vilayet of Turkey in Asia on the Gulf of Antalya, founded c.150 B.C. by King Attalus II Philadelphus of Pergamum. From here Paul sailed to Antioch on his first mission (Acts 14:25). Pop. 21,659.

ANTARCTIC REGIONS is the name given to that part of the earth's surface surrounding the South Pole. The area is defined as extending beyond the Antarctic Circle to include the outer limits of ice drifting offshore to about 50° south latitude, although icebergs have been seen as far north as 40°. 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 is almost as large as the United States and Canada combined.

Exploration.—Early voyages into the regions south of the equator and the discovery of many islands gave rise to the belief that a vast continent 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 Antarctic land was seen on these voyages. In October 1819, Capt. William Smith rounded Cape Horn and sighted the South Shetland Islands. On Jan. 30, 1820, Edward Bransfield sighted what he called Trinity Land (probably the South Shetlands). Nathaniel Brown Palmer was the first to sight the great southern continent, when, on Nov. 18, 1820, he drew close to the mainland in his sloop *Hero*, discovered Orleans Channel at latitude 63° 45'S., and surveyed the northwest coast of the peninsula which now bears his name—Palmer Peninsula. Capt. Fabian Gottlieb von Bellingshausen, sailing still farther south, 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, steered southward, and in March reached latitude 70° 14'S., longitude 40° 11'W. James Weddell, on Feb. 20, 1823, sailed south to 74° 15'S., longitude 34° 17'W. The ice-filled sea which he discovered now bears his name. Capt. John Biscoe circumnavigated the continent in 1831-1832 and, penetrating the pack ice, reached farther south 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, made a long voyage during which he discovered Adélie Coast (Adélie Land), south of Australia. The voyages of Lieut. Charles Wilkes of the United States Navy, in 1838-1842, were of great importance. Wilkes Land (Wilkes Coast) 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 floes offshore, Ross worked the pack ice for weeks, making steady progress, and was eventually rewarded by finding ice-free waters. Thinking the door to the South Pole was open, he continued southward in the open sea. 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 13,350 feet above the sea. Another 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 Shelf Ice 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, captain of a whaler, in 1892 discovered along the east coast of Palmer Peninsula great areas which he named Oscar II Coast (Oscar II Land) and Foyn Coast (Foyn Land). Two active volcanoes were sighted, and the first fossils were found on Seymour Island. Capt. Leonard Kristensen of the vessel *Antarctic* and Carsten Egeberg Borchgrevinck were the first to set foot on the continent, in January 1895. Borchgrevinck, as Norwegian leader of the Scottish expedition on the *Southern Cross*, was also the first to spend an Antarctic winter, in 1898-1900, and the first to sledge on the continent, reaching latitude 78° 50'S., the farthest south then attained. In 1898 a Belgian expedition under Lieut. Adrien de Gerlache penetrated to latitude 71° 30'S., and under Henryk Arctowski produced noteworthy scientific results. Their ship was caught in the ice on March 3, 1898. Beset for over a year, it drifted between longitudes 80° 30'W. and 102° W.

From 1901 to 1916, Antarctic exploration was very active. Several wintering expeditions were fitted out; one of these, under Capt. Robert Falcon Scott, in 1901 sledged to latitude 82° 17'S., longitude 163° 30'E., to accomplish a new record in southing. 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, who had participated in Scott's 1901 expedition as a member of the party which reached latitude 82° S., wintered at Ross Island in the Ross Sea with easy access to the Ross Barrier. With the coming of Antarctic spring, Shackleton and three companions started south using Siberian ponies. These were soon lost, forcing the party to man-haul its supplies. The men reached within 97 nautical miles of the pole, passing all previous records by 366 miles. Their turning point, at 88° 23'S., longitude 162° E., was reached on Jan. 9, 1909. This feat received worldwide acclaim and resulted in Shackleton being knighted in 1909. A second party sledged

along the coast of Victoria Land and reached the vicinity of the South Magnetic Pole. In 1909-1910, Charcot on his vessel *Pourquoi-Pas?* had a successful year of exploration in which he found new lands, including Charcot Island.

In 1911 five expeditions, most of which had the South Pole as their goal, were in the field: Norwegian, Roald Amundsen; German, Wilhelm Filchner; British, Robert Scott; Australian, Dr. Douglas Mawson; and Japanese, Lieut. Choku Shirase. 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 the news of Capt. Robert E. Peary's attainment of the North Pole (April 6, 1909) electrified the world, and when Amundsen reached Funchal, Madeira Island, he disclosed that the goal of his expedition had been changed to the South Pole. At that time, Scott was ready to sail on the *Terra Nova* from New Zealand for an intended wintering base in McMurdo Sound, when he 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 Barrier, 400 miles farther east and about 60 miles farther south, on Jan. 14, 1911, and set up his base, Framheim. While unloading his ship, Amundsen was visited by the *Terra Nova*, which had deposited Scott's wintering party at McMurdo Sound 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. On Aug. 13, 1911, the lowest winter temperature of -59°C. was recorded; the year's mean was -26°C. Amundsen's preparations were completed by Oct. 20, 1911, and he started for the pole with four companions, 52 dogs, four sledges, and a four months' food supply. At 85°S., where the Ross Barrier joins land, the party had to climb over 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 observations until December 17 before starting the return journey to Framheim. All five men reached the wintering base in excellent condition on Jan. 25, 1912.

Beginning one of the most dramatic stories in polar exploration, Scott's party of five, accompanied by supporting groups, left McMurdo Sound on Nov. 1, 1911. When their Siberian ponies proved ill adapted to the snowy terrain, they began man-hauling their supplies on sledges. They followed the same route up the glaciers toward the pole which Shackleton had used two years earlier. Exhausted, Scott's party reached the pole 35 days after Amundsen, and the disappointment at finding Amundsen's cache there disheartened them further. The exact point of the pole was determined by observation to be less than half a mile from Amundsen's tent, where Scott picked up a written message for King Haakon VII of Norway. On their return journey, considerably weakened by man-hauling and by the prevailing low temperatures encountered, 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. The bodies of Scott and his comrades were located together with records, collections, and scientific data, and a cairn was constructed over the tent with a cross on top to mark the icy rendezvous.

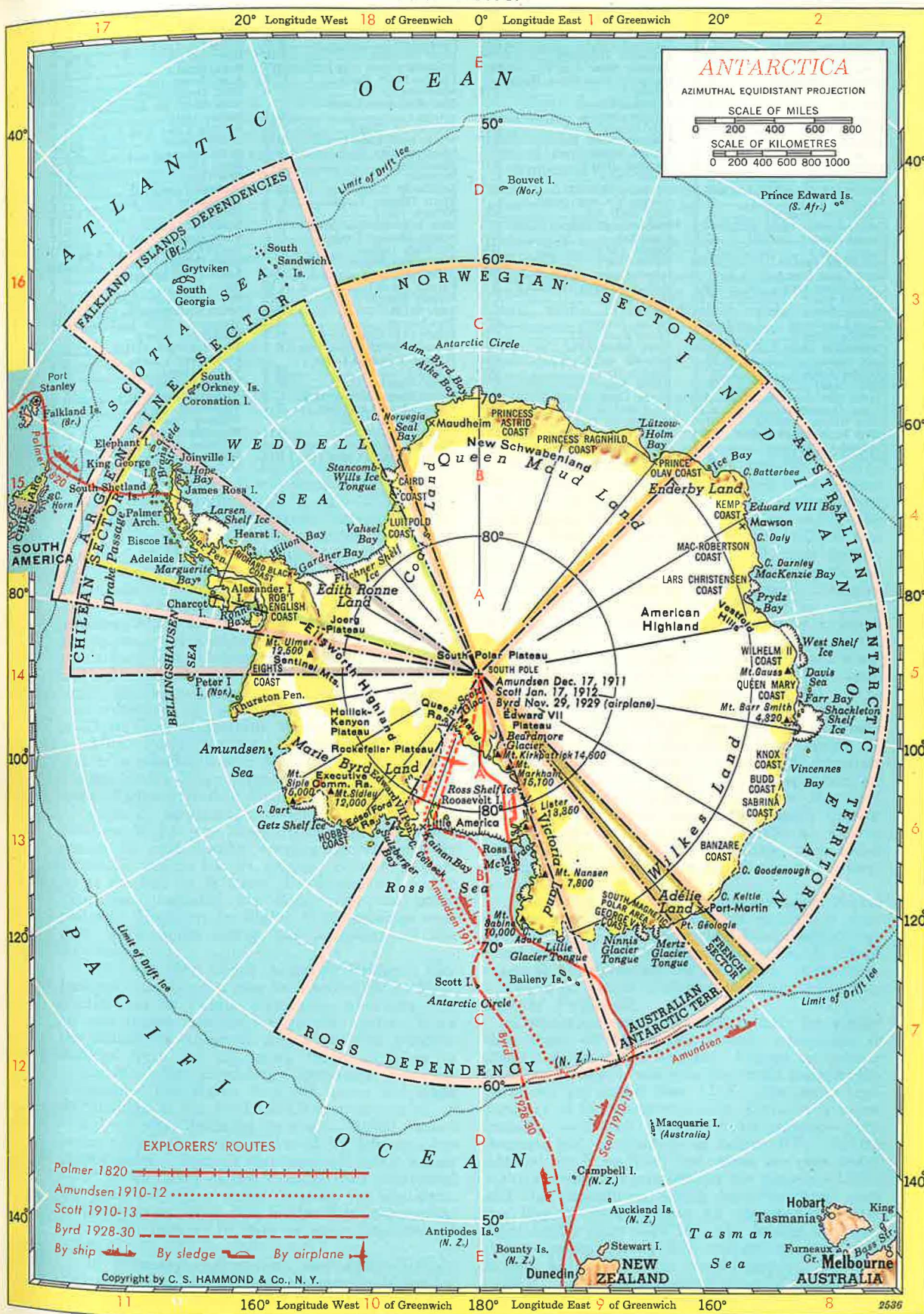
In 1911, Wilhelm Filchner entered the Weddell Sea and sighted Luitpold (Leopold) Coast. His party attempted to set up a wintering base on the ice and named Vahsel Bay (renamed Duke Ernst Bay). On a journey inland they reached an elevation of 975 feet in latitude 77°45'S., longitude 36°W. The ice on which their base was established broke loose, and they had to abandon their plan. Their ship was caught in the pack ice in March 1912, and for eight months drifted helplessly northward before it was freed.

Shirase visited the Bay of Whales in 1912 and made a short sledge trip on the Ross Barrier. From 1911 to 1914, Mawson, who had been a member of Shackleton's expedition and was one of the party which successfully ascended Mount Erebus, commanded an expedition to the Australian sector, made geographical discoveries, and gathered extensive scientific data. In recognition of his exceptional work he was knighted in 1914.

Shackleton, in August 1914, launched a daring Antarctic project. He contemplated sledging across the continent from Coats Land at the Weddell Sea to his old base at McMurdo Sound in the Ross Sea. He employed two ships: one for a party headed by himself to make the trans-polar sledge trip with dogs, the other to meet him at the Ross Sea side of the continent. Shackleton's ship, the *Endurance*, entered the heavy pack ice of the Weddell Sea but within view of the Coats Land became fast in the ice and began drifting helplessly northward. Eventually it was crushed by the ice and sank. The men, after a perilous journey drifting and walking with the ice pack, reached Elephant Island. There 22 men remained behind, while Shackleton, with 5 companions in a small whaleboat, made a hazardous crossing of treacherous waters between Elephant Island and South Georgia Island, 800 miles northeast. All were rescued by the end of 1916. In 1921, Shackleton again sailed south, this time aboard the *Quest* to explore the Enderby Land quadrant. He died in South Georgia in 1922.

The advent of the airplane brought a new era which made possible exploration of larger areas in a much shorter time. 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 superb flight from Deception Island in the South Shetlands southwest along the east coast of Palmer Peninsula and added thousands of square miles to the known Antarctic. Wilkins led a second expedition in 1929, establishing knowledge of the outlines of Charcot Island, and made flights southward over the floating pack ice to the west. Comdr. Richard Evelyn Byrd in 1929 wintered close to Amundsen's old base, Framheim, at the Bay of Whales. He captured popular imagination by flying, with Bernt Balchen as pilot, to the polar plateau (Nov. 28-29, 1929). Byrd, now a rear admiral, returned to the same base in 1934. John R. Rymill, in 1935-1937, wintered on the west side of Palmer Peninsula in Marguerite Bay,

ANTARCTICA



al was dated March 29, following Antarctic spring, a rescue party succeed in the dead. The bodies of s were located together s, and scientific data, and ed over the tent with a the icy rendezvous.

ilchner entered the Wed- uitpold (Leopold) Coast. set up a wintering base hsel Bay (renamed Duke rney inland they reached et in latitude 77°45'S., ice on which their base loose, and they had to heir ship was caught in 912, and for eight months ward before it was freed. ay of Whales in 1912 and rip on the Ross Barrier. awson, who had been a s expedition and was one cessfully ascended Mount i expedition to the Aus- raphical discoveries, and ific data. In recognition he was knighted in 1914. st 1914, launched a daring e contemplated sledging n Coats Land at the Wed- se at McMurdo Sound in ployed two ships: one for nself to make the trans- dogs, the other to meet a side of the continent. *Endurance*, entered the Weddell Sea but within d became fast in the ice lessly northward. Even- play the ice sank. The ourney drifting and walk- reached Elephant Island. behind, while Shackleton, small whaleboat, made a treacherous waters be- and South Georgia Island. All were rescued by the . Shackleton again sailed the *Quest* to explore the . He died in South Geor-

irplane brought a new era ploration of larger areas . First to utilize a plane s Sir Hubert Wilkins, years' conspicuous service ns-Arctic flight. In the a superb flight from De- outh Shetlands southwest of Palmer Peninsula and are miles to the known d a second expedition in vledge of the outlines of de flights southward over the west. Comdr. Rich- 1929 wintered close to Framheim, at the Bay of popular imagination by hen as pilot, to the polar 929). Byrd, now a rear e same base in 1934. John 37, wintered on the west sula in Marguerite Bay,

ANTARCTICA

Adare (cape).....	B 9	Edward VIII (bay).....	C4	Larsen Shelf Ice.....	C16	Rockefeller (plateau).....	A12
Adelaide (isl.).....	C15	Eights Coast (reg.).....	B14	Lillie Glacier Tongue.....	C 9	Ronnie (bay).....	B15
Adélie Land (reg.).....	C 7	Elephant (isl.).....	D16	Lister (mt.).....	B 8	Roosevelt (isl.).....	A10
Admiral Byrd (bay).....	C18	Ellsworth Highland.....	A14	Little America.....	B10	Ross (isl.).....	B 9
Alexander I (isl.).....	B15	Enderby Land (reg.).....	C 3	Luitpold Coast (reg.).....	B17	Ross (sea).....	B10
American Highland.....	B 4	Executive Committee Range		Lützow-Holm (bay).....	C 2	Ross, James (isl.).....	C16
Amundsen (sea).....	B13	(mts.).....	B12	MacKenzie (bay).....	C 4	Ross Dependency.....	C10
Antarctic Circle.....	C 1	Falkland Islands		MacRobertson Coast		Ross Shelf Ice.....	A10
Argentine Sector (terr.).....	D15	Dependencies.....	D16	(reg.).....	B 4	Sabine (mt.).....	B 9
Atka (bay).....	C18	Farr (bay).....	C 5	Marguerite (bay).....	C15	Sabrina Coast (reg.).....	C 6
Australian Antarctic		Filchner Shelf Ice.....	B16	Marie Byrd Land (reg.).....	B13	Scotia (sea).....	D16
(terr.).....	C 4, C 8	French Sector (terr.).....	C 7	Markham (mt.).....	A 8	Scott (glacier).....	A10
Balleny (isls.).....	C 9	Gardner (bay).....	B16	Maudheim.....	B18	Scott (isl.).....	C10
Banzare Coast (reg.).....	C 7	Gauss (mt.).....	C 5	Mawson.....	C 4	Seal (bay).....	B18
Barr Smith (mt.).....	C 5	Géologie (point).....	C 7	McMurdo (sound).....	B 9	Sentinel (mts.).....	B14
Batterbee (cape).....	C 3	George V Coast (reg.).....	C 8	Mertz Glacier Tongue.....	C 8	Shackleton Shelf Ice.....	C 5
Beardmore (glacier).....	A 8	Getz Shelf Ice.....	B12	Nansen (mt.).....	B 8	Sidley (mt.).....	B12
Bellinghausen (sea).....	C14	Goodenough (cape).....	C 7	New Schwabenland (reg.).....	B 1	Siple (mt.).....	B12
Biscoe (isls.).....	C15	Grytviken.....	D17	Ninnis Glacier Tongue.....	C 8	South Georgia (isl.).....	D17
Bouvet (isl.).....	D 1	Heart (isl.).....	B16	Norvegia (cape).....	B18	South Magnetic Polar Area.....	B 8
Bransfield (strait).....	C16	Hilton (bay).....	B16	Norwegian Sector		South Orkney (isls.).....	C16
Budd Coast (reg.).....	C 6	Hobbs Coast (reg.).....	B12	(terr.).....	B18	South Polar (plateau).....	A 4
Caird Coast (reg.).....	B18	Hollick-Kenyon (plateau).....	B13	Palmer (arch.).....	C15	South Pole.....	A 5
Charcot (isl.).....	C15	Hope (bay).....	C16	Palmer (pen.).....	C15	South Sandwich (isls.).....	D17
Chilean Sector (terr.).....	C14	Ice (bay).....	C 3	Peter I (isl.).....	B14	South Shetland (isls.).....	C15
Coats Land (reg.).....	A17	Indian (ocean).....	C 3	Port-Martin.....	C 7	Stancombe-Wills Ice Tongue.....	B17
Colbeck (cape).....	B10	James Ross (isl.).....	C16	Prince Olav Coast (reg.).....	C 3	Sulzberger (bay).....	B11
Coronation (isl.).....	C16	Joerg (plateau).....	B15	Princess Astrid Coast (reg.).....	B 1	Thurston (pen.).....	B14
Daly (cape).....	C 4	Joinville (isl.).....	C16	Princess Ragnhild Coast		Ulmer (mt.).....	B14
Darnley (cape).....	C 4	Kainan (bay).....	B10	(reg.).....	B 2	Vahsel (bay).....	B17
Dart (cape).....	B12	Keltie (cape).....	C 7	Prydz (bay).....	C 4	Vestfold (hills).....	B 4
Davis (sea).....	C5	Kemp Coast (reg.).....	C 3	Queen Mary Coast (reg.).....	C 5	Victoria Land (reg.).....	B 8
Drake (passage).....	C15	King George (isl.).....	D16	Queen Maud Land (reg.).....	B 1	Vincennes (bay).....	C 6
Edith Ronne Land.....	B16	Kirkpatrick (mt.).....	A 8	Queen Maud Range		Weddell (sea).....	C16
Edsel Ford Range (mts.).....	B11	Knox Coast (reg.).....	C 6	(mts.).....	A11	West Shelf Ice.....	C 5
Edward VII (pen.).....	B11	Lars Christensen Coast		Richard Black Coast (reg.).....	B15	Wilhelm II Coast.....	C 5
Edward VII (plat.).....	A 7	(reg.).....	B 4	Robert English Coast (reg.).....	B15	Wilkes Land (reg.).....	B 7

Rockefeller (plateau).....	A12
Ronnie (bay).....	B15
Roosevelt (isl.).....	A10
Ross (isl.).....	B 9
Ross (sea).....	B10
Ross, James (isl.).....	C18
Ross Dependency.....	C10
Ross Shelf Ice.....	A10
Sabine (mt.).....	B 9
Sabrina Coast (reg.).....	C 6
Scotia (sea).....	D16
Scott (glacier).....	A10
Scott (isl.).....	C10
Seal (bay).....	B18
Sentinel (mts.).....	B14
Shackleton Shelf Ice.....	C 5
Sidley (mt.).....	B12
Siple (mt.).....	B12
South Georgia (isl.).....	D17
South Magnetic Polar Area.....	B 8
South Orkney (isls.).....	C16
South Polar (plateau).....	A 4
South Pole.....	A 5
South Sandwich (isls.).....	D17
South Shetland (isls.).....	C15
Stancombe-Wills Ice Tongue.....	B17
Sulzberger (bay).....	B11
Thurston (pen.).....	B14
Ulmer (mt.).....	B14
Vahsel (bay).....	B17
Vestfold (hills).....	B 4
Victoria Land (reg.).....	B 8
Vincennes (bay).....	C 6
Weddell (sea).....	C16
West Shelf Ice.....	C 5
Wilhelm II Coast.....	C 5
Wilkes Land (reg.).....	B 7

which was surveyed in detail through two winters of activities. At various times from 1930 to 1937, Lars Christensen conducted exploratory flights along the Queen Maud Land sector. Surveying was accomplished from the air. This was the first time ice-free lakes were discovered along the rocky coastline in this sector, although Griffith Taylor on Scott's expedition had discovered these features in the Ross Sea area some 30 years earlier. These lakes are caused by melting water running into depressions along the coast; the summer's sun is sufficiently strong to keep them free of ice. Lincoln Ellsworth, in four expeditions (1933-1939), discovered large areas of new land by airplane. His trans-Antarctic flight in 1935, from Dundee Island, off the east coast of Palmer Peninsula, to the Bay of Whales, at the Ross Sea, was outstanding. In a single-engine plane with four landings en route, he took 22 days to cover the distance. This area he called James W. Ellsworth Land (now Ellsworth Highland). In 1938-1939, Ellsworth penetrated the continent for 300 miles in longitude 80°E., overlooking an area now called American Highland. Capt. Alfred Ritscher led a German airplane expedition to the Queen Maud Land sector in 1939. A series of flights were made, and land mapped between latitudes 21°E. and 12°W.

The United States Antarctic Service Expedition (1939-1941), under the auspices of the Department of Interior, established two bases, one in the Bay of Whales and the other on Palmer Peninsula. In addition to scientific work conducted at both bases, the eastern base, using one airplane, added 150,000 square miles of new land to the map. A sledge party under Finn Ronne established that Alexander I Land was an island and surveyed 400 miles of new continental coastline. The known coastline of the Weddell Sea was extended by plane 200 miles beyond the southern limit of Wilkins' flight in 1928.

After Pearl Harbor, Antarctic exploration was at a standstill until December 1946, when a United States Navy expedition under Rear Admiral Richard Harold Cruzen sailed south with 13 ships, 21 airplanes, and 4,000 men. This expedition, which was designed to train navy personnel in cold-climate operations, remained in Antarctic waters for six weeks. A base was set up at the Bay of Whales. Byrd, attached to the expedition, repeated his flight over the polar plateau. Exploratory flights from seaplane tenders were made along the periphery of the continent.

The 1946-1948 Ronne Antarctic Research Expedition established a base in March 1947 in Marguerite Bay on Palmer Peninsula, where its vessel was frozen into the ice for the winter. With the coming of Antarctic spring outlying weather stations were set up, using three airplanes in preparation for extending operations into the unknown. The planes flew 346 hours and made 86 landings in the field; 250,000 square miles of new land were included in some 700,000 square miles which the party covered by trimetrogon photography. Ronne's discovery of Edith Ronne Land at the head of the Weddell Sea eliminated the possibility of a strait dividing the continent. Sledge parties were also in the field, accumulating a rich harvest of data in many branches of science.

In February 1950 a joint Norwegian-British-Swedish party under John Gaver established a base on Queen Maud Land in longitude 10°W.,

with 14 men to conduct scientific studies. The party was scheduled to remain on the continent until 1952. In January 1950, André Lotard landed a French expedition on the ice-filled shore of Adélie Coast in the French-claimed sector. This party also expected to remain on the continent until 1952. See also biographies of the leading explorers.

Antarctic Ocean.—The depth of the waters in the Antarctic regions 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, while Thomas Poulter in 1934 sounded 300 fathoms off 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 surface water ranges from a few degrees below freezing to a few degrees above.

Antarctic Ice.—The huge tabular icebergs found drifting off Antarctic shores have broken off the continental shelves and, intermingling with glacier icebergs, have drifted seaward. The largest floating iceberg was seen in 1927; it was about 130 feet high and some 100 miles square. The entire continent is surrounded by pack ice, which may be of one or several years' thickness. In summer the current sets this ice in motion, forming leads which ships can penetrate to reach the continent.

Antarctic Continent.—Of the continent's approximately 6,000,000 square miles of land area, two thirds was still unexplored by 1951. The 2,000,000 square miles of explored area has an average elevation of 5,000 feet; the South Pole's elevation is about 9,500 feet. Nine tenths of the known area 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 at various localities, and petrified wood on Alexander I Island.

Argentina, Australia, Chile, France, Great Britain, and Norway claim large sections of Antarctica. None of these claims have been recognized by the United States government, which reserves all rights on the continent. Argentina, Chile, and Great Britain maintain bases on Palmer Peninsula.

Climate.—Antarctica's coasts are far colder than those of the Arctic Ocean, which are in 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 Shelf Ice values are even lower—the average temperature for the year is -13°F., and the 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 obtained 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 and 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 much lower than any reported from Arctic coasts, but 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 Greenland; 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 an 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 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.

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 90 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 Borchgrevinck, 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.

Bibliography.—Cook, James, *A Voyage Towards the*

South Pole and Round the World, 3 vols. (London 1777); Wilkes, Charles, *Narrative of the Exploring Expedition During 1838-1842*, 6 vols. (Philadelphia 1845); Borchgrevinck, C. E., *First on the Antarctic Continent* (London 1901); Nordenskiöld, Otto, and Andersson, J. G., *Antarctica* (London 1905); Scott, R. F., *The Voyage of the "Discovery"*, 2 vols. (London 1905); Shackleton, E. H., *The Heart of the Antarctic*, 2 vols. (London 1909); Amundsen, Roald, *The South Pole*, 2 vols. (New York 1913); Scott, R. F., *Scott's Last Expedition*, ed. by Leonard Huxley, 2 vols. (London 1913); Mawson, Douglas, *The Home of the Blizzard* (London 1915); Shackleton, E. H., *South* (London 1922); Wilkins, Hubert, "First Airplane Exploration in the Antarctic," *American Geographical Review*, June 1929-1930; Byrd, R. E., *Discovery* (New York 1935); Ellsworth, Lincoln, *Beyond Horizons* (New York 1938); Hobbs, W. H., "The Discoveries of Antarctica Within the American Sector," *Transactions, American Philosophical Society*, January 1939; Ronne, Finn, *Antarctic Conquest* (New York 1949).

FINN RONNE,

Commander, USNR (Inactive); Commander of the Ronne Antarctic Research Expedition, 1946-1948.

ANTARES, ān-tār'ez (Gr. *anti*, like + *Arēs*, Mars; so called because of its color), a red double star of the first magnitude, the middle one of three in the body of the constellation Scorpio; its diameter is estimated at 300 million miles. It is used by navigators in ascertaining longitude.

ANTEATER, a name given to several quite different mammals, but particularly applied to the Myrmecophagidae, a South American family of the order Edentata and suborder Xenarthra, with the head extremely long; the snout slender; the mouth, ears and eyes small; the jaws entirely toothless; the tongue long, wormlike and protrusible, and covered with a viscid saliva which holds whatever insects are licked up until the tongue can be withdrawn into the mouth. The legs are strong and heavy; the toes vary in number in the different forms but in all species are united as far as the base of the large claws, which, in the great anteater, are adapted to tearing open the hills of ants and termites, on which, together with their larvae, the animal feeds, but are turned under the feet when the animal walks. The great anteater or ant bear (*Myrmecophaga jubata*), found in tropical South America, is a sluggish animal, forest-dwelling but entirely terrestrial; it grows to a height of two feet and a length of four feet, not including its long and very shaggy tail. Though timid, it is capable of effective self-defense, using its strong forearms to hug and the claws to tear its opponents. Its body color is gray, set off by a black band which crosses the breast and tapers to the top of the shoulders, and by white feet and forelegs. The hair is long, particularly on the back toward the tail, and on the tail itself. A related species, *M. centralis*, is found in Panama, Costa Rica, and southern Mexico.

Another, much smaller form (*Tamandua tetradactyla*), which is also tropical, but ranges northward into Central America and Mexico, is arboreal and has a prehensile tail. It is about the size of a cat. A third form (*Cyclopes didactylus*), the little two-toed anteater, is about the size of a rat, is also arboreal and has a prehensile tail. Its claws are curved and very sharp for climbing.

Besides the animals of this family, called the true anteaters, are the old-world scaly anteaters or Manids (see MANIDS), the aardvark (q.v.), the spiny anteaters (see ECHIDNA) and certain insectivorous marsupials found in Australia and belonging to the genus *Myrmecobius*.