

GEOGRAPHY

# New Attacks on the Last Continent

## Discovery of the Earth Nears Its End as Explorers Plan to Pierce Again the Fractionally Known Antarctic

By EMILY C. DAVIS

WHEN ELLSWORTH and Balchen take to the air one carefully picked day next December and head their monoplane on a daring flight straight across the Antarctic continent, they will be off on one of the last thrilling adventures left in this almost-conquered world.

No human being has ever crossed the South Polar land, either on foot or in the air. To try is a big adventure. To succeed would be a triumph of exploration.

When you "read all about it" in the newspaper you can get a thrill of your own by stopping to realize that the last continent on earth is being discovered and explored in your lifetime. Not to appreciate what that means is to miss something—like living in the sixteenth century in Europe and being casual about the explorations of De Soto or Balboa. This twentieth century is finishing the world exploration job. People born in the twenty-first century will never know the excitement of discovery in the grand manner, after the fashion of Columbus, Magellan, and La Salle; Peary, Amundsen, and Byrd.

### An Unfinished Map

But right now the Antarctic is as mysterious and interesting as America was when explorers were trying to find out how far the New World extended and what its shape might be.

In American exploration days, map-makers drew queer outlines to represent the New World. New England they could draw with confidence, and a good deal of the seaboard to the south. But they shaped Florida like a knotty pear, and they left out the Great Lakes, and a vague gesture of the pen outlined the vast Northwest.

Antarctic maps are in that state today. Opposite Australia, where Byrd and other explorers have done intensive research, lies the "New England" of the frozen continent. That part of the South Polar map is drawn in considerable detail. Beyond that stretches

an ice-covered wilderness mainly uncharted. It spreads round the South Pole in a roughly circular mass as big as the United States and Mexico.

The area, if you think best in figures, is five million square miles, and only about a small fraction of it has ever been seen by man. It is a desert land with snow instead of sand, and the rocky tips of mountains for dark oases in the icy waste. But it is not a monotonous land. The ice and snow take varied scenic forms, such as rolling dunes, fields of "snow flowers" formed of drifting snow, cliffs of towering ice masses, and along the shore the giant glaciers. A glacier 60 miles long was measured once, along that frigid coast. There are volcanoes, one at least known to be actively smoking. As for the whiteness that such a country suggests, that whiteness is often wonderfully colored by sunsets, shadows, and the magnificent aurora phenomena. The cold is intense, even the summer months of December and January being colder than freezing. As for winds, Antarctica

is the home of the most terrific gales on earth.

These forbidding but fascinating shores have been approached from different angles by explorers, who planted flags for their countries at different points and named the surrounding territory after kings and other notables. These known sectors are joined with dotted lines by the map-makers in order to suggest the probable outline of the vast South Polar country.

### Graham Land an Archipelago

Just four years ago, Sir Hubert Wilkins flew over a corner of the Antarctic and discovered that the region of Graham Land is not joined to the continent at all. It is a separate group of islands. And that may be only the first of a series of surprises. Some geographers think that the South Polar "continent" may turn out to be no continent at all. It may be several large islands welded together in ice.

This is one of the geographical mysteries that the Ellsworth flight may solve. Making the longest non-stop polar flight ever attempted, Ellsworth and Balchen will cross and return over Antarctica at its narrowest point—



Photo by Byrd Expedition

BEAUTY AND MAJESTY OF ANTARCTIC ICE TONGUES

where the Ross Sea and the Weddell Sea cut deeply into the circular land.

This is the line along which geographers think Antarctica may be divided in two. A smaller portion may be separated from the larger by a strait obscured by ice. Admiral Byrd and Sir Hubert Wilkins recently showed that the seas run farther inland than had been expected.

So little is this part of Antarctica known that Ellsworth has estimated only 300 miles of his 1,450 mile crossing have been seen by the eye of man. The middle third of the journey will be the most full of unknown quantities. Flying from the Ross Sea to the Weddell Sea, he expects to turn his plane and fly back without stopping, making a 2,900 mile journey in 20 hours.

All the way along the lonely route, a clock-like camera will map the terrain, snapping a picture every ten seconds. Given such a record, geographers at home in comfortable laboratories may be able to decide what the land mass of the Antarctic shall be called—continent or islands.

Admiral Byrd's next expedition, awaiting favorable conditions, will also continue to gather data showing what the land is like that lies under so much ice. With a base camp only 300 miles from the Pole, Admiral Byrd is planning to explore Marie Byrd Land, which he discovered and named after his wife.

There are lofty mountains in Marie Byrd Land, with rocky tips sticking up through the ice. Such peaks are the geographer's prime clues to the hidden land. By struggling with winds and cold, a geologist can manage to gather a few treasured rock samples from these exposed points. Then by comparing the kinds of rock collected in other parts of the continent, he can gain an idea of how the mountains are, whether aligned in chains or otherwise.

So rare are the bits of rock that a geologist can find in Antarctica, that stomachs of penguins even have been searched for valuable additions to the rock collection.

For some years both geographers and geologists have been trying to determine whether these mountain ranges of Antarctica are an extension of ranges on South America, Africa, and Australia. Not enough data have been gathered yet to answer that.

If the mountains do prove to be sections of the long chains, now broken down in part and covered by the in-

## Conquest of The Last Continent

**COOK**—first to sail across the Antarctic Circle, 1773.

**BELLINGSHAUSEN**—first to circumnavigate the South Pole, 1775.

**WILKES**—reported the Antarctic land to be a continent, 1840.

**ROSS**—Explored the continent extensively, 1840-1842.

**SHACKLETON**—first to attain the South Polar Plateau, 1908.

**DAVID**—located the South Magnetic Pole, 1909.

**AMUNDSEN**—first to reach the South Pole, 1911.

**SCOTT**—arrived at the Pole a month later, 1912.

**WILKINS**—first flew a plane in the Antarctic, discovering Graham Land to be an archipelago, not part of the continent, 1928.

**BYRD**—first to fly over the South Pole, 1929.

**MAWSON**—traced the longest continuous land border in the Antarctic—west of the Ross Sea—1911-1931.

**ELLSWORTH**—plans flight across the continent, 1933.

**BYRD**—planning to establish base camp within 300 miles of the Pole, 1933.

tervening ocean, it will indicate that long ago in earth history the South Polar land was joined to one or more of the other continents. And if such land bridges did exist, leading down to the South Pole, doubtless in those remote days animals and birds from South America and Africa migrated across the polar region.

Biologists rather think this must have happened, for otherwise they can only wonder how the ancestors of the Australian kangaroos, wombats, and other paunch-carrying animals managed to get there from South America, where the marsupials presumably originated.

But at present so little is known about the far-off times in Antarctica that Dr. Isaiah Bowman, director of the American Geographical Society of New York, once said: "Finding a fossil marsupial in Antarctica would excite science as much as a message from Mars."

That the South Polar region was once warm enough to encourage life is certain, because coal beds outcrop in

the mountain peaks. That means that 150 million years ago, the weather must have been mild enough for trees and plants to live and die and decay and be packed down to form coal. Today there are only two flowering plants in the Antarctic, and they are scrawny, stunted things. The largest form of land life there today is a spider, except on the rocky island fringes where penguins and seals congregate.

Barrenness of the Antarctic is almost incredible. The ice sheet is no thin frozen veneer but a cap thousands of feet thick, the remnant from an ancient glacial age.

There again science calls upon explorers to find out—

How thick is the ice sheet, and is it really shrinking?

The present scientific view is that the cap is shrinking, but so slowly that no perceptible change takes place. Why it is shrinking is one of the weather mysteries of the Antarctic.

The thickness of (Turn to Page 186)

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the sheet is enormous, if the German geologist Prof. W. Meinardus is right in his estimates. It is definitely known that the South Pole is 10,000 feet above sea level, which is almost as lofty an elevation as some of the Alpine peaks. The known portion of Antarctica has a high average elevation.

But—Prof. Meinardus believes that most of this loftiness is just ice. The hidden land, he estimates to be not more than 2,000 feet above sea level. In reaching this conclusion, he was guided mainly by the height of neighboring continents. If he is right, the ice sheet over Antarctica is so enormous a store of cold that it is hard to find ways of appreciating it. He says that if spread thin over the earth, it would bury every country under more than 120 feet of ice. If it should melt, it would raise the oceans 100 feet.

This ice, piled on top of Antarctica, is reason enough why that continent had to wait for the age of science before its secrets could begin to be probed.

### World's Weather Factory

Remote and fantastic as the Antarctic seems, it is important to the rest of the world. If nothing else comes from the ice cap, plenty of weather is manufactured there, and nobody knows yet how directly it affects the weather of the United States and Europe. The ice patrol has reported that water from the Antarctic apparently creeps as far north as Greenland, a 10,000 mile sea journey. Between Greenland and Labrador the patrol found that the deep water was so cold and salty as to suggest an origin in the distant Antarctic.

It is generally agreed that the world should be having weather reports and forecasts from its Antarctic weather factory. The influences of that weather factory on northern countries may still be doubtful, but there is no doubt that southern continents get a large share of their "weather" from the frozen south. Australian wheat farmers and South American cattle men could be better prepared for droughts and other weather troubles if warnings were dispatched from far southern stations.

Dr. Bowman in a discussion of this problem said, "It would pay handsomely in crops and cattle and security of life if meteorological stations were set up on the borders of the Antarctic and on the island groups that girdle it."

And Dr. Bowman added: "It is under the impulse of this idea that Captain Sir Hubert Wilkins has carried on his explorations in the Antarctic Archipelago for two seasons. He did not go down there just for fun; he was searching for suitable bases for meteorological stations to be established by international cooperation. With a ring of such stations about the Antarctic and with daily weather reports from them by radio, it would be possible to draw charts that would trace the effects of cyclones and anticyclones as they move forward from breeding places out over the southern ocean."

Physicists are among the scientists who have important errands for exploring expeditions to do in the Antarctic. For one thing, they would like to have records taken of the cosmic rays in the world's highest latitudes. As far as such researches have gone, they have shown that the rays from outer space gain in intensity as the higher latitudes are reached. Perhaps the polar regions may yield facts that will help in learning whether or not the cosmic rays are electrons, as some physicists think.

The beautiful southern auroral displays, which are like brilliant curtains and arcs, may be linked with the cosmic rays. A French physicist, Dauvillier, has evolved the theory that the rays are electrons shot from the sun through the action of strong electric fields on the sun. Those cosmic rays that approach the earth, he reasons, would be affected by the earth's magnetic field, and near the magnetic poles would produce the aurora. That, too, is something for expeditions to test and prove.

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Science News Letter, September 16, 1933



## HOW ANIMALS SPEND THE WINTER

an address by

**Austin H. Clark**

of the U. S. National  
Museum

To be given Friday, Sept. 22, at 1:45 p. m. Eastern Standard Time over stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

PSYCHOLOGY

## Waltz Time Preferred To Foxtrot Rhythm

**D**ESPITE the great popularity of the foxtrot, its rhythm takes second place when compared with the rhythm of the waltz, it was revealed by tests reported by F. H. Lewis of Bates College.

The tests eliminated the possibility that the subjects would be influenced by melody or other factors by having the rhythm produced by timed and amplified oscillator tones. Not only was the three-four time preferred, but the waltz rhythm was also better able to produce movement, it was found.

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PSYCHOLOGY

## Chimpanzee's Vision Is As Acute As Man's

**H**OW CHIMPANZEES were given tests of vision and found to have about the same keenness of eyesight as man was related to members of the American Psychological Association in Chicago by Kenneth W. Spence, of Yale University.

A new test of vision was devised to compare the vision of the apes with that of a five-year-old child and also human adults. For, of course, the chimpanzee cannot be expected to read the queer looking E's, A's, and so on, that appear on the chart usually used for testing vision. Neither, for that matter, could the human child.

The test for them consisted of choosing a box having a circle with black and white stripes on it, in preference to one having a plain clear circle. The width of the stripes could be varied by the examiner very gradually until they were so narrow as to be invisible to the eyes of the subject. The keener the eyes, the narrower the stripes could be made before the subject would be confused and be unable to choose the right box. The box with the striped circle contained food.

The human adults were tested with the same circles, but were allowed to say which had the stripes.

The eyesight of one of the chimpanzees was about the same as that of the human adults and definitely better than that of the five-year-old. The other chimpanzee had the poorest vision but was probably upset by his physiological condition at the time.

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