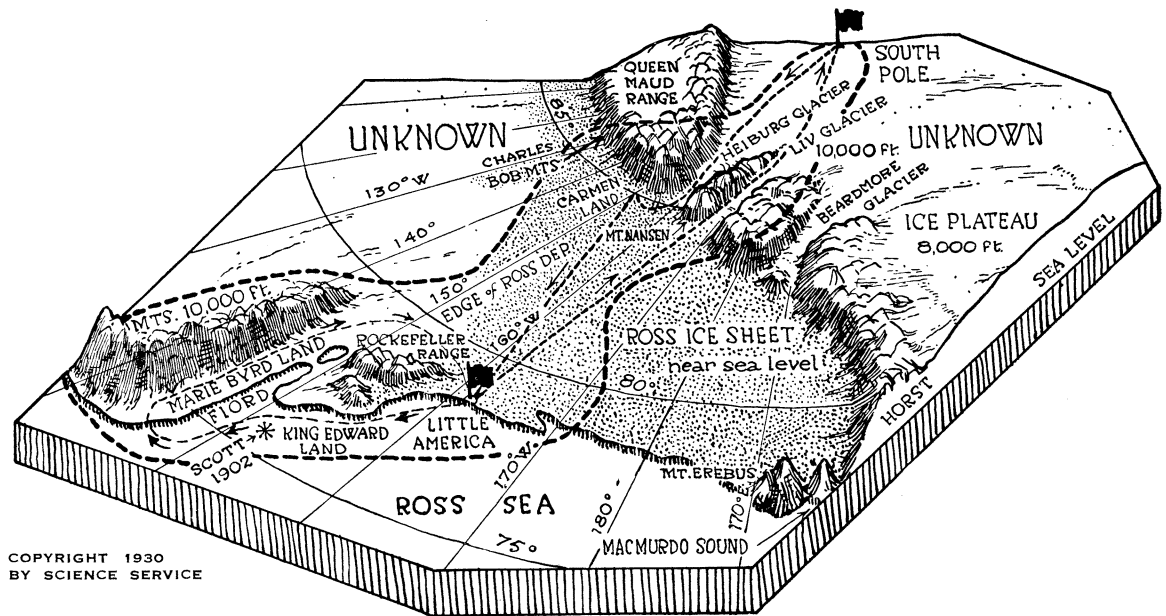


Where the Byrd Expedition added to Antarctic knowledge. The heavy dotted line circles the area, over a thousand miles long, which was surveyed by Admiral Byrd. The light dotted lines show the routes of his airplane exploratory trips. This block diagram by Prof. Griffith Taylor is in isometric projection in order that the geography of the area may be better visualized.



# Admiral Byrd's Discoveries in Antarctic

*Exploration*

By Griffith Taylor

*Professor of Geography of the University of Chicago,  
Geologist with Scott's Last Antarctic Expedition.*

THE American expedition to the Antarctic which is just returning to America with such a record of success is of special interest in the annals of exploration for a variety of reasons. Perhaps the three outstanding features are the large area of new country surveyed, the new light thrown on major scientific problems and, lastly, the new technique in polar exploration, so far as Antarctica is concerned, which Byrd and Wilkins have developed.

Byrd's major geographical achievement lies in his charting of the eastern portion of the Great Ross Ice Shelf and the adjacent coast. To this he has added the discovery of a large number of new areas of somewhat less importance, since their major features were known from Amundsen's sledge journeys in 1911-1912, or from Scott's voyage early in 1902. The block diagram will make his achievements clear. Before Byrd's explorations, Scott had traversed the front of the Ross Ice Shelf—sailing far along its icy front, which towered one or two hundred feet above the sea. He reached nearly to longitude 150° west where he was blocked by dense pack ice. He sighted the black rocks in King Edward Land (called Scott's Nunataks) and also the adjacent summits of the Alexandria Range. Amundsen in 1911 and 1912 placed his headquarters at Framheim, which was

within a mile or two of "Little America" shown on the diagram. His journey to the Pole was as direct as possible. He reached the Plateau by way of the Heiberg Glacier, and attained the Pole on December 14, 1911. He returned the same way. His surveys were not very complete, and of course were confined to a short distance from his track. He made practically no scientific collections. He reported the presence of Carmen Land, which seemed to limit the low-level Ross Ice Shelf on the east about longitude 150° west.

Let us first of all consider the salient results of Byrd's wonderful flight on November 28 and 29, 1929. Leaving at 3:30 p. m., he rapidly crossed the undulating low icy surfaces of the Ross Ice Shelf and then flew up the Liv Glacier which lies somewhat to the west of Amundsen's route. By midnight he reached the Ice Plateau at 10,000 feet. He was at the Pole an hour or so later. He came back via the Heiberg Glacier, and then flew east along the foot of the Great Mountain Scarp to obtain a nearer view of the Charles Bob Mountains, which he discovered and named. He found no land where Amundsen placed Carmen Land, and Dr. Gould corroborated this absence later.

His second great flight was for a distance of about 350 miles to the

northeast of Little America. This coastline from King Edward Land to the east was previously entirely unknown until Charcot Land (discovered in 1909) is reached some 1500 miles away. No unknown stretch of the Antarctic shoreline of such extent occurs elsewhere around this huge continent. Byrd's flight last December enabled him to chart 200 miles of new coast, including a great range of mountains separated from King Edward Land by a long fiord or gulf. This new land, lying east of the British Dependency, he calls Marie Byrd Land. The mountains rise to 10,000 feet and the preliminary maps seem to support the view that it is a great scarp or fault-face of the same type as that bounding the Ross Ice Shelf on its western side. About 100 miles from the coast, Byrd discovered the Rockefeller Range between Marie Byrd Land and Little America.

No method of rapid mapping can compare with a photographic survey from the air. At the normal height of flying the camera can photograph a belt of country of the order of 100 miles wide. So that the observer from Byrd's airplane was able to fix with reasonable accuracy the topography in an enormous terrain; where the sledger with his sextant or theodolite would only determine the position of a few of the nearer dominant features. (Turn to page 398)

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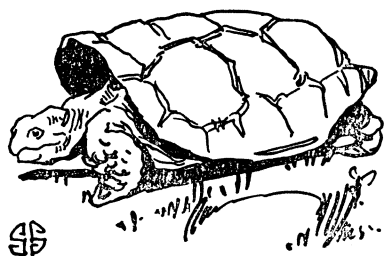
## NATURE RAMBLINGS

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By Frank Thone



*Galapagos Tortoises*

ABOUT a hundred years ago a young naturalist scrambled around among the rocks on the shores of the Galapagos islands, south of Panama and west of Ecuador. He was having the time of his life, for almost every animal and plant he saw was a species new to him. Reflecting on the possible why and wherefore of this island life being so different from that of the nearby mainland, he was hit right between the eyes with a big idea.

Not being a precipitate young man, Charles Darwin went home and incubated this big idea for forty years before he let it loose in print, to startle the world and revolutionize biology and philosophy.

One of the first things that the young Darwin must have seen on the Galapagos islands were their turtles. He must have seen them very soon, for they are among the biggest things in sight there. The old ones—and nobody knows how old they are—get to have a shell diameter of half a dozen feet, and can carry full-grown men on their backs apparently without effort. They are really monumental reptiles.

There were giant tortoises practically without end when Darwin visited the islands. But there are relatively few of them now. Ecuador has never bothered itself about the conservation of wild life on these offshore possessions, and the ranks of the tortoises have been mercilessly decimated by reckless hunters and by whalers that wanted a big mess of turtle soup for their crews.

So the best chance that the Galapagos tortoises have is in emigration. A few zealous zoöphiles have carried off quite a number of them alive, and they now crawl their indifferent tortoisian ways in the reptile houses of some of the larger zoological parks, where they may be seen by the curious.

*Science News-Letter, June 21, 1930*

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## The Discoveries of Byrd—Continued

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Quite apart from the discovery of new lands, we may therefore reasonably hope for an accurate reconnaissance by Byrd of a belt of country over 1,000 miles long and perhaps 200 miles wide. Such a piece of charting has never been accomplished by any previous Antarctic Expedition.

Let us now consider the scientific problems which Byrd's expedition has helped to solve. As regards continental structure, the most important result has already been referred to. It seems probable that the low-lying Ross Ice Shelf continues far to the southeast of the limits assigned to it by Amundsen. It is as if Americans had not yet crossed the States, and were in doubt whether there were a low-level route to San Francisco—or whether a rugged topography confronted them. The Ross Ice Shelf is probably an enormous sheet of floating ice, reaching to the foot of the giant scarp of the mountain ranges. This scarp (shown in the diagram) towers to 15,000 feet in places, and represents the edge of a block of the earth's crust. This block or "horst" has been thrust up many thousand feet above sea level. It seems likely that Marie Byrd Land is another horst, in which case the gulf covered by the Ross Ice Shelf is probably an area of subsidence of the nature of a "graben." The Charles Bob Range seems to be an extension to the east of the great horst, while the low-lying area seen by Byrd and later by Gould, seems to be an extension of the (ice-covered) depression or graben. Thus, there may be a belt of low-lying land or even of frozen sea the whole way between the Ross Sea and the Weddell Sea on the opposite side of the continent. This is a theory advanced by the writer and others, but apparently demolished by the discovery of Amundsen's "Carmen Land" in 1912.

It is not possible yet to discuss adequately the other scientific results of the Expedition. Some of us feared that Byrd would rely entirely on air surveys, but the surface surveys of Dr. Gould and others show that Byrd realizes the limitations as well as the immense advantages of the airplane in the Antarctic. In a journey to the Rockefeller Range—in which Gould's airplane was destroyed in a blizzard—the rocks were found to consist of granites and similar materials. These are stated to be like those of the Alexandria Range and

presumably like those of the basement rocks of the great mountains across the Ross Ice Barrier. It is an interesting fact, which I discuss in my recent book "Antarctic Adventure and Research," that the rocks on the Graham Land side of Antarctica (near South America) belong to one group (the Pacific type) while those of the Ross Sea belong to the other group (the Atlantic type). These two types contain different minerals which are also associated differently. If now the Rockefeller rocks contain felspathoids they will agree with the other rocks of the Ross Sea area. If they are unusually rich in quartz they will be more akin to the Pacific type. In the latter case we have some evidence for a structural connection between Byrd's region and Graham Land (and also with South America).

In his survey of the rocks at the lower end of the Liv Glacier, Gould has discovered carbonaceous shales which approach coal in composition. Coal has been found at the head of the Beardmore Glacier in 1908 and 1912, but Gould's discovery extends this potential Antarctic coal field possibly 150 miles to the east. It has been suggested that one of the world's largest coal fields occurs either in this great horst, or to the west of it under the Ice Plateau. Its present economic value is doubtful—but scientifically the presence of coal so near the Pole is of the greatest interest. It is not generally known that the present climatic zones of the world did not exist throughout most of the geological record. This record tells us something of the world's history during some 500 million years. Through all that long period the world for the most part enjoyed much more uniform climatic conditions than those which characterize it today. It seems likely that fairly temperate climates extended right to the Poles. So that the presence of valuable coal in Spitsbergen in latitude 78° north is interesting but not unexpected. There is no need to invoke a tropical climate to produce a coal vegetation—though clearly conditions near the Liv Glacier must have been very different some 150 million years ago (when coal vegetation was growing) than they are now. Indeed the most surprising result of the fairly complete geological record from Antarctica is that nowhere do we find any evidence of a Great Ice Age, such as that which today (Turn to next page)

# Canada Receives Prehistoric Art

*Archaeology*

## Replica of Ancient French Bison Given to Museum

CANADA, the Land of the Bison, has received a replica of the celebrated bison group which was modeled in clay by a first-rate artist of France some 30,000 years ago.

The original clay models were discovered in 1912 in a large cave of several chambers on the north slope of the Pyrenees in southern France. The entrance to the chamber in which they were found was blocked by stalactites that had been formed by slow natural processes operating through the long period of time that had elapsed since the artist left his work. The floor of the chamber bears the impress of naked human feet, mainly of the heel, and on the floor also is drawn an outline sketch of a bison.

Sketches of the bison and other animals are found on the walls of the cave. In one chamber were found the remains of bears, and the floor plainly showed their claw marks. The jaw bones of the bears when found in 1912 had been broken and the incisors removed, probably for decorative purposes.

Dr. Henry M. Ami, who arranged for the clay bison to cross the Atlantic, points out that Canada's real bison came from the Old World in prehistoric times. The real bison presumably reached America not



across the Atlantic, but from the opposite direction, journeying eastward across Asia and entering Alaska.

Dr. Ami spent almost half of last year in France, excavating at important sites where prehistoric men once lived. From this expedition, he has obtained collections of flint tools and weapons, and the bones of animals that supplied food to the primitive Europeans. Some of these collections have been placed in French museums. Other collections are now being distributed to museums of Canadian universities and to the Canadian National Museum.

Dr. Ami holds the view that the Eskimos of northern Canada belong to the same family tree as some of these prehistoric Europeans whose art and industries are shown in the exhibits. According to this theory, one of the European races was driven eastward during the retreat of the northern ice sheet, when the animals wandered north. These people followed the reindeer, the great stag, the bison, musk-ox, lemming, marmot, and other animals until the chase led into northeastern Asia, and thence across into the New World.

*Science News-Letter, June 21, 1930*

## Prehistoric Indian House Unearthed

*Archaeology*

THE complete plan of a big circular Indian house has been excavated in a cotton field in Mississippi, is the announcement made by Henry B. Collins, Jr., of the U. S. National Museum. Mr. Collins, who has returned from Mississippi bringing a drawing of the house plans, said that this is the first discovery showing clearly how the prehistoric Indians of the Southwest designed their buildings.

The house, which is in the frequently plowed cotton field of Claude Pepper near Deasonville, was recently recognized as an Indian site when bones and potsherds were dug up by two young men working for the Mississippi Department of Archives and History. These men, Moreau Chambers and James Ford, invited Mr. Collins to work with them in excavating the site.

The house plan shows three circles

of post holes which were used for roof supports, Mr. Collins explained. The outermost circle is sixty feet in diameter. Tracing the circles with a string, as the Indians probably did in the first place, the archaeologists found that the circles were perfectly laid out. The Indian house builders dug the three circles in shallow trenches and set the posts firmly two feet deep within the trenches. The wall of the structure was very likely of wattle-work of reeds plastered with clay, Mr. Collins explained. Traces of a fire pit were inside the house, and also a square of post holes which provided additional roof supports and possibly set off an inner room.

The outermost trench was filled in with kitchen and household refuse, including bones of deer, bear, and smaller animals, fish jaws, clam and mussel shells, arrow points, bone

scrapers and awls, one pipe and much broken pottery. Some of the pottery is a red and white kind heretofore found only in Arkansas. The trash of an Indian settlement was usually piled in a heap, and it is difficult to account for this use of it to fill the trench, Mr. Collins said.

*Science News-Letter, June 21, 1930*

## Byrd's Discoveries—*Cont'd*

prevents the growth of any living plant higher than a moss. Nor does any living animal larger than an insect a few millimeters long permanently inhabit this great continent of five million square miles. For the discussion of these and numberless other scientific problems in meteorology, magnetism, glaciology, etc., the world awaits with the greatest interest the return of the Byrd Expedition.

*Science News-Letter, June 21, 1930*