# *ANTARCTICA*

## *I. INTRODUCTION*

R: Antarctica is the fifth largest of the Earth's seven continents. It is the southernmost, coldest, windiest, highest, most remote, and most recently discovered continent, which surrounds the South Pole, the point at the southern end of the Earth's axis. Antarctica is almost completely covered by ice and has no permanent human population. The continent is ringed by the South Atlantic, South Pacific, and Indian Ocean. Name of Antarctica means an opposite to the Arctic the Earth's northernmost region. What does name Artic mean, you'll hear next year.

M: The continent is shaped somewhat like a comma, with a round body surrounding the pole and a tail curving toward South America. It covers about 14 million square kilometers or 5.5 million square miles. Antarctica is located 1,000 km (600 mi) from South America, which is its nearest neighbor; 4,000 km (2,500 mi) from Africa; and 2,500 km (1,600 mi) from Australia. Antarctica's latitude (location in relation to the equator) and high elevations make it the coldest continent. Air temperatures of the high inland regions fall below –80°C in winter and rise only to –30°C in summer. The warmest are the coastal regions where the temperature can reach the freezing point in summer but is also drop well below in winter.

R: Antarctica was the last continent that has been discovered. First discoveries started in the early 19th century. Because of the extreme cold and the lack of native peoples, forests, land animals, and obvious natural resources, the continent remained largely neglected (zanemarjen) for decades after discovery. Scientific expeditions and seal hunters had explored only fragments of its coasts by the end of the 19th century, while the interior remained unknown. Explorers first reached the South Pole in 1911, and the first permanent settlements (scientific stations) were established in the early 1940s. From that time explorations increased rapidly. Scientists continue to conduct research in Antarctica, and in recent years increasing numbers of tourists have visited Antarctica to appreciate the region's majestic scenery and wildlife.

M: Antarctica's territory is devided by seven nations: Argentina, Australia, Great Britain, Chile, France, New Zealand, and Norway. Other nations, mainly the United States and Russia, do not acknowledge these claims and make no claims of their own. Since 1961 the continent has been administered under the Antarctic Treaty, an international agreement to preserve the continent for peaceful scientific study.

## *II. LAND AND CLIMATE*

R: With an area of 14 million sq km, Antarctica is larger than either Europe or Australia. It is the highest continent, its average elevation of more than 2,000 m is over twice that of Asia,

which is the next highest continent. However, much of this mass is ice. East Antarctica is a landmass (about the size of Australia), and West Antarctica is a collection of islands. Only 2.4 percent of the total continental area is exposed rock. Only about 2 percent of the coast is exposed cliffs or beaches; the rest is made up of ice cliffs that extend beyond the end of the continental rock. (slika) Numerous bays also indent the outer edge of East Antarctica, creating a jagged (razčljenjena) coastline.

## *A. Land of Ice*

M: The total volume of the ice sheet covering Antarctica is estimated to be 29 million cu km, or about 90 percent of the world's ice. If the ice sheet melted, the oceans of the world would rise by 60 m. 11 percent of the ice sheet consists of ice shelves (plosce) - massive floating plate of permanent ice surrounding the continent. The largest, ice hhelf, is about the size of France. The Antarctic ice sheet has an average thickness of 2,160 m; its greatest recorded depth is more than 4,700 m.

Antarctica's ice sheet formed over millions of years. As new snow falls, it compresses the layers of older snow beneath it into ice. Large masses of moving ice known as glaciers move down the continent's five major drainage (odtočni) systems in two ways. Glaciers flow directly out to the edges of the continent, where portions break off and form floating masses called icebergs. Carried by winds, these icebergs travell westward around the continent and then northern part  of the Antarctic, before breaking up and melting upon contact with warmer waters.

## *B. Land Regions*

R: About 240 million to 65 million years ago Antarctica was a central part of Gondwanaland, an ancient landmass that consisted of the present continents of South America, Africa, Antarctica, and Australia as well as the Indian subcontinent. Evidence from oceanic ridges surrounding Antarctica indicates that Gondwanaland began to break up about 150 million years ago. Antarctica gradually drifted towards the South Pole, arriving near its present polar position about 100 million years ago. Climatic cooling caused the gradual formation of the Antarctic ice sheet.

During the millions of years high mountain ranges and vulcanos  have formed. The highest point in Antarctica is Vinson Massif, which has an elevation of 5,140 m.

## *C. Climate and Weather*

M: Antarctica has several climates, all cold but also slightly differing. The west coast of the Antarctic and the neighboring islands have the mildest climates, with average January temperatures above freezing.

The entire region south of the Antarctic Circle, which is the parallel of latitude at 66°30' south, experiences at least one day of continuous daylight during the Southern Hemisphere's summer (around December 21) and one day of continuous darkness during the winter (around June 21). The interior of Antarctica has almost continuous daylight during the summer and darkness during the winter.

Precipitation (padavine) falls mainly as snow or ice, with occasional rain in coastal areas. Very little precipitation falls on the higher grounds. Average annual accumulations of 50 mm there make it one of the world's driest deserts. Winds are light and variable on the plateaus, rarely reaching more than 30 km/h.

## *D. Optical Phenomena*

R: Antarctica experiences many unique atmospheric optical phenomena. Most spectacular are the southern lights, caused by entry into the upper atmosphere of streams of charged particles (mainly protons and electrons) from the Sun.

Refraction of light from the Sun and Moon by concentrations of ice crystals in the lower atmosphere produces iridescent (mavrične) clouds in the sky and rainbows.

## *E. Vegetation*

R: Almost completely covered by thick ice, Antarctica has very little land available for soils to form or vegetation to settle. Existing soils were formed late in the continent's geologic history and have little organic content or water-holding capacity. Isolation from other continents makes it difficult for new types of vegetation to spread to Antarctica. Constant low temperatures, high winds, and lack of moisture (vlaga) discourage all but the hardiest plants, which may be capable of active growth for only a few days per year. These factors limit plant life in Antarctica almost entirely to *protists* (simple, often one-celled organisms), algae, lichens, and mosses. Only two known species of flowering plants grow in Antarctica.

Antarctic waters support other types of vegetation. Coastal seaweeds thrive on and around islands near the Antarctic Convergence. The cold waters of the Southern Ocean support masses of phytoplankton that provides a rich source of food for marine animals.

## *F. Animal Life*

M: The harsh climate and sparse vegetation of Antarctica's land regions support only microscopic animals and primitive insects. The largest land animal is wingless midge, which grows up to 12 mm (0.47 in) long.

In contrast to the land, the Southern Ocean supports a wide variety of animal life. Zooplankton feeds on phytoplankton and it is also food for fish and squid. Concentrated zooplankton, together with larger fish and squid, provide food for the seals, whales, and seabirds that are Antarctica's major predators. There live about 40 species of seabirds: 7 species of penguins, 4 species of albatross, 20 species of cormorants and gulls. Antarctica is specially known as a penguin country.

Large marine animals played an important role in attracting humans to Antarctica: Sealers and whalers contributed substantially to the early exploration of the Southern.

## *G. Mineral Resources*

M: Although only about 1 percent of the continent's ice-free areas have been surveyed for minerals, evidence indicates that Antarctica contains rich mineral deposits. The Transantarctic Mountains contain huge deposits of coal as well as copper, lead, zinc, silver,

tin, and gold. Other importat minerals are iron, chromium, platinum, and nickel. It is also believed that deposits of petroleum and natural gas exist on the continent.

## *IV. RACE TO THE SOUTH POLE*

R: In 1908 British explorer Ernest Shackleton, who had accompanied Scott on his earlier expedition, led a British expedition expressly to reach the South Pole.Lack of food forced the expredicion to turn back within 179 km of the pole. In addition to attaining a new farthest-south point, they returned from the mountains with samples of coal.

In 1910 Scott returned to McMurdo Sound, again to seek the pole. In October 1911 he and four companions left their base on Ross Island and began traveling along Shackleton's route, hauling their supplies on sleds. Scott's party reached the pole on January 17, 1912, only to find that Roald Amundsen, a Norwegian explorer with experience on both Arctic and Antarctic expeditions, had reached the pole almost five weeks earlier. Scott and his party died on the return journey. Two of the men were injured along the route, and the rest died from starvation and exposure after a blizzard forced them to camp just short of their supply station.

## *V. SCIENTIFIC RESEARCH*

M: In the late 1990s there were already 36 researching stations on Antarctica, which were operated by scientists from 17 nations. Most stations are located on rocky shores or coastal ice slopes. There are also a few stations farther inland of the continent cut off from the outside world except by radio. The largest is McMurdo, which may accommodate several thousand visitors in summer, including those on their way to inland stations or field camps. Life at the smaller stations is simple, with comfortable living quarters and a family atmosphere. Men far outnumber women. Larger stations resemble hotels or barracks, with cafeteria meals and fewer home comforts. The largest stations are effectively small towns, with stores, cinemas, chapels, banks, offices, laboratories, garages, powerhouses, airstrips, and hostels for residents and visitors.

Antarctica is a valued source of fossils, which provide a record of the breakup of the supercontinent Gondwanaland, and meteorites, including those from the Moon and from Mars. That is why scientists have studied extensively Antarctica's ice sheet and the land beneath it. Physicians have also made discoveries about the behavior of viruses in a cold, isolated environment.

The atmosphere above the continent provides another important area of study. Antarctica's relatively unpolluted, thin, and dry atmosphere allows scientists to study phenomena such as auroras, cosmic rays, and transmission of radio waves. Most notably, these scientists study the levels of ozone, the atmospheric gas that protects life on the Earth from the Sun's harmful ultraviolet radiation. In 1985 they identified the so-called ozone hole, a region of depleted ozone that develops over Antarctica each spring and virtually disappears several months later. Continuous monitoring has revealed that the size of the hole and overall ozone concentrations are increasing.

## *VI. GROWING INTEREST*

R: Until the middle of the 20th century only explorers visited Antarctica. Tourism has grown slowly since its beginning in 1958. In the late 1990s about 10,000 tourists visited Antarctica annually between November and March. Most travel by ship and only go ashore for brief periods, so they require very few facilities on land. Several thousand more tourists take sightseeing flights over the continent from Australia and New Zealand. Although some environmental groups feel that an increase in tourism would undoubtedly increase its impact, on its current scale tourism makes few demands on the environment and does not interfere significantly with scientific activities. In introducing nonscientists to the scenery, wildlife, and mystery of Antarctica, tourism may well be helping broaden public interest in Antarctica, thereby ensuring a safer future for this most remarkable area of the world.