

SCIENCE NEWS

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ACTIVITY OF THE VOLCANO MAYON

MAYON, the volcano that has destroyed the coast town of Libog and several neighboring villages in the Philippines, has aroused itself after a slumber of twenty-eight years. The eruption has not come as a surprise to students of volcanoes, because although quiescent, it was known to be active. During the nineteenth century 26 eruptions occurred, with especially violent ones in 1814 and 1897.

The Philippines boast a dozen volcanoes that are classified as active, but eruptions of most of them are rare. Mayon, and its neighbor, Taal, both of which are in south Luzon, are the most energetic, though no severe eruption of Taal has happened since 1754.

When Mayon erupted in 1897, the circumstances must have been very similar to the present one. That of 1928 began on June 21, while the one in 1897 started without warning on June 23. By the next day it began to excite alarm, and on the day after that began its work of destruction. Lava flowed down the side and for seven miles to the east; volcanic ash was rained over the surrounding country for 100 miles to the east and 75 miles to the west. Finally, by June 30 the volcano was again quiet. The next eruption was in 1900, and since then it has been inactive. Even the fiery glow which its vapors gave forth at night for centuries has been absent in recent years, but volcanologists have learned by experience that such a thing can occur without indicating that the volcano has retired for good.

Mayon forms a picture of a typical volcano. It is nearly 8,000 feet high and rises from the plain to form a perfect cone. The circumference of its base is about 120 miles.

Altogether there are sixty-six active volcanoes scattered about on the earth's surface. Their eruptions are quite independent of each other, in the opinion of volcano experts, and all are intermittent in their action.

When Krakatoa, near Java, erupted in 1883, it did so after two centuries of dormancy. One famous Japanese volcano, Bandaisan, which went off with particularly great force in 1888, was quiet for over a thousand years, so it seems that volcanoes erupting after long inactivity are apt to be unusually severe.

As a contrast to these volcanoes there stands Stromboli, in the Mediterranean, known to mariners as the "light house." For two thousand years it has been continuously, though moderately, active.

THE ADVANCE OF SANITARY SCIENCE

THE decade since the world war has allowed an evaluation of the health aspects of that conflict. The war provided a great triumph for sanitary and medical science. Whatever its political and historical significance, its chief significance to sanitarians and medical men is that for the first time in the history of the world,

the number of wounded in a war exceeded the number attacked by disease. The great epidemics, amounting to plagues, of typhoid fever, smallpox, venereal diseases and dysentery and related diseases that have followed every other war, causing enormous mortality in troops and civilian population, were conspicuously absent after this last war.

The great advances in medical science during the last 30 years are credited by Dr. R. C. Williams, of the U. S. Public Health Service, with this accomplishment. Vaccination for smallpox, protective inoculation for typhoid fever, purification of water supplies and preservation of foods, vitamins and other dietary factors, prophylaxis and improved methods of treatment of venereal diseases, were able to keep the incidence of these diseases down to a minimum.

The one appearance of conditions amounting to plague—the epidemic of typhus fever and the famine in Russia and parts of Poland—was in a region where ignorance and the political situation made impossible the practice of medical science or any other science.

The only other epidemic comparable to the plagues of old was the outbreak of influenza toward the close of the war and just after. The enormous spread of this disease was due to the suddenness and unexpectedness of its onset, together with the fact that scientists knew very little about it or how it was transmitted. In spite of this, the few uninfected areas in which strict quarantine could at once be instituted escaped with relatively few cases.

An example of this is Australia, where the disease was successfully kept out for the first eight or nine months of the world-wide epidemic. Undoubtedly the insular position of the country helped here, for influenza is known to have followed lines of travel, appearing at its worst where there was great movement of civilian population and troops, such as around training camps in Europe, America and some parts of Asia.

THE FISH TAPEWORM

IN 1897 Dr. Alfred S. Warthin, professor of pathology and director of pathologic laboratories at the University of Michigan, prophesied that the fish tapeworm would be present habitually in Michigan, just as the fish themselves were in Michigan's lakes. Recent reports show that that prophecy has come true to-day.

Dr. Warthin based his prediction, back in 1897, on the fact that the large numbers of Finns who were coming to the upper peninsula of Michigan were infested with these tapeworms, which they had acquired by eating infested fish that were raw or not properly cooked.

Before 1895 there had apparently been no fish tapeworm in the state. The Finns were suspected of bringing it with them from the Baltic, for at first none of the fish in the Michigan region were infested. But

when the second generation born here of Scandinavian parents began to be infested also, it was apparent that the fish of the region were becoming infested through the sewage. Now infestation has progressed to the point where persons in the southern part of the state, of non-Finnish descent, are also becoming infested from eating the fish of the upper lake region.

In very nearly all of the cases the patients had eaten raw or insufficiently cooked fish. So the warning has again been issued from health authorities to eat no fish that is not thoroughly cooked.

THE ORIGIN OF DIAMONDS

How does Nature make her diamonds? The fascination of the glittering jewel is heightened by the mystery of its origin. It remains a mystery, in spite of many attempts to solve it. Diamonds are known to be a form of carbon. Graphite, another form of carbon, may be produced from diamonds, but the reverse has never been accomplished.

The most famous attempt to make diamonds artificially was that of Professor Henri Moissan. He melted pure iron with sugar charcoal in an arc furnace, then plunged the molten mass into cold water. The pressure produced by the quick chilling of the outer crust was supposed to convert the carbon so that it would crystallize from the iron solution as diamond and not graphite. After treatment with various acids so as to remove all other minerals, Moissan obtained tiny crystals which had the optical properties of diamonds. Sir Charles Parsons, the English scientist, has since repeated the experiments, but he concluded that Moissan's theories were erroneous and that the crystals were due to impurities in the iron.

Many other methods have been tried from time to time. Rifle bullets have been fired into cavities which they fitted closely. Rapid compression and heating of acetylene has been tried. In every case the results have been negative, and the diamond mystery to-day remains unsolved.

A NATURAL ROCK FLOWER

A NEW "glass flower," the work of nature and not of man, has been acquired by the Harvard Museum. Visitors this summer will have their attention drawn from the world-famous Ware collection of glass flowers to a spectacular group of gypsum crystals in an adjoining hall.

Six huge crystals, the largest as long and as heavy as a man, will be displayed in a central position in the mineralogical room. This group was taken from a mine in Chihuahua, Mexico, last summer. With great difficulty, the heavy, soft, fragile crystals, as perfect in form as they are huge in size, were brought to the surface from a depth of 800 feet.

Few minerals are more easily scratched and broken than gypsum; few places are less suited for delicate work than an ill-lighted mine tunnel; nor was the operation facilitated by the desire of the native miners to be photographed while seated upon the largest and finest of the group! These obstacles were overcome by the

patience and skill of the museum representatives, and the crystals have been reassembled in Cambridge in as nearly as possible their natural arrangement. Six massive spikes, radiating from a common center, show clearly why the natives called this group a "petrified century plant." Gypsum is, however, an entirely inorganic substance. Underground waters, charged with salts, built up these huge crystals. Gypsum is a fairly common mineral, but such a group as this is probably without a duplicate in the world.

EXPLORATION OF MONGOLIA

THE footsteps of Marco Polo will be followed by Professor George B. Cressey, Shanghai College geologist, who has just passed through Hankow, China, en route to Kansu and Inner Mongolia where he will study the ancient past of those remote districts of China.

New evidence of the origin of man may be unearthed by Professor Cressey in his studies although his principal studies will be upon the climate of Asia during the past ten millions of years.

Whether the people of the overcrowded plains of China will be able to emigrate to the great expanses of empty land in Mongolia, as some writers have urged, may be determined by agricultural studies to be made by Professor Cressey.

The area to be explored lies in western Inner Mongolia, north of the Great Wall from Kansu. Except for irrigated strips along the Yellow River all of this region is a desert. In the center of the area lie the great Alashan range of mountains which rise to over 10,000 feet and divide the desert into two distinct regions; the Alashan desert on the west and the Ordos on the east. The Ordos includes the district within the great northward bend of the Yellow River outside the Great Wall.

Although an ancient Mongolian trade route crosses this district, it has seldom been followed by foreigners. Except for the few trails most of the Ordos and Alashan is quite unknown, both geographically and geologically. Marco Polo crossed the area on his journey to China, and during much of the summer the expedition will be following in his footsteps. The Chinese city of Ninghsia and the Mongol trade center of Wang Yeh Fu will be the headquarters for work.

"During the Glacial Period in Europe and North America, Asia was free from ice," Professor Cressey explained. "Mongolia, furthermore, apparently had a much more moist climate. This problem is of more than theoretical interest, for climate controls vegetation and thus influences animal life. Since Asia seems to have been the center of human evolution, climate throws light on the habitability of this area. The record of climate is written in sediments and erosion cycles, and the preliminary studies made in 1924 indicate that this area contains critical information. While no direct search is to be made for ancient man, it is important to note that the best evidence of early man so far found in central Asia is on the borders of the Ordos near Ninghsia.

"The desert is the geologist's paradise. All the agents of erosion and transportation are actively at work, for despite the limited rainfall with which they carry on their work there is no protecting vegetation. Geologic processes are demonstrated on every hand, often in text book perfection.

"Geologically the map is white, and large areas are geographically unknown as well. Prejevalsky and Obruchev, two Russians, visited the region sixty years ago, and most of our knowledge dates back to them."

Professor Cressey has over 2,000 miles of travel in Inner and Outer Mongolia to his credit. Both the Ordos and the Alashan were visited in 1924 on the return from an expedition to Koko Nor in Tibet. There was no opportunity for detailed studies at that time, but hasty examination indicated several promising areas. Since that time the few available reports of earlier explorers have been examined and definite projects mapped out.

An attempt to continue work in 1926 resulted in an attack by brigands, before the area was reached. Mongolia itself is characteristically peaceful, but the Chinese borderlands are often in an unsettled condition. Reports indicate that conditions along the route which it is now proposed to follow are quiet.

This is the land of wandering nomads who pasture their flocks of sheep and camels on the sparse desert grass. The rainfall is less than ten inches, and wells are few and far between. It is often necessary to carry water. Camels are commonly used, but they travel at night and only ten miles a day; for the most part the expedition will use pack mules.

LIFE HISTORY OF THE EEL

EELS, the "snaky fish" of yesterday's crossword puzzle fame, are the inspiration and objective of a two-years' scientific cruise in the Pacific on which Professor Johannes Schmidt, of the University of Copenhagen, has just embarked. He will endeavor to solve the riddle of the spawning grounds and migration routes of the Pacific eels as he did for the Atlantic species of these highly valuable fish.

The story of the eel, as so far unfolded, is one of the most interesting and even romantic of all scientific sagas. Eels have been favorite fishes in Europe since remote antiquity, and their ways while in fresh water were fairly well known, though always puzzling. Young eels were never seen to descend a river, and old eels never went any other way. No one had ever seen an eel's egg. The young ones came up from the sea, the old ones went to sea; but what happened in the sea was an unsolved mystery for centuries. The most fantastic stories imaginable were told of the eel's origin: they were said to arise from everything between spontaneous generation in the mud and parenthood directly from Jupiter himself.

Professor Schmidt set himself to solve the riddle, and for seventeen years he labored on it. At the end he knew the whole story. Eels come up out of the sea, as young "elvers," persistently ascending the rivers. They live and feed in fresh water for several years. When

full grown they go down to the sea, and swim across the whole width of the North Atlantic to an area northeast and east of the West Indies. Here they lay and fertilize their eggs and then die.

The young eel larvae do not resemble eels in the least. They are leaf-shaped, flat, thin and as transparent as glass. They feed on minute water organisms, and slowly make the long voyage homeward. How they find their way without guides (since their parents are all dead) is still a mystery. And the strangest part of the story is that though American and European eels breed in the same general region of the ocean, their respective young always find their ways back to the proper sides of the Atlantic.

It takes three years, more or less, for the young eels to get back from their deep ocean cradle to the off-shore waters of home. Nearing the close of their voyage, they change their shapes from the flat, leaf-like form to the familiar round, thin figures of the elvers, and then go up the streams to begin their parents' life-story over again.

All this Professor Schmidt discovered by patient study in field and laboratory and endless sailing on the North Atlantic. Now he is undertaking to learn what he can of the ways of the eels that live in the rivers that flow into the great ocean on the other side of the world.

ITEMS

THE region of Fort Humphrey, Virginia, will echo to the explosions of radium atomite, new explosive claimed to be more powerful than T. N. T., sometime in August. According to the office of the chief engineers of the War Department, Major William H. Lanagan, of the board of engineer equipment, has requested such a demonstration. A preliminary test of the explosive invented by Capt. H. R. Zimmer, of Los Angeles, former army officer, was made at Pasadena by Lt.-Col. L. M. Adams, of the California Institute of Technology. Lt.-Col. Adams reported to the chief of engineers, and the board, after examining his report, has decided that the new explosive "appears to have military value."

ARE you the stuff that civilizations are made of? Pioneer minds of civilization—the type of men who bridge the gap between old established customs and a new, higher type of culture—are being sought for study by two graduate students of the University of Chicago, H. M. Bond and H. P. Becker. The minds of such men are signposts, showing the way in which our civilization is headed, according to Professor Robert Park, of the university, whose theories of sociology will direct the study. Professor Park terms such men "marginal men." As migrations bring groups of people into new environment, the "marginal men" strive to live in two diverse cultural groups, and they free themselves from the old ways to make a better adjustment to life. The conflicting cultures meet and fuse in these "marginal men," and it is in the minds of this type that the process of civilization is visibly going on and may best be studied.