SCIENCE NEWS

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THE SOUTHERN CALIFORNIA EARTHQUAKE

THE earthquake which shook southern California on the night of March 10 was not much larger than the one that eight years ago (June 29, 1925) damaged Santa Barbara, and the great 1906 San Francisco earthquake was much larger. It will rank, however, as one of California's major earthquakes. The probable origin of the quake, as determined from records at the Seismological Laboratory, Pasadena, was in the San Pedro Channel within the triangle formed by Point Firmin, Avalon on Catalina Island and Laguna Beach on the mainland.

Drs. H. O. Wood and Charles O. Richter, seismologists in charge of the cooperatively maintained earthquake laboratory which is set in solid rock back of Pasadena, explained to *Science Service:* "At just twenty seconds past 5:54 P. M. Friday our instruments began recording a moderately strong local shock which was sharply felt in the laboratory and which was evidently sufficient to cause damage near its source. The source appears to be sixty to seventy miles southeast of this laboratory, but because of peculiarities in the geological structure a precise distance can not yet be given. A large number of aftershocks have been recorded with very brief interruptions. Three or four of these have been stronger than the rest and have been barely felt at the laboratory. One or two hundred shocks have been recorded on the less sensitive instruments and it is probable that the more sensitive instruments will record a great many more." Six auxiliary seismologic stations placed at strategic points in California recorded the earth movements, and Drs. Wood and Richter explained that the precise location will not be possible before the receipt of these records.

This earthquake had been expected by seismologists for over a decade, although few definite public predictions had been issued in consideration of public fears. Geologists studying the crust of the earth and earthquake specialists operating sensitive recording instruments and listing the past history of southern California earth movements felt that conditions were ripe for a serious earth disturbance in that region. While residents of southern California had not in general recognized the existing earthquake danger, leading citizens and investigators cooperated to study the conditions.

Not for 78 years has the Los Angeles region suffered a large earthquake, although on July 8, 1929, a moderately severe shock was felt in the region surrounding Los Angeles and centering at Whittier. On June 21, 1920, the Inglewood earthquake occurred near Los Angeles and partially destroyed some weakly constructed buildings.

But the great earthquakes of Los Angeles recorded in history occurred in 1769, 1852 and 1855. Four violent shocks, on July 28, 1769, with strong aftershocks on five days following, are listed in the records of the California missions. This earthquake was probably strongest along San Pedro Bay near the present harbor of Los Angeles. This is the location of the present earthquake center. October and November, 1852, brought many earth shocks to the southern California of gold-rush days. October 26 saw eleven severe shocks at Los Angeles. On July 10, 1855, a quite severe earthquake did considerable damage in Los Angeles.

The ocean region off the San Pedro-Long Beach coast near Los Angeles lying between the coast and Catalina Island is known as San Pedro Channel. Geologists describe it as the San Pedro submarine fault zone and they know that this is an area where the mountains are growing. It is probable that the present earthquake was caused by an earth crustal adjustment in this area under the sea.

Professor Albert Einstein walked through the earthquake and did not notice it. He had just emerged from a California Institute of Technology building after attending his last seminar with local scientists before leaving for New York. Walking with Dr. Beno Gutenberg, the eminent authority on earthquakes, both he and Dr. Gutenberg were so absorbed that they said later they had not noticed the earthquake.

Buildings of the California Institute of Technology at Pasadena creaked and swayed greatly, but no damage was done to these structures especially designed to withstand earthquakes.

A NEW STRAIN OF BARLEY

"OUT of rough and black get smooth and white." This problem, reminiscent of one of the ancient riddles of the Sphinx, confronted Professor B. D. Leith, of the University of Wisconsin, at one stage of his endeavor to produce a new strain of barley that could be grown with profit by farmers in Wisconsin and other Grain Belt states.

It was not so impossible a task as it might sound, for he had already put the smooth and the white qualities into the genetic mixture where they were covered over by the rough and the black. All he had to do was plant his cross-bred grain and let the old reliable Mendelian mode of segregation do the work.

To go back to the beginning: Wisconsin farmers used to raise a strain of barley known as Oderbrucker. It was good barley, good for stock feed and good for the once-great Milwaukee brewing industry. But it had one fatal drawback: the beard on its heads was armed with innumerable little back-pointing barbs that would cause these bristly hairs to work their way through the threshermen's overalls, and made life so miserable for them that they finally rebelled at working with it at all. Also, it was subject to a destructive fungus disease known as stripe.

Professor Leith set to work to produce a hybrid barley that would have a smooth beard, and, if possible, be stripe-resistant, yet preserve the virtues of Oderbrucker barley—good white grain, high yield and stiff straw.

His first crosses, with other strains of domestic barley, were not very successful. But in 1917 a new smooth-bearded barley from Southeast Russia was brought in. It was black-grained, but that did not bother Professor Leith, for he was sure he could juggle the undesired color character out of the hybrid strains.

When he crossed Oderbrucker with the new Russian barley the first generation offspring were as undesirable as could be imagined, for the beard was as rough as in Oderbrucker and the grain was black as in the Russian barley. Here, then, was his Sphinx-riddle: out of black and rough to get smooth and white.

Professor Leith, like all good students of Mendelian behavior in heredity, knew that the blackness and roughness were "dominant" characters in any mixed strain, hiding but not destroying their "recessive" opposites, whiteness and smoothness. He knew also that such recessive characters segregate out when the hybrid first generation is inbred.

This he did, and the second generation barleys came out in approximately the following ratio: 9 rough and black, 3 rough and white, 3 smooth and black, 1 smooth and white. The last, a hybrid containing only recessives in its pairs of characters, was what he was hunting for; and he knew also that so long as it was inbred neither roughness nor blackness could reappear.

This smooth-white strain forms the basis of the barley strain now known as Wisconsin Barbless, Pedigree 38. In several years of practical crop growing by a large number of farmers, some of them outside the state, it has out-yielded Oderbrucker, resisted drought, and proved highly resistant to stripe, though not to other diseases. Most important of all, its smooth beard makes it possible to harvest and thresh the new barley without making life a burden for the farmer or the threshermen.

With an eye to the eventual return of beer, the owner of one of the most famous of the old-time Milwaukee breweries has made large-scale tests of the malting qualities of the new barley at his own expense, and reports that so far as its chemical make-up is concerned it is at least the equal of the best of the old barleys.

PETRIFICATION IN THE YELLOWSTONE NATIONAL PARK

TREE stumps now undergoing the process of petrification are an interesting sight in the Upper Geyser Basin, in Yellowstone National Park. Upper Geyser Basin is the general name for that portion of the park containing Old Faithful and other famous geysers.

On the north side of Old Faithful there are at least six or eight stumps in which the wood-fibers have been found to contain a large amount of silica. Evidently this silica is being deposited at intervals from the geyser water, according to the park naturalist, C. Max Bauer. The petrification of the stumps is a very slow process.

The Yellowstone already has an interesting display of fossil forests located over extensive areas in the northern part of the park. These, however, are the result of successive outbreaks of volcanic activity in the past. What happened in these cases apparently was that a standing forest was engulfed in great clouds of volcanic dust until the trees were completely buried. Water seeped through this dust and into the buried trees, carrying with it silica from the volcanic ash. The woody structure of the trees was dissolved and the silica deposited in its place. The trees thus became fossilized.

Long afterwards, when the volcanic activity had quieted and sufficient soil had accumulated on top of the buried trees, another forest grew, only to meet the same fate. This happened again and again.

To-day, at Specimen Ridge in the northeast portion of the park, trained observers can distinguish in some places a succession of these forests, twelve in number, one above the other.

JANUARY MORTALITY RECORDS

THE good health records for the United States and Canada maintained during the last few years will probably not be continued in 1933. Judging from the January death reports, the health outlook for the coming year is anything but promising, officials of the Metropolitan Life Insurance Company point out in their most recent report.

The January, 1933, death-rate of 10.8 per thousand is the highest recorded for the first month of any year since 1929 and with the exception of 1929, it is the highest for more than a decade.

Influenza and pneumonia were responsible for nearly one fifth of all the deaths during January, 1933. In addition, deaths from cancer, diabetes, cerebral hemorrhage, heart disease and suicide increased sharply over the deaths from these causes a year ago.

The death rate for diabetes reached a new high figure in January, 1933, which has never been even closely approached in any month of any preceding year. This is thought to be the result of the influenza epidemic. Diabetics who become victims of influenza are frequently without sufficient resistance to withstand both diseases, and their deaths occur during the influenza outbreaks instead of later.

A number of years have made excellent health records despite bad beginnings. The year 1929, which started with a bad influenza outbreak, is given as a conspicuous example. "Nevertheless health conditions from now on will need to be exceptionally good to counterbalance the January setback and to establish a record for the year at or near the remarkably low mortality figure for 1932."

MEDIEVAL CONSERVATION

CONSERVATION of natural resources in Germany is no new thing. It has its roots in the Middle Ages, a recent examination of old records has disclosed.

Long before pearls appeared in any numbers from distant India and Ceylon, ladies in Central European castles wore excellent fresh-water pearls that came from the tributaries of the Danube in the Bavarian and Bohemian mountains. In Passau, where the River Inn flows into the Danube, a long line of Bishops of the Church held sway also as temporal princes, their reigns lasting from 739 to 1803 in uninterrupted succession. These bishops gave thorough protection to the pearl-

producing river mussels and clams, and decreed severe punishment to poachers. This protection ended when the temporal rule of the bishops was broken and the secular authorities sought wealth in the timber of the mountains. The logging operations kept the streams so constantly roiled that not only were the pearl mussels vastly reduced in numbers but the salmon, beaver and otter were practically wiped out. Not until 1929 did this destruction cease.

The churchmen-princes protected other forms of native animal life besides the wealth-bringing pearl mussels. They protected meadows where wild swans, herons and storks bred, and maintained regular beaver preserves. They even sent their retainers out to fight when neighboring noblemen attempted to raid these game sanctuaries. Not even the Peasants' War of Reformation times, with its attendant hardships and anarchy, was able to wipe out the beaver. They held out until the wars of the eighteenth century, and a few were seen alive even into the nineteenth.

The pearl mussels have survived, though in much reduced numbers. At a recent fisheries exhibition held in Passau, native pearls were displayed which compared favorably with pearls in Ceylon.

ITEMS

A HEAVENLY object that may be a new comet or a minor planet has been found on the photographic plates of the Harvard College Observatory by Dr. F. L. Whipple. It is faint and visible only through large telescopes.

SPRING of 1933 will commence at 8: 43 P. M., Eastern Standard Time, on Monday, March 20, according to computations made at the Nautical Almanac Office, in the U. S. Naval Observatory. At that moment, the sun, which has been traveling northwards through the sky since last December, will cross the equator, and enter the zodiacal sign of Aries. This is called the vernal equinox and at this time of year the sun is below the horizon just as long as it is above, so that days and nights are of equal length. Also, on this date, the sun rises directly east and sets due west. Spring will continue until June 21, when the sun ceases its northward journey, and will start south again.

PUBLIC health need not suffer when budgets are reduced. Evidence of this is found in Chicago, the American Medical Association has pointed out. In this city during 1932 the infant death rate and the general death rate were reduced below the records of any other year, although the health department budget was reduced $500,000 in this one year. For a cosmopolitan as well as metropolitan center like Chicago, the American Medical Association considers this an achievement of the first magnitude.

YELLOWSTONE PARK beavers are not slaves of one material in their engineering efforts. Park Ranger F. Sheldon Dart has found a beaver dam built of stones on a small stream in the Thorofare district. The dam is approximately six feet long and varies from one to two feet in width. It is two and a half feet high at the highest point. Only a few willow twigs appear in its construction, almost all of its material being stone. The rocks range in size from pieces as large as a man's fist to some ten inches in diameter and twelve to fourteen inches in length.

GERMANY'S moose herds, relatives of the great antlered animals of the American and Canadian woods, are facing the danger that comes to them annually in the early spring flooding of the rivers that flow through the flat woods of East Prussia where they live. Burdened with ice, the streams sweep down the strongest swimmers among them. Another menace that the floods bring to the moose is that of starvation. The inundations force the moose to abandon their usual habitats and take to higher lands or to refuge islands which have been especially constructed for them. As long as the food supply holds out all is well, but the amount of browse available on these limited areas will not suffice the crowded herds long, especially if the waters rise high. Losses through starvation are especially large among the young animals, which can not reach the higher branches of the shrubs on which they feed. In a really bad flood year all the calves may starve.

THE nation-wide government inventory, or census, of Sweden's forest supply has now been completed after eight years of incessant work and at a total cost of about $280,000. The census was made by means of examining all trees within many parallel forest belts ten meters (30 feet) wide and drawn at certain fixed intervals. The combined length of the lines thus covered by the tree checkers is about 52,000 kilometers (31,200 miles) or more than one and a quarter times around the world, and the number of tree trunks marked and examined amount to more than 12,000,000. The result of the inventory as a whole was most gratifying, in so far as it showed not only the forest wealth of the country, but also indicated that the regrowth was considerably greater than what had generally been anticipated. Sweden's total forest area is about 58,000,000 acres. The present value of the wood is estimated to be about $240,000,000. The investigators found that the regrowth is improving considerably. Another fact is the high age of the trees. Thus in Lapland 32 per cent. of the trees were found to be over 160 years and 45 per cent. over 120 years old.

EVIDENCE that moving storm areas of low barometric pressure affect radio signals of wave-lengths longer than 100 meters by varying the strength of the lower ionized layer of the earth's atmosphere was presented by Professor R. C. Colwell and I. O. Myers, of the West Virginia University, speaking at the meeting of the American Physical Society. Two ionized layers that reflect radio waves are now known to exist. One of these, the lower, Kennelly-Heaviside or E layer, has been shown by Dr. E. V. Appleton, British physicist, and others, to reflect the long waves, while a higher, or F layer, sends back to earth the short waves. This indicates to Professor Colwell that the lower, or E layer, is in the region affected by varying pressure. He finds that the E layer is concentrated in the regions of low pressure and is most active in the eastern half of the storm cyclone or whirl of winds.