FORESTRY

Fertilizer Fights Fire Near San Bernardino

➤ A BRUSH AND TIMBER FIRE was brought under control recently by aerial sprayings with fire-fighting fertilizer.

A fire near San Bernardino had blackened more than 10,000 acres within a few days. Eleven planes were used continuously to spray thousands of gallons of fertilizer over the fastest-burning edges, in strips 50 feet wide and 700 feet long.

More than 900 fire fighters joined the around-the-clock battle. Marine detachments and helicopters joined civilians in both the spraying and ground fight.

Double-barreled action of the fertilizer "very effectively" checks the spreading of fire and also stimulates regrowth of burned-out areas with nutrients for plants, San Bernardino National Forest officials said.

Original research on fire-fighting fertilizers was done by the Tennessee Valley Authority's National Fertilizer Development Center at Muscle Shoals, Ala.

Aerial sprayings with TVA's fertilizer have successfully halted or minimized forest fires in tests in the eastern United States. Tests in Oklahoma have shown that aerial sprayings of fertilizer can stop grass fires in winds up to 30 miles per hour.

The Iowa State Highway Department is trying the TVA's fertilizer on newly seeded roadbeds mulched with straw. Hopes are that the fertilizer will provide nutrients for the young grass and at the same time prevent straw fires from being touched off by motorists' cigarettes.

• Science News Letter, 86:88 August 8, 1964

OCEANOGRAPHY

Gigantic Channels Found In Indian Ocean Floor

➤ HUGE CHANNELS, gouged out in the distant past by massive onrushes of mud, have been found in the Indian Ocean floor.

Scientists previously believed such trenches were structural faults in the ocean bottom, and that only a few of them existed. Now, however, they have evidence that these channels are arranged in a complex network.

Conducting the research were Drs. Robert Dietz and Harris B. Stewart Jr. of the U.S. Coast and Geodetic Survey, Washington, and Dr. Francis P. Shepard of the Scripps Institution of Oceanography, La Jolla, Calif. The study is part of a 20-nation effort to investigate the relatively unexplored Indian Ocean.

Dr. Dietz said the channels were discovered off the eastern coast of India in the Bay of Bengal.

"These channels are of enormous dimensions," he said. The largest channel surveyed by the scientists is about two miles below the sea's surface and is about four miles wide and 300 feet deep.

The scientists believe that mud, deposited by the many rivers flowing into the Bay of Bengal, builds up for years on the edge of the ocean's drop-off until it gives way and slides down. Dr. Dietz estimated that this happens one or twice a century.

Once the mud reaches the bottom of the drop-off, or continental slope, it probably oozes over the flat sea floor for hundreds of miles, cutting the deep trenches, Dr. Dietz said.

The volume of mud that flows is thought to be so great that it overflows the channels, and builds levees. Thus, the more mudflows, the higher the sides of the channels.

The channels are believed to extend out from the shore as far as 500 miles.

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OPHTHALMOLOGY

Russian Eye Doctor Uses Spectacles With Holes

➤ DARK EYEGLASSES full of tiny holes, or slits, seldom used in this country, are successfully used for eye treatments in the Eye Hospital of Leningrad, Dr. E. Utekhina, Russian ophthalmologist, reported in the journal Science and Life, published in Moscow.

In Leningrad, Dr. Utekhina said, these "stenopaic" glasses are used for patients with cataracts, for persons with persistent dimness of cornea and for persons with other eye troubles.

Sometimes the usual correction glasses are used with stenopaic glasses in cases where the crystalline lens refracts the light's beam irregularly, Dr. Utekhina said.

Dr. Harold R. Downey, Washington ophthalmologist, told SCIENCE SERVICE that stenopaic spectacles are very old as a treatment, but they can still be useful once in a while for persons with cataracts who are not physically able to have operations. As a temporary thing they can make it possible for a cataract patient to read and otherwise use his eyes until such time as he can undergo surgery.

An official of the National Institute of Neurological Diseases and Blindness, Bethesda, Md., said that the device is used more in testing eyes than for treatment.

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ZOOLOGY

Sea Urchins Have Simple Circulatory System

➤ SEA URCHINS have a sort of heart.

For nearly 150 years, scientists have argued whether echinoderms have a circulatory system. Now in the purple sea urchin, the *Stronglocentrotus purpuratus,* there has been found a pulsating vessel within the hollow organ called the axial gland.

This pulsating vessel contains two distinct chambers and has regular rhythmic contractions, averaging about six beats per minute.

Contraction of one chamber follows that of another, as in a two-chambered heart with auricular and ventricular beats, the researchers reported in Science, 145:173,1964.

The researchers who found this primitive heart were Richard A. Boolootian, department of zoology, University of California, Los Angeles, and James L. Campbell, Los Angeles Valley College, Van Nuys, Calif.

• Science News Letter, 86:88 August 8, 1964

IN SCIEN

GEOLOGY

Prehistoric Mineral Formations Recreated

➤ GEOLOGICAL PATTERNS which took millions of years to occur deep in the earth are being recreated in the laboratory.

Scientists at Lehigh University, Bethlehem, Pa., using special electric furnaces that can heat up to almost 1500 degrees Fahrenheit, are working with special man-made minerals to study what kinds of geological phenomena produce certain sulfide minerals. Sulfides were chosen because of their relationship to ore deposits of copper, zinc, lead and other metals.

Various sulfide minerals are placed in silicon tubes in the furnaces and subjected to great heat and pressure, to determine what stable mineral phases will result. After the work with man-made minerals is finished, data will be compared with selected samples of natural mineral and ore deposits.

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ASTRONOMY

Asteroid Due to Make Near-Miss of Earth

➤ A MINOR PLANET, or asteroid, will make an unusually close approach to the earth on Aug. 10 when it will pass within 11.7 million miles.

The asteroid is known as 1948 OA and was discovered by Dr. C. A. Wirtanen of the University of California's Lick Observatory, Mt. Hamilton, Calif., on July 17, 1948. It will be much too faint, magnitude 12.5, to see with the naked eye or with binoculars, but can be spotted with a six-inch or larger telescope.

On Aug. 10 the minor planet will be in the constellation of Cepheus, which is in the northern sky a little to the right of the Little Dipper. It is a fast-moving object. (See p. 89)

Details of the asteroid's orbit were calculated by Drs. Samuel Herrick and Kenneth C. Ford of the University of California at Los Angeles.

The only minor planet ever visible to the naked eye, Vesta, will be at its brightest for this year during late August and early September, when it will be visible with binoculars as a sixth magnitude object. It will be in Aquarius in the southern sky during this time, not too far from the planet Saturn.

This brightest of all asteroids was discovered on March 29, 1807, by the German amateur astronomer Heinrich Wilhelm Olbers, and has been a favorite object for amateur observers since then.

Asteroids move generally in orbits between those of Mars and Jupiter. They are members of a swarm of many thousands of small objects.

• Science News Letter, 86:88 August 8, 1964

CE FIELDS

VETERINARY MEDICINE

Bizarre House Pets Are Hazard to Owners

➤ THE MONKEYS, hamsters, guinea pigs, snakes, lizards, alligators and the legions of other odd pets kept in American homes are creating real health hazards for their owners.

Dr. Alfred W. Moller. St. Louis, Mo., veterinarian, told the American Veterinary Medical Association, meeting in Chicago, that these strange pets are sources for many and often hard-to-recognize health hazards to humans.

Many animals, he pointed out, can either transmit or have diseases similar to those of man. The monkey alone can spread numerous diseases, such as tuberculosis, and a host of parasites such as hookworms, amoebas and fungi.

Dr. Moller said that the number of odd creatures harbored in homes is increasing rapidly.

There is a need for better diagnosis and treatment techniques for the little-known diseases carried by strange pets which are posing problems for veterinarians, as well as owners.

The illnesses of America's three million pet turtles have opened a new field of medicine for cold-blooded animals.

Other maladies with which the veterinarian is confronted include pregnancy problems of the guinea pig, diets for "figure-conscious" rabbits that are particular about what they eat, and depressed states in lizards.

"There is a significant difference between keeping such animals in zoos or laboratory colonies and in the home," Dr. Moller said.

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NAVIGATION

Landing Device Shows Runway Image in Fog

➤ PILOTS approaching fog-bound runways will be able to "see" the landing strip almost as though it were a normal clear-night landing, using a new system called "Microvision."

Microvision is based on a series of microwave radio transmitters placed along the sides of a runway, which send an "image" of the runway to a receiver in the cockpit of an approaching plane. The receiver, a cathode ray tube like that of a radar screen, shows a series of "blips" in the shape of the outline of the runway.

The blips are projected onto a partly mirrored surface in front of the cockpit window. The pilot simultaneously sees both the runway image projected on the mirror and the actual view through the mirror.

The advantage of this system is that it permits constant visual reference to the ground, unlike conventional methods in which the glide path is defined only by panel indicators and dials.

Microvision allows the pilot to "see" the runway from as far away as ten miles, regardless of weather conditions, radio or other conventional landing aids, said Paul Noxon, project engineer for Microvision at Bendix Corporation, Teterboro, N. J., in an interview with SCIENCE SERVICE.

The new system is currently being tested by Bendix in a DC-3 aircraft. The U.S. Air Force has already conducted over 1,000 successful Microvision approaches at different airports.

The equipment in the plane weighs less than 20 pounds, said Mr. Noxon, of which most is the optical projection system. The projection on the mirror-window covers about 30 degrees of the pilot's vision, and future versions will cover as much as 40 degrees.

• Science News Letter, 86:89 August 8, 1964

SEISMOLOGY

Quake Damage Greater Miles From Origin

➤ IF THE SAN ANDREAS fault in Southern California were suddenly to rupture, causing a major earthquake, damage to many buildings in the Los Angeles Basin, 20 to 40 miles from the quake, would probably be much greater than in communities near the fault.

This was pointed out by Dr. Hugo Benioff, seismologist at California Institute of Technology, Pasadena, who said that in the immediate vicinity of a fault rupture there is one primary heave. At greater distances, however, vibrations occur in the ground that are prolonged and more destructive.

Dr. Benioff noted this effect while studying photographs of earthquake damage. In many cases there was no visible damage to houses and barns near the fault, but the same earthquake destroyed similar buildings miles away.

"Seismic waves radiate outward from a fault break," the seismologist said. "The wave which started out as a pulse is transformed into an oscillating wave train."

Dr. Benioff also said that much earthquake damage appears to be a result of buildings being "in tune" with the quake.

Every building has a period of vibration and, unfortunately, the vibration periods of many earthquake waves are the same as those for most buildings, he said.

Since the vibration periods of both earthquakes and buildings are often in the one-tenth-of-a-second to three-second range, this accounts for most of the destructive effects of the quakes.

From his study Dr. Benioff has created a seismic spectrum of an earthquake in which various waves have been sorted into a pattern showing the amplitude for each of their periods.

This seismic spectrum can be used as a basis for engineering design for buildings in earthquake areas. Structures can be designed to withstand earthquake forces by reducing the period of the structure's vibration rate.

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MARINE BIOLOGY

Giant Enteropneust Discovered in Ocean

➤ A GIANT enteropneust has been discovered lurking in the waters off the Atlantic Coast of South America.

There is little cause for alarm, however, since this giant is a fragile acorn worm, so-called because the upper part of its body is shaped like an acorn. A giant it is, though, measuring more than five feet in length.

This enteropneust was found on the coast at Praia do Araca, Sao Sebastiao, Brazil, in March 1962 and is believed to belong to a new species of hemichordate, a phylum of worm-like marine animals.

The normal length of the acorn worm is approximately 4 to 17 inches. This animal, pinkish-tan in color, lives in masses of seaweed or under rocks, or he burrows in the sand and mud in shallow water.

The largest known acorn worm was more than seven feet long.

C. Burdon-Jones, Marine Science Laboratories, Menai Bridge, Anglesey, and J. A. Petersen of the University of Sao Paulo, Brazil, reported the newest discovery in Nature, 203:97, 1964.

• Science News Letter, 86:89 August 8, 1964

GEOLOGY

Alaskan Lakes Marked To Register Land Tilts

➤ BY PLACING MARKERS around lakes, geologists can now check land tilts resulting from volcanoes and earthquakes.

They compare how far the markers are from the water before and after abrupt geological changes. Eighteen lakes in southern Alaska are now being used for this purpose. The work is being done by the U.S. Department of the Interior's Geological Survey.

• Science News Letter, 86:89 August 8, 1964

ASTRONOMY

Bright Comet Will Pass Close to Earth Soon

➤ A BRIGHT COMET will pass within nearly 19 million miles of the earth on Aug. 12, making an unusually close but not the closest-ever approach.

This will be the second heavenly object to make a close brush with earth within two days. On Aug. 10, the minor planet known as 1948 OA will come within 11.7 million miles of the earth. (See p. 88)

The comet is called Ikeya after its discoverer, the Japanese amateur astronomer Kaoru Ikeya. It is now bright enough—magnitude six—to be just barely visible to the unaided eye under good conditions.

Although the comet will grow brighter until Aug. 12, it will be extremely difficult to see without a good-sized telescope because it is close to the sun, whose brilliant light drowns even that of a bright comet.

At its closest approach to the sun on Aug. 2, Comet Ikeya was some 74 million miles from the sun.

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