

ZOOLOGY

Groundhog Will Soon See That Much-Debated Shadow

See Front Cover

CANDLEMAS Day is a good month too early for any groundhog to come out and look for his shadow. These rodents are very determined sleepers, and have never been known to break their winter sleep, in the southern part of their range, until about the first of March. Farther north, they sleep longer still, and may not appear until nearly May. In any case, the groundhog may be depended upon to wait until winter is surely over before he emerges; no silly business of sticking his nose out into early-February cold waves for him!

The picture on the cover of this issue of the SCIENCE NEWS LETTER also demonstrates convincingly the sound observational commonsense that underlies the groundhog's other name of woodchuck.

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PHYSIOLOGY

Glands Increase the Body's Resistance to Poisons

EXTRA POWER to fight poisons or other damaging influences and also to adapt to extreme cold or other change in environment are given to the body by two small glands on top of the kidneys, the adrenals.

Evidence for this new and important function of the adrenal glands, from which comes the well-known adrenalin, is reported by Dr. Hans Selye of McGill University, Montreal. (*Science*, Mar. 5.)

"One of the most important functions of the adrenals," Dr. Selye concludes from his studies, "is to increase the resistance to alarming stimuli."

By alarming stimuli Dr. Selye means such things as exposure to changing temperature in the surroundings, excessive muscular exercise, poisonous doses of various drugs or substances apt to reduce dangerously the amount of sugar in the blood.

These alarming stimuli may cause a number of conditions, such as lowered blood pressure, lowered body temperature, loss of water from the blood and the formation of gastric and intestinal ulcers, Dr. Selye found. These conditions are almost identical with those produced in patients whose adrenal glands are not functioning fully because of disease or injury or in animals whose adrenal glands are removed.

The poisons or other alarming stimuli cause much more pronounced symptoms, Dr. Selye reports, in animals lacking adrenal glands than in normal animals. Consequently he believes the adrenals act to increase the body's resistance to such stimuli.

They also play a very important role in the first stage of the body's adaptation to conditions of the environment. This is because most stimuli are alarming when the body is first confronted with them. By helping the body resist the alarming stimuli, the adrenal glands also help it to get used to or adapt to the stimuli. After the first stage of adaptation, however, the job is completed by changes in other tissues.

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PLANT PHYSIOLOGY

Plants Need to "Sleep" For Normal Growth

NIGHTLY sleep, or something very like it, is as necessary to plants as it is to men and animals, recent researches at the Smithsonian Institution indicate. The work was done by Dr. Earl S. Johnston of the Smithsonian Institution and Dr. Paul R. Burkholder of Connecticut College.

It has to do with the physiological reaction to light on the part of auxins, the substances within plants that cause growth. Strong sunlight was found to be destructive to the auxins, while "controls" containing like amounts of the substances were left with much greater growth-promoting power after being "exposed" to darkness for equal periods.

The destruction or inactivation of the growth substances, the experimenters found, varied with the length and intensity of the illumination. It also varied, as might have been expected, with the species of plant. Some plants, such as the sunflower, are much more sensitive than others—so sensitive, in fact, that its movements seem superficially to be controlled by an animal-like intention.

Offhand it might appear somewhat paradoxical that growth should be most rapid in darkness, yet the phenomenon has often been observed. From these experiments it appears that light and darkness play complementary roles in growth. Light is required for the synthesis of the auxins in the growing tip of the plant, but, once formed, they are most effective as growth's activator in darkness.

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IN SCIENCE

ANTHROPOLOGY

Skeleton with Big Teeth May Show Old American Type

DISCOVERY of an ancient skeleton with remarkably big molar teeth is announced by Dr. Cyrus N. Ray, of the Texas Archeological and Paleontological Society.

Dr. Ray, who unearthed the skeleton about 18 miles from Abilene, Texas, believes that it may reveal a prehistoric type of American who camped and hunted in this region. Previous excavations yielded a deeply buried campsite in an eroded river bank, about half a mile distant.

The individual represented by the skeleton had a head very long in proportion to width. Describing the teeth as unusual in both size and shape, Dr. Ray states that the molars "appear to be nearer to the anthropoid pattern"—that is, more ape-like—than any encountered in his previous discoveries.

The first and second molars measure one-half inch from front to back, which means considerably more grinding area than modern man carries on his back teeth. The third lower left molar of the Texas skeleton is even longer, being measured at nine-sixteenths of an inch in length.

Large teeth were a trait of early and primitive humans.

When unearthed, the Texas skeleton was found lying with bent knees, buried in a cist, or primitive coffin made of stone slabs.

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ZOOLOGY

Humane Traps Used On Indian Lands

HUMANE traps, that catch and hold animals with a loop of flexible chain and cannot mangle their catch, have been ordered to replace steel jaw traps on all Indian lands. A holiday for wildlife has also been declared. Only wild animals harmful to crops and domestic animals may hereafter be exterminated on lands under the Office of Indian Affairs.

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E FIELDS

CHEMISTRY

Artificial Stone is Now Being Made From Waste

SYNTHETIC stone is now being produced both in England and Russia from waste rock. Granite, diabase or basalt fragments are heated and cast in molds while molten. Floor tile, curb-stones and other products are obtained. A cheap source of fuel is needed to make the method economical, reports the U.S. Bureau of Mines.

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SEISMOLOGY-ENGINEERING

Geologists' Aid Needed In Planning Buildings

EARTHQUAKE-PROOF buildings for regions where major earth shocks are liable to occur need the benefit of geological knowledge as well as the skill of architect and engineer, Capt. N. H. Heck of the U. S. Coast and Geodetic Survey told an audience of geologists. Earthquake danger to a building varies greatly according to the kind, depth, and arrangement of rock and earth layers in the spot where it is to be built, and its design may need to differ radically from what would be required for a building to be erected only a few hundred yards away, where the geology of the terrain changes.

Capt. Heck described a number of different types of earth movement, each of which causes differences in both kind and degree of earthquake danger to man-made structures. There may be movement along a vertical fault or rock-crack in either up-and-down or sidewise direction; there may be oblique slips, or even horizontal slidings of deeply buried rock strata. There are also various kinds of sinking and humping-up movements, which may not be associated with earthquake shocks at all.

And when the movements do occur, their effects on buildings differ according to the kind of substratum on which the foundations stand, whether rock, sand, clay, natural alluvium, or made land. The amount of water in the soil also is an important factor. It is usually assumed that the danger to a building

on loose soil or sand is greater than on solid rock, but there are circumstances under which the reverse is true, Capt. Heck said. And sometimes a building may escape damage while delicately aligned machinery within it is thrown out of line.

Capt. Heck also offered a new concept of an earthquake epicenter. This has always been thought of as a sharply limited spot or small area where the principal movement of an earthquake occurs. Now, he stated, it is necessary to think of the epicenter as the spot where the earthquake movement starts; but the site of the movement may itself migrate as the earthquake develops.

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BIOGRAPHY

Travels of Early Naturalist Are Traced and Mapped

WIDE-RANGING travels of an early American naturalist, Thomas Nuttall, who wandered and collected specimens all over the United States when most of the country was still "Wild West," have been traced by Dr. Francis W. Pennell, curator of botany at the Academy of Natural Sciences of Philadelphia.

Although he was the most traveled of our early naturalists, and especially famous for his work in botany, the whole course of Nuttall's journeys has never before been traced. Sources of information include works of other early travelers, incidental contemporary notices, records of plants and birds scattered through Nuttall's own works, and a remarkable discovery of old letters and manuscripts recently made by Mrs. John R. Delafield at "Montgomery Place" in Dutchess County, New York.

For one who did all his traveling between the years 1807 and 1836, Thomas Nuttall covered an astonishing territory. He traveled extensively through the more settled parts of the United States, down the Ohio, through the southern Appalachians, through the Great Lakes to the Wisconsin River, down the Mississippi and up the Arkansas River to the present Oklahoma, up the Missouri only a few years after Lewis and Clark, and later by the Oregon Trail across the continent to the mouth of the Columbia River, thence across the Pacific to Hawaii and back again to California. He collected thousands of plants, was responsible for the naming of scores of species, and introduced many flowers into cultivation.

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ASTRONOMY

Going to Desert Island To Watch Total Eclipse

ASTRONOMERS from the United States will go to a real desert island in the South Pacific next spring and spend a month there for the sole purpose of looking at the sun for four minutes and ten seconds. But the journey is reckoned well worth while, for this intensive sun-watching will be done during an unusually important total eclipse of the sun, which will take place on the morning of June 8.

The party will go as a joint expedition of the National Geographic Society and the U. S. Navy. The scientific program has been initiated and is being directed by Dr. Lyman J. Briggs, chairman of the Research Committee of the National Geographic Society. Scientific leader of the expedition will be Dr. S. A. Mitchell, director of the Leander McCormick Observatory, University of Virginia. Capt. J. F. Hellweg, superintendent of the U. S. Naval Observatory, will have charge of the Navy's participation. Included in the personnel will be: Dr. Paul A. McNally of Georgetown University, Dr. Heber D. Curtis of the University of Michigan, Dr. Floyd K. Richtmyer of Cornell University, Dr. Irvine C. Gardner of the National Bureau of Standards, John W. Willis of the U. S. Naval Observatory, and a photographer from the National Geographic Society.

The expedition, with its equipment of telescopic cameras, spectrographs, and other instruments useful in eclipse work, will go to Honolulu on a regular Pacific liner. There they will transfer to the Navy tender "Avocet," formerly a mine-sweeper, and on May 6 will steam away toward Samoa. Two-thirds of the way there, they will come to the Phoenix Islands. Between two of these, Enderbury Island and Canton Island, they will make their choice, and there they will land themselves and their equipment.

Both these spots in the ocean are true desert islands, mere coral reefs without even a tree. The expedition will have to take all provisions, even drinking water, and will have to stay for a solid month. The "Avocet" will stand by, since there is of course no harbor for even a small ship. Indeed, the better of the two islands for observing purposes, Enderbury, is only two and one-half miles long and one mile wide.

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