SCIENCE NEWS

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NOVA OPHIUCHI NUMBER THREE

NEWS of a stellar catastrophe that happened possibly several thousand years ago has reached the earth. Watching from his private observatory in the middle of a cornfield near Delphos, Ohio, Leslie C. Peltier noticed a sixth magnitude star in the constellation of Ophiuchus in a spot where his charts indicated no star of that brightness. Thus, to his record of the discovery of several comets, he has added one of a new star, or nova, as astronomers call them.

Mr. Peltier did as astronomers always do when they make a new discovery. He notified the Harvard College Observatory at Cambridge, Massachusetts, which acts as a clearing house to distribute news of discoveries to observatories.

A nova is not really a "new" star that is suddenly created out of nothing. It is a faint star that suddenly becomes bright, sometimes exceeding any other star or planet.

Though Nova Ophiuchi Number Three, as the new discovery will be called because it is the third recorded in that constellation, is now just too faint to be seen with the naked eye (magnitude 6.4), this is probably because of its great distance, which has not been measured. Perhaps it has not yet reached its maximum brilliance and if that is so and it becomes much brighter, it will be visible without the aid of a telescope.

Ophiuchus, which means the serpent carrier, is now visible in the southwestern sky, just above the constellation of Scorpio which can be identified by the red star Antares.

The exact cause of a nova is still uncertain. Formerly it was thought that novae are due to the collision of two stars. However, several are detected each year. Most of them are visible only when brightest and when viewed with the largest telescopes. The stars are so sparsely distributed in space that collisions could not occur so often. Now it is supposed that there is some sort of an internal explosion that causes the flareup. After the rapid increase in brightness the star gradually dims and a few years later is continuing to shine as if nothing had happened.

ENERGY FROM COSMIC RAYS

COSMIC rays are the chief source of energy in the universe. From 30 to 300 times more energy is shooting through celestial space in the form of cosmic rays than in all other radiant energy forms combined. This is the conclusion of Drs. I. S. Bowen, Robert A. Millikan and H. V. Neher, of the California Institute of Technology, expressed in a communication to the *Physical Review*.

Their estimate of the energy falling on some body millions of light years away from the earth is based on new high-altitude measurements of cosmic ray intensities. They conclude that the energy falling on the earth from the stars is only twice as great as that coming from space in the form of cosmic rays.

The earth is located not far from a huge group of stars that astronomers call our galactic system so that the earth is in a region of highly energized space. A body located in inter-galactic space would receive from 60 to 600 times less starlight than the earth.

Measurements have been taken on the decrease in strength of the cosmic rays as these rays plow through the atmosphere. By adding up all the measured energies over all heights from the surface of the earth to the top of the atmosphere definite information has been obtained of the total cosmic ray energy intercepted by the earth.

The estimates of the density of starlight energy in the universe were made by Dr. S. A. Korff, also of the California Institute of Technology. The uncertainty as to the exact amount depends upon the uncertainty as to the exact number and brightness of all the stars and luminous matter in the universe.

THE WHITE PINE BLISTER RUST

"FOREST destruction as spectacular and ruthless as that caused by chestnut blight will begin in 1936 in the western pine forests of Idaho, Montana and Washington, except where white pine blister rust control is applied before that time."

With this prophecy S. B. Detwiler, of the U. S. Department of Agriculture, opens a survey of the white pine situation in the official publication of the Society of American Foresters. The rust invasion has reached the epidemic stage through this region.

White pine blister rust is a fungus disease of the highly valuable white pine species, which first invaded this country in the eastern states some years ago. It spends an essential part of its life cycle on gooseberry and currant bushes, so that if these shrubs are all destroyed in a given region, the white pines growing in the area will be saved. Blister rust control based on this principle has been successful in the parts of the eastern white pine area where it has been applied; but general economic conditions have prevented extensive use of the method in the larger white pine areas of the West. Since the U. S. Government still owns about a third of all the western white pine now standing, a large responsibility obviously rests with it.

Although the regular funds for the control of white pine blister rust, as provided heretofore through the Department of Agriculture, have been seriously curtailed through recent severe budgetary restrictions, it is expected that this loss will be more than offset by the use of the newly recruited "Forestry Army"; but this is an emergency measure only, and there is no definite long-time plan for carrying the fight into future years, which is indispensable if the western white pine forests are to be saved. Mr. Detwiler feels that this lack should be supplied at the earliest possible opportunity.

PROTECTION OF WHITE PELICANS

WHITE pelicans, among the most interesting of the water birds of western America, are in need of careful

scientific study and additional protection of their few remaining nesting grounds if the species is to be kept alive, according to a study just completed for the U. S. National Park Service by Ben H. Thompson.

There are still from 20,000 to 25,000 of these great birds in the United States, plus an unknown but probably smaller number in Canada. But their tenure of life is not so secure as their numbers might indicate. In the old days, before the West became so well settled, they had plenty of nesting grounds. Mr. Thompson's study of the record indicates something over seventy known locations of colonies scattered over the western parts of Canada and the United States in earlier times, whereas there are now only seven known large nesting colonies. Fortunately, five of these are in government-protected areas.

The principal menace to the white pelican is from the drainage of lakes where its nesting islands were located. Second to this has been the deliberate destruction of its nests or eggs by fishermen who disapprove of the bird's voracious appetite, though it has now been demonstrated that in most places pelicans make most of their meals off fish not good for sport or food.

Several years ago there was a brief period of artificial control of the pelican numbers on Molly Island in Yellowstone Lake, because of the pelican's rôle as carrier of a parasite of the trout. However, this policy has been given up and the Yellowstone pelicans now enjoy absolute protection by the National Park Service. No one is even allowed to land on Molly Island without written permission from the park administration.

ITEMS

BERYLS, which when clear are used as precious stones, contain different amounts of helium gas, according to the age of the rocks from which they have been obtained. This helium gas is derived from the transmutation of other elements which has been going on extremely slowly ever since the rocks were first formed. Therefore the amount of helium in a given mineral may give a clue to the age of the rock in which it is contained. Lord Rayleigh, the distinguished British physicist, reports in *Nature* that from his latest analyses of beryls containing helium gas, and from his experiments of the rate at which alpha particles or helium atoms are being produced from the element beryllium, it would take about fifty to a hundred billion years for the observed amounts of helium to accumulate in the mineral. This period of time is much longer than that estimated from the amount of lead derived from the transmutation of radioactive elements, in similar rocks, which never indicate an age of more than two billion years.

THE lowest temperature ever produced and measured by man, eighty-five thousandths of a degree on the absolute scale, has been achieved in the Kamerlingh Onnes Laboratory at the University of Leyden. This is extraordinarily close to the absolute zero point or minus 459.6 degrees on the Fahrenheit scale, at which all atomic motion would cease, electricity would flow without hindrance and other strange things would happen. The new greatest cold breaks records of about twenty-five hundredths of a degree which were made at both the University of California and the Leyden laboratory about two months ago. Professor W. J. de Haas, of Leyden, and Professor H. A. Kramers, of Utrecht, who made the experiments, used the method that is known as the "adiabatic demagnetization of paramagnetic salts." This takes advantage of the fact that when a substance is magnetized, it heats up. Using liquid helium made by cooling, liquefying, and solidifying of air, and then liquefying hydrogen to cool the helium, a substance is cooled as low as possible. Then it is magnetized. It heats up. Liquid helium is used to remove that heat. Then it is demagnetized taking care to keep it heat insulated. It becomes colder as a result of the demagnetization. Thus a lower temperature than ever before attained has been reached.

IT has long been known that many fishes have a chameleon-like ability to change color rapidly, by contracting or expanding their color-bodies; but Dr. Francis B. Sumner, of the Scripps Institution of Oceanography, has discovered that if their contact with a changed background is prolonged enough they will actually grow new color-bodies in considerable numbers, or get rid of part of those they have, according to the degree of darkness which it is necessary for them to match. How deeply this ability is inbred in the very nature of the fishes is demonstrated by the fact that very dark specimens, that have lived in black jars all their lives, will still respond fairly promptly and shed part of their complexions when transferred to white jars; while fishes kept from the day of their hatching in white jars will make the opposite change equally promptly if transferred to black-lined homes.

THE companion star to Sirius, the brightest star in the sky, has been found to be only one third as bright as previously thought. The trouble that arises from this dimness is explained by Dr. A. N. Vyssotsky, of the University of Virginia, in a communication to the current issue of the *Astrophysical Journal*. The size of a star is known from its brightness so the companion star must be much smaller than heretofore assumed. Thus bodies on its surface weigh less than before. The force of gravity on heavenly bodies is of interest for it is this force that produces the Einstein "red shift," which means that light coming from this star has had its frequency of vibration increased or its color reddened by a minute amount. The heavier the star, the redder the light. Values of this red shift obtained by Dr. Walter S. Adams at the Mount Wilson Observatory are greater than can be accounted for from Dr. Vyssotsky's observations. This discrepancy between theory and experiment will be checked by further observations on both the brightness and the reddening of the light. This little star has caused trouble in the past, for astronomers had to assume that it was made of something about four hundred times heavier than gold. The fact is partially overcome by Professor Vyssotsky's observations which indicate that it is about sixty times as heavy as the densest object on earth.