

GENERAL SCIENCE

Carnegie Reports

Annual round-up tells of nebulae resolved into individual stars, better rangelands in the West, and further results with chlorellin, antibacterial substance.

See Front Cover

➤ PERHAPS the most interesting astronomical result of the past year has been the resolution into stars of several extragalactic nebulae, among them the two companions of the Andromeda nebula and the central region of the Andromeda nebula itself. This is described in the new yearbook of the Carnegie Institution of Washington.

Photographs taken on red-sensitive plates with Mount Wilson's 100-inch telescope by Dr. Walter Baade have for the first time resolved into stars such nebulae as Messier 32 and those known by the New General Catalogue Numbers of 205, 147 and 185. Previous to this, NGC 147 and 185, shown on the cover of this SCIENCE NEWS LETTER, were not known to belong to the group of galaxies which, relatively speaking, are close neighbors to our own universe. Messier 32 and NGC 205 probably accompany the Andromeda nebula in its travels through space, Dr. Baade's work revealed.

Science News Letter, December 23, 1944

Ex-Nova for Companion

➤ THE BLUE companion of R Aquarii is an ex-nova, investigations conducted by Dr. Rudolph Minkowski of Mount Wilson Observatory showed. Measurements of a pair of plates made 16 years apart indicated that the nebulosity seen around R Aquarii was ejected 600 years ago. With its low velocity of ejection, the blue companion of R Aquarii is believed to be related to the recurrent novae RS Ophiuchi and T Pyxidis.

Science News Letter, December 23, 1944

Better Rangelands

➤ BIGGER and better bluegrass stands will some day wave over rangelands in the West, now depleted through overgrazing and drought. Creation of the new kinds of grasses through hybridization is described in the new yearbook.

One of the species used in the new hybrids is a giant grass, reaching a height

of six feet, that grows in parts of the Pacific Northwest. Crossed with the more conventional kinds of bluegrass, it contributes something of its size and rapidity of growth, besides other desirable characteristics, states Dr. H. A. Spoehr, chairman of the division of plant biology.

The breeding of new kinds of range grasses is being conducted as a joint project with the U. S. Soil Conservation Service, with Dr. Jens Clausen, Dr. David D. Keck and Dr. William M. Hiesey carrying on the field work, mainly in the Pacific Coast states. Once a desirable new grass species has been obtained, it is propagated by stolons or runners; this asexual reproduction preserves the valuable hybrid properties against loss

through segregation, which would occur if seeds were depended on.

Science News Letter, December 23, 1944

Chromosomes Doubled

➤ BREEDING plants to produce higher yields of useful substances, and lower percentages of harmful drugs, occupied the attention of Dr. H. E. Warmke and Harriet Davidson, of the Institute's division of genetics. Carrying on from preliminary results obtained a year ago, they found that they could get bigger roots, containing a higher percentage of rubber, from the Russian dandelion, *koksaghyz*, if they subjected parent plants to chemical treatment that doubled the number of chromosomes in the cells of the offspring.

Science News Letter, December 23, 1944

Chlorellin Hits Bacteria

➤ FURTHER results with chlorellin, the antibacterial substance produced by the green alga, *Chlorella*, are announced in the yearbook by Dr. H. A. Spoehr, Dr. J. H. C. Smith, Dr. H. W. Milner



NOT A LEAK!—This is friendly, fire-smothering carbon dioxide gas pouring out of ceiling nozzles to protect precious fur coats hanging in a storage vault. It is released automatically from high-pressure storage cylinders when the first warning drift of heated air touches a special heat detector. Walter Kidde & Co., who designed this newest protection for the minks and sables which are not easily replaced today, have also harnessed the same gas for use as a fire-extinguisher in planes, ships and tanks, and to inflate rubber life-rafts and lifebelts.

and Dr. G. J. Hardin. Chlorellin was found able to stop the growth of a strain of *Staphylococcus aureus*, the boil bacterium, that had become resistant to the action of penicillin.

Science News Letter, December 23, 1944

Artistic Indian Sandals

► INDIANS living in North America from the third to the twelfth century A.D. expressed their craving for beauty not by constructing magnificent monuments or by molding elaborate pottery, but by making sandals of intricate design, states Dr. E. H. Morris, who directed the study.

Many of the cross-woven sandals, with their flat soles of tight, hard fabric, are made entirely of yucca fiber. Others, however, used yucca only for the warp and made the weft of such materials as Indian hemp, human hair and, in more recent times, even cotton. These were dyed yellow, several shades of red, brown or black.

In many of the sandals found in Arizona, Utah and New Mexico, supplementary warp and weft were wrapped and twisted about one another, resulting in a two-ply fabric held together only by occasional loops.

Science News Letter, December 23, 1944

Columns and Altars

► THE DISCOVERY of new stelae and altars in Chiapas, Mexican state near Guatemala, by Dr. and Mrs. S. G. Morley, and correcting readings on two of the ancient columns, extends backward some 50 years, to about 475 A.D., the dating of monuments in this region that were known to have been created at a definite period.

On the basis of these dated remains, this makes Altar de Sacrificios, which lay at the crossroads of the Old Empire, 40 years earlier than any other known city in the Usumacinta Valley. It also again raises the unsettled question, Dr. Morley states, of just what route Maya culture followed in reaching this valley.

Good evidence was found that the Maya used rebus writing, where words or phrases are expressed by pictures of objects whose names resemble these words or the syllables of which they are composed. J. E. S. Thompson advanced evidence that the symbol for counting was the figure of the mythical fish called "xoc," since this and the Yucatec word "xoc," meaning "count," sound alike.

Science News Letter, December 23, 1944

MILITARY SCIENCE

Oil Bomb Damages City

Known as the M69, this terrifying new weapon is credited with creating a fire that all but destroyed the northwest section of the city of Changsha, held by the Japs.

► A TERRIFYING new six-pound oil bomb, known as the M69, is credited with creating a fire that all but destroyed the northwest section of the city of Changsha, China, now occupied by the Japanese, the first time it was put into use, last July.

Landing in the streets and on rooftops, the bomb spits chunks of flaming oil up to 25 yards in all directions. These flaming chunks of oil cling to the surface of whatever they strike, making them one of the most effective fire-starters developed in this war. The glow against the sky above Changsha was visible to Army Air Force pilots for 80 miles, and columns of black smoke could be seen rising more than half a mile.

The new fire bomb, developed by the Chemical Warfare Service, consists of a slender six-sided steel case 19 inches long and no bigger around than a baseball bat. The center portion of the cylinder holds a cheesecloth sock containing about three pounds of gasoline blended with a thickening compound. This mixture looks like orange gelatin, and it burns at a temperature of about 3,000 degrees Fahrenheit.

The thickened oil is similar to that used in Army flamethrowers. Each bomb holds enough of the jelly-like substance to make a flaming flapjack a quarter of an inch thick and a yard in diameter.

White cloth streamers, packed in the tail, act like parachutes to slow the descent of the bomb so that it will not smash to bits when it lands, and yet leaving it with sufficient force to pierce roofs covered with tile, slate, wood, galvanized iron, or composition shingles.

In about five seconds after the bomb lands, a delayed action fuse spits out the cheesecloth sock from the tail of the bomb and ignites it. The bomb burns for 8 to 10 minutes. The bombs are dropped from planes in clusters of 38. A total of 78 clusters of the M69 bombs were used in the Changsha raid.

The M69 is an outgrowth of research dating back to 1941 to discover a substitute incendiary mixture at a time when large quantities of magnesium for incendiary bombs were not available. The Office of Scientific Research and

Development and the Chemical Warfare Service worked out the petroleum-base incendiary compound. After exhaustive tests, both the mixture and the bomb design were standardized.

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