PHYSICS

Cosmic Rays Measured In Stratosphere

COSMIC RAYS have been measured as they plunge through the earth's stratosphere 18 kilometers (over 11 miles) above sea level. Three successful flights of pilot balloons bearing cosmic-ray measuring devices were described by Prof. Robert A. Millikan of the California Institute of Technology in an address before the National Academy of Sciences. On two of them the effects were measured at 18 kilometers elevation.

At this great height, Prof. Millikan reported, the cosmic ray intensities are approximately 100 times greater than at sea level.

In other experiments, on platforms that were carried up towering mountain heights to elevations as great as 29,000 feet, observations were made of the penetrating power of the rays through lead shields. They showed, Prof. Millikan reported, a rapid "softening" with altitude, and essentially the same softening in temperate latitudes as in equatorial latitudes.

"The observed behavior is such," he concluded, "as to be best interpreted in terms of cosmic ray photon bands of widely differing penetrating power, the less penetrating bands coming into play at the higher altitudes."

With Prof. Millikan in these researches were associated Dr. I. S. Bowen and Dr. H. V. Neher.

Science News Letter, April 29, 1933

PALEOBOTANY

New Fossil Plant Found In Illinois Deposit

A NEW SPECIES belonging to a long-extinct plant family has been found in what was once the bottom of a shallow pond in Illinois, now a stratum of silt hardened into shaly stone. The stems, leaves, flowers and fruits of this plant, dead for millions of years, were described before the National Academy of Sciences by Dr. David White of the U. S. Geological Survey, who made his discovery while on an expedition under the auspices of the Illinois State Geological Survey.

The plant belonged to the extinct genus known as *Cordaites,* a remote relative of the modern conifers, that lived during the ages when coal was in the making. The character of its wood suggests the modern Araucarias, exemplified by the "monkey-puzzle tree" familiar in the South and in northern greenhouses. Its leaves and the chambered pith within its stem are more like those of the cycads, tropical plants which look like palms but are really much more primitive in their kinships.

The flowers were small, bud-shaped, and covered with overlapping scale-like growths. They were spirally arranged around a central stalk, forming a kind of loose spike. Male and female flowers were borne separately, and both kept their essential organs well protected until maturity. The plant seems to have produced an abundance of pollen, for its pollen sacs were numerous and relatively large.

The seeds found in the Illinois deposit range in age from exceedingly small ones, just formed, to full-grown specimens. A full-grown seed was somewhat less than half an inch in length and about a quarter of an inch wide, and was provided with a flat, flaring wing on each side. It was covered with minute, spinelike scales.

Science News Letter, April 29, 1933

PHYSIOLOGY

Climate Stimulates Sex Activity in Man

MAN'S GLANDS of internal secretion, the sex glands along with the others, are affected by climatic stimulation, Dr. C. A. Mills and Cordelia Ogle, of the University of Cincinnati reported to the Federation of American Societies for Experimental Biology.

Experiments with mice confirmed the findings for humans, that in a cold climate sexual activity begins earlier and fertility is greater. But after one or two generations, in mice, the stimulating effect of a cold climate is lost and apparently functional exhaustion comes on similar to that caused by the severe stimulation of frequent changes from hot to cold climates.

Discussing a report on fertility in males, Dr. Mills said that his studies also confirmed the finding of Dr. David L. Belding, of the Evans Memorial of Massachusetts Memorial Hospitals, that there are two apparent seasonal peaks of fertility.

For men, Dr. Belding found these appeared in June and again in late September.

Science News Letter, April 29, 1933

IN SCIEN

ANTHROPOLOGY

Ancient Indians Had Ear Troubles

INDIANS of ancient America, before Columbus came, had plenty of trouble with their ears. One of the commonest of their diseases was bony outgrowths into the external auditory canal. At the meeting of the National Academy of Sciences, Dr. Ales Hrdlicka of the U. S. National Museum described his study of over 7,000 skulls of pre-Columbian Indians as well as later Indians, white men, Eskimos, Negroes, Polynesians and Melanesians.

Complete absence of the bony canal was rare, he found, but bony outgrowths were common. There were none in Negro skulls, and they were rare in skulls from eastern Asia, but frequent in Polynesians and American Indians.

They never exist at birth, and are rare in childhood, developing essentially during the earlier half of adult life. They are somewhat more common in men than in women, and exist more often in both ears than in one ear only. When they do occur on one side it is more often on the left.

Science News Letter, April 29, 1933

PHYSICS

Faint Radiations From Night Sky Called Cosmic

FAINT radiations from the night sky, not perceptible to human eyes but detected and analyzed by the spectrograph, were termed "cosmic radiations of the sky" by Dr. V. M. Slipher, director of the Lowell Observatory at Flagstaff, Ariz., speaking before the American Philosophical Society. The radiations extend throughout the spectrum from ultraviolet to deep infra-red, generally stronger in the longer wavelengths.

Other illuminations from the night sky intercepted by Dr. Slipher's instruments have included light from auroral displays and the brief morning and evening twilight solar stimulation in the high atmosphere.

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CE FIELDS

ASTRONOMY

More Dark Matter Than Luminous in Universe

THERE is more dark matter scattered between the stars than there is of shining substance in the stars themselves. Such at least is the indication of astronomical studies reported before the National Academy of Sciences by Prof. Joel Stebbins and Dr. C. M. Huffer, of the Washburn Observatory, Madison.

The two astronomers have been studying the reddening of the light from distant stars in the great group, or galaxy, to which our sun belongs. This reddening is an indication of partially obscuring matter between these stars and ourselves, just as lights on earth are made redder in appearance if they shine through smoke or clouds of dust.

There is so much of this obscuring matter—dust or gas—that it is doubtful whether we can see as far as the center of our galaxy, Prof. Stebbins said. Because of this obscuration effect, it is probable that we have been estimating many astronomical distances much too high, and in future we must allow for this in figuring our estimates.

Science News Letter, April 29, 1933

ARCHAEOLOGY

Ancient Greece Had "Dark Age" Period

ANCIENT Greece had three centuries of "dark ages," comparable to the period of sag in western Europe that came between the final breakdown of the Roman Empire and the rise of medieval culture. Only in ancient Greece the "dark ages" were more completely dark, for whereas in pre-medieval western Europe there was at least some continuation of the old culture, during those three centuries in Greece even the art of writing was lost completely.

This was part of the report brought before the American Philosophical Society by Prof. Rhys Carpenter of Bryn Mawr College. Up to about 1100 B.C. a brilliant civilization flourished in Greece, with its principal center at Mycenae. It was linked with the high culture of Minos, in Crete. It left ruins of great buildings which have been excavated by archaeologists. It left also many inscriptions which as yet nobody has been able to read.

Then, at about the time when the Israelites were conquering the Promised Land, this civilization fell. When the classic Greek culture arose, between 800 and 700 B.C., it was built by a different people who used a different alphabet. The language of classic and modern Greece contains no key to the inscriptions of the civilization that died about 1100 B.C.

But Prof. Carpenter thinks he may have a possible lead. In classic Greek times, the inhabitants of Cyprus continued to use the old script. He suggested today that a study of this neglected Cypriote Greek may at last unlock the secrets of the Mycenaean inscriptions.

Science News Letter, April 29, 1933

PHYSIOLOGY

Over-Supply of Oxygen Found to Be No Advantage

OXYGEN in three to four and one-half times the usual percentage in the air mixture breathed during muscular work seems to offer no advantages, experiments by Dr. Francis G. Benedict and Robert C. Lee of the Nutrition Laboratory of the Carnegie Institution of Washington, at Boston, Mass., indicate. Their researches were reported to the American Philosophical Society.

They used volunteers, who breathed ordinary air containing 21 per cent. of oxygen during part of the tests while the rest of the time they were supplied with air mixtures containing from 60 to 90 per cent. They found no significant alteration in the total oxygen consumption per minute for the same amount of work. Neither was there any change in the ratio of oxygen used to carbon dioxide exhaled, thus indicating no change in the character of the material burned in the body. Finally, the oxygen absorbed during the recovery periods after work remained unchanged.

Prolonged administration of high-oxygen mixtures to animals has been shown to have a toxic effect, but in the present experiments the use of oxygen was discontinued before the human subjects showed signs of oxygen poisoning.

Science News Letter, April 29, 1933

PHYSICS

"Minus Colors" Promise Revolution in Painting

A REVOLUTION in the painter's art may result from a new type of pigments which were demonstrated before the National Academy of Sciences by Dr. Herbert E. Ives, physicist of the Bell Telephone Laboratories.

Hitherto the painter's supposedly "primary" colors were red, yellow and blue. Each absorbed all of the other colors in sunlight except the one it reflected. Mixing these colors theoretically gave blended hues and shades. Actually, however, the artist's palette has had to carry dozens of different kinds of pigments.

Dr. Ives has worked out three pigments which he calls "minus red," "minus blue" and "minus green." Each of these reflects mostly the light-rays complementary to its "minus" hue, but also a large range of others. Mixing them gives all desired ranges of hues, and combining all of them gives black. Adding white, to give tints and for the actually white parts of the painting, Dr. Ives offers a palette carrying only four kinds of paint, which he states are sufficient for every imaginable requirement of the artist.

Science News Letter, April 29, 1933

ASTRONOMY

Twin Super-Universes Seen in the Heavens

GALAXIES, vast lens-shaped aggregations of stars that have received the popular name of "island universes," are often grouped into super-galaxies, which in the aggregate contain simply unimaginable numbers of giant suns. Dr. Harlow Shapley of Harvard College Observatory, one of the leading students of the new knowledge of the structure of the universe, has now discovered that these super-galaxies are often found in pairs. In the course of an address before the National Academy of Sciences, he told of occasionally finding such pairs, separated by less than the diameter of one of the members, out in the vast reaches of space.

Prof. Shapley has been endeavoring to obtain a figure to represent the average distribution of matter in outer space. He stated that in the space beween the galaxies matter exists on the order of 10^{-30} grams per cubic centimeter.

Science News Letter, April 29, 1933