

PHYSICS

Scientists Still Differ Concerning Cosmic Rays

Their Nature and Manner of Creation as Well as Place of Origin Uncertain Though Experiments Agree

COSMIC RAYS, after years of observations by some of the most brilliant physicists in the world, still constitute one of science's major mysteries. It is as though men were not sure that the sun's rays are light, or that rain is water.

Not only is the nature of the cosmic rays a matter of opinion but science does not know from whence they come, nor how they are created. The one unchallenged point about the rays is that they bombard the atmosphere of the earth and every plant or animal which lives on its surface unceasingly and unvaryingly.

Dr. Robert A. Millikan, of California Institute of Technology, a cosmic ray pioneer, presented to the American Physical Society meeting in Berkeley, Calif., his interpretations which remain steadfast to the idea that cosmic rays are mostly photons; that is, they constitute a phenomenon like ordinary light, heat and X-rays.

Dr. Thomas H. Johnson, assistant director of the Bartol Research Foundation of Philadelphia's Franklin Institute, had previously told the gathered scientists his experiments could best be interpreted, in his opinion, by assuming that cosmic radiation consists of particles, predominantly the nuclei, or hearts, of atoms.

Experimentally cosmic ray observations are now in good agreement among the various investigators. It is in the interpretations of the observed data that opinions and theories differ. Scientists are not worried by a multitude of theories, however, for they know that adequate explanations will be reached more surely because of them.

Dr. Millikan concludes that practically all the electrical "fuss" kicked up in the earth's atmosphere by cosmic rays is due to the passage of positive and negative electrons, most of these particles being born of photons and electrons in the atmosphere.

Dr. Millikan finds that not more than three or four per cent. of the cosmic

ray electrical disturbance, or ionization, found at sea level is due to electrons that come in from outer space; nevertheless, he believes that these electrons are responsible for the variations in cosmic ray intensities found over the various parts of the earth.

Dr. R. M. Langer of California Institute of Technology, suggested that it may be necessary to credit cosmic ray effects to some kind of radiation yet unappreciated in order to obtain an adequate explanation. Perhaps even the newly discovered neutron may play a part.

The most easily seen and captured light coming from the stars and nebulae of the heavens also contains scientific mystery.

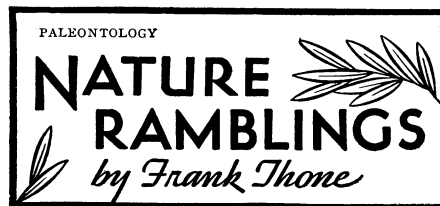
Realization is growing that the vast spaces between the great star systems, the nebulae, are not entirely empty but contain a "cosmic haze" composed of extremely diffuse atoms. Sodium and calcium "fog" of this sort has been detected by the fact that inter-nebular dust filters out some of the light from the objects behind it.

What is the most plentiful material in the distant parts of the universe is another great problem of science. Dr. Donald Menzel of Harvard College Observatory finds evidence for larger amounts of neon and fluorine occurring in novae, or momentary brilliant stars that flare up to great brightness for a year or two and then dwindle to their former orthodox intensity. Other astronomers find that the recognized large amounts of hydrogen and helium in the stars and nebulae sometimes masquerade in greatly agitated states as other elements.

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Grapefruit rind yields essential oils which are found to be valuable in perfume and flavor manufacture.

A North Carolina post office has been equipped with "electric eyes" in the sorting room, to maintain correct light for the work, regardless of weather.



Dinosaur Eggs

FOR many years after scientists had pieced together the fossil bones of dinosaurs and had reconstructed a good deal of the natural history of these monster reptiles, the question of how little dinosaurs first saw the light remained a persistent and perplexing riddle. It was assumed that they hatched from eggs, because hatching from eggs is the orthodox method for coming into the world among the reptiles we know today. But in all the great deposits of dinosaur bones in America and Europe, which yielded many tons of fossil skeletons, nobody had ever found a single dinosaur egg.

Then came the day when scientific parties could take the field as though they were military expeditions or engineering enterprises, with men, equipment and money enough to work on a really large scale. One of the first fruits of one of these expeditions, under Roy Chapman Andrews of the American Museum of Natural History, was the discovery of dinosaur eggs in abundance, under the sands of the Mongolian desert. He found them not merely singly, but as whole nests or "clutches," where they had been sifted over and prevented from hatching by drifting dust.

The eggs of these monster reptiles were not so large as might have been anticipated, judging by the huge bulk of their parents. Their shells were comparatively thin, and had a pebbled, leathergrained kind of surface. But Mr. Andrews was not the first man who ever saw a dinosaur egg. His discovery was anticipated, by at least 25,000 years. For in the same desert he found fragments of dinosaur eggshells that had been bored as pendants for the necklace of some caveman chief!

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