

PHYSICS

**Altitude Increases
Quantity of Cosmic Rays**

FIVE MILES up in the air cosmic rays are many times as plentiful as they are on the surface of the earth, but they are also much less powerful and less effective than those at ground level.

Thus may be summarized research into the character of the puzzling cosmic radiation conducted by Dr. L. M. Mott-Smith of Rice Institute, Houston, Texas, and the U. S. Air Corps at Wright Field, Dayton, Ohio. Data were collected by Capt. A. W. Stevens, prominent because of his achievements in long range photography, Capt. R. C. Moffat, Lieutenants J. F. Phillips and C. D. McAllister. They used an electro-scope designed especially for air-plane observations by Dr. Mott-Smith and Dr. L. G. Howell, also of Rice Institute.

"We find that the intensity of cosmic rays at 25,000 feet is about 21 times that at sea level and is still increasing rapidly," Dr. Mott-Smith told Science Service. "Another interesting thing is that at 25,000 feet as small an amount as one inch of lead reduces the intensity by forty per cent, a surprisingly large amount."

An inch thickness of lead is an ineffective barrier in the path of cosmic rays on the surface of the earth. Though this much lead will stop practically all X-rays and other forms of radiation, a quantity sufficient to block cosmic rays must be measured in feet.

In this study measurements of cosmic rays were made at elevations of 5,000, 10,000, 15,000, 20,000 and 25,000 feet, each measurement consisting of an average of ten individual readings.

Science News Letter, November 12, 1932

CHEMISTRY

**Tungsten Electroplating
Process Patented**

THREE PATENTS for electroplating tungsten from solutions of the metal salt dissolved in water have just been issued by the U. S. Patent Office to Prof. Colin G. Fink of Columbia University.

The tungsten deposit is smooth, hard and coherent, and has a high luster. No polishing after the plating operation is necessary if the article to be plated is first polished.

The tungsten plating has unusual properties. It is not attacked by acids or

aqueous alkaline solutions and does not tarnish in the air. It is, therefore, an ideal metal for protecting other metals from corrosion, especially in chemical apparatus.

Many unsuccessful attempts have been made during the last sixty years to develop a commercial method for electroplating with tungsten. Prof. Fink has the distinction of being the first chemist to succeed in plating out tungsten from solutions of tungsten salts in water by a process which can be carried out on a commercial scale. He accomplishes this by using alkaline solutions of tungstates and carefully controlling the temperature, current density, and hydrogen ion concentration of the solution.

Prof. Fink has made many other important chemical inventions. He perfected and patented a process for chromium plating which has become a great commercial success. His process is widely used today throughout the world to plate automobile parts and other metal objects with bright chromium which does not tarnish. His patent for chromium plating has been recently sustained in the federal courts against infringers.

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PLANT PATHOLOGY

**Common Weed Destroyed
To End Celery Disease**

CELERY growers in Florida are now able to eliminate one of the most troublesome of the plant diseases with which they have to contend by destroying one species of weed that grows around their fields. Dr. F. L. Wellman of the U. S. Department of Agriculture tells how it was done, in *Science*.

Celery mosaic has been a major crop disease in Florida, often rendering unmarketable whole fields of the vegetable. It was known that the disease is carried by an insect, the celery aphid. After the celery harvest, this insect feeds on the weed *Commelina nudiflora*, sometimes called the day-flower, and so survives until the next crop of celery has been set out.

It seems to be unable to live on any other weed, for when all the *Commelina* was eliminated from around two test fields near Sanford, the loss due to mosaic was cut to between 1 and 1½ per cent., while another field, left with its girdle of *Commelina*, was so badly scourged with mosaic that its owner decided that the crop was not worth harvesting.

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ASTRONOMY

**Recently Found Asteroid
Given Name "Amor"**

AMOR is the new companion of famous Eros, formerly most famous of the minor planets or asteroids. This name has been given to the interesting planet discovered by E. Delporte at Uccle in March of last year. It won particular notice among astronomers when it was discovered that it approached the earth closer than Eros itself, which before held the record. Shortly after the discovery of Amor's close approach to the earth, another little planet, discovered by K. Reinmuth, approached even more closely to the earth.

Amor also has the number 1221. The Berlin Rechen-Institut, which numbers the new planets discovered, has just assigned permanent designations to fifteen new planets discovered between 1927 and 1932.

Amor in mythology was identical with Eros.

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SEISMOLOGY

**Opposite Ends of Pacific
Feel Submarine Quakes**

OPPPOSITE ends of the Pacific ocean felt the force of a pair of earthquakes that occurred about the turn of the month. The sea bottom off the coast of Alaska was shaken by a severe earthquake, on Sunday, Oct. 30, at 3:47.3 p. m., eastern standard time. Scientists of the U. S. Coast and Geodetic Survey, using data collected telegraphically by Science Service, located its epicenter at approximately 54 degrees north latitude, 156 degrees west longitude.

A submarine earthquake of moderate severity was recorded on the morning of Wednesday, Nov. 2. The epicenter was located at 24 degrees south latitude, 111 degrees west longitude. This point is in the Pacific Ocean, a little to the northwest of Lonely Easter Island. Time of origin was 6:03.4 a. m., eastern standard time.

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CE FIELDS

CHEMISTRY

Lignin Made Artificially By Heating Cellulose

LIGNIN, one of the chief constituents of wood, and as yet one of the most puzzling to chemists and industrialists, has been made artificially in the U. S. Forest Products Laboratory at Madison, Wis., by Drs. L. F. Hawley and E. E. Harris. This research followed pioneer work done previously by Dr. Hawley with Dr. Jan Wiertelak.

Lignin was made in sealed tubes, by heating cellulose, the most useful constituent of wood, at a temperature of 135 degrees Centigrade for periods up to eight days in length. The artificial lignin thus obtained gave the same reactions as the natural lignin to various chemical tests.

It is not expected that this artificial lignin will be of immediate direct commercial importance. On the contrary, natural lignin is now a nuisance and an expense to chemical manufacturers, for they do not know any use for it, and in making wood pulp have to get rid of it by various costly methods. But the discovery of Drs. Hawley and Harris will eventually be of economic value, because it leads to a better knowledge of what lignin is and will do, and this knowledge in turn is of use either in getting rid of it or even in finding a profitable occupation for it.

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GEOLOGY

Texas May Have Had Glaciers in Coal Age

GLACIERS great enough to transport heavy boulders may have crunched their slow way across Texas landscapes millions of years ago, during the Coal age. Evidence to this effect has been found in the western part of the state, in the Trans-Pecos region, by Charles Laurence Baker, University of Texas.

The evidence consists largely of boulders of the same general type as were transported by the vast continental glaciers of the pleistocene period, millions of years later—almost yesterday,

as compared with the antiquity of the Coal Age. Mr. Baker does not think his Coal Age boulders were necessarily carried by continental glaciers, however. There were mountains in West Texas then, he points out, and they could easily have been lofty enough to bear alpine glaciers of their own.

Nor would such mountain glaciers have interfered with coal formation, he believes, calling attention to the presence of coal beds in India and in the Southern Hemisphere, close to glacial deposits, while in New Zealand and Chile rich vegetation can be found within a mile of glacier fronts.

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PHYSIOLOGY

Six Blood Types Announced by Dane

SIX TYPES of human blood can be detected and should be differentiated in blood transfusion operations, Dr. Oluf Thomsen, director of Copenhagen University's Pathological Institute has reported.

Before Dr. Thomsen's discovery, only four blood groups have been recognized practically. Whenever a blood transfusion must be performed, the surgeon must take great care to assure that the blood of the donor is of the proper type. The discovery of six types may improve the methods and success of transfusion.

As compared with the Landsteiner or International system which recognizes four groups, A, B, AB and O, Dr. Thomsen designates his groups A₁, A₂, A, A₁B, A₂B and O. No evidence has been found in Dr. Thomsen's researches that the blood group A₁ and A₂ are not real groups of equivalent rank to those now recognized.

A family of 138 living individuals in four generations was studied by Dr. Thomsen in substantiating the theory that the new groups are true.

The groups of human blood are, detected by the way in which the red blood cells react with the blood serum of individuals whose blood type is known.

Serum of the wrong type will cause blood cells of another blood to form clumps. These agglutinations clog the minute blood vessels when the wrong blood is transfused into a patient.

A refinement of the agglutination reaction was used by Dr. Thomsen in differentiating the two new blood groups.

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ENTOMOLOGY

Sicilian Assassin Wars Against Mexican Bandit

THE STILETTO of a Sicilian killer, first brought to this country to combat an undesirable alien presumably also from the Mediterranean region, is whetted against a Mexican outlaw as well.

All this has happened in the small but intensely-lived world of insects. At the headquarters of the Illinois State Natural History Survey, Urbana, Ill., two entomologists, Dr. Herbert Dozier and C. C. Compton, have discovered Mexican mealybugs, which are destructive parasites of greenhouse plants, to be themselves victims of the Sicilian mealybug parasite. The latter insect was brought to America to fight against another mealybug that attacks citrus trees, and has apparently been able to enlarge its field of operations. It kills by piercing the body of the mealybug and laying an egg, which hatches into a destructively feeding grub.

Mr. Compton plans to introduce the parasite into greenhouses infested with mealybugs. If the experiment succeeds, large-scale use of the Sicilian insect is probable.

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OCEANOGRAPHY

Scripps Institution Building Named for Dr. Ritter

RITTER HALL is the name that has been given to the new laboratory building of the Scripps Institution of Oceanography at La Jolla, Calif., in honor of Dr. William Emerson Ritter, the Institution's first director. A suitable inscription, carved in raised letters on a plaque of Mexican mahogany fixed over the door, proclaims the name.

Dr. Ritter, who was associated with the late E. W. Scripps and his sister Ellen Browning Scripps in the founding of the Institution, cooperated with Mr. Scripps also in the establishment of Science Service in Washington, D. C., of the Scripps Foundation for the Study of Population Problems in Miami, Ohio, and in other philanthropic enterprises.

Dr. Ritter was the first professor of zoology at the University of California, and since his retirement as director of the Scripps Institution has returned to Berkeley, where he is continuing his zoological researches. He is honorary president of Science Service.

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