

PHYSICS

New Kind of Atom Destruction Found in Pike's Peak Tests

COSMIC RAYS, already one of the most baffling mysteries of the world of science, are even more complex in their behavior than hitherto imagined. New ways, heretofore unreported, in which the penetrating rays can destroy atom nuclei by impact have been discovered by Drs. Carl D. Anderson and Seth H. Neddermeyer of California Institute of Technology. Dr. Anderson is well known for his discovery of the famous "positron", one of the fundamental particles from which all matter appears to be composed.

In a report to the American Physical Society (*Physical Review*, Aug. 15) the California scientists make the first full disclosure of their recent high altitude experiments atop Pike's Peak, Colorado.

The California scientists discovered:

1. That the bundles of cosmic ray energy, known as photons, can disintegrate heavy atoms such as lead.
2. That light and tiny electrons can smash into the nuclear heart of atoms and occasionally break them up and make them eject massive particles.
3. That some of the disintegrations seem to be produced by the non-charged

and piercing particles known as neutrons occurring as secondary radiation in the cosmic rays.

In the experiments tons of apparatus were moved from Pasadena by truck across deserts and up Pike's Peak in order that the identical equipment could be used at the two locations to give a most accurate comparison of results.

In an intensive program of research on the mountain top Dr. Anderson and Dr. Neddermeyer accomplished what was virtually a whole year of investigation in a few weeks. Thousands of photographs were taken with Wilson cloud chamber apparatus which showed cosmic rays destroying atoms and molecules. Use of the mountain top was prompted by the knowledge that much of the earth's atmosphere would be below the instruments so that the cosmic rays observed would be more powerful than in the Pasadena laboratory near sea level.

While other investigators have taken measurements of cosmic rays at even greater heights, the Anderson-Neddermeyer research was the first in which actual photographs of the atomic breakdowns were obtained.

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temperature change between July and December is but five or six degrees. Because December finds the thermometer standing at 84 degrees does not mean in Hawaii that during the summer months it will climb higher. Trade winds help to maintain a fairly stationary temperature the year around, the mean being about 75 degrees.

First public knowledge of an apparent slight upward climb in Hawaii's temperature was obtained in 1925, when Edward A. Beals, at that time in charge of the U. S. Weather Bureau in Hawaii, reported to his department head in Washington that "Hawaii is growing warmer year by year."

In his report, Mr. Beals stated that seasonal high pressure that before 1925 had prevailed several hundred miles off California, slightly west of San Francisco, had shifted its position and was, in the final analysis, responsible for the rise in temperature in Hawaii.

Observer Beals' records indicated that the temperature in Hawaii had increased nearly a degree in 20 years.

These findings of ten years ago are borne out by a continuance of the study under direction of Mr. Voorhees, who believes the shift in the direction of the trade winds to be responsible.

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MEDICINE

Effect of Nursing On Breast Cancer Reported

A POSSIBLE effect of nursing on the development of breast cancer in mice is reported by Dr. John J. Bittner, of the Jackson Memorial Laboratory at Bar Harbor, Me. (*Science*, Aug. 14).

The effect is not on the mother but on the offspring. It indicates that the transmission of cancer from one generation of mice in a cancer family to another is not due to straight inheritance but to influences outside the heredity-bearing chromosomes. The cancer-producing factor, it appears from the report, is lapped up at the breast of a mother who carries it.

In Dr. Bittner's investigations, infant mice, less than 24 hours old, from a family line in which breast cancer occurred very frequently were nursed by foster-mothers from a line in which this type of cancer rarely occurred. The percentage of breast cancers occurring in the fostered mice was appreciably less than that for the ancestors of these mice.

Experiments will have to be made

CLIMATOLOGY

Hawaii's Climate Changes With Shift in Trade Wind

WHILE weather on the "Mainland" is giving people plenty to think about, students of climatology in Hawaii are having their own problems to puzzle over. Three changes have become apparent:

Tradewinds in the Pacific have shifted their course.

Hawaii's temperature is gradually rising.

Distribution of rainfall in the mid-Pacific American territory is changing.

Some points in Hawaii are receiving 30 per cent more rain than they did 30 years ago while other points are receiving 21 per cent less. Every month in the year is slightly warmer than the

corresponding period 30 years past.

These are some of the conclusions John H. Voorhees, in charge of the U.S. Weather Bureau at Honolulu, has drawn from a study of records covering the period since the Federal Government established an official weather bureau there in 1904.

The warmest December day in Honolulu in nearly half a century was Dec. 8, 1935, when the maximum temperature was 84.6 degrees. The next highest temperature for that month in the past 46 years was Dec. 11, 1926, at 84.1 degrees. These high year-end figures are deceiving in relation to those during July and August, since the

with many more mice to confirm these results. Dr. Bittner reports such experiments have already been started and indicate similar results.

Previous investigations establishing the existence of genetic influences outside the chromosomes in the causation of breast cancer in mice have already been

reported by Dr. Clarence Cook Little of the Jackson Memorial Laboratory.

The work described in Dr. Bittner's preliminary report was all done with mice. No mention of human cancer was made and no relation should be drawn between these experiments and problems of cancer prevention in man.

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GENETICS

New Knowledge of Heredity From Study of Primrose

Two New Strains Developed by Dr. Shull Show Characteristics Not Found Even Among Wild Relatives

USING primroses as his laboratory "guinea pigs" for experiments on evolution, Dr. George H. Shull, professor of botany and genetics at Princeton University, has advanced two steps further in his study of the mechanics of heredity with the location and separation of two new strains of Lamarck's evening primrose.

One variety of the species, known as *acuminata* because of its long pointed leaves, first appeared just recently in the experimental field of forty thousand plants. The other strain, called *pollicata* after the solid stem it grows between the ovary and style, appeared in 1932 and 1935, but was not proved to be a separate and distinct strain until this summer.

The new plant is striking in that its long leaves almost completely lack the usual crinkledness of the primrose. Its characteristics are recessive, as is demonstrated by the fact that the *acuminata* appeared in only six out of 25 plants, indicating a one to four ratio for these characteristics in the offspring of the hybrids.

The *pollicata* first appeared for Dr. Shull in 1932 when it occurred as a gene mutation in pure bred material of Lamarck's evening primrose. Last year it appeared anew in another strain of this species, independent of its previous origin in 1932.

New Strain

This indicated that the *pollicata* might be a latent characteristic of all primroses, rather than a new development, so Dr. Shull crossed this plant with all 25 different strains of his evening primrose.

The *pollicata* has now reappeared

only in the offspring of the family in which it appeared last summer. None of the crosses with the other plants produced this solid-stemmed flower with "clubby" stigmas, proving that this is now another new strain of the primrose.

It is entirely possible, Dr. Shull explained, that the *pollicata* might be developed independently in any other experimental work in primroses, but to date this is the only example of this solid-stemmed variety, which is not even found among the wild relatives of the primrose.

The dry weather of the past few weeks has stunted the size of Dr. Shull's plants, but has not hindered the effectiveness of the bloom. The total number of plants growing this year is nearly three thousand larger than the number Dr. Shull has been able to handle any one year at a time since he began this experimental work in 1905.

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PHYSIOLOGY

Woman Without Mystery On Display in New York

"THE WOMAN without a mystery"—a transparent, life-size anatomical model showing every organ, veins, arteries, nerves and skeleton in a woman's body—is on display at the New York Museum of Science and Industry.

Following the private showing before a distinguished group of physicians and scientists, the counterpart of the now famous "transparent man" will go on a two-year tour of 100 cities of the nation. A doctor-lecturer will introduce the figure to scientists, public health officers and the medical profession nationally.



NO SECRETS

The model, which took two years to construct in the Dresden, Germany, Hygiene Museum, is the property of S. H. Camp, philanthropist of Jackson, Mich. It is the only one of its kind in existence.

Cellhorn "Skin"

Outer covering of the transparent woman is a tough, clear material known as cellhorn, made by a secret process only in the German museum which built the intricate model. Cellhorn is a synthetic material which is non-inflammable and almost unbreakable.

Viewing the figure is a weird sensation akin to having something like X-ray eyes. Embedded in the outer transparent covering one sees the veins and arteries interlacing through the body. The nerves spread from the brain and spinal column to their tiny ramifications at the body extremities. Deep inside the figure the skeletal structure is visible, partially covered in places by the various organs of the body proportioned and located as in real life.

Through an ingenious lighting system each organ of the body is illuminated in turn until the whole body stands forth in natural color. As each organ is illuminated its name appears on glass labels around the base.

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Some fish can "sing" by rubbing together the pectoral fin-rays.