

▼ HOW WE REMEMBER

R an address by
A Dr. S. W. Fernberger

Professor of Psychology,
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D Wednesday, February 21, at
I 4:30 p. m., Eastern Stand-
O ard Time, over Stations of
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nent scientist speaks over
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AGRICULTURE—METEOROLOGY

**Winter Drought Causes
Worry in Wheat Belt**

GENUINE winter drought conditions, bad enough to cause real worry, persist over a large portion of the country's best grain lands, studies directed by J. B. Kincer of the U. S. Weather Bureau have shown.

"A decidedly apprehensive situation has developed in the matter of soil moisture," the Weather Bureau report states. "An unusually large area of the West has become critically dry, resulting in drifting of soil by high winds and a general deterioration in winter crops. This is especially true in the western sections of the main winter wheat belt, and extends to a lesser degree, eastward to the lower Missouri, central Mississippi, and much of the Ohio Valley areas. Considerable hauling of stock water is necessary in some central valley sections, and the subsoil is very dry."

"Dust storms were widespread in western grain areas, with damage from soil blowing reported from Missouri, Iowa, and Kansas northwestward; moisture is seriously needed in the first two States, although no serious injury from the cold weather is probable. In Kansas winter wheat was unfavorably affected in the western area and many central counties by continued dryness, with rather severe damage from soil blowing in the southwestern quarter; little change was noted in the eastern part. Widespread deterioration was reported from Nebraska, South Dakota, Wyoming, and eastern Colorado, where the moisture situation is acute, with much drifting soil and dust storms."

Science News Letter, February 17, 1934

PHYSICS

**Sub-Atomic Positron Has
Shortest Life in Universe**

**Newly-Found Particle of Matter is Born of Radiation and
Dies in Fraction of Second Giving Birth to New Radiation**

THE LATEST sub-atomic entity to be discovered can now claim the honor of being the shortest-lived thing in the universe. It is the positron, fundamental particle of matter, complementary to the more familiar fundamental stuff of electricity, the electron.

The story starts when Prof. P. A. M. Dirac as a result of abstruse mathematical calculations predicted the anti-electron or positron, as scientists now call it. Prof. Dirac is the 31-year-old mathematical physicist, British despite his French name, who last fall was honored with a half-share of the 1933 Nobel prize in physics.

The positron would be born of radiation, Prof. Dirac foretold. But its life would be short. It would be immediately absorbed by surrounding matter and die giving birth to new radiation.

If water were the absorbent, the interval between these two events, he estimated, would be of the order of a billionth of a second—longer if the absorbing matter were rarer, shorter if it were denser. Only in interstellar space far removed from all other sorts of matter could the positron live to a respectable old age. Its extremely short life under terrestrial conditions explained, he said, why it had never been detected.

The precise manner of a positron's death was also predicted by Prof. Dirac.

If it encountered a free electron, both particles would be annihilated and give rise to two photons or gamma rays traveling in opposite directions, of a total energy of a million electron volts—the energy equivalent of the matter destroyed. If it encountered an electron firmly bound to the nucleus of an atom, only the positron would be annihilated, and one photon would be emitted of half a million volts.

So fantastic this theory seemed at the time it was promulgated, that physicists doubted if Prof. Dirac himself believed it. But a year ago last August, Dr. Carl D. Anderson of the California Institute of Technology discovered the positron, and since then it has become a very active member of the growing family of atomic components. Evidence has been obtained by Skobel'tzyn of Leningrad and others, that positrons are born of radiation and consequently are not pre-existing fragments of the atom that are simply knocked out, as electrons are, by the impinging radiation. And now Prof. F. Joliot and Prof. Jean Thibaud, two French physicists, have reported in simultaneous but separate communications to the French Academy of Sciences, evidence that the positron dies when absorbed by matter in the precise way that Prof. Dirac described.

As a source of positrons they used

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aluminum bombarded by the alpha rays of polonium, a method previously discovered by Prof. Joliot and his wife, Mme. Irene Curie-Joliot, daughter of the discoverers of radium. The method gives both positrons and electrons, five of the former to three of the latter. The numbers were counted by a sort of detective-adding machine called a Geiger-Müller counter. The source was placed between the pole pieces of an electromagnet, which caused the emitted particles to whirl about and progress along a curved path to a lead plate by which they were absorbed, and which emitted the resulting radiation. It was so arranged that when the electric current traversed the coils of the magnet in one direction, only the positrons arrived at the lead plate. When the current was reversed, only the electrons arrived. In this case, nothing unusual happened.

But when positrons fell on the plate, photons were produced, each of half a million volts energy, and double in number the number of positrons arriving. Furthermore, it was calculated that the average life of the positrons created and destroyed in this experiment was the hundred thousandth part of a second.

Thus Prof. Dirac's theory seems to be confirmed in all its parts, and the positron may well claim to be the shortest-lived entity in the universe.

Science News Letter, February 17, 1934

The vicious career of one man-eating lion in India was believed to be explained when an examination of the dead animal's skull showed an old bone injury causing partial paralysis of the lower jaw. This may have caused the animal to attack natives rather than fight large animals.

MEDICINE

Change of Machine Oil May Lessen Skin Cancer

SKIN cancer among textile workers, known as mule spinner's cancer, may be lessened by changing the quality of lubricating oil used on textile machinery, it appears from studies made by Dr. C. C. Twort and J. W. Twort of the Manchester (England) Committee on Cancer. This type of cancer is due to the irritation of the skin by the constant soaking of one spot on the clothing with oil as the worker tends his machine.

In their report, published in *The Lancet*, the Manchester investigators state that the cancer-producing property of the mineral oil is closely related to its refractivity constant. This term, referring to the oil's ability to bend light waves, is used by physicists and chemists to indicate its type.

The refined grades of oil used on textile machinery have greater cancer-producing power than crude oil, the Tworts found. Treating oils with sulfur dioxide profoundly lowers their refractivity. So the Manchester scientists suggest this treatment or careful selection of lubricating oils as a means of reducing the amount of cancer among textile workers.

Science News Letter, February 17, 1934

ARCHAEOLOGY

Tombs Found in Burial City of Indian Kings

EXPLORING at Mitla, beautiful Indian city where Zapotec Indian kings and priests were buried, Mexican archaeologists have discovered two tombs. Both tombs had been sacked, the archaeologists found.

One tomb, found in the backyard of a modern Indian dwelling, still contained thirteen copper bells, a broken painted vessel, and numerous batches of bones. The bones apparently were once arranged around the walls with skulls on top. The other tomb, found under a mound, still contained some Zapotec pottery, human bones, bits of turquoise and jade, and two fancy gold beads the size of marbles.

Mitla, still noted for its beautiful temple adorned with stone mosaics, was in its ancient heyday a city of the dead. Local tradition held that Mitla was the entrance to Hades. Caves under the city, said to be vast and rambling, were used as tombs.

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