

PHYSICS

Research Upholds Idea of Energy Changing Into Matter

British Experiments Producing Positrons Demonstrate What Relativity Theory Considered Theoretically Possible

THE MANUFACTURE of matter out of energy, theoretically possible according to Einstein's theory of relativity, is demonstrated by experiments in which positrons, the new building blocks of matter, are produced.

To the Royal Society in London Drs. J. Chadwick, P. M. S. Blackett and G. Occhialini of Cavendish Laboratory, Cambridge, reported that their observations of the energy of positrons produced in gamma ray bombardment confirm the idea that the interaction of a gamma ray with an atom always produces an electron simultaneously with a positron and that both of these particles have the same mass.

While the artificial radioactivity discovered by the Joliotis in Paris a few weeks ago (*SNL*, Feb. 10, '34, p. 83; Mar. 3 p. 133) may show that the positrons ejected from disintegrating atomic hearts are contained in these atoms themselves, the Cambridge physicists' experiments by three bombardment methods seem to confirm that the twin electrons are created from radiant energy in the field of influence of the atom outside its nucleus.

If atomic nuclei permanently contain positrons, remarked Dr. Blackett, the positrons must be "inoculated" in some manner against annihilation. Perhaps this is accomplished by a closer union with some other particle. Normally the positron, almost immediately that it is created, combines with an electron to form radiation.

Dr. G. Temple, professor of mathematics at London University, presented the first quantum theory of the neutron, which was developed by squaring the Dirac equation, which was so useful in predicting the positron before it was discovered. He followed the method of Sir Arthur Eddington, although there is an admitted theoretical drawback, since the Dirac analysis was directed to a linear equation. But Prof. Temple added no arbitrary constants.

One set of solutions of the new equation yielded results referring to the

ordinary hydrogen atom and another set referred to the neutron. The equation gave the effective radius and binding energy of the neutron which agrees well with Dr. Chadwick's estimates.

The quantum theory at present fails to explain why all hydrogen atoms do not collapse into neutrons. This is partially explained by Prof. Temple's wave equations which indicate that hydrogen is in such a state as to permit no transitions to take place.

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ZOOLOGY

Bitten 13 Times, Black Johannes Fears No Snake

See Front Cover

ST. PATRICK was probably not even a legendary name to black Johannes, at least until he left his native Basuto village and came to the white man's town to be "king" at the Port Elizabeth Snake Park. But if the great space-time gap that separates ancient Ireland from modern South Africa could be bridged, Caucasian Patrick and Negro Johannes might find at least one congenial topic in common.

For black Johannes has no fear whatever of snakes, is a veritable genius at handling them, and appears to be quite immune to the venom of the deadliest of them, although he has been bitten thirteen times. Visitors at the park get a shuddering thrill out of watching him drape an assortment of South Africa's wickedest serpents all over himself, with no ill consequences.

On the cover of this issue of the SCIENCE NEWS LETTER, Johannes is shown in such a pose. The snake most prominently displayed is an African puff adder, one of the most poisonous and at the same time most widely distributed of African serpents. The head of a second puff adder shows alongside that of its companion.

Johannes' duties at the snake park are manifold. He cares for the delicate

species, picks out the ailing ones for hospitalization, forcibly feeds the sulkers that refuse to eat in captivity, and in general serves as a faithful nurse to a reptile population that fluctuates from several thousands in good seasons down to only a few hundreds when winter chill reduces their numbers.

The Port Elizabeth Snake Park is maintained primarily for scientific purposes, but it has also become a great show place. Admittance fees of a shilling for adults, sixpence for children, have made it self-sustaining and have amortized a debt of ten thousand pounds contracted when it was built.

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PLANT PATHOLOGY

Mosaic Disease Causes Crippled Pea Pods

DEFORMED pods, which add further to the destructive effects of the mosaic disease of peas, have become of considerable concern to the California grower of summer and fall peas, according to Dr. William C. Snyder of the University of California.

When the pea plant becomes infected with the virus prior to the completion of pod development, Dr. Snyder says, the pods become markedly distorted, the walls assume a rough, ridged, wrinkled condition and, as a result of the corrugations, are badly deformed and somewhat dwarfed. Pods resulting from blossoms borne on a badly diseased vine may become so badly twisted or curled as to be hardly recognizable. Such pods remain severely stunted and may produce no seed.

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RACE CROSSING AND HUMAN HEREDITY

an address by

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Wednesday, March 21, at 4:30 p. m., Eastern Standard Time, over Stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.