ods of decay depending upon how it is produced. Dr. J. D. Cockcroft of Cambridge's Cavendish Laboratory described the making of nitrogen thirteen both by bombarding carbons with protons and with deutons. In both these cases the "half life period," or the time that it takes for half of the newly manufactured nitrogen to disintegrate, is ten and a half minutes. But if this nitrogen isotope is made by the method discovered by the Joliots of Paris, bombarding boron with alpha particles, it has a decay period of fourteen minutes.

"This proves that some nuclear component or condition as yet unknown must exist," Dr. Cockcroft said in an interview.

Wide support was given in the conference for the existence of two particles of matter, the neutrino and the negative proton, which physicists have not yet discovered, although their existence has been suspected.

Experiments looking toward the use of neutrons in medicine, somewhat in the same way as radium rays and X-rays are now used, are being made by Prof. J. C. McLennan, emeritus professor of physics of Toronto University now resident in England, it was revealed at the conference.

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PHYSICS

Annihilation of Matter Seen As Cause of Cosmic Rays

MATTER being annihilated in the heated interiors of the stars and flashing "new star" novae as the origin of the cosmic rays was suggested by Dr. R. A. Millikan when he reported to the International Conference on Physics the first details of the very high altitude survey of cosmic rays made by the California Institute of Technology research team consisting of Dr. I. S. Bowen, Dr. Millikan and Dr. H. Victor Neher.

"The only source of the observed cosmic ray energies now in sight," Dr. Millikan reported, "is the annihilation of matter. But the softest components of the cosmic rays have energies corresponding to the partial annihilation or atom building hypothesis, while the energies of the hardest correspond to the complete annihilation of atoms."

Thus, in his latest interpretations, Dr. Millikan sees the cosmic rays as both the "death cries" and "birth cries" of matter. These mysterious penetrating radiations are seen as the signals of both tearing down and rebuilding of the stuff of the universe.

The process of annihilation and atom building conceivably take place, Dr. Millikan suggested, because of the ease with which hydrogen particles cluster at the extreme heat of interstellar temperature. Or they may happen because of the extremely high temperatures found in novae as suggested by Dr. Fritz Zwicky, one of Dr. Millikan's colleagues at California Institute of Technology.

Another outstanding conclusion by Dr. Millikan is that photons or radiation of the same kind as ordinary light are responsible for most of the cosmic ray effect or ionization found at sea level or underneath the sea. This is in accord with Dr. Millikan's previous findings and is opposed to the ideas of some other cosmic ray observers.

The resistance of the atmosphere to incoming electrons, suggested by some as composing the cosmic radiation, would require energies of a billion electron volts on the basis of encounters outside the nucleus of the atoms and five billions of electron volts on account of the encounters within the nuclei of atoms, Dr. Millikan told the conference. Nuclear electron encounters were seen as producing only very soft secondaries consisting of both photons and electrons.

Dr. Millikan also reported that:

Nearly all the non-field sensitive part of the ionization of the atmosphere above sea level is due to photons of energy below 500 million electron volts.

In the equatorial belt of the earth a small part of the ionization is due to incoming secondary electrons of energies as high as ten billion volts.

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FOUND NEAR "FOUNTAIN OF YOUTH"

Florida's "Fountain of Youth" at St. Augustine failed to bring eternal youthfulness to these Indians of Ponce de Leon's day. But archaeologist J. R. Dickson, formerly with the University of Illinois, has found that this Indian graveyard he is unearthing contains an array of strong-framed skeletons with remarkably good teeth. The graveyard, discovered recently, has revealed over 90 burials. Mr. Dickson calls them some of the earliest Christianized Indians in the United States, because many lie with arms crossed as in prayer, and because the graves lack the offerings and equipment for a future world that the prehistoric Indians placed with the dead.