

PHYSICS

Cosmic Rays Bombard Earth With 40,000 Million Volts

New Estimate Based on Evidence from Various Sources Places Energy Forty Times as High as Previously Thought

COSMIC radiation bombards the earth with energies of some 40,000 million volts, which is about forty times the highest energies usually assigned to the ultra-penetrating radiation being so intensively studied by physicists throughout the world.

The new estimate is made by Dr. Thomas H. Johnson, assistant director of the Bartol Research Foundation of the Franklin Institute, Swarthmore, Pa., who in a communication to the American Physical Society, interprets evidence obtained by various investigators and his own experiments.

It has been recognized as a result of photographs made by Dr. Carl D. Anderson at the California Institute of Technology (*SNL*, Dec. 12, 1931, p. 373; Dec. 19, 1931, p. 387.) that at least some of the tracks of particles measured and photographed in the form of water droplets in cloud chamber apparatus or detected by various sorts of electron or particle counters are not caused by primary cosmic radiation but by the secondary radiations that result from collisions of the cosmic rays with earthly materials in their path.

Interpreting the measurements of the German physicist, Dr. H. Schindler, Dr. Johnson develops the idea that the measured intensity of the radiation depends upon the particular kind of material through which the rays have just passed. This led to an estimate of the energy of each of the secondary radiations produced by one cosmic ray, which in turn allowed him to arrive at the sum of energies of the secondaries from a single primary ray at the earth's surface at some 20,000 million electron volts. Since these rays have already passed through the atmosphere, dissipating energy as they traveled, Dr. Johnson doubled this figure to obtain the energy of a cosmic ray entering the earth's atmosphere.

Such immense energies discourage the hopes of scientists that some day it will be possible to produce artificial cosmic radiation here on earth. When Dr. Rob-

ert A. Millikan estimated in his early work on cosmic rays that some cosmic rays had energies of the order of ten million volts there was hope that synthetic cosmic radiation might be produced. As research has progressed the energy assigned to cosmic rays has increased. From 100 to 1000 million volts have been the favorite figures until this latest estimate by Dr. Johnson.

Science News Letter, October 1, 1932

MEDICINE

Find Fever Treatment Relieves Stubborn Asthma

ARTIFICIAL fever, which has been helpful in treating paresis, is now being turned to the treatment of another ailment, chronic asthma. Thirty cases of the disease in which relief was obtained by this means have been reported to the American Medical Association by Drs. Samuel M. Feinberg, Strafford L. Osborne and Meyer J. Steinberg of Northwestern University Medical School.

In nineteen of these patients the relief of symptoms was complete and lasted from several days to nine and one-half months. In the other eleven cases, there was improvement without complete remission of the symptoms.

The fever was induced in these patients by high frequency electric currents, or diathermy. In all of the cases, other means of treating asthma had been tried without success.

Science News Letter, October 1, 1932

ENGINEERING

New Ventilation Standards Would Save Fuel

THE specifications of municipal building codes that govern ventilating practice in buildings throughout the United States are based on tradition and are without scientific foundation. This is the belief of the American Society of Heating and Ventilating Engineers, which seeks the establishment of new

national standards under the auspices of the American Standards Association.

Fuel bills will be lowered if recommendations of the engineers are adopted, it was stated, because the new specifications reduce the amount of outside air required by present codes to a minimum of ten cubic feet per occupant per minute. However, standards are also given for temperature, humidity, air quality, movement and distribution. The recommended code is based on recent research at the Society's laboratory in Pittsburgh.

Science News Letter, October 1, 1932

PHYSICS

Artificial Voice and Ear Excel Human Counterparts

A MECHANICAL speaker that talks better than the human mechanism and an artificial ear that hears more effectively than man's auditory organ, for testing telephone transmitters and receivers, are at work in the Bell Telephone Laboratories in New York. This newly developed apparatus replaces the human voice and ear in research devoted to the production of telephones that will transmit speech more effectively.

An electrical phonograph is the source of the voice in the artificial speaker and a number of electrical circuits assure its natural qualities. The artificial mouth is so carefully built that its speech is distorted by objects in front (*Turn Page*)



A MAN'S WORK

The mechanical speaker is facing the mouthpiece and the artificial ear is clasping the receiver to test the telephone. It does this work better than the human voice and ear.