

PHYSICS

Man-Made Gamma Rays Six Times As Piercing As Nature's

Presence of Radiation of 16,000,000 Electron Volts Detected Definitely By Study of Atomic "Debris"

MAN-CREATED gamma radiation, of the kind so widely used in the treatment of cancer, and excelling the best efforts of nature over six times, is being studied at California Institute of Technology.

Four scientists, headed by Prof. C. C. Lauritsen, of the Kellogg Radiation Laboratory, report in the *Physical Review* (July 15) that they have unmistakable evidence of laboratory-produced gamma rays having energies of 16,000,000 electron volts. The highest energy found in natural gamma rays—given off by radioactive substances such as radium—is only 2,600,000 electron volts, an energy "record" held by the radioactive element known as thorium C."

Prof. Lauritsen's 16,000,000 electron volt gamma rays were obtained in experiments performed in collaboration with Dr. H. R. Crane, Dr. L. A. Delsasso and W. A. Fowler. The light metal element lithium was bombarded with protons, the positively-charged nuclei of hydro-

gen atoms, to yield the piercing rays.

The proton atomic "bullets" were driven down a special vacuum tube, in the research, by electric voltages which ranged from 400,000 to a million volts. On striking the lithium target, the proton is believed to combine momentarily with lithium atoms.

The lithium atoms, the investigators report, are thought to be the isotopic form of mass seven. When a proton joins them, it adds its mass of one so that the total mass is eight.

The 16,000,000 electron volt gamma rays which emanate from the union are best explained by assuming that the lithium and proton of total mass eight break up into two helium particles, each of mass four. Such helium nuclei are known as alpha particles and, along with gamma rays and electrons, are given off when radium disintegrates.

To balance the queer-looking energy equation, it is necessary to postulate that

17,000,000 electron volt gamma rays come out when the two alpha particles are created.

The presence of 16,000,000 electron volt rays was detected quite definitely by a study of the atomic "debris" knocked out.

Tracks of the flying electrons from the impacted atoms of the lithium target were observed in a Wilson cloud chamber in the investigation of the high energy gamma radiation.

Science News Letter, July 27, 1935

ENGINEERING

Electrical Device Aids in Measuring Speeds of Cars

THE UNIVERSAL protest of motorists caught speeding, "But officer, I was only doing twenty-five," may soon be a thing of the past. A new portable electrical device, measuring the instantaneous speed of an automobile and lessening the chances of error on the part of traffic officers, has been perfected by Dr. Harry R. DeSilva, head of Massachusetts State College's psychology laboratory.

Two concentrated beams of light are thrown across a road by 50-candle-power lamps operated from an auto storage battery. These activate two photoelectric cells in the indicating instrument. An automobile passing across the light beams, which are only 18 inches apart, cuts off first one light beam, charging a condenser in the recording apparatus, and then a fraction of a second later, cuts the second beam, stopping the charging process. The amount of "charge" in the condenser is translated directly by the instrument into miles per hour. Accuracy within 2 miles per hour at 60 miles auto speed and within a fraction of a mile at 30 is claimed.

By pressing a button, the instrument can be made ready for another speeder. Accuracy is not the only virtue of the device, for it can be carried about in the rear of a car and set up at will to measure speeds on curves, intersections, and places to which other measuring devices are not easily adapted.

Dr. DeSilva plans several additions to his original device. One is the installation of a camera photographing the license number of the car going through the "trap," and the speed dial reading simultaneously.

Whether any such device as this could be used as legal evidence in many states, is problematical. Some state speed laws require proof that a driver has violated the speed regulation over a stretch of road, such as one-half mile, rather than at some



CHECKING UP

With this device, the motorist's speed can be determined without the expedient of having a policeman give chase and clock him. The time taken for the car to travel the distance between two beams of light is measured and may be read in terms of miles per hour.

specific instant before he can be arrested.

Other states, such as Michigan, have no speed limit, the law providing that how well a person drives under certain circumstances, not how fast, is the test of legal driving. The possibilities of inaccuracy due to mechanical failure or tampering would probably prevent its

use as evidence, just as the "lie detector" is barred in murder trials.

The main use of such a device will probably be in studies and surveys of average speeds on highways, curves and at intersections, to provide a much needed statistical background for more sensible speed laws.

Science News Letter, July 27, 1935

MEDICINE

Find New Way to Attack Disease of Muscle Weakness

A NEW attack has been launched in the fight against the strange disease of muscle weakness known as "myasthenia gravis."

This distressing and usually fatal, but fortunately rare, illness comes on gradually. The first symptom is usually general tiredness. This may be followed by trouble in walking or in lifting the arms or in grasping things. In a later stage the facial muscles often become so weak that the jaw cannot be kept shut or the eyes properly open.

Various physicians in London have lately been giving special attention to the search for an adequate remedy for the disease, and not long ago a possible way for checking it with complex chemicals called eserine or prostigmin was reported.

Eserine is believed to act by delaying the abnormally high rate of destruction, in myasthenic patients, of acetylcholine—the chemical "transmitter" which forms the link between a muscle and the nerve-ending which should control it. Another way of achieving the same result would be to stimulate the production or, at any rate, the utilization of the acetylcholine.

This latter method has now been tried by Drs. L. P. E. Laurent and W. W. Walther, who report their results in *The Lancet*. (June 22).

Had Worked With Cats

It was known that similar stimulation could be produced in cats by means of potassium chloride, and the London physicians decided to try this substance for the human sufferers from myasthenia. The temporary results from this treatment were striking. Strengthening of the facial muscles was particularly marked, the appearance of a patient frequently changing remarkably from the wasting look of starvation to relative vitality in less than an hour after administration of the drug.

Six patients have received the potassium chloride daily for a period of two

months, six doses being given daily. The treatment is stated to have proved valuable in conjunction with prostigmin. Several of the patients have found that a dose of potassium chloride, taken before the action of the prostigmin has ended, relieves the trying exhaustion which often followed the earlier treatment.

Many more experiments will have to be made, however, before any finality can be reached in the relief of the illness.

Science News Letter, July 27, 1935

ORNITHOLOGY

Sound Recording Methods Preserve Bird Calls

THE JOINT expedition of Cornell University and the American Museum of Natural History of New York City, which has just returned from recording the calls of almost extinct species of birds for posterity, had its amusing as well as its difficult experiences.

In the ten miles of film record and sound recording brought back by the expedition's director, Prof. A. A. Allen of Cornell, are the calls of the rare Ivory-billed Woodpecker, the Limpkin, the Sandhill Crane, the Wild Turkey, the Bald Eagle, the Golden Eagle, the Prairie Falcon and the Trumpeter Swan.

In Florida a Carolina Wren insisted on building its nest in the sound truck while the scientists were trying to record its voice. In Colorado a Golden Eagle tried to swallow the microphone which had been lowered 700 feet over a cliff to reach the ledge on which the eagle's nest was built. In Florida, again, a mockingbird recognized the sounds of a rival when one of the films was being tested. It dashed at the window of the room trying to drive the rival away.

In recording the bird records, which eventually may be transferred to phonograph records and distributed through



FOSSIL TREE'S STRUCTURE

How the microscope viewed the wood of the petrified tree shown on the opposite page. A tangential section.

the schools of the nation, the expedition met its technical difficulties.

How, for example, would you record the sound of the rare Water Ouzel, which lives only near water falls? Dr. Allen's party solved the problem by getting the microphone within two inches of the bird's beak so that the sound was much louder than the crash of water in the background. How long it took them to achieve this feat is not revealed.

Then, too, it was no easy task to record the "dance" of the bird known as the Lesser Prairie Chicken, but patience finally yielded the sound, caused by the pattering of the bird's feet on the ground with extraneous sounds muffled as background noise.

Freak weather followed the expedition's entire journey. There was frost in Florida, dust-storms in Oklahoma, cloud-bursts in Colorado, July snow storms in Montana, and to cap it all, when Prof. Allen was safely home in Ithaca, along came the recent New York flood, which swept around his home and carried off his outdoor runs and captive birds.

Science News Letter, July 27, 1935

A crossed-eye, if not given competent medical attention, may decrease in seeing power through non-use, while the good eye is overworked.

Cornell scientists are studying the production of onions, in the hope that New York State may grow mild varieties such as those from Italy and Bermuda.