Institute of Technology, were described by Drs. Robley D. Evans and Robert S. Harris.

The two scientists fed young rats three different amounts of radium chloride in daily doses of 20, 35, and 70 millionths of a gram, respectively. The rats got rid of most of this by excretion—at the highest dosage levels 98 to 99 per cent. of it. Yet the small amount remaining proved fatal.

Their growth appeared normal, yet after a short time the bones became very fragile, so that they would break when the rats were picked up and handled in the ordinary manner. After fifteen months they developed osteogenic sarcoma (bone cancer) that closely resembled the bone ailment in radium paint workers who had been exposed for from ten to fifteen years.

Rats seem to be much more resistant to radium poisoning than human beings. Dr. Evans stated that the average concentration of the element in their skeletons was several hundred times greater than the concentration required to produce osteogenic sarcoma in man.

New Chlorophyll

Something new under the sun, a definitely new kind of green coloring matter (chlorophyll) in plants, was presented for the consideration of the Academy by Prof. O. L. Inman of Antioch College and Dr. A. F. Blakeslee of the Carnegie Institution of Washington.

The new chlorophyll was obtained by manipulating one particular chromosome, the heredity-controlling structure within the cell, in a plant of the jimsonweed family. It resulted in the production of a strain of offspring with a different combination of the "a" and "b" chlorophyll components than that of all other known plants. It is the first case of its kind on record.

Medals Awarded

A British biologist and an American electrical engineer were honored with the presentation of two gold medals at the meeting.

The Agassiz Medal for Oceanography was awarded to Dr. Edgar Johnson Allen, director emeritus of the Plymouth Laboratory of the Marine Biological Association of the United Kingdom. Dr. Allen is noted for his researches on marine organisms, and he has also done much to encourage scientific work by others.

Dr. Allen was unable to be present in person to receive the medal, and in his absence it was handed to Leander McCormick-Goodheart of the British Embassy for transmission through diplomatic channels. Dr. E. G. Conklin of Princeton University, president of Science Service, made the speech of presentation.

The Academy's Public Welfare Medal was presented to Dr. Willis Rodney Whitney of the General Research Company research laboratories. The presentation address was made by Dr. Albert W. Hull, a colleague of Dr. Whitney.

Dr. Whitney's outstanding researches in the field of electrical engineering have been on electric lighting and in the use of high-frequency currents in the treatment of arthritis, paresis, and other diseases. He began the organization of General Electric's research laboratories in 1900, as a part-time diversion from his position as a professor at the Massachusetts Institute of Technology, and has seen their development to an institution with a full-time staff of 300 scientists.

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GEOPHYSICS

"Late" Artillery Reports Give Clues to Stratosphere

Minute Slow in Arriving, Sound Travelled Very High And Was Reflected From Warmer Stratospheric Layer

REPORTS of naval guns, arriving at distant sensitive instruments later than they should according to theory, give meteorologists clues to the temperatures high in the stratosphere, Dr. Beno Gutenberg, California Institute of Technology geophysicist, reported to the American Geophysical Union, meeting in Washington, D. C.

Using a special air-pressure-change instrument, resembling a radio loudspeaker, designed by Dr. H. Benioff, Dr. Gutenberg detected variations in air pressure that coincided with naval gunfire offshore.

Sound from the gunfire arrived at the sensitive instruments almost a minute later than it theoretically should have, indicating that it traveled into the stratosphere and was reflected from a layer of warm air high above the earth's surface. From time and distance studies, Dr. Gutenberg, assisted by the U. S. Navy, determined that sound in Southern California travels at the same speed as in Europe, suggesting similar upper-air conditions.

Hot Rock Destroys

Evidence that geological records of the earth's oldest happenings have been destroyed by molten rock masses rising to the surface of the earth in later times was reported by Dr. E. N. Goddard of the U. S. Geological Survey.

Starting more than 50,000,000 years ago during the eocene age when primitive mammals were displacing the great dinosaurs, a mass of molten rock rose up from the depths to break the billion-year-old crust of the earth at a point where today the mining camp of Jimtown, Colo., is located, Dr. Goddard declared.

In the intruded rock, he found fragments of these older rocks, some of them hardly changed by their submersion in the molten mass. Other fragments were greatly changed, and there is evidence that still others had been melted and dissolved in the rising mass, transformed into part of it.

These findings, Dr. Goddard pointed out, show on a small scale the cycle of rock changes that is going on everywhere. Molten rocks are washed away, deposited as sediments, then they are heated and squeezed into new forms, then are absorbed by intruding melted rocks, beginning the cycle all over again.

Roots of Volcanoes

Volcanoes' roots may go down to a molten earth-interior after all, despite the disrepute into which that theory, once universally held, has fallen during recent years. A picture of the roots of volcanoes, presenting the old theory in more acceptable modern form, was offered by Prof. Reginald A. Daly of Harvard University.

Prof. Daly likened the crust of the earth to a wrinkled layer of solid paraffin floating on an interior of melted paraffin. The actual materials of the earth's crust and deeper layers are, of course, stony. Solid stone floats on the molten stone. Connecting masses be-

ACADEMICIANS

At the spring meetings of the National Academy of Sciences—Dr. Ross G. Harrison, chairman, National Research Council and trustee of Science Service (above). Entering the lobby (above, center) are Dr. Frank R. Lillie, president of the Academy, and Dr. John C. Merriam, of the Carnegie Institution of Washington.

PETITIONERS

Discussing a petition to President Roosevelt on the Spanish situation are (lower center) Dr. Harlow Shapley, Harvard College Observatory, Dr. Harold C. Urey, Columbia University, and Dr. F. R. Moulton, permanent secretary, AAAS. Listening intently (above) are Dr. R. A. Millikan, California Institute of Technology and Dr. Gano Dunn, of New York City.

tween the volcanoes and the molten interior Dr. Daly called by a new name, "abyssoliths," meaning bottomless stone. An abyssolith carries to the surface molten rock material, with steam and other gases under great pressure. These gases are the real explosives that supply motive power to volcanoes, he said. When the abyssolith's supply of them is spent the volcano "goes out."

The molten interior of the earth is of course not to be thought of as a liquid sloshing around like water in a jug. If it were at the surface, it might be liquid; the material is hot enough so that at least some of it would flow freely. But buried at great depths as it is, the molten interior mass is under such terrific pressure that it is held to a steely rigidity. In terms of the surface the interior can be stated only as a paradox: molten, yet stiff.

Electrical Rivers

Vast electrical rivers several hundred miles wide flow through the thin atmosphere between 60 and 90 miles above the earth in the polar regions, Dr. A. G. McNish of the Carnegie Institution of Washington stated. He has recently conducted a study of these currents by means of a new method of mathematical analysis.

The currents flow westward along the auroral zone, a belt about 1,500 miles from the North and South Poles. They appear during magnetic storms and are attributed to the action of particles projected through space from the sun. These particles also give rise to the auroral displays. During the most intense magnetic storms the auroral zone shifts to lower latitudes and the currents flow in more southerly regions.

This accounts for the interruption of radio and wired communications during several severe magnetic storms that occurred last year, Dr. McNish explained.

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PHYSICS

Cosmic Rays Operate Radioteletypewriter

COSMIC rays and ultra short radio waves were combined to operate a radioteletypewriter in a novel exhibit in Rochester, N. Y.

Speeding across interstellar space from the most distant galaxy, the cosmic rays register their passage on a Geiger-Mueller counter, which in turn operates a relay to supply an initiating impulse to operate a radiotype. The radiotype machine receives news bulletins distributed by one of the major news services. The exhibit is sponsored by the International Business Machines Corporation, one of whose electric typewriters is included in the radiotype circuit.

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GENERAL SCIENCE

Harrison, Murphy, Riegel Science Service Trustees

THREE new trustees of Science Service, the institution for the popularization of science, were elected at its annual meetings in Washington.

Dr. Ross G. Harrison, chairman of the National Research Council, will become one of the representatives of that organization on Science Service's governing body. Dr. Harrison is director of the Osborn Zoological Laboratory at Yale University.

O. W. Riegel, director of the Lee School of Journalism at Washington and Lee University, was named one of the trustees representing the newspaper profession. J. Edwin Murphy, managing editor of the Baltimore Evening Sun, is the third new trustee. He also represents journalism.

Science Service, established by the late E. W. Scripps, newspaper publisher and philanthropist, to bring before the public authoritative accounts of the achievements of science, is governed by a board of trustees containing 15 members, representing scientific organizations, the Scripps estate and the newspaper world.

Dr. Robert Andrews Millikan, California Institute of Technology Nobel