

deutons, the hearts of double-weight hydrogen.

Helium is the rare gas of the air first discovered in the sun. Nearly a half century later it was found in the air of the earth. During the World War, American chemists extracted it from natural gas in quantity and used it to fill airships, replacing inflammable hydrogen gas.

The ordinary kind of helium consists

of atoms having four times the weight of those of ordinary hydrogen. In the past few years multiple varieties of both helium and hydrogen have been discovered. Hydrogen now exists as "triplets," having atomic weights one, two and three. Helium has been detected of mass three and five besides its normal weight of four. Now comes the discovery of the kind of helium isotope having mass six.

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PHYSICS

Physics May Soon Discover New Group of Elements

DOCTOR Enrico Fermi the Italian physicist whose experiments on bombarding heavy uranium with non-electrical particles known as neutrons, has set the world of science in a controversy over whether or not super-heavy element No. 93 was created, has just performed similar experiments on the element thorium.

In an interview in London, while attending the International Conference on Physics, Dr. Fermi indicated that his preliminary experiments make him inclined to anticipate the discovery of a whole new radioactive family between the elements actinium and thorium.

Actinium has atomic number 89 in the periodic table of the elements. Its atoms weigh about 227 times as much as those of hydrogen. Thorium has atomic number 90. Its atoms are 232 times as heavy as hydrogen.

By his atom bombarding experiments Dr. Fermi has discovered two radioactive substances of thorium having periods of one and fifteen minutes during which they decay, or disintegrate to half their amount. These are the first two members of the new, anticipated radioactive family for which he is searching. They are probably isotopes of thorium or actinium since there is no gap in the table of the elements at this point.

Paradoxical

A paradoxical action of gamma rays, one of the radiations from radium, was reported by Dr. R. A. Millikan at the conference on behalf of his Pasadena colleagues, H. R. Crane, and Dr. C. C. Lauritsen of the California Institute of Technology. They found that the higher the energy of a gamma ray the more it is absorbed. These experimenters

produced gamma rays by bombarding lithium and fluorine with protons and beryllium, boron and carbon with deuterons.

A record was made when the maximum energy of the gamma rays was measured as between twelve to thirteen million electron volts.

The theoretical physicists had a difficult time keeping up with the experiments reported. One suggestion of what happens in the central portion of the atom was made by Prof. G. Gamow, Soviet scientist who is lecturing this year at the George Washington University, Washington, D. C. Prof. Gamow suggested that within the nucleus there is an exchange of a proton and negative proton for nuclear neutrons. This change does not affect the mass or charge of the atom but it does provide an explanation of the uranium transformation. Prof. Fermi expressed doubt, however.

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MEDICINE

Advanced Cancer Now Called Arrestable Disease

By **CHARLES A. DUKES, M.D.**, Vice-President-Elect, American College of Surgeons.

ONE of our great clinicians recently said, "You may die with cancer, but not necessarily of cancer."

Although there is great discouragement in the field of research as regards the cause of cancer, much has been learned about cancer and since the American College of Surgeons has sponsored and adopted certain rules governing cancer clinics, the clinical progress

made in treatment and cure has marked a great advance.

The American College of Surgeons will be told that cancer is curable. Also that though you may have cancer, the mortality has been reduced in advanced cases from 90 per cent. or more to 25 per cent. or less. These cases have been classified among the so-called arrestable diseases.

I believe that the same encouragement that is given to the person who has tuberculosis, can be given to a high percentage of the advanced or neglected cases of cancer.

American College of Surgeons is presented, through public lectures and by the means of symposium in the scientific sections, the garnered knowledge of the medical world in the treatment of this disease.

Today it is well-known that due to the complexity of the decision about cancer treatment the cases are best handled through clinics in which are gathered together the pathologist, the surgeon, the internist, the specialist and the X-ray and radiologist. They study these cases and those who come early are assured of more than 75 per cent. of cures. Those who come late can be assured of relief from pain and in many cases an arrestment of the disease so that the statement made at the beginning of this article is made come true, that "You may die with cancer, but not of cancer."

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ASTRONOMY

Planet Pluto Similar In Size to Our Moon

PLUTO, the planet which was discovered by Lowell Observatory astronomers in 1930 beyond the orbit of Neptune, is probably very similar in size to the moon, whose diameter is 2,160 miles. Dr. Walter Baade of the Mt. Wilson Observatory has compared the brightness of Pluto with that of Triton, the satellite of Neptune. This moon is known to be about the same size as ours, and it appears even in the telescope as a point of light, like Pluto.

He has found that Triton is about a fifth of a magnitude brighter than Pluto, a very slight difference, and therefore concludes that they are similar in size. Pluto's average brightness is of magnitude 15.41, and when it is most brilliant it is only 14.14, much too faint to be observed with any but the largest telescopes.

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