

previously healthy, gets fits of apparent terror followed by more or less depression. Encephalitis has been suggested as a possible cause of the symptoms.

Mr. Walston's investigations, however, indicate as the cause of the complaint vitamin A deficiency, together with proportionately too much of another dietary factor called E-substance, found in dog-biscuits and other cereals.

Fifty cases of dogs suffering from hysteria were investigated, reports Mr. Walston in a communication to *Nature*. Of these, all except one were fed on a diet consisting mostly of cereal; twenty-six of these, continuing on the same diet, remained hysterical, while twenty-eight, the diet of which was changed to contain more vitamin A, recovered.

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## PHYSICS

## Deutons Creating Neutrons Promise to Smash Atoms

### Radium Definitely Superseded as Creator of Projectiles For Exploring Secrets of Hearts of Material Particles

**T**WO PARTICLES recently discovered by science, the neutron and the deuteron, promise to play an important role in atomic disintegration as the result of experiments just made at the California Institute of Technology at Pasadena, Calif.

Radium has been definitely superseded as the most effective generator of neutrons, those neutral particles which since the discovery of their existence two years ago have assumed an increasingly important place in experimental physics. Recently, H. R. Crane, a graduate student, Dr. C. C. Lauritsen and Dr. A. Soltan, an international research fellow from Poland, using the large million-volt X-ray tube developed by Dr. Lauritsen, showed that the hearts of helium atoms or helium ions could be speeded up sufficiently to knock neutrons out of beryllium atoms. In this way they produced twice as many neutrons as any radioactive source ever did.

Now they have tried deuterons, the hearts of the double-weight hydrogen atoms, as the projectiles flung by high voltage at various substances. They were astonished to find that deuterons used instead of helium hearts release from beryllium five hundred times as many neutrons as ever before obtained.

Deuteron is the name given to the nucleus of the hydrogen isotope of mass two. The heavy-weight water was sent to Pasadena by Prof. G. N. Lewis of the University of California to see whether the Pasadena workers could cause their deuterons to shatter themselves against heavy atoms. They do not. But

when propelled against the light beryllium atom they penetrate the nucleus and apparently turn it into boron. In its exuberance the newly born boron nucleus kicks out a neutron with ten million volts energy.

Elated over their results, the physicists tried the deuterons on lithium. It yielded neutrons even more copiously than beryllium. Helium is the byproduct in this case.

With such powerful means of producing neutrons of varying energy it will be easy to disintegrate atoms in relatively large numbers. The neutron is the ideal tool for this purpose. It insinuates itself into any nucleus with great ease and then treacherously splits it open. The contriving physicist watches this scandal and gains much wisdom therefrom.

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## GENERAL SCIENCE

## U. S. Science Advisory Board Answers Queries For Officials

**P**RESIDENT Roosevelt's Science Advisory Board now has six committees of experts at work on questions referred to it by governmental agencies, President Karl T. Compton, chairman of the board, has announced.

As the actual problems upon which cabinet officers and other officials have sought the advice of this Board are pressing and of a confidential nature, Dr. Compton did not discuss details.

## RADIOLOGY

## Blue Skin Reaction May Help Solve X-Ray Mystery

**A** NEW reaction to X-rays, discovered by Dr. J. C. Mottram, Director of the Research Laboratory at the Mount Vernon Cancer Hospital, London, may help to solve the long-standing mystery of what happens in living tissues after they have been X-rayed but before any recognizable changes occur. Dr. Mottram's research is described in *Nature*.

"If, during the afternoon the skin of a rat be exposed through a small hole in a lead screen to approximately a U. S. D. of X-rays, and immediately afterwards a solution of Pyrrol blue be inoculated into the circulation, then the next morning there will be seen," he says, "a blue mark on the skin precisely corresponding to the hole in the lead screen."

He thinks this indicates that the X-rayed capillary blood vessels have been altered so that the dye passes through them more readily than through normal capillaries.

The special importance of this observation lies in the fact that the reaction occurs within 24 hours after the application of the X-rays. Only three other instances of biological change within comparatively few hours after exposure to X-rays have as yet been known, and none of them are easy to determine.

"It is to be hoped," concludes Dr. Mottram, "that this new reaction with Pyrrol blue, when fully exploited, will elucidate some of the hidden changes which occur during the latent period."

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"Three general types of problems are under consideration," Dr. Compton said. "The first are questions of proper organization, or functioning, or program of the scientific and technical services of the government on which the advice of the Board has been specifically requested.

"The second are similar matters which have otherwise come before the Board, and which need attention in order that