

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.

Science News Letter, October 7, 1933

PHYSICS

Deutons Creating Neutrons Promise to Smash Atoms

Radium Definitely Superseded as Creator of Projectiles For Exploring Secrets of Hearts of Material Particles

TWO 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Radium has been definitely superseded as the most effective generator of neutrons, those neutral particles which since the discovery of their existence two years ago have assumed an increasingly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

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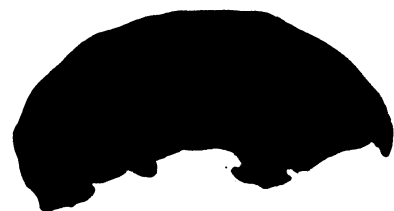
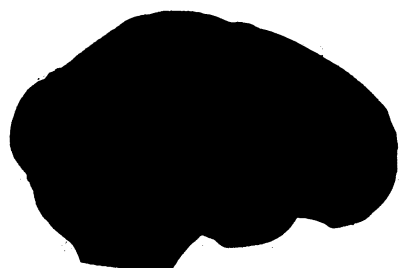
"Three general types of problems are under consideration," Dr. Compton said. "The first are questions of proper organization, or functioning, or program of the scientific and technical services of the government on which the advice of the Board has been specifically requested.

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

ANTHROPOLOGY

Peking Man a Neandertaler, New Brain Cast Indicates

Dr. Eugene Dubois, Discoverer of Pithecanthropus,
Says Sinanthropus Youth Had Very Small Brain



PEKING AND TRINIL

Similar in total volume, but quite different in type, are the brain casts of Peking Man (above) and Java Man (below).

essential technical services shall not be impaired by economy, or unwise projects be supported, as may easily happen when the determining issues are obscure or highly technical.

"The third are basic considerations of the more permanent policy of the government toward scientific work."

President Compton explained that the Board finds that the government definitely must operate certain technical services. It seems advisable to leave others entirely to private enterprise. There is also a rapidly increasing third class of services where the public welfare and future prosperity of the country will depend very much on the successful development of some method of cooperative attack by governmental and private agencies. It is the idea of the Board that there should be marshalled temporarily the best scientific talent of the country in order to solve these problems as they arise.

Interlocking contacts with other governmental advisory services are being established by the Board. It is realized that an effective attack on the great technical problems facing the government can not be made by any one group of experts alone, be it scientific, economic, social or business. Every problem, Dr. Compton explained, is being considered from all points of view so that the recommendation made to the government will be backed by all groups of qualified experts.

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PEKING MAN had a brain distinctly human in type, showing a notable advance in development over the brain of *Pithecanthropus*, the Java Man discovered over forty years ago by Dr. Eugene Dubois. But the one brain cast it has been possible to make thus far indicates that the first-found Peking skull belonged to a young man with a small head.

"The adolescent *Sinanthropus* is a human male, belonging to the Neandertal group of mankind, the species *Homo neandertalensis*, maybe an interesting new race, with individually imperfectly developed and hence abnormally small brains," says Dr. Dubois.

These verdicts have been presented by Dr. Dubois himself, to the Royal Academy of Sciences in Amsterdam, after the noted anthropologist had made a long and careful comparative study of brain casts made in the Peking Man and Java Man skulls.

The total volume of the brain cast received by Dr. Dubois from Dr. Davidson Black, first student and describer of Peking Man, is 918 cubic centimeters. This is approximately the same size as the brain cast of Java Man.

The High Arch of Homo

In shape and anatomical development, the Peking Man's brain cast resembled the Neandertaler's—and even modern man's—much more than it did the brain cast of Java Man. Most notable was the relatively high-arched front portion, as compared with the almost flat-fronted brain of the Java Man. This arching of the front part of the brain is considered one of the most distinctly human characters found in brain architecture.

This presented a poser: here was a brain almost as small as that of the very primitive Java Man, showing the same basic form as that of advanced human species. But Dr. Dubois points out that the brains of modern "microcephals" show exactly the same peculiarity: they are subnormal in size but quite normal

in general shape and structure. Hence he suggests that this particular individual Peking Man was an ancient "microcephal." He found further support for his opinion in certain peculiarities in the bones of the skull itself, which have their counterparts in the skulls of modern "microcephals."

The skull which yielded this interesting brain cast was that of a young male individual, perhaps fifteen or sixteen years old. It was most nearly whole when found, so that it was possible to prepare the cast with relatively little loss of time.

Second Skull Shattered

The second Peking Man skull, which appears to be that of a woman, was broken into many fragments, so that before a cast can be made in its brain-cavity it will be necessary to piece it together—a tedious and time-consuming task. It may be several years before the second brain cast will be ready for study.

The outcome of Dr. Dubois' study confirms the opinion expressed by Dr. Ales Hrdlicka of the U. S. National Museum when the first photographs of the Chinese skull were received in this country. At that time he told Science Service that the skull was without doubt of the Neandertaloid type. Several other American anthropologists, impressed by the strong resemblance of the photographs to known Neandertal skulls, offered similar opinions.

Dr. Hrdlicka does not think it necessary to conclude, as Dr. Dubois did, that the particular individual had an abnormally small brain, so that he might be classified as "microcephalic" and possibly have been an idiot. The Peking Man brain is small, admittedly. But Dr. Hrdlicka points out that in the Smithsonian Institution collections there are over thirty skulls of recent men, mostly Peruvian Indians, that are of this same order of size, yet none of them is classifiable as idiotic or otherwise pathological.

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