

An electron or proton, according to the theory, would be a "two-bridge" problem.

Still another conclusion reached by the new theory is that the mass of a particle like an electron is not related to its electric charge. The charge (e) and the mass (m) are independent constants of integration, to use the mathematician's term.

In his analysis of his own new theory, Prof. Einstein gives as points in its favor:

1. It explains the atomistic character of matter.
2. It explains the circumstance that no neutral particles of negative mass exist.
3. It uses no other variables in the equations than those of the gravitational field and the electromagnetic field.

"On the other hand," Prof. Einstein concludes, "one cannot see *a priori* whether the theory contains the quantum phenomena. Nevertheless one should not exclude *a priori* the possibility that the theory may contain them."

Which, in effect, means:

While the new theory does not, at present, explain atomic happenings as does quantum theory, one should not jump at the conclusion that there is no possibility that it may do so.

One can be sure that Prof. Einstein and Dr. Rosen are hard at work right now trying to make the "possibility" much nearer a certainty.

The Authors' Words

The following is the description of the new theory in the words of Prof. Einstein and Dr. Rosen:

"The writers investigate the possibility of an atomistic theory of matter and electricity which, while excluding singularities of the field, makes use of no other variables than the gravitational field variable of the general relativity theory and the electromagnetic field variable of the Maxwell theory. By the consideration of a simple example they are led to modify slightly the gravitational equations which then admit regular solutions for the static spherically symmetric case. These solutions involve the mathematical representation of physical space by a space of two identical sheets, a particle being represented by a "bridge" connecting these sheets. One is able to understand why no neutral particles of negative mass are to be found. The combined system of gravitational and electromagnetic equations are treated similarly and lead to a similar interpretation. The most natural elementary charged particle is found to

be one of zero mass. The many-particle system is expected to be represented by a regular solution of the field equations corresponding to a space of two identical sheets joined by many bridges. In this case, because of the absence of

singularities, the field equations determine both the field and the motion of the particles. The many-particle problem, which would decide the value of the theory, has not yet been treated."

Science News Letter, July 13, 1935

GENERAL SCIENCE

Bill Provides \$1,000,000 For Research in Agriculture

SCIENTIFIC research that will benefit future generations, as well as the present, is contemplated by a bill introduced in the House by Rep. Marvin Jones, of Texas. The measure has passed both House and Senate.

According to the terms of the bill, the Secretary of Agriculture "is authorized and directed to conduct research into laws and principles underlying basic problems of agriculture in its broadest aspects," and also to carry on investigations looking to improvements in handling and marketing, as well as "research relating to the conservation, development of land and water resources for agricultural purposes."

The research thus contemplated is to supplement, not to replace, other researches now going on under the aegis of the Department of Agriculture; but both activities are to be coordinated so far as practicable, and "shall be conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish."

The initial funds for this work will

amount to \$1,000,000. This sum will be increased by an additional \$1,000,000 each year until the total reaches \$5,000,000, and thereafter the special research fund will be maintained at the latter sum each year. Forty per cent. of the total in any year is to be expended under the direct supervision of the Secretary of Agriculture, in any places and for any research purposes he may approve within the frame of the act. The remaining sixty per cent. will be prorated among state agricultural experiment stations according to the size of their respective rural populations. Funds thus allocated must be matched dollar for dollar by the states receiving them.

The establishment of new laboratories is within the authorizations of the act, since it is provided that funds may be used for the erection of buildings and the purchase or rental of land needed for the purpose. These laboratories might be set up in the major agricultural regions of the United States, in places designated by the Secretary of Agriculture.

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AVIATION

England Develops High-Speed Radio Operated Robot Plane

PILOTLESS, full-sized and radio-controlled airplanes capable of exceeding 100 miles an hour and reaching altitudes as high as 10,000 feet have been developed for anti-aircraft target practice by the Air Ministry in London.

The robot planes have the flight characteristics of the familiar Tiger and Moth types. Equipped with 130 horsepower motors, they can take off either from an airport or by catapult from an airplane carrier at sea.

In flight the planes sweep in great circles, with a maximum radius of ten miles, at all times under radio control from staff officers on the ground.

The search for better types of anti-aircraft targets has long been a pressing problem among the great powers of the world. The U.S.S.R., with its current emphasis on gliders and parachute jumping, has been reported by its news agency Tass to have developed a system whereby a train of gliders are towed

aloft by an airplane and then cut loose one by one to be shot at by anti-aircraft guns on the ground. The glider pilots set the course of the gliders and then jump safely to the ground.

The new British system of using high speed airplanes operated by radio control, while more costly, would appear to bring much more reality into the target practice.

Science News Letter, July 13, 1935

MEDICINE

Leprosy, Man's Ancient Foe, Fought With New Weapons

LEPROSY, one of the most ancient of human ills, is being fought with the most modern weapons in medical science's armamentarium. At the meeting of the American Association for the Advancement of Science's medical section, Dr. H. W. Wade of the Leonard Wood Memorial, New York City, told of new efforts against this old enemy.

Dr. Wade, who flew to the meeting from the ship on which he came in from the Orient, told of closer identifications of the bacillus that causes the disease. Different research workers had obtained different organisms, each of which was blamed for leprosy. Finally, one research worker was sent to different parts of the world, and his cultures from both Occident and Orient show the same bacillus. It is necessary to use special synthetic atmospheres containing 60 per cent. oxygen and a high concentration of carbon dioxide to keep the leprosy germs alive. This technique, the first to produce successful culture of the bacillus outside a living body, was worked out by Dr. Earl B. McKinley, dean of the medical school of George Washington University, Washington, D. C.

Efforts are also being concentrated on a method for testing suspected cases by a method more or less similar to the one used in testing for tuberculosis, but thus far they have not been particularly successful. However, they are being continued, with persistent hope for better luck in the future.

Leprosy, said Dr. Wade, is not confined to the tropics, as we are rather prone to imagine. Some of the worst cases in the world occur in Japan and Korea, which are temperate-zone countries. It is increasing in Argentina. It was known a thousand years ago in Norway, and used to be common in northern as well as southern Europe during the middle ages.

The disease appears to be transmitted mainly by close personal contact between the sufferer and members of his own

family; though it is not known whether there is any hereditary tendency toward susceptibility. It is not primarily a "dirt disease," though lack of sanitation seems to have something to do with its spread in some cases. Badly balanced diets, such as are common in the Orient, seem to be a predisposing factor, Dr. Wade said.

Special efforts are now being made to recognize leprosy in its early stages, when it can be treated with greater success and less cost. This often involves house-to-house visits, for as a rule patients do not report to clinics until the malady is in an advanced stage, due to their own inability to recognize it at its inception.

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PSYCHIATRY

Sodium Rhodanate Useless For Mental Disease

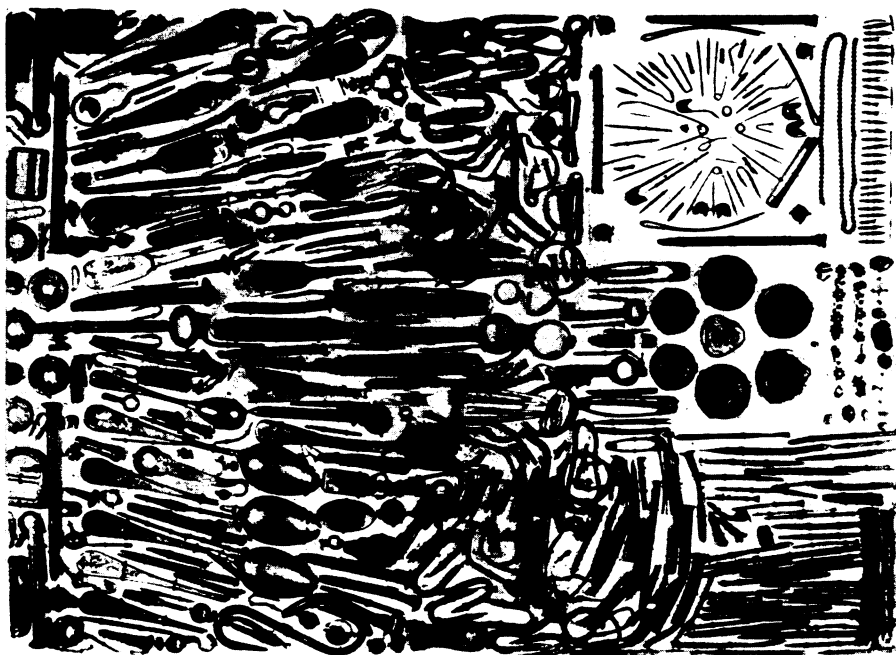
SODIUM rhodanate, contrary to claims advanced for it, is of no value in treating mental disease, Dr. Purcell G. Schube, of the Boston State Hospital, has found. His opinion, based on experience with 75 patients suffering from various mental disorders, is reported to the *American Journal of Psychiatry* (May).

The sodium rhodanate treatment was advocated by Prof. W. B. Bancroft of Cornell University, who suggested that mental disease, dementia precox and manic-depressive psychoses, by the contrasted use of sodium amyral and sodium rhodanate.

Dr. Schube found, contrary to Prof. Bancroft's views, that it is impossible to differentiate between two types of mental disease, dementia precox and manic-depressive psychoses, by the contrasted use of sodium amyral and sodium rhodanate.

"The ideas of Bancroft and his co-workers relative to mental disease and the methods of treating it did not prove to be of any value at all when the experimental method was applied to them," Dr. Schube concluded. "They are therefore untenable."

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HE SWALLOWED THINGS

But not until an X-ray was made of his stomach was it known that a patient suffering from the mental disease, schizophrenia, had this collection of 500 foreign bodies inside him. A live revolver cartridge, 3 pocket knives, 37 phonograph needles, 45 needles and pins, and 218 nails and screws were included in the lot. The patient died. The case was reported in the *British Medical Journal* by Dr. R. Stewart Kennedy, of the Cheshire County Mental Hospital.