



CONVULSION

This group of physicians watching the first electric treatment for mental disease to be given at the Institute are all needed to hold the patient on the bed as the convulsion wracks his body.

fixed posture and mutism may some day be cured simply in his own home or a local hospital by a physician who places two electrodes on the distressed head and then just plugs in on ordinary house current stepped down to the harmless voltages used.

Science News Letter, July 20, 1940

MEDICINE

Cure for Bubonic Plague Seen in New Chemical

CURE of bubonic plague by chemical remedies of the sulfanilamide group is expected as a result of successful experiments with plague-susceptible mice. The experiments were made by Dr. S. S. Sokhey, director, and Dr. B. B. Dikshit, pharmacologist, of the Haffkine Institute, Bombay, India, and are reported to physicians. (*Lancet*, June 8)

One of these remedies, sulfathiazole, saved 80% and 90% of the plague-stricken mice after the disease had reached the most dangerous stage, when the germs had invaded the blood stream.

Even better curative results are hoped for when sulfathiazole is used to treat humans because the disease is much more severe in mice than in men. Drs. Sokhey and Dikshit hope soon to try it on human cases of plague.

Sulfathiazole proved, in mouse plague, to be more effective than sulfapyridine or other of the sulfanilamide group of chemical remedies. Results of treatment with sulfathiazole are as good as those obtained with the Haffkine Institute anti-plague serum.

PHYSIOLOGY

Ability to Make Vitamin C Linked With TB Resistance

Men, Monkeys and Guinea Pigs, Who Must Get Their Vitamin C From Diet, Are All Susceptible to TB

ABILITY to manufacture anti-scurvy vitamin C in the body and ability to resist invasion of the tuberculosis germ are apparently linked in some as yet unexplained way.

The relationship is pointed out by Dr. T. W. B. Osborn, of the University of the Witwatersrand, and Dr. J. H. S. Gear, of the South African Institute for Medical Research, Johannesburg. (*Nature*, June 22)

Man requires vitamin C in his diet because he is unable to manufacture it in his body. Monkeys and guinea pigs also must get their vitamin C rations from their diet. Men, monkeys and guinea pigs are also susceptible to both human and bovine tuberculosis.

Dogs and rats, on the other hand, are known to be able to manufacture the anti-scurvy vitamin C in their bodies. These animals and also mice are resistant to both human and bovine tuberculosis germs.

Mice may or may not be able to manufacture vitamin C in their bodies. Authorities are still in doubt on this point. There is also some question as to whether or not rabbits, pigs and cattle can make this vitamin or whether they depend on food for it.

These same animals, rabbits, pigs and calves, as well as goats, sheep and horses, stand between man and dogs in ability to resist tuberculosis germs, having resistance to the germs of the human disease but being susceptible to germs of the bovine or cattle tuberculosis.

The South African investigators believe this cannot be pure coincidence. In support of the view that there is a relationship between ability to resist tuberculosis and ability to manufacture vitamin C in the body are many reports showing that tuberculosis patients use

more vitamin C than normal persons. No one knows just why this is so, but tests of the amount of vitamin C in the blood of such patients have shown it.

Patients with other infectious diseases besides tuberculosis also seem to use more vitamin C than normal. Some authorities believe that this may be because of the fever in these sicknesses which speeds up the body processes known as metabolism. This would include a speeding up of use of vitamin C.

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BOTANY—PHOTOGRAPHY

Plant Growth Shown Fast With Amateur Movie Outfit

DEVELOPMENT of an inexpensive electrical movie outfit which will permit amateurs to record the growth of plants on 8 mm. film, so that the growth of days and weeks can be animated on a 30-foot roll of film may lead to important discoveries in plant growth. The device, perfected by Wesley C. Casson, chemical engineer, of suburban Birmingham, Mich., permits running off the reel in two and a half minutes growth which may have covered months.

The equipment consists of an eight-millimeter motion picture camera, and an electric motor drive, controlled by a timing clock electrically driven. Individual frames can be exposed at intervals ranging from 15 minutes to two days apart, without any attention on the part of the operator. A battery of photoflood lights can be connected for continuing the sequence of pictures through the night or in overcast weather.

The entire unit is weatherproofed and may be left in position in the garden. A completed picture when screened shows

a plant springing into maturity and blossoming, as the action of days is telescoped into a few minutes. Previously, this has been done only by elaborate studio

methods, but by using Mr. Casson's equipment any amateur gardener can record plant growth in his own garden.

Science News Letter, July 20, 1940

PHYSICS

Radium-Like Substances Produced Inexpensively

Patent Granted Italian Physicists Covers Bombardment by Neutrons From Cyclotron

ARTIFICIAL production of substances like radium, which can probably be produced much less expensively than the natural material, yet have the same qualities that make it useful in medicine, is covered in United States Patent 2,206,634. This has just been granted to a quintet of Italian physicists, who were at the University of Rome when application was made for the patent, October 3, 1935. They are now widely scattered.

Chief of the group is Dr. Enrico Fermi, winner of the Nobel prize in physics in 1938. At the end of that year he came to the United States to join the faculty of Columbia University, New York City. His co-patentees are Edoardo Amaldi, still in Rome; Emilio Segre, University of California, Berkeley; Franco Rasetti, Quebec, and Bruno Pontecorvo, now in South America. The patent is assigned to G. M. Giannini and Co., Inc., New York City.

Most chemical elements consist of several isotopes, which have similar properties except that they differ in atomic weight. In radium, and other substances naturally radioactive, there is a disintegration into various isotopes of other elements. This is accompanied by the emis-

sion of the alpha, beta and gamma rays, which produce the effects of radium.

In 1934 the French physicists, F. Joliot and his wife, Irene Curie-Joliot, daughter of the Curies, discoverers of radium, found that radioactivity could be started artificially. They bombarded light elements, like boron, with alpha particles from radium. After the bombardment ceased, the boron itself gave off some of the radium rays.

Later, other ways were found of producing the same effect. By bombarding with other rays or particles of high energy, isotopes of different elements can be converted into other isotopes. These may be of the same or of other elements. Some of them are so unstable that they quickly decompose. In doing so, they show radioactivity.

The first efforts were to get bombarding particles or rays with energies as high as possible, but Dr. Fermi found this desirable only when the particles were electrically charged. Then high energy was needed to break through the barrier surrounding the nucleus of the atom. With neutrons, electrically neutral particles, the greatest efficiency is obtained with low energies.

Neutrons can be produced in various ways, chiefly by the use of the cyclotron, invention of Dr. E. O. Lawrence, of the University of California, who was awarded the Nobel prize last year. These neutrons, however, have very high energy, so Dr. Fermi's problem was to slow them down, and reduce their energy.

"We have found it possible to achieve the desired results by passing the neutron radiation against or through a screen of a suitable material," states the patent. "The materials which have been found best suited to this purpose are those containing hydrogen (including all its isotopes, but the light isotope which predominates in natural occurrence being most efficient) and especially water and

the hydro-carbons, such as paraffin for example."

In use, the screen may be either solid or liquid. In the latter event, the material to be treated can be dissolved or suspended in the liquid itself. The new patent covers the use of neutrons, with such an energy reducing screen and the production of radioactive isotopes thereby. Since this is so far the only satisfactory method of producing artificial radioactive substances, and these have begun to find medical use, the patent seems to be quite basic.

Sodium has been one of the most widely used elements, but many others show the effect. The patent specifications list all those that have been tried, including most of the 92 known. Platinum, gold, iodine, potassium, copper and chlorine, among others, can be made more or less radioactive. Certain elements, including hydrogen, carbon, tin, thallium, lead, bismuth and mercury, showed no activity. With these, it is supposed, the neutrons produce a change to a stable isotope.

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MEDICINE

Protein Migrations May Aid in Diagnosis

THE WAY protein molecules of the human body migrate in solutions under the influence of electric current may make possible a rapid and accurate diagnosis of disease.

Dr. D. A. MacInnes of the Rockefeller Institute for Medical Research, New York City, told of the new method in his lecture at Western Reserve University sponsored by the Society of the Sigma Xi, national honor fraternity for the promotion of research in science.

Dr. MacInnes described the new robot "moving boundary apparatus" which makes it possible to get patterns created by normal blood plasma, and the plasma and serum patterns in different diseases.

The black and white diagnostic outlines are called schlieren patterns and consist of a series of peaks. In normal blood one peak, the largest, is caused by albumin A found in the blood plasma. Other and smaller peaks are caused by other proteins in the blood, three globulins—alpha, beta and gamma—and by the fibrinogen. The height of these peaks and their relationships to one another appear characteristic of different condi-

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