

SCIENCE NEWS

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INSULIN IN THE TREATMENT OF MENTAL DISEASE

THE accidental discovery of the effect of insulin on the clouded minds of narcotic drug addicts and sufferers from schizophrenia was described by Dr. Manfred Sakel, of Vienna, Austria, at the Pittsburgh meeting of the American Psychiatric Association. This treatment is regarded as almost the first promising weapon of attack on this centuries-old mental disease.

A morphine addict in a Vienna hospital, the story goes, was found to be suffering from diabetes. He was given insulin for this condition. As sometimes happens with insulin treatment, he had an "insulin shock," a state the reverse of diabetes in which the body uses up sugar too fast and the amount of sugar in the blood falls below normal level. When this patient recovered from the insulin shock, his mental condition was greatly improved.

Other patients, who had no diabetes, but were suffering either from drug addiction or from mental disease, were then given large doses of insulin, to induce shock. In many of these, the mental condition also improved, apparently permanently. Similar experiences with the use of this new treatment for schizophrenia were reported by American psychiatrists: Drs. Solomon Katzenelbogen, Herbert Harms and Dean A. Clark, of the Henry Phipps Psychiatric Clinic, Baltimore, and Spring Grove State Hospital, Md.; Drs. Joseph Wortis, Karl M. Bowman and Leo Orenstein, of Bellevue Hospital, New York, and Drs. G. Alexander Young, Richard M. Young and Louis G. Rousek, of Omaha.

From a third to half the patients treated by this method showed improvement in their mental state which appears to be permanent, although the treatment is so new that it is not yet possible to say how long the improvement will last. In some cases it has lasted for three years.

It is apparently agreed that the treatment is most successful in acute cases of schizophrenia in which the patients are young and have not been ill very long. Chronic cases do not seem to respond as well to the treatment. When insulin shock is induced to treat mental disease, the resulting hypoglycemia or sugar lack is checked by giving sugar. The danger of the new treatment is that the sugar may not be given soon enough. The Omaha physicians reported two deaths and two other cases which nearly ended fatally in spite of efforts to bring the sugar level back to normal following the shock.

Since no one knows what causes schizophrenia, no one can yet say why the treatment remedies the condition in certain cases. But the treatment itself may give a clue that will lead to solution of the cause of the disease.—JANE STAFFORD.

RECENT CANCER RESEARCH

A HINT that starch grains injected into cancerous tumors will stop their growth and in many cases cause them to disappear is contained in one of the thirty-three cancer researches in America and abroad supported by the

International Cancer Research Foundation grants amounting to over \$300,000.

This experiment was made on a mouse tumor by Professor Robert Chambers and C. G. Grand, of the Department of Biology of New York University. Injections of starch grains "produced a marked infiltration of polymorphonuclear leucocytes into the tumor." The accumulation of leucocytes inhibited further growth of the tumor and, in many cases, the tumor disappeared completely. Inert particles, like charcoal, did not produce the effect. So far the method has been applied to mice only.

Human cancer cells and tissues have been kept growing for years in glass dishes and fed artificially, according to the report of the Johns Hopkins Cancer Research and Tissue Culture Laboratories. The "J.D." human tumor strain has been maintained in pure and continuous tissue culture for 5½ years and an "A.R." strain has existed 4 years. A number of human brain tumors had been cultured for almost a year when the report was submitted.

A new theory of cancer formation is suggested by experiments of Dr. A. Haddow, of the University of Edinburgh. Chemicals from coal tars produce certain kinds of cancers and the new idea is that these carcinogenic hydrocarbons actually inhibit growth of the cells instead of stimulating them. The cancer is believed to result from the rise of a new cell race that rebels from the prolonged retardation of the growth of normal cells and multiplies rapidly, forming the cancer.

COSMIC RAY RESEARCH

PROFESSOR J. F. CARLSON and Professor J. R. Oppenheimer, of the University of California, have developed a theory of how the piercing cosmic rays are absorbed when they hit the upper atmosphere and eventually find their way into the recording instruments. A majority of researches on cosmic rays reported at the recent meeting of the American Physical Society in Washington gave the work of Professors Carlson and Oppenheimer as references.

The passage of a cosmic ray through the earth's atmosphere is like the return to earth of a fourth of July starburst, according to the picture which physicists now have in mind. The path of the original ray branches out again and again into an ever-increasing number of new rays, called secondaries.

The task of Drs. Carlson and Oppenheimer was to calculate how often this branching-out takes place, how many times it can occur before the energy of the original ray is used up. Physicists want to know this in order that their observations near the earth's surface may tell them how many rays are coming into the atmosphere from outside. According to the calculations, the branching-out occurs when the cosmic ray particle comes very close to the nucleus of an atom in the air. In the intense electric field of the nucleus the cosmic ray particle, electron, generates a powerful kind of x-ray, photon, which in turn, when it comes close to another nucleus, is transformed

back into a pair of electrons, charged positive and negative, respectively. The process repeats itself until the energy of the original ray is exhausted.

Another but less frequent kind of branching which Drs. Carlson and Oppenheimer mention in their paper involves the actual destruction of the atom with whose nucleus the cosmic ray collides. This results in a spray of atomic debris and is of the same nature as the transmutations which physicists accomplish with their high voltage atom-splitting machines and cyclotrons.

A current point of discussion is whether calculations like these are valid for the tremendously high cosmic ray energies. The question might be, "Do the high-speed electrons from outer space obey the same laws as the electrons in radio tubes?" The tide seems to be turning in favor of the answer "Yes," according to recent reports.

A NEW RADIO LANDING BEAM

A NEW radio landing beam that emerges from an underground pit and holds great promise for making blind landings of airplanes practical and safe in foggy weather has been described by H. Diamond and F. W. Dunmore, of the National Bureau of Standards. The transmitting antenna is placed in a special subterranean compartment under the center of the landing field instead of being erected dangerously in the air at the edge of the field. The preliminary work was completed and ready to report two years ago, but the interest of another government bureau delayed the scientific announcement. The paper read before the recent joint meeting of the International Scientific Radio Union and the Institute of Radio Engineers was the first public report.

About six years ago the same group of government workers developed a radio beacon system for aircraft landing fields which was so effective that after demonstrations in this country it was adopted and put into extensive use in Europe, Japan and Russia. It has not been installed as regular equipment on American landing fields, however.

The new pit antenna improves this radio landing beacon. In the landing system, the airplane glides down a path that is marked by equal strength of radio signal, indicated on a convenient dial on the plane's instrument panel. The way that radio waves travel from the transmitting antenna makes this system possible. One kind of wave goes directly from the antenna to the plane, while another goes from the transmitting antenna to the ground and then is reflected to the plane. The interference of these two waves and decreasing distance combine to allow the plane pilot to steer his craft along a radio path to a safe landing even if he can not see the landing field.

When the transmitting antenna is in the air at the field's edge the path of the landing glide was a little too flat. Now the pit antenna gives a steeper and more satisfactory approach path. A further advantage of the underground system is that it can be built on a turn-table and swung around to conform to wind direction, thus allowing landings from any direction to be made with the aid of only one antenna. Previously several antennae at the edges of the field were necessary. One possibility

is that the whole radio equipment, transmitter as well as antenna, can be put underground at the landing field's center. Two Berlin investigators, Ernst Kramar and C. Lorenz, discussed the principles of blind landing radio system applied in Germany based in part on the earlier American system.—WATSON DAVIS.

ITEMS

THE planet Mercury has no trace of atmosphere, according to observations of the May 11 transit of Mercury made at the astronomical station of Harvard University, at Bloemfontein, South Africa. A cable reporting fair observing conditions for the infrequently occurring transit was received by Dr. Harlow Shapley, director of Harvard College Observatory, from Dr. John S. Paraskevopoulos. There was no luminous arc around the planet, indicating no air. Best astronomical evidence was that Mercury, like the moon, was completely without air, any that it may have had having escaped into space long ago. But the evidence for the lack on Mercury was less detailed than for the moon.

A SERIES of hundred-million-year-old strata of the Upper Cretaceous, discovered in Utah last summer by government geologists, will be explored for remains of giant reptiles this season by Charles W. Gilmore, of the Smithsonian Institution. It was in the Upper Cretaceous that the dinosaurs, evolved into horned and armored forms, made their last stand against inevitable extinction. A hundred million years ago they ended the domination which they had exercised over the earth for almost that long, and made way for the coming of the Age of Mammals.

THE origin of giant sunflower pictures on southwestern rocks has been explained as a process of erosion by Walter B. Lang, of the U. S. Geological Survey. Mr. Lang solved the puzzle by chemical tests of a typical "sunflower" specimen in the Smithsonian Institution. The giant sunflowers range from about one to two feet in diameter, and are formed on hard sandstone rock. Showers tend to dissolve the binding cement and mineral salts in the sandstone, and in arid climate a small depression in the rock may soon grow into a deep pocket. Such a pocket resembles the disk of a giant sunflower. Rills of rainwater flow in troughs from the pocket outward, forming the rays or petals of the flower.

A NEW type fuel feed system which virtually "shifts gears" when the airplane's altitude changes or when the load on the engine becomes less or greater has been announced by United Air Lines. The twin-engine experimental transport of the company will test the equipment during the coming summer and, if it is found satisfactory, it will be adopted for the company's regular planes. While details of the device are kept secret because of its military value, it is said that the equipment virtually eliminates the conventional aircraft engine carburetor. Greater dependability and freedom from ice formation in the fuel intake systems are claimed for the equipment.