MEDICINE

Mental Depression Drug Helps Other Ailments

MANY DISORDERS closely identified with a patient's mental attitude appear to be helped by a drug originally aimed at the mentally depressed, it has been reported.

Angina, arthritis, asthmatic bronchitis and gastrointestinal distress were just a few of the diseases which Dr. Walter L. Evans of St. Clare's Hospital, New York, found responsive to doses of Nardil. His report appears in New York State Medical Journal, March 15.

Nardil, Dr. Evans reports, appears to enable the patient to channel usefully his capacity for positive aggressive action, diverting his energy outward rather than into psychosomatic channels. Certain people seem to have the capacity to channel conflict into some target area like the musculoskeletal system, with the result that the biochemical processes producing arthritis are thrown into gear.

Another individual, facing a similar situation, might develop a severe depression, while still another could develop asthmatic bronchitis or angina pectoris, he explains.

The drug also proved effective in treating cases of bursitis, neuritis, herniated spinal disk, relapsing pancreatitis, high blood pressure and fibrositis, or muscular rheumatism. Dr. Evans reports that after treatment, he rated 16 as excellent, six as good, while four showed only slight or no change. Nardil is a product of Warner-Chilcott Laboratories of Morris Plains, N.J.

Science News Letter, March 26, 1960

GEOLOGY

Hidden Water Traced By Bomb Fallout in Rain

RADIOACTIVE fallout from atom bomb tests can be used to seek out and "expose" new sources of drinking water that lie hidden deep in the earth.

This prospect was suggested by a special report prepared by the Atomic Energy Commission and the U.S. Geological Survey for the Senate Select Committee on National Water Resources, Sen. Robert S. Kerr (D-Okla.), chairman.

The report said research projects for developing such techniques are now under way in New Jersey, Wisconsin and New Mexico.

Raindrops have an affinity for absorbing minute particles of tritium from the fallout left in the atmosphere after nuclear bomb tests. Scientists seek ways to use these particles as "atomic dog tags" to identify underground water and find out how it percolates into the earth, where it goes and how fast it travels. This, they believe, may be done by taking samples from test wells at different places and depths from which water "tagged" with tritium can be identified with delicate instruments to learn its origin as rain or snow.

Then, by using harmless quantities of tritium to "tag" water entering the ground at later dates, they hope to be able to measure how fast the water tables are replenished and determine the extent to which they can be dependably put to use.

Much still remains to be learned about the precise location and extent of underground water resources, how they are formed and recharged, their travels, and what can be done to replenish them as they are diminished by use or natural causes.

Sen. Kerr pointed out that more ground water sources will be needed for national growth in many areas, in addition to full conservation of stream flows.

Science News Letter, March 26, 1960

TECHNOLOGY

Multifuel Diesel Engine Passes Army Tests

AN ENGINE designed to burn several different kinds of fuels has turned in a better performance at burning gasoline than a standard Army engine designed specifically to burn only gasoline.

In tests by the U. S. Army Transportation Corps, the multifuel diesel engine at its worst got five miles to the gallon when burning Army gasoline. The standard gasoline-burning engine in the Army's M-48 two-and-a-half-ton tractor got only 3.2 miles to the gallon.

Developed by Dr. J. S. Maurer of the Mann Company, Augsburg-Nuremburg, Germany, the multifuel diesel also performed economically on JP-4 fuel, kerosene, standard diesel and marine diesel fuels. Performance figures for these fuels, respectively, were 5.7, 5.5, 6.1 and 5.4 miles per gallon.

This means that an M-48 tractor equipped with the multifuel diesel engine could travel almost twice as far on a given amount of fuel as one powered by the regular gasoline engine. Furthermore, the tractor could be fueled with any of the five fuels that happened to be on hand.

Details of the study are carried in a report on the "Multifuel-Diesel-Engine Truck" by J. T. Gurganious and R. L. Berriker of the U. S. Army's Transportation Corps. The report was published by the Office of Technical Services, U. S. Department of Commerce, Washington, D. C.

Science News Letter, March 26, 1960

AERONAUTICS

Modified Truck Tests Tomorrow's Rotorcraft

A SPECIAL tractor truck for safe "flight" tests of rotorcraft and ducted fan aircraft has been developed for the army, the Cornell Aeronautical Laboratory in Buffalo, N.Y., has announced.

The aircraft, sometimes called tomorrow's jeeps, are placed on a tower on the truck. Then the truck is driven along at speeds up to 60 miles per hour.

Instruments measure the effect of the passing air. The laboratory developed the tractor truck because wind tunnels for full scale rotorcraft tests have not been readily available.

Science News Letter, March 26, 1960

IN SCIEN

CIVIL ENGINEERING

Strong Epoxy Plastics Repair Concrete Roads

REPAIRS in concrete California highways are being made with plastics so strong they hold even when the concrete itself breaks.

Bailey Tremper, supervising materials and research engineer for the California Division of Highways, told the American Concrete Institute's meeting in New York that epoxy resins form "strong, chemically resistant structures having remarkable adhesive properties." A recent product of chemistry, the resins have long, crosslinked molecules that provide great strength.

Mr. Tremper said his division, as far as is known, first discovered "that epoxy adhesives will form a strong, durable bond between fresh plastic concrete and old, hardened concrete."

In one application, holes are coated with resins and fresh concrete poured in. The repair thus made is strong and more economical than the resins used for the whole filling job.

California installations have proved the durability of the resins in areas of mild weather. Only recently have they been tried in locations where winter temperatures fall below zero. Mr. Tremper said he is "not prepared to state at this time that the typical formulation yields adequate flexibility for exposure to cold weather."

Science News Letter, March 26, 1960

MINING

Radiation May Be Used To Make "Better" Coal

THE POSSIBILITY that atomic radiation could be used to make better bituminous coal for some purposes has been raised by the Bureau of Mines.

Research conducted by the Bureau showed that irradiation (by neutron and gamma-ray bombardment) makes some bituminous coal harder. This might ultimately make possible production of stronger coke.

It is believed that radiation also disturbs the delicate electrical balance of certain bituminous coal molecules, predisposing the coal to react more readily with other materials.

If true, this could lead to improvements in processes for changing coal to liquid fuels and chemicals. But "considerable research will be required to confirm this possibility," the Bureau said.

The research, carried out at Government-owned atomic installations, showed that radiation left most varieties of coal "substantially unchanged." Analyses were made on irradiated samples representing all ranks of bituminous coal, including lignite.

Science News Letter, March 26, 1960

CE FIELDS

NUTRITION

Milk Tastes Better With Added Non-Fat Solids

MILK WILL TASTE better as the result of the addition of "solids not fat" (SNF). A test for such solids could become a basis for milk buying, replacing the traditional butterfat test.

Taste tests conducted at the University of Arizona and supported by the American Dairy Association are reported by D. H. Jacobsen, research director for the dairy association.

In milk with a 3.5% butterfat content, milk containing 9.5% SNF was preferred by 60% of those making the test, compared with 40% who preferred milk with 8.5% SNF, the amount found in "regular" milk.

In another test, 3.5% milk containing 8.5% SNF was preferred by 47%, while milk with only two percent butterfat but containing ten percent SNF was preferred by 53% of the persons trying it. The total solids were 12% in both cases, and therefore preference for high solids content does not necessarily mean fat content.

Work is still being done on perfecting a satisfactory test for SNF. One such test involves the use of plastic beads of different density, dropped in a milk sample. The richer the milk in solids, the fewer beads drop to the bottom.

Science News Letter, March 26, 1960

ZOOLOGY

Sex? Male-Female Relationship Chemical

WHY ARE FEMALE sex cells inclined to get together with only male sex cells of the same species?

Dr. John R. Shaver believes the relationship between male and female cells is chemical. A similar relationship, he thinks, may be the reason why other cells join together to form tissue.

The Michigan State University zoology professor and a graduate assistant, Charles A. Shivers, reported findings supporting this concept to the Midwestern Conference on Developmental Biology at Kenyon College, Gambier, Ohio.

Frog eggs of different species, they said, appear to vary in the chemical make-up of the jelly-like coating that surrounds each one.

This difference, they noted, may be the reason why only a sperm (male sex cell) of the same species clings to the coating and then works its way through the jelly-like substance until it reaches the egg proper. Sperm of a different species is rejected.

The coatings of different species of frog eggs appear to be formed of the same basic substances, polysaccharides and amino acids.

However, serological experiments indicate there is a difference. In these experiments, the scientists produced an antiserum to coatings from one species by injecting particles of them into rabbits.

They then treated frog eggs with this antiserum and found they became much less fertile than they were before.

Whatever it is in the coating that attracts sperm appears to react with antibodies to it and is used up. Therefore the attraction for the sperm no longer exists, reducing the possibility that a sperm will penetrate the coating.

Science News Letter, March 26, 1960

VETERINARY MEDICINE

Hog Cholera Virus Grown in Tissue Culture

HOG CHOLERA virus has been grown and maintained successfully for 16 months on cultures of swine cells.

After 13 transfers the virus is still strong enough that very small injections will produce the disease. This is the first step toward finding a simple laboratory method to detect and diagnose cases in live pigs.

Hog cholera costs United States owners $50,000,000 every year. Clinical diagnosis is difficult. Symptoms vary and are often similar to those for other swine diseases.

At present the only way to detect hog cholera is to inject a healthy pig with fluid from a diseased one, a time-consuming and expensive process.

Dr. D. P. Gustafson and the team of Purdue University veterinary scientists who developed the cultures believe that with more experience they will be able to diagnose the disease by a faster and cheaper method. Samples from diseased pigs will be grown on cultures of swine embryo lymph node cells or buffy coat (white blood) cells. If hog cholera virus is present, it will cause certain changes in the appearance of the culture cells.

The scientists also are trying to develop an immunization method and to find out how the disease is passed from one animal to another. They have discovered that the bacterium *Salmonella choleraesuis* makes it easier for hog cholera virus to penetrate the skin and pass through the intestine.

Science News Letter, March 26, 1960

PSYCHOLOGY

Blame Personality Traits For Many Auto Accidents

WHEN A DRIVER has an automobile accident, his personality characteristics are more likely to be responsible than inefficiency at the wheel. Dr. J. J. Conger, head of the division of clinical psychiatry at the University of Colorado Medical Center, Denver, Colo., found that the "average driver" is more accident prone when he is worried, angry, tense or even unusually elated. The old yardsticks, such as reaction time, depth perception, coordination and general intelligence, have little value in differentiating the safe from the unsafe driver, Dr. Conger said.

Science News Letter, March 26, 1960

ASTRONOMY

60-Inch Eye to Show Sun 34 Inches in Diameter

THE WORLD'S largest solar telescope will be located at Kitt Peak Observatory which was dedicated at Tucson, Ariz., March 15.

The solar telescope will have a 60-inch mirror with a focal length of 300 feet. The sun will be shown as an object 34 inches across. This image will be more than twice as large as that of any other existing solar telescope.

The observatory also plans to launch a 50-inch satellite telescope to orbit the earth at heights of 22,400 miles. This instrument will make observations on remote-control command from the earth and relay them back to earth.

The satellite telescope is a long-range project on which National Aeronautics and Space Administration scientists are cooperating in the planning and and design with the observatory and the National Science Foundation that supports it.

At the dedication of the observatory a 36-inch reflecting telescope of advanced design saw its first use. This instrument will be used primarily as a photoelectric telescope. Its ratio spectrometer will measure star brightness both in the long and short ranges of the spectrum and compare the two findings. This cancels out star twinkling and gives a more accurate picture of star brightness. The focal length of the instrument is 40.5 feet with a Cassegrain focus of f13.5.

An 84-inch reflector is to be installed in 1961 or 1962. The observatory will be open to all qualified U.S. astronomers.

Science News Letter, March 26, 1960

TECHNOLOGY

Making Cars May Be Sticky Business

TOMORROW'S automobile will probably be glued together.

Two adhesives experts told this to the Society of Automotive Engineers in Detroit. A. Farley Thomson and Albert F. Martin of the coatings and sealers division of Minnesota Mining & Manufacturing Company reported that structural adhesives can compete with welding and riveting for fastening light metals such as aluminum.

"The fact that joining with adhesives forms a seal as well as a bond should not be overlooked," Thomson and Martin's research paper said. "Think of the headaches which will be eliminated when it is no longer necessary to gunk up the drip rail and the trunk gutter with sealer. This can be extended to the cowl and floor seams."

Tests reported by the researchers showed adhesives outperformed spot welds and rivets in some situations. A major drawback of adhesives, however, is the extra time and new techniques required for their use, Mr. Thomson and Mr. Martin said.

But as lighter metals such as aluminum are used more and more, the researchers said, adhesives will grow in use.

Science News Letter, March 26, 1960