

MEDICINE

Bring on Attacks of Angina For Test of Treatment

Sedative Drugs Producing Unconsciousness Interfere With Rhythm of Brain Waves, Scientists are Told

CLIMBING up and down a two-step stoop, while a physician holds a stop-watch, until the exertion induces an attack of angina pectoris: This is the heroic-sounding method by which the effect of various medicines was tested on patients suffering from this dreaded form of heart disease.

Ratings of fifteen different medicines obtained from such tests and also by clinical observation were reported by Drs. Joseph E. F. Riseman and Morton G. Brown of Beth Israel Hospital, Boston, at the Kansas City meeting of the American Society for Clinical Investigation. The patients, it should be noted, did not suffer permanent harm from the test, but were promptly helped to quick recovery from the exertion-induced attacks. The test, besides giving an indication of the effect of medication on the disease, has also proved a help to diagnosis, occasionally enabling Dr. Riseman to rule out angina pectoris as the cause of symptoms from which the patient complained.

About one-third of the patients failed to benefit from any of the 15 different drugs used, Dr. Riseman reported. Nitroglycerine given prophylactically enabled about two-thirds of the patients to undertake about 100 per cent more exercise before an angina attack was induced. In several cases this medicine, taken in a dose of 1/500 grains every hour, rendered the patients free of attacks in daily life.

Study Heart Failure

Heart failure is "a great rarity" in pneumonia, apart from cases in which the patient already had an injured heart before the pneumonia attack. This discovery, which is important in connection with the treatment of pneumonia, was reported by Dr. Arthur M. Fishberg of New York City at the meeting. Researching with Dr. Fishberg were Drs. W. M. Hitzig, F. H. King and J. G. M. Bullowa of New York City.

The discovery was made by what might literally be called a "sweet test" for measuring how fast the blood flows in the human body. This test, devised by

Drs. Fishberg, Hitzig and King, consists in injecting saccharin into an arm vein of the patient to be tested and having him announce when he detects a sweet taste in the tongue.

"This measures the time it takes the blood to flow from the arm vein to the right side of the heart, through the lungs, and then to the tongue," Dr. Fishberg explained. "In health, this interval is between 9 and 16 seconds, while if the heart is weak the interval is as much as 60 seconds, depending on the severity of the heart failure. In the present investigation this procedure was applied to pneumonia, to see how often the heart fails in this common disease."

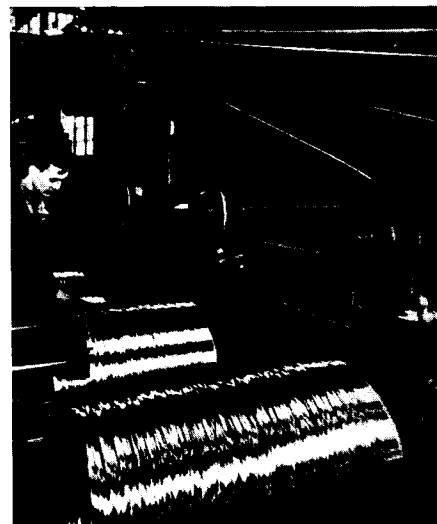
The much-dreaded edema (watery swelling) of the lungs in pneumonia is not due to heart failure, Dr. Fishberg and colleagues also found. Instead it is probably due to certain changes in the capillary blood vessels of the lungs.

Drugs Change Brain Waves

Drugs which interfere with consciousness produce "profound" changes in the electrical activity of the brain, Dr. W. G. Lennox and Dr. and Mrs. F. A. Gibbs of Harvard University Medical School reported.

A comparison with automobile spark plugs was used by Dr. Lennox in an informal explanation of these changes, which were found by means of apparatus which makes a continuous written record of the electrical currents taken simultaneously from four different regions of a person's head. These records, popularly called "brain waves," are known scientifically as electroencephalograms and are akin to the electrocardiogram which has aided greatly in the understanding of disorders of the heart. Electroencephalograms are expected in the same way to help unravel many knotty problems of nervous and mental diseases.

The Harvard investigators studied the effect of some 20 drugs on these brain currents. When sedative drugs of a type interfering with consciousness were given, the electrical rhythms became much slower and (Turn to page 312)



NEW LUSTER

The use of dies for polishing and densifying zinc-coated wire gives it a mirror-like finish under a new electrolytic process for producing a rust-resistant product.

METALLURGY

New Zinc Coatings for Wire Are Perfected

PRODUCTION of a new type of zinc-coated wire by an electrolytic process was started before a convocation of editors, metallurgists, and rural economics professors at the Cambria Plant of Bethlehem Steel Company, Johnstown, Pa. The occasion was the opening of the new unit for the bethanizing process.

The characteristics of this process, as compared with the customary method of dipping wire in molten zinc, include the production of zinc to a purity of 99.9975 per cent to increase its resistance to oxidation as well as its ductility; the use of a new pickling method for cleaning the steel wire core, using a fused salt such as sodium hydroxide; and the employment of a 40,000 ampere homopolar generator set, which is a complete breakaway from tradition.

Another new development is the use of dies for polishing and densifying the zinc coating which gives the wire a mirror-like chromium type finish.

The initial applications of bethanized wire are in farm fence, where it has advantages because of its highly polished appearance and resistance to rust. Developments are going forward, however, in adapting the product for telephone wire, window screening, spokes and other applications where the zinc wire has hitherto not been feasible.

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of much higher voltage, "big ocean swells replacing pool ripples."

"The alteration," Dr. Lennox explained, "probably means that various clusters of cells in the brain are discharging electricity simultaneously and not, as normally, in rapid sequence. An automobile whose six or eight spark plugs 'sparked' simultaneously would not run. Just so the most profound changes in the rhythm of the discharging centers of the brain were attended by unconsciousness.

"This method of graphic recording of electrical brain rhythms may be useful during operations as a means of informing the surgeon of the depth of the anaesthesia.

"The observations also reveal the manner in which anti-epileptic drugs prevent or break up the electrical rhythms associated with the unconsciousness of epileptic seizures."

Physicians Hurt Themselves

Deliberately inducing pain in themselves by injuring the skin with irritants and by injecting strong salt solution under the skin, two physicians of the University of Pennsylvania School of Medicine studied the effect of counter-irritants, such as heat and cold, commonly used to relieve pain. Results of the studies, made by Drs. George D. Gammon and Isaac Starr, were reported.

The other two counter-irritants used were electrical and mechanical agents. The effectiveness varied greatly in the two types of pain. Heat, for example, relieved pain from salt injection but increased that due to skin injury. Rhythmically applying and removing the counter-irritant for brief intervals relieved severe pain which constant application of heat or other counter-irritant could not relieve. Periodic electrical stimulation was found a convenient method for doing this. The net result of the counter-irritation, whatever the method of applying it, seemed to depend both on changes of tissue temperature and alteration in the blood supply.

The physicians were also able, by a special technique, to listen in on pain messages from nerves to the brain and spinal cord. These messages were obtained from sensory nerves of anesthetized animals. This method showed the changes in the nerves which occurred in response to counter-irritation and which informed the brain of changes in pain in the injured tissues.

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UNDISPUTED LEADER

The unicorn of scientific reality follows in the steps of his mythical forerunner in being a creature of calm assurance, unchallenged power and tolerant disposition.

ZOOLOGY

Unicorn No Longer Fabulous; Biologist Has Produced One

By DR. FRANK THONE

UNICORNS no longer belong wholly in the doubtful twilight of mythology, where dwell griffins, dragons, and such-like fabulous beasts. There is a live unicorn right here in the U. S. A. of this modern year 1936. Nor is he under the suspicion and ban of science; quite the contrary, science is responsible for his existence. (*Scientific Monthly*, May.)

The 1936 model unicorn was produced by Dr. W. Franklin Dove, biologist at the University of Maine, through a rather simple surgical operation on the head of a day-old bull calf. By transplanting both horn buds, or little knots of tissue that normally produce a pair of horns, to a close side-by-side position at the center of the calf's brow-ridge, Dr. Dove induced the growth of a single very massive horn, that has proved to be a most efficient weapon. Indeed, so much more successful has it been than the usual two horns that its proud possessor has undisputed domina-

tion over his companion cattle, and has developed much of the proud yet unaggressive bearing and disposition ascribed to the unicorn of fable.

The operation by which Dr. Dove's bull calf was enabled to become a unicorn was similar to some of the tissue transplantations used in plastic surgery on human beings, to remedy the disfiguring loss of a nose or other facial feature. When the horn buds were cut loose from the young animal's skull, a strip of skin and underlying flesh was left attached to each one, to carry the normal blood supply until the transplanted beginnings of horns could take hold on the spot where he planted them. Also, since the horn buds are circular, Dr. Dove cut their adjacent edges flat, so that he could set them close together, and so encourage the growth of a single horn mass.

The Maine unicorn is now about two and one-half years old, a splendid young animal of the Ayreshire breed. He is strong, fearless, well able to fight though seldom doing so. His biological