

MEDICINE

Instrument Tells Whether Crossed Eyes Can Be Fixed

A NEW instrument for telling in advance of treatment whether the eyes of a cross-eyed person can be straightened to work together as a seeing unit was announced by Dr. J. F. Neumueller, director of the American Optical Company's Bureau of Visual Science.

The instrument gives the diagnosis in one-half minute. The test with this instrument is based on the phenomenon of the after-image and on the fact that normal eyes can definitely locate objects in space. If the eyes and brain are unable to do this, as determined by the after-image test, Dr. Neumueller stated, normal visual functioning cannot be restored.

The after-image tester consists of a glass tube containing an electric wire. The current is switched on and as the wire glows the patient looks through one eye only at a red dot on the center of the tube. The tube is then turned from its horizontal position to a vertical position and the patient peers at the red spot through his other eye.

Then the light is turned off and the patient, both eyes now open, looks at a fairly bright wall. Soon he notices two dark lines, the negative after-images. If these two lines form a cross, his cross-eyes can be successfully treated. But if the two lines do not meet, chances of restoring binocular vision are remote.

Science News Letter, December 7, 1940

CHEMISTRY

Double Power Gasoline Possible When Knock Goes

WHEN science can produce gasoline entirely free from knock, double the power or mileage of present day gas will be possible. This was the promise made to members of the American Chemical Society by T. A. Boyd, of the General Motors Research Laboratories.

"From an altogether knock-free fuel, it would not be hard to get either double the power or nearly twice the mileage per gallon, but not both at once," he stated. "Such a fuel should make possible an engine of much smaller displacement than that of today. If with 100 octane number gasoline," (present day fuels have an octane number of about 70) "miles per gallon could be increased only by 50%, the saving to the car user would amount to one half of

the present retail value of fuel. So even if the present cost of manufacture of gasoline, about five cents a gallon, had to be doubled to make the 100-octane fuel, there would still remain a net saving in cost to the car user of 20%."

Mr. Boyd declared that the shortage of gasoline which was feared in 1914 as the use of motor vehicles rapidly mounted has been kept off by chemical research. Then there was about an 18% yield of gasoline from the crude oil; now it is about 45%, while 70% to 75% is possible in modern refineries.

Because drivers up to now have been demanding better acceleration and hill climbing ability, producers have been boosting the performance of gasoline, increasing it about 45% since 1927, but the improved economy, in terms of mileage, has been around 20%.

"Only incidental improvement in economy can be obtained when the primary objective is to boost power," he said. "It begins to appear that from now on the car users may prefer to take the benefits of further improvements in fuels and of advances in engineering in terms of more miles per gallon."

Science News Letter, December 7, 1940

ENGINEERING

Melted Salts Convey Heat In Oil Cracking Process

TRANSFER of heat by liquid is familiar to anyone who lives in a house with hot-water heating. The water is heated down in the cellar and piped to radiators where it gives up its heat to warm the room.

Many industrial processes make use of similar processes, but liquids other than water are often used, because they can be heated to a higher degree before they turn into steam. Therefore, a considerably greater amount of heat can be transferred.

A melted mixture of salts, especially the nitrates and nitrites of sodium and potassium, has been recently devised for the purpose by three du Pont chemists, W. E. Kirst, W. M. Nagle and J. B. Castner. This can be used for temperatures between 290 degrees and 1000 degrees Fahrenheit. Below this maximum, they state, the mixture is quite stable and can be used for years, but above 1,000 degrees there is a slow decomposition.

The first extensive use of the new compound, which is known as HTS, is in the Houdry catalytic cracking process, for oil refining.

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IN SCIEN

PHYSIOLOGY

Heparin Different in Different Animal Species

HEPARIN, a chemical formed in the body that keeps blood from clotting in the veins and which therefore is proving a useful and life-saving remedy in many conditions, is different in different species of animals, Dr. L. B. Jaques, of the University of Toronto, reports. (*Science*, Nov. 22.)

Heparin from dogs, for example, is about two and one-half times as powerful an anti-blood-clotting agent as heparin from cattle, and 10 times as potent as that from sheep, Dr. Jaques and an associate found. The amount of sulfur in this chemical is also different in different animals.

The same kinds of crystals, in rosettes and sheaves, however, are formed by the barium salts of all the heparins. This, Dr. Jaques points out, is a rare finding for substances having such different activity.

Science News Letter, December 7, 1940

AGRICULTURE

Harvest of Wild Grass Seed Provides New Cash Crop

COOPERATIVE efforts of farmers and the U. S. government to heal the wounded dusty plains of the West have resulted in the creation of a new cash crop.

This consists of the seeds of the native grasses which grew wild and thick in the old days, bound the soil together and protected the prairie from the ravages of dust storms—such grasses as gramma and buffalo, blue-stem, galleta, Indian wild rye, western wheat, and many others.

More than 100,000 pounds have been collected this fall in eastern Colorado, northern Texas, the Oklahoma panhandle, and in western Kansas. Everything has been used, from grain combines to hand-threshing, where the grass is not adapted to machine methods. The Soil Conservation Service has purchased more than 60,000 pounds of wild grass seed, and farmers and ranchmen have bought heavily.

Science News Letter, December 7, 1940

CE FIELDS

MEDICINE

Pussy Gets Pellagra; Cure is Nicotinic Acid

PUSSY, or her brother Tom, can get Dixie's hard-times disease, pellagra, from a poor diet just like the rest of the family. Nicotinic acid, the cure and preventive of the ailment for humans and dogs, will also cure or prevent the disease in cats.

Discovery that cats require this B vitamin, nicotinic acid, for health is announced by Dr. M. K. Heath, Dr. J. W. MacQueen, and Dr. Tom D. Spies, of the University of Cincinnati, the University of Alabama and Hillman Hospital, Birmingham, Ala. (*Science*, Nov. 28.)

Cats' need for this vitamin, and pellagra in cats, have apparently never before been reported, although scientists have found that pigs and monkeys, as well as dogs and humans, need the vitamin.

Science News Letter, December 7, 1940

CHEMISTRY

Invisible Light for Analysis Of Chemical Solutions

A METHOD of analysis employing fingerprints of molecules, which is so delicate that it can detect an impurity of a thousandth of one percent in a few drops of chemical solution, was described to the American Chemical Society by Norman Wright, of the Dow Chemical Company, Midland, Mich. Furthermore, even those few drops can be returned unchanged after the test, for it consists merely in passing beams of invisible infra-red light through them.

The method, known as infra-red spectroscopy, depends on the fact that highly complex molecules of organic chemicals, that is, those containing carbon, produce characteristic "fingerprints" or patterns when the infra-red rays are spread out into a spectrum. Glass cannot be used to do this, because it is opaque to the rays. A two-pound prism of rock salt, however, separates the radiation into its various wavelengths.

If our eyes could see infra-red rays, we should view a spectrum, crossed by dark lines where certain wavelengths are ab-

sorbed by the molecules. Since the rays are invisible, and unable to affect even a photographic plate, they are detected with a thermopile, which measures their heating effect. This can detect a rise in temperature as small as a hundred-millionth of a degree.

The analysis method consists in plotting the pattern made by the absorption bands, and comparing this with the pattern for known organic substances. When the two match, just as when two fingerprints match, it is known that the same individual produced them.

Science News Letter, December 7, 1940

PALEONTOLOGY

Pre-Ice-Age Elephant Discovered In Siberia

THE SKELETON of a young elephant that lived in Siberia shortly before the pleistocene Ice Age has been unearthed near the town of Novosibirsk, according to word received by Dr. Ales Hrdlicka of the U. S. National Museum. Skeletal remains of mammoths belonging to the Ice Age itself are found quite abundantly in northern lands; but the new specimen is of an earlier type of elephant with straighter tusks, that rates as a great rarity. No entire skeleton of this species has ever been found in the USSR before.

The height of the skeleton is nearly nine feet, and the one tusk with it is five feet long. The bones are recognizable as those of a young animal because they are not hardened throughout but consist partly of cartilage.

Dr. Hrdlicka has forwarded to *Science*, the description he received from Novosibirsk.

Science News Letter, December 7, 1940

OCEANOGRAPHY

Bathysphere Being Built For Ocean Depths Study

A BATHYSHERE is now under construction in Leningrad, a TASS dispatch received in the United States indicates. It is to be used for scientific study in oceanic depths.

Unlike previously constructed devices of its kind, the new Russian bathysphere will not require a ship to let it down and haul it up on a cable, the Soviet news agency states. The diving globe is expected to descend to depths of more than a mile and a half and to come to the surface again under its own power, controlled by its crew of two men. It is claimed that it will be able to remain submerged for ten or fifteen hours.

Science News Letter, December 7, 1940

CHEMISTRY

New Paint Kills Germs Long After Application

A PAINT that will kill the germ of typhoid fever nine weeks after the wall was painted, and still has some killing power after six years, was described by S. S. Epstein and F. D. Snell, of Foster D. Snell, Inc., Brooklyn, N. Y.

The paint was made with oils to which chlorine or iodine were added. Such paint also prevented the growth of mold and yeast, an important factor in damp atmospheres such as that of breweries, it was stated.

"Laboratory results were confirmed by practical determination that the bacteria or molds on the paints containing chlorine or iodine when used in hospitals or breweries were markedly reduced or nearly eliminated," it was reported. "Such a paint represents a step forward but is far from the ideal which may be reached or at least approximated sometime in the future."

Science News Letter, December 7, 1940

FORESTRY

Parachute Fire Fighters Found Most Economical

PARACHUTE-JUMPING forest fire fighters can save the government a good deal of money, it appears from experiences in the West, reported to the U. S. Forest Service.

The Forest Service keeps close track of the cost of suppressing forest fires. In 1934, a fire in the Nezperce National Forest in northern Idaho cost \$12,000 to put out, when fire-fighting crews moved in by truck and on foot. During the fire season just closed, another fire occurred in the same area. This time two parachute jumpers formed the spearhead of the attack, and the cost was held down to \$500.

Another comparison was made even more directly, when ten fires were reported in one day, on the Bitterroot National Forest in Montana. Two of them, in inaccessible areas, looked as though they might become bad ones, so planes flew over and dropped crews of "smoke jumpers," with tools and provisions. The other eight were attacked in the orthodox manner, by crews going on foot from roadheads.

It cost only \$160 apiece to suppress the fires attacked by the parachutists. The ones put out by ground crews alone cost from \$2,000 to \$17,000 apiece.

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