OPHTHALMOLOGY

Radioactive Chemical Treats Eye Tumors

➤ A RADIOACTIVE chemical from the atomic pile is now being used instead of radium or the related radon for treatment of certain eye conditions, three Cleveland, Ohio, scientists announced at the meeting of the American Roentgen Ray Society in Cincinnati, Ohio. The scientists are Dr. Hymer L. Friedell, Dr. Charles I. Thomas and Jack S. Krohmer.

The chemical, radioactive strontium, is put into a lucite capsule which completely encloses it and this capsule is then deposited in an aluminum applicator. This is used in direct contact in treatment of such eye ailments as superficial tumors, or growths, corneal ulcers and the inflammatory condition, conjunctivitis.

It is the beta rays from the radioactive strontium that are effective in treating these conditions, the Cleveland group explained. Their short range is particularly useful because deeper tissues such as the eye lens are not reached and therefore not damaged.

Radium and radon emit beta rays but they also emit the more deeply penetrating gamma rays which must constantly be guarded against in treatment of eye conditions. The lack of gamma rays constitutes one advantage of the radioactive strontium.

Science News Letter, October 22, 1949

DENDROLOGY

Revival of Chestnut Is Now Possible

➤ A REVIVAL of home-grown chestnuts may soon restore the all-American quality of Thanksgiving that it lost when the native tree was wiped out by the chestnut blight. The traditional roast turkey, now stuffed with Italian or Spanish chestnuts, may once more bulge with domestic ingredients.

This will be possible because three new chestnut varieties have been developed which produce a great quantity of large sweet nuts. The new nuts are larger, sweeter and less grainy than those now seen at the market. U. S. Department of Agriculture scientists who developed the trees say they are highly productive and, even more important, resistant to chestnut blight.

Graft trees of the new varieties, which are called Naking, Meiling, and Kuling, are now available through tree nurseries. If they live up to expectations, they will make us independent of foreign sources. The trees reach such high yields, over 100 pounds per tree, more than a ton per acre, that government experts foresee their widespread use as an orchard crop. They advise growers, however, to start out small, because the public will have to develop a taste for the nuts before they can be marketed in any quantity. They point out that it has been some years since chestnuts were a commonplace household item.

The new trees, developed under the direction of Dr. H. L. Crane of the Beltsville, Md., Research Center, are the culmination of nearly 40 years of research. In 1915 and earlier, chestnut trees were imported from China in order to develop a high nut-producing variety. The American chestnut was primarily a timber tree. Its nut production was relatively small and was considered of secondary importance.

The only result of these early experiments was to introduce the chestnut blight. The blight is native to the Orient and oriental trees had developed a resistance to it. The blight was unknown in the United States before then. It spread with remarkable rapidity throughout the stands of American chestnut and wiped them out.

The new trees, the best of some 400 types tested, flourish in the southeastern United States where trial plantings have been made. Dr. John W. McKay is conducting further tests at Beltsville to determine their suitability to northern and central states.

Science News Letter, October 22, 1949

ENGINEERING

Molten Zirconium Provides Very Brilliant Light

➤ A POOL of molten zirconium at a temperature of near 6,500 degrees Fahrenheit provides the light in a new lamp which has a brilliancy one-eighth that of the sun, it was revealed at the meeting of the Society of Motion Picture Engineers in Hollywood, Calif., by W. D. Buckingham of the Western Union Telegraph Company.

The particular applications for which this new light is suitable are in the fields of projection, television, photography, lithography and photo-copying. It will also have wide medical and scientific uses, and will be of especial importance in color photography.

It was described as a high-power, high-intensity electric arc light whose luminescent source is two-tenths of an inch in diameter. It operates in the open air and not in a glass bulb. It is said to be extremely stable in operation, producing a uniformly bright, sharply defined circular spot of white light of dazzling brightness. In a 1000-watt lamp, operating at 55 volts and 18 amperes alternating current, the light has 20 times the brightness of the ordinary tungsten filament lamp.

In spite of operating in the open air and at this extremely high temperature, the lamp can be made to have a life of several hundred hours, Mr. Buckingham explained. This is due to a unique operating principle whereby the zirconium metal is constantly renewed and reproduced from its own products of combustion. The electrodes are small and can be easily replaced. The new lamps may operate on either alternating or direct current.

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IN SCIENC

MEDICINE

Folic Acid Is More Deadly to the Female

➤ A CHEMICAL that is more deadly to the female than to the male has been discovered. The chemical is one of the newer vitamins, folic acid, or pteroylglutamic acid as it is called in chemical circles.

"Male mice easily tolerate amounts of this material lethal to every female injected," Drs. Alfred Taylor and Nell Carmichael of the University of Texas and the Clayton Foundation, Austin, Tex., reported to the Society for Experimental Biology and Medicine.

It was large doses, not the ordinary sized ones, that showed this sex selective lethal action.

"Why the female should be so much more susceptible than the male to high dosage of folic acid has not been determined," the scientists stated.

"So far as could be discovered, no other compound has ever been reported which manifests such a sex difference in its pharmacology (drug action)."

Smaller doses, which did not kill the females, nevertheless affected them more than the males. They averaged a 10% loss in body weight, followed by slow recovery, after a single injection of a dose that only slowed slightly but did not stop continued weight gains in young males.

More than 400 pure bred mice were used in the experiments.

Science News Letter, October 22, 1949

ENTOMOLOGY

New Automatic Sprays Banish Pests from Planes

➤ DANGEROUS, disease-carrying insects and agricultural pests on overseas transport planes can now be banished automatically by a flick of the pilot's finger.

The insecticide spray system, developed by the Navy in cooperation with the U. S. Public Health Service and the Department of Agriculture, will prevent undetected insects, such as the Hawaiian fruit fly or the oriental peach moth, from being flown into the United States.

Interiors of planes so equipped are sprayed before passengers are allowed aboard. After the passengers are seated, the pilot then gives the plane another, lighter dose sufficient to kill insects that might have flown into the plane during loading.

Use of the automatic system eliminates any possibility of missing certain recesses of the plane, such as the wheel wells, as might happen when spraying is done by hand.

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E FIELDS

OPTICS

Supermicroscope Uses Mirrors Instead of Lenses

➤ SUPERMICROSCOPES that use mirrors instead of lenses to peer into the chemistry of cancer and other living tissues will soon be available to American scientists who have heretofore known them only through reports from English and Dutch scientists.

Because these new microscopes use mirrors instead of lenses, scientists can use them with both visible light to see the cancer or other tissues and with the invisible light of infra-red rays to identify chemical compounds in the material being seen through the microscope. They may also be used with ultraviolet light.

Reflecting microscopes developed abroad use aspherical mirrors which must be polished and corrected by hand, a costly and time-consuming process. Now a new system, using spherical mirrors which can be made by standard machine methods, has been developed by Arthur J. Kavanagh, research physicist at the American Optical Company's Stamford, Conn., research laboratory.

Plans to manufacture the new optical parts for use on any standard microscope stand are now being made at the company's instrument division in Buffalo, N. Y., Alva H. Bennett, director of the company's research laboratories, announced at the meeting of the Electron Microscope Society of America in Washington, D. C.

Scientists at the U. S. Bureau of Standards where the meeting was held were also informed that another manufacturer of optical equipment, Bausch and Lomb, has developed a reflecting type objective for use in ultraviolet light.

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PSYCHOLOGY

One-Arm Driver Has Unsteady Hand on Wheel

➤ THE one-arm driver does not have even one steady hand on the wheel, even if the other arm is not around a girl.

This is indicated by experiments conducted by Dr. Austin S. Edwards, of the University of Georgia, who tested the effect of this and other distractions on the involuntary movements in the arm and hand.

Using a mock-up auto steering wheel attached to scientific instruments that would measure unsteadiness in the arm and hand, Dr. Edwards found that if the individual keeps his attention fixed, looking steadily at a point about six feet in front of him, bright headlights flashed in his eyes or auto horn blasts sounded near him do not disturb him enough to make an appreciable change in the steadiness of his hands.

But if someone distracts the "driver's" attention to hand him a pencil, it disturbs him so that the involuntary movement in his hand goes up 4.46 times if it is a man, 4.91 times if it is a woman (the driver, that is.)

Asking him to look out the window increased the involuntary movement as much as 65%. Distracting his attention to look out the window when he had only one hand on the wheel was even more disturbing, causing a 304% increase in the trembling.

The psychologist does not report whether he measured the disturbance caused when the driver's arm is around the girl friend.

Dr. Edwards believes that his results are less than the disturbance of hand steadiness would be on the road.

"If so great increase of involuntary movement takes place in the relative quiet of the laboratory, how much is to be found under the disturbing conditions of actual automobile driving?" he asks.

Results of the study are reported in the JOURNAL OF APPLIED PSYCHOLOGY, published in Washington, D. C.

Science News Letter, October 22, 1949

DENTISTRY

Dentists May Soon Use New Metals

➤ USE of new metals for manufacture of false teeth, dental inlays and other dental material is foreseen by Dr. Joseph R. Lane of the Massachusetts Institute of Technology.

Tantalum, light weight metal which surgeons use to replace pieces of skull bone and in other ways, is one metal which Dr. Lane suggests might be useful also in dentistry.

Titanium, only recently available in quantity, a strong metal as corrosion-resistant as the stainless steels, is another which he thinks should be explored for possible dental uses.

The conventional gold and amalgam alloys now used in dentistry probably will be "steadily, though slowly, improved," he predicts in a report to the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (Oct.).

"With the alloys now at hand it would be entirely possible to produce dentures of considerably improved properties," he declares.

If dentists demanded stronger, more ductible dentures with more consistent and reproducible properties, they could, he says, be produced "with the knowledge now at hand and without a prohibitive increase in cost."

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PALEONTOLOGY

Bones of Birds Which Could Swim Are Found

➤ A JIG-SAW puzzle of fossil bird bones has been put together by Dr. Loye Holmes Miller, professor of zoology, emeritus, at the University of California at Los Angeles, to reveal the existence of a small, penguin-like bird that existed in southern California more than 3,000,000 years ago.

At that time most of the city of Los Angeles was under water and the flightless fowl, called Mancalla, paddled around with flippers which, in previous ages, might have been wings.

First evidence of the bird's existence was discovered 50 years ago when a single bone was dug up during the excavation for the Third Street tunnel in downtown Los Angeles.

Since then a number of fossil remains have been unearthed at various places in southern California. Sufficient remains now exist to furnish a rather accurate picture of the Mancalla, states the U. C. L. A. scientist.

The bird is biologically significant, he points out, because it is a good example of the way nature adapts her creatures to the situation at hand, in this case, for aquatics rather than flight.

Why did the Mancalla, members of the auk family, become extinct? At present the reason is not known, says Dr. Miller. Far to the south, birds of similar qualities, members of the albatross tribe, managed to survive. We know them as penguins.

Science News Letter, October 22, 1949

RADIO

Unstable Radio Reception Broadcasts To Begin

➤ UNSTABLE radio reception conditions, as well as normal and disturbed conditions, will be broadcast by the National Bureau of Standards in Washington, D. C., starting Nov. 1.

Station WWV, the Bureau's radio station that tells of the conditions in the atmosphere at 19 and 49 minutes past each hour, is adding this new service to warn operators that unstable conditions exist.

Previously only two radio reception conditions have been broadcast, the letter "N" in International Morse Code indicating normal conditions and the letter "W" warning that disturbed conditions are present or expected within 12 hours. Station WWV also broadcasts the standard musical pitch, time announcements and standard radio frequencies.

Unstable radio reception often occurs as major disturbances subside. Mobile services such as airplanes on transatlantic flights particularly and shortwave broadcasts experience difficulty at that time.

Science News Letter, October 22, 1949