

MEDICINE

Radioactive Gas Tracer Aids "Shunt" Detection

► A RADIOACTIVE GAS tracer can detect blood leakage, or holes between the heart chambers, Dr. Robert B. Case and his associates at St. Luke's Hospital, New York, report. They used ethyl iodide tagged with radioactive iodine which the patient inhaled.

The patient breathes the gas for 15 seconds after which it is absorbed by the blood and travels to the left side of the heart. If there is a hole between the chambers of the heart, a quantity of the tracer blood shunts across to the right side of the heart where samples are rapidly drawn off.

This tagged blood, from the right chamber, is then compared with blood taken simultaneously from a leg artery. The amount of radioactive tracer found in the blood from the right chamber determines the amount of leakage, and thus the size of the defect.

Shunts, the physician's name for leakages within the heart, had previously been detected by having the patient breathe a mixture of the gas nitrous oxide and tracing its course through the circulatory system.

Another method employs a harmless blue dye injection into the blood stream while the standard method is to introduce a thin tube through an arm vein into the right heart chambers and draw off blood samples directly.

The advantage of the radioactive tracer lies in the fact that the size as well as the defect itself can be determined before surgery by comparing the count of the two blood samples.

The methods previously used were "hit and miss" or, if the defect was detected, unable to determine the size.

Science News Letter, March 1, 1958

GERIATRICS

Aged's Mental Health Better in Own "Home"

► OLD PEOPLE have better mental health, are more socially alert, less concerned with thoughts of death and less seclusive if they live in their own private apartments than if they are housed in the traditional old people's home.

This was found when residents of the two kinds of housing were interviewed and tested with personality and intelligence tests. The research is reported in the *Journal of the American Geriatrics Society* (Jan.) by Dr. Samuel D. Shrut of New York.

Both groups of old people were maintained by the Home for Aged and Infirm Hebrews of New York. One group lived in the traditionally institutional Central House where many of the residents live in nurse-supervised ward accommodations and where daily activities, including recreation, are supervised and where the residents may go out only on "pass."

The other group lived in an apartment house where each individual or couple oc-

cupies his or her own closed-door private rooms. All residents are free to come and go as they wish. They keep their own apartments in good order and furnished to suit their own taste. They, however, dine together in pleasant dining rooms with small tables for four diners each. They may also enjoy lounges for television, cards or movies or parties.

There is a need, Dr. Shrut stresses, for de-emphasis of mass-dwelling arrangements for aged persons. There should be provision of small unsegregated cottages and small apartments with the features the residents have been used to such as shopping areas, theaters, and other centers.

Institutional residences should not be considered as terminal residences. Old persons should be allowed to elect to leave them for as long as desired without forfeiting privileges of resumed residency.

Health and other services should be provided for the elderly without the necessity of their entering an old people's home. Research should be done on providing home care for the aged parallel to the similar foster care of children.

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PSYCHIATRY

Psychopaths Have Wonderful Memories

► PSYCHOPATHS have wonderful memories.

Scientific evidence that this group can remember longer and better than more normal individuals is reported in the *Journal of Personality* (Dec. 1957). The evidence was obtained in experiments conducted by Dr. Lewis J. Sherman of the Veterans Administration Hospital, Brockton, Mass., when he was with the University of Illinois.

The results confirm the impression of clinicians who report psychopaths are "able to relate early experiences endlessly during therapy sessions."

The psychopaths tested in Dr. Sherman's experiments were picked from among the criminals in the Illinois State Penitentiary at Joliet. They are the "tough guys," "trouble makers" and "bugs" who continually violate prison regulations, spend long periods in solitary confinement and, the warden said, "are the men most difficult to manage."

They were given memory tests on both meaningful material and nonsense syllables and their achievement was compared with that of other prisoners not considered psychopaths and with neurotic patients at the VA Hospital in Danville, Ill.

The tests showed the psychopaths forgot significantly less than either the normal prisoners or the neurotics. The neurotics forgot more than the normals, but there was not too much difference between these two groups.

Dr. Sherman explains the excellent memories of the psychopaths as due to the fact that they have little if any anxiety. Anxiety seems to interfere with the retention of learned material.

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IN SCIEN

TECHNOLOGY

Tiny X-Ray Unit Spots Flaws in Rocket Fuels

► A TECHNIQUE for locating potentially disastrous flaws in cast charges of solid rocket fuels has been developed by engineers who use a small "extension arm" of huge X-ray generators to photograph the fuel from inside out.

Until now inspection of cast solid fuels has been a difficult, costly process involving wrapping X-ray film around the cylinder of fuel and passing X-rays completely through the fuel. The X-ray intensity was greatly reduced by passing through the entire fuel thickness.

The new technique involves transmitting high voltages from a large Van de Graaff X-ray generator to a small electron tube inserted in the "burning hole" running through the center of the fuel charge. Because the X-rays start at the center of the charge and pass through only half the fuel thickness, penetration requirements can be cut by 50%, and clearer pictures result.

The technique was developed jointly by High Voltage Engineering Corporation, Burlington, Mass., Thiokol Chemical Corporation, Trenton, N. J., and Friez Instrument Division of the Bendix Aviation Corporation, Towson, Md.

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NATURAL RESOURCES

Detergent Helps Air Force Save Fish

► THE AIR FORCE is protecting fish and wildlife around its installations by scrubbing its airplanes with a detergent, similar to the familiar household product, instead of the kerosene-based cleaner that had been in use.

Besides reducing stream pollution, the Air Force is saving money and also getting a better scrubbing job.

It takes about 5,000 gallons of water to bathe the half acre of exposed surface on a B-52 Stratofortress, and it must be washed about once a month.

Until recently a kerosene-based solvent was used. However, the used cleanser running from airport drains was a potential threat to fish and wildlife living in or drinking from nearby streams. Until development of the new cleanser, the only solution to the problem appeared to be installation of costly solvent-recovery systems.

The new detergent, harmless to fish and wildlife, consists of alkaline phosphates, silicates and wetting agents similar to those in most household detergents, the Air Research and Development Command, Baltimore, Md., announced.

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CE FIELDS

MEDICINE

Salivary Tumors Show In Blood Type 'A' Persons

► PERSONS with blood type "A" may be more susceptible to tumors of the salivary tissues than other blood types.

Evidence that indicates this susceptibility turned up in a study made by Dr. J. Malcolm Cameron of the University Department of Orthopedics, Western Infirmary in Glasgow, Scotland, and reported in the British medical journal *The Lancet* (Feb. 1).

Of 341 patients with tumors of salivary tissue, 206 or 60.4% were in group "A".

These findings, Dr. Cameron says, provide convincing statistical evidence of an unusually high incidence of blood group "A" in this series of patients with salivary tumors.

"This is all the more striking because in Scotland group "A" is found in a smaller proportion of the population than in England," he points out.

Dr. Cameron notes that recent investigations into the relationship between disease and "A-B-O" blood groups indicate that these groups are associated with susceptibility to some disorders and relative immunity to others.

Other scientists have shown statistically, for example, that the incidence of group "A" has also been found to be unduly high in patients with pernicious anemia, stomach cancer, and broncho-pneumonia in infancy.

Group "O," on the other hand, occurs with excessive frequency in persons with peptic ulcerations.

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GERIATRICS

Find Indicator to Causes Underlying Aging

► A POSSIBLE clue to part of the aging process and a lead to a way to keep bones young throughout life has been found.

The research, performed on rats by Dr. E. A. Tonna and his associates at the Hospital for Special Surgery, New York, N. Y., shows a chemical parallelism between respiratory enzyme activity and bone aging processes. As a person grows older the enzymes slow down in their activity.

From their studies, the New York research team has drawn this picture of the aging process as it relates to enzymes and bones:

There is a steady state of respiratory enzyme activity in the periosteum surrounding bone from birth to adolescence. After sexual maturity, however, there is a drastic reduction in the activity of the enzymes. This slow-down cuts the amount of energy available to the cells which is essential for their work, such as for the repair of damaged bone and for growth. This inability

of the bone to stay young is somehow directly or indirectly related to enzyme activity.

"What we have seen in our studies," Dr. Tonna told SCIENCE SERVICE, "is a reflection or mirror-image of something else happening somewhere farther back in the chain of events that contribute to the aging process of the periosteum.

"If we can discover this 'something else' and tell why and how it affects the bone later on, we might be able to reverse the process. This is our hope."

It has also been noted in the studies that as an animal ages there is a loss in the ability to re-activate the site of bone repair. It never reaches the level noticed in young animals, and shows up as a progressive loss.

Dr. Tonna was extremely cautious in pointing out that these are preliminary findings and more research into the nature of enzymatic effects on aging will have to be studied.

"But," he stressed, "the finding is a valuable indicator to the underlying causes behind aging."

Dr. Tonna reports the findings in *Nature* (Feb. 15).

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ICHTHYOLOGY

Tuna Larvae Discovered Off Washington Coast

► TUNA LARVAE, fish in the early stages of development, have been taken off the Washington coast for the first time. The species of tuna is not yet known, Dr. Richard H. Fleming, executive officer of the department of oceanography at the University of Washington, Seattle, reported.

Tuna larvae were found among the more than 5,000 fish taken on the return cruise from the Aleutians and the Bering Sea by the "Brown Bear," research vessel of the oceanography department. Research instructor William I. Aron at the University supervised the studies.

The cruise was part of the oceanography studies for the International Geophysical Year.

Ten specimens of the tuna larvae, some 10 to 15 millimeters in length, were taken in water with a temperature of 55 degrees to 60 degrees Fahrenheit, 60 to 400 miles west of Cape Flattery.

The larvae have been sent to the Pacific Oceanic Fishery Investigations of the U. S. Fish and Wildlife Service in Honolulu, Hawaii, for identification.

The find may aid considerably in solving some tuna secrets, unknown facts that have many times left commercial fishermen and cannery operators in an expensive quandary. Some years the valuable, white-meated albacore tuna appear in very great numbers off the Oregon and Washington shores and some years not at all. "Why" is not known and the prized albacore has remained the "mystery fish" of the Pacific Ocean.

Areas of spawning for the albacore tuna are not known, nor have larvae or immature fish been found, nor is it known where the tuna go after their sometimes July to October appearance off the Oregon coast.

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PLANT PHYSIOLOGY

Effects of Gibberellin Vary With Plants

► GIBBERELIC acid, a growth promoting substance originally isolated from rice, may not always increase a plant's growth.

The chemical may cause an increase in growth, a decrease or, even, have no effect at all, Dr. L. G. Nickell of the phytochemistry laboratory at the Chas. Pfizer and Co., Inc., Biochemical Research and Development Division, in Brooklyn, N. Y., reports. Each of four different plants reacted differently when gibberellins were added to their food.

All the tests were made on cultures of plant tissue *in vitro*, or grown "in glass," not on normally growing, whole plants.

Using ten parts per million of gibberellin, Dr. Nickell found both growth stimulation and inhibition occurred. A greater increase took place in root growth of one plant, a member of the sweet clover family, than in tissue from its stem. Growth in sunflower and periwinkle was inhibited, while growth in the tobacco plant was stimulated.

Gibberellic acid's effect depends on the plant species, the part tested and the type of tissue, the scientist concludes. The report, part of the larger study now being prepared, appears in *Nature* (Feb. 15).

Dr. Nickell also concludes that, based on his exploratory study, "no generalities" can be drawn concerning the effects of gibberellins on plants. However, new studies in which the medium is varied along with the type of tissue tested and its source should be helpful in discovering what growth changes are caused by gibberellic acid.

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MEDICINE

Chemical Spray May Cause Gradual Poisoning

► PARATHION, a chemical spray used on apples, pears, grapes, hops and citrus fruits, it being investigated as a possible factor in causing poisoning among crop workers.

A study of a six-year-period of outbreaks among workers, reported in the *Journal of the American Medical Association* (Feb. 15) by Dr. Griffith E. Quinby of Wenatchee, Wash., and Allen B. Lemmon of Sacramento, Calif., suggests the possibility that the poisoning may be the result of exposure to residues left on plants after they have been sprayed with insecticides.

A striking difference between poisoning produced by direct contact and that of residue contact was that large numbers of workers were affected by residue contact compared to the few cases produced by direct contact with the insecticide.

The residue contact cases are considered milder, and the onset to be more gradual, than the direct contact type.

The study also demonstrated that of those crops examined all had foliage at least chest high, which may mean that workers are poisoned only when dusted or bathed in the dilute residues almost from head to foot.

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