

## ACOUSTICS

**Gunfire Deafens Ears Of Jet Plane Mechanics**

► GUNFIRE was considered to be the major cause of hearing loss among 1,200 jet plane mechanics and other aircraft maintenance men studied at Naval Air Station Cecil Field, Jacksonville, Fla.

Hearing tests were first made in hot weather during heavy flight operations and then a follow-up test was made in cold weather with little flying.

The men exposed to noise from both piston type engines and jet engines without afterburners showed more hearing loss than non-exposed men of the same age. But the difference became insignificant when it was taken into account that the maintenance men had also been exposed to more gunfire.

Aircraft noise produced temporary hearing losses that were flatter in frequency change than the shifts caused by gunfire and other impact noises.

The survey also turned up the interesting and as yet unexplained fact that the right ear was more sensitive to sound than the left ear. Tests showed that this was not because the left ear had been subjected to more noise than the right one. The difference seemed to be somehow related with the handedness of the individual, although no final conclusions about it could be drawn.

It was found that hearing generally improved between the two tests when protective helmets were worn by the personnel. In contrast to their attitude about ear plugs, which was almost always unfavorable, the men generally liked the helmets and wore them more frequently.

The study was made by Dr. W. Dixon Ward, Central Institute for the Deaf, St. Louis, Mo., and U. S. Naval School of Aviation Medicine, Pensacola, Fla. It is reported in *The Journal of the Acoustical Society of America* (Dec. 1957).

Dr. Ward is now with the Subcommittee on Noise in Industry, Los Angeles.

Science News Letter, February 1, 1958

## PHYSIOLOGY

**Built-in Alarm Clock Governs Worm Behavior**

► STUDIES of a worm may throw light on the internal rhythms of other animals, such as man's heartbeat, Dr. G. P. Wells, zoologist of the University of London, reported to the Smithsonian Institution, Washington.

The worm studied by Dr. Wells is the European lugworm. It is about the size of a fountain pen and makes its home on beaches of muddy sand. Its brain is very small and its nervous system is comparatively simple.

The lugworm lives a sheltered and simple life under the sand, alternately eating sand and digesting some of the organic content, then backing to the surface and ejecting the residue.

It feeds in little bursts, each lasting for a few minutes, with rests of a minute or so in between. It makes its backward trips to the

surface also at regular intervals, usually once every 40 minutes.

The alternate feeding and ejection, Dr. Wells found, despite their rhythm are not controlled by the biological need of the worm for food or for relief from its fullness. Put into a glass tube of sea water without any sand to eat, the worm continues with the little bursts of feeding movements and goes on making its backward trips, even though it is not burdened with sand to eject.

Its action seems to be controlled, Dr. Wells concludes, by a "physiological alarm clock." He has located the "alarm clock" in the esophagus of the worm. When the esophagus is removed and put in a dish of sea water, its complicated, automatic rhythm can be seen.

When the worm is intact, the activity of the esophagus can spread through the body and cause periodic feeding movements of the whole worm.

Dr. Wells found a similar inherent rhythm in the singing of some wild birds. The chaffinch is one such bird; it shoots off little song phrases at extremely regular intervals, often of about ten seconds. Even chaffinches that have been reared in isolation will sing at about the usual intervals.

Science News Letter, February 1, 1958

## MEDICINE

**New Drug Promises Protection Against TB**

► A DRUG that promises to protect man from developing tuberculosis instead of helping to cure the disease after it appears has been synthesized at the Irish Medical Research Council, Trinity College, Dublin, Ireland.

The drug, still known by the laboratory label B663, has been shown in experiments with animals to be more effective against the tubercle bacillus than any other anti-tuberculosis agent in present-day use, Dr. Vincent Barry, director of the Council, reported.

Current compounds control TB only when they are administered after the moment of infection. A remarkable thing about the new drug is that even when given to the experimental animal some time before inoculation with the germ takes place, it still exerts its full curative power.

A group of mice was given small amounts of the drug for some weeks and then injected with a lethal dose of virulent tubercle bacteria. A second group of mice which had not received any drugs were inoculated in the same way.

On the average, the untreated animals died in two weeks. All the treated mice were still alive four months later.

If this principle is applied to man, the new drug holds out the possibility of being able to protect persons susceptible to TB against exposure to the natural infection.

Compound B663 is a member of the phenazine family of dark red dyes, some of which are used in bacteriology to stain germs for examination under the microscope. It is completely non-toxic for the animals investigated.

Science News Letter, February 1, 1958



## SURGERY

**Surgical Thread Gets Atomic Sterilization**

► THE CATGUT used for surgical stitches is now being sterilized by atomic energy at Ethicon, Inc., Somerville, N. J., a division of Johnson and Johnson.

The atomic sterilization process which has been in the experimental stage for 10 years, has become a full-time commercial process.

The sutures are sterilized after they have been put in their sealed containers by bombarding them with high speed electrons.

Three major advantages for the process are the elimination of the danger of recontamination after sterilization; greater tensile strength in the suture than is found in heat-sterilized catgut; and 10 times the safety margin for the surgeon, Dr. Walton Van Winkle Jr., director of Ethicon research, said.

The electron beam process can be likened to surfboard riding. The electrons are generated by high voltage apparatus and are sent along a radar wave in a tube until they reach the traveling belt carrying trays of sutures.

The sterilization is accomplished as the electrons destroy all microorganisms in or on the catgut suture by altering the molecular structure of the bacteria without disturbing the structure of the suture itself.

Electrons are used because they do not produce any residual radiation, and no radioactive byproducts are formed in the process. The sterilization is done in a room lined with seven and a half feet of concrete.

Science News Letter, February 1, 1958

## FOOD TECHNOLOGY

**Antibiotics Preserve Fish Up to Two Weeks**

► FRESH FISH caught in the oceans may soon be plentiful in Midwestern markets as a result of the use of antibiotics for preservation up to two weeks without freezing.

The fish are given a dip in the antibiotic, Aureomycin, and then refrigerated. Commercial scale experiments have demonstrated that the fish remain fresh and marketable for as long as two weeks.

The experiments were performed by Dr. Lionel Farber and Peter Lerke at the University of California Medical Center, San Francisco.

Use of antibiotics to preserve fish for market must be approved by the Food and Drug Administration. FDA previously has found such a method acceptable for poultry preservation.

The antibiotic prolonged the freshness of fish whatever the conditions, but was best when sanitation and refrigeration were good and when treatment came early after the catch.

Science News Letter, February 1, 1958

# CE FIELDS

## MEDICINE

### X-Rays of Kidneys Can Raise Blood Pressure

► X-RADIATION of the kidneys can cause high blood pressure in humans, Drs. Clifford Wilson and J. M. Ledingham, The University of London, and M. Cohen, The London Hospital, London, England, have found.

They described two cases where heavy doses of X-rays were used to treat cancer patients. One of the patients was apparently cured by the X-rays but was re-hospitalized eight years later with a fatal case of high blood pressure and uremia. The other patient died 11 months after X-ray treatment.

From these two cases and a series of animal experiments, the researchers concluded that irradiation of the kidneys has two distinct and independent biological effects.

One is interstitial fibrosis, in which delicate kidney tissue is damaged and begins to scar, and the other is hypertension or high blood pressure.

"Both in man and in the rat these effects may develop together or separately," the scientists report in the British medical journal, *The Lancet* (Jan. 4).

The most important finding was that high blood pressure could be produced by irradiation of the kidney in the absence of kidney tissue changes. Later, the structural changes do occur, but they closely resemble the lesions found normally in many cases of high blood pressure, and so must be regarded as secondary to the hypertension.

An interval of several months after the irradiation and before the high blood pressure appears is a regular and striking phenomenon both in man and in the rat. The reason for the delay is not known, but it may be related to the regeneration time of vascular tissue and the selective effect of irradiation on immature cells, the scientists conclude.

Science News Letter, February 1, 1958

## ANTHROPOLOGY

### American Boys Get More Height Earlier Than Dads

► NOT ONLY are Harvard students of the present generation taller than their fathers, they are less fat and more muscular.

This is reported in *American Anthropologist* (Feb.) by Dr. Edward E. Hunt Jr. of Harvard University and Forsyth Dental Infirmary for Children.

The sons have broader necks, shoulders and waists than their fathers and these increases are about equal. But their hips are narrower, giving them a more "masculine" appearance.

When it was first observed young men

of today appear taller than their fathers were at the same age, scientists wondered whether their height was greater when fully grown or whether they merely got their growth at an earlier age.

Now it has been found that in England growth is earlier but there is no increase in final height. In the United States, although acceleration of growth has been striking, there is also an increase in final height.

Comparison of fathers with sons at Harvard and mothers with daughters at several eastern women's colleges shows no difference in the age at which final height is attained.

Evidence was found, Dr. Hunt reports, that the fathers underwent more frequent arrests of skeletal growth than did their sons.

Contrasted with the accelerated growth in the United States and England are the measurements obtained among the Micronesians of Yap. The people there have remained unchanged in height since the late 19th century and are characterized by a late attainment of adult stature.

Science News Letter, February 1, 1958

## SURGERY

### Use Artery of Heart To Repair Esophagus

► CANCER-RAVAGED throats can be repaired by using the large artery of the heart.

This promising new technique of restoring the esophagus was reported at the southern section of the American College of Surgeons meeting in Palm Springs, Calif., by Dr. Joel Pressman, professor of surgery at the University of California at Los Angeles.

The research has been supported by the U. S. Public Health Service.

The technique was developed during years of animal experimentation, the UCLA surgeon said. The operation has been performed successfully in two human cases.

The large artery, known as the aorta, is the main exit of blood from the heart. Supplies for surgical use can be obtained from a human artery bank where the artery is stored dehydrated in a sealed tube.

The aorta may be used as an intact tube to replace the entire section of the esophagus situated in the neck. Or a portion of it may be used to "patch" the cervical esophagus, depending on how much of the organ has been removed in cancer surgery.

Actually the aorta serves as a "form" around which the body's natural repair processes rebuild a new esophagus. The artery may remain in place for many months but is eventually absorbed and replaced by new tissue.

The elastic tissue of the large artery seems ideally suited to the body's repair processes, Dr. Pressman said. This is because it is absorbed much less slowly than other soft tissue. Portions of it can be identified for as long as two and one-half years. Other materials, such as polyethylene tubes, have been tried but have not proved suitable for repairing the esophagus.

Science News Letter, February 1, 1958

## PHYSIOLOGY

### Cats and "Hot" Mice Used to Study Drugs

► ADULT CATS and electrically "hot" mice are being used to study the effects of tranquilizers and similar drugs on conditioned behavior.

The cat-and-mouse test was developed by three Canadian scientists who first conditioned the cats against mice by an electric current applied whenever the mouse was attacked.

The test is done on a concrete floor with an automobile spark coil and battery supplying the current. The mouse is "wired" by a clip on the tail and when the cat attempts to pick up the mouse, the current is applied by the operator.

Before drug tests, the cat is taught to ignore the presence of a mouse with a few shocks. Some cats give up after only one such experience; the average cat takes three. After that, the avoidance behavior will last for several weeks without further conditioning.

But if certain tranquilizing-type drugs are given to the cats, they continue attacking the mice regardless of the shocks. The cat feels the shock, for the mouse is dropped, but it is picked up again and again.

How quickly the cats forget their learning about the charged mice is an indication of the strength of the tranquilizer.

The test has the advantage of requiring only a short training period and yet giving results that compare well with those from more involved procedures, the scientists report.

The cat-and-mouse test was developed by P. Sacra, W. B. Rice and J. D. McColl, Research Laboratories, Frank W. Horner Ltd., Montreal, Quebec, and is reported in the *Canadian Journal of Biochemistry and Physiology* (Dec. 1957).

Science News Letter, February 1, 1958

## TECHNOLOGY

### Wind Tunnel Will Test Nose Cone for Missiles

► A WIND TUNNEL that will reach the extreme speeds and temperatures needed to test nose cones for the Navy's Polaris missile is being built at Palo Alto, Calif.

In its speeds of 15,000 miles an hour and temperatures of 18,000 degrees Fahrenheit, more than 6,000 degrees hotter than the sun's surface, are reached momentarily. The tunnel, being built by Lockheed's Missile Systems division, uses shock waves to generate the high temperatures.

It is one of three similar wind tunnels, the other two being located at the U. S. Air Force Research and Development Command's engineering center at Tullahoma, Tenn.

A 20,000,000-kilowatt jolt of electricity will send a blast of air against a nose cone with the tremendous force and heat the cone would meet in hypersonic flight through the earth's atmosphere.

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