PHYSIOLOGY

"Frozen Twitch" Aids Heart Studies

➤ THE "FROZEN TWITCH" may help science to understand better what makes a heart beat or falter.

It is now being used in the new Cardiovascular Research Laboratory at the University of California at Los Angeles Medical School.

Director of the laboratory, which was made possible through the support of the Los Angeles County Heart Association, is Dr. Wilfried F. H. M. Mommaerts, one of the nation's outstanding heart investigators. His research is concerned with the chemistry of muscle action.

The "frozen twitch" technique involves two equal pieces of turtle muscle strung up in a special apparatus. One piece is stimulated electrically, causing it to twitch.

At the instant (.003 of a second) when the muscle twitches both bits of muscle are plunged into liquid propane. Thus one piece is frozen in the act of twitching and the other frozen at rest. The two specimens are then crushed and chemical contents compared.

Through such experiments Dr. Mommaerts hopes to establish more clearly the chemistry by which muscle obtains its energy.

"When this process is better understood," he says, "science will know more about how the heart beats and what happens when disease causes it to falter."

Science News Letter, July 13, 1957

ANTHROPOLOGY

Expedition to Study Lost Tribe of Bindaboo

➤ THREE MEN will leave soon to explore the land of the Bindaboo people, a lost tribe of aborigines that wanders in a desolate corner of central Australia.

The expedition will penetrate the little known desert around Lake Mackay, a country of shimmering salt lakes and sunken valleys.

It will be led by Dr. Donald F. Thompson, associate professor of anthropology at Melbourne University. William Hosmer, a herpetologist and technical assistant at Melbourne University, will assist Dr. Thompson. The third member of the party will be Walter McColl, who will service the three four-wheel drive vehicles and be in charge of supplies.

The party will make a three-month reconnaissance into the desert. Detailed research will then follow. Two years of planning and research preceded the expedition.

The expedition will try to contact the Bindaboo people who still live the nomadic life of the Stone Age. Their life is centered around secret waterholes and wells. The area around Lake Mackay, on the West Australian-Northern Territory border, is one of the most remote and inhospitable in Australia.

The explorer Col. Warburton traveled into the area with camels in 1870. Col. Warburton was forced to turn back after crossing the dry bed of Lake Mackay. On the way back he and his men had to eat their camels.

In the 1930's an aerial reconnaissance and another by camel team were made of the area, but little was learned.

In the last few years reports have come through on the "bush telegraph" of unique sunken and hidden valleys lying hundreds of feet below the dry level bed of remote Lake Mackay.

Science News Letter, July 13, 1957

PATHOLOGY

Skunks Carry Disease Resembling Meningitis

➤ THE SKUNK has now been added to the list of animals that may be carrying the often fatal disease of listeriosis.

Listeriosis infects certain animals and man and creates symptoms like those of meningitis and encephalitis. In sheep and cattle, it has sometimes been called "circling disease" because of the peculiar nervous behavior of stricken animals.

Dr. John W. Osebold of the School of Veterinary Medicine, University of California in Davis, Calif., and co-workers found the listeriosis organisms in a diseased skunk that had been captured in a sheep pasture. The skunk's strange behavior had attracted the attention of several sheep which stood around it in a circle.

Exactly how the disease spreads is not known. In man it has been associated with meningitis, infectious mononucleosis and meningoencephalitis. The possibility of preparing a vaccine against it is being studied, but there is no effective treatment now available, Dr. Osebold said.

Antibiotics are apparently not very effective in saving animals, although they are useful in treating human cases, he added.

Science News Letter, July 13, 1957

CHEMISTRY

Pearl Essence Made From Fish Scales

➤ IMITATION PEARLS owe their glamorous luster to the rather unglamorous fish scale—and to Japanese technical skill and ingenuity.

The "pearl essence" is prepared by treating the scales of certain species of fish with benzene. The scales and skin of these fish contain a thin deposit of the chemical, guanine. When extracted from the scales and other material, guanine breaks down into small glittering crystals.

Further chemical washes with alcohol, acetone, amyl acetate and celluloid complete the separation and purification process. The commercial pearl essence is prepared by combining the guanine crystals with lacquers or varnishes.

The U. S. Fish and Wildlife Service reports that production of the essence in the U. S. is being encouraged since new plastics in which a pearly luster is desired are being developed.

Science News Letter, July 13, 1957

IN SCIEN

FORESTRY

Instrument Measures Age and Growth of Trees

➤ THE AGE and annual growth of trees can now be automatically computed using a combination electronic computer-microscope invented by Swedish scientists.

A core of wood taken from the tree trunk is fed into the machine, which then both counts the number of concentric rings and measures the width between them.

With this information, experts can assess the results of forestry programs and more accurately forecast forest resources. In the past, reports UNESCO in describing the invention, such statistics were only obtained after long and painstaking research.

Details of the invention were given at the annual meeting of the Academy of Agricultural Sciences, Stockholm, Sweden.

Science News Letter, July 13, 1957

TECHNOLOGY

Glass-Toothed Saw Cuts Wood

➤ AN INGENIOUS HAND-MADE tool may provide a solution for an ancient scientific puzzle.

Scientists have long wondered how, without steel saws or axes, the Mayas, Aztecs and other pre-Columbian peoples could have cut wood in the vast quantities necessary for construction and lime burning.

Inspired by paintings of Aztec war clubs, Dr. J. Ogden Outwater, Jr. of the University of Vermont made a tool such as may have served these people for wood-cutting.

He made teeth of equal length from ordinary bottle glass. These he embedded in resin and then clamped firmly between two slats of wood.

He tested the resulting tool against a tree and also on a two-by-four pine board. With light pressure and a fairly swift motion, the home-made saw seemed almost as satisfactory as a modern commercial steel saw.

The ancients did not have available bottle glass as used by Dr. Outwater in making his saw, but they did have the natural volcanic glass, obsidian, he points out. In fact, the hoards of obsidian flakes found on prehistoric sites may well have been the teeth of such saws, their wooden parts long since decayed.

The glass-toothed saw, Dr. Outwater indicates, is a much more plausible tool than a stone axe. He tried out the stone axe and found it "a very sorry implement indeed; the wood does not get cut, it merely crushes and the fibers are just as tough as before."

A report of his experiment is in the quarterly journal, *American Antiquity*.

Science News Letter, July 13, 1957

CE FIELDS

BACTERIOLOGY

Coconut Water Speeds Growth of TB Germs

➤ THE WATER from coconuts speeds up the laboratory growth of tuberculosis germs, Drs. T. Ramakrishnan, M. Indira and M. Sirsi report in *Nature* (June 29).

When needed in large quantities for biological research the germs, technically known as *Mycobacterium tuberculosis*, are usually grown on the surface of a culture media that takes two to three weeks before they can be "harvested."

But with added coconut water, even when it is diluted 10,000 times, the 20 days normally required for maximum growth are reduced to 12. The coconut water by itself is useless, and works only when added to the standard culture material used.

After the surprising effects were noticed, the coconut water was thoroughly analyzed to discover what its growth-promoting factor was. It was found to be some type of polysaccharide, a combination of simple carbohydrates such as are found in starches and gums. Further purification of the compound still needs to be done, the scientists report.

The possibility that this faster growth might make the germs more deadly was studied in experimental tuberculosis in mice which were given doses of the specially grown bacteria.

But judging from the survival time of the mice and the extent of the lesions produced by the new bacteria, it appeared to be no more virulent than the normally grown kind.

Science News Letter, July 13, 1957

TECHNOLOGY

Tiny X-Ray Generators To Fight Malignancies

➤ MEDICAL SCIENCE has a new weapon to fight malignant growths—tiny X-ray generators that can be made into needles, capsules or sandwiches and implanted in the human body. The miniature X-ray machines promise to eliminate the bulky, complex and expensive X-ray apparatus now being used to bombard cancers.

The generators, some of which can be made to measure one-tenth of an inch in diameter and three-tenths of an inch long, are the invention of Dr. Leonard Reiffel, supervisor of the nuclear radiation section of the Armour Research Foundation, Chicago, Ill.

The new source of X-rays makes use of an effect that was long considered a nuisance to nuclear physicists. The effect is called Bremsstrahlung and is radiation generated when high energy beta particles (electrons) are slowed down in the region of target nuclei.

Although the theory of the effect has been known for years, Dr. Reiffel claims that no practical use of it has been made before he used it as a source of X-rays that are compact, efficient, safe and inexpensive.

With the X-ray source, Dr. Reiffel has made tiny X-ray generators that contain a beta-emitting source such as radioactive strontium-90 and a target. The target, he points out, is formed to have oppositely facing boundaries such as a plate having parallel boundary surfaces.

Dr. Reiffel received patent No. 2,797,333 and assigned the patent rights to the Armour Research Foundation, Chicago, Ill.

Science News Letter, July 13, 1957

Tranquilizer Acts As Heart Drug

➤ THE TRANQUILIZER chlorpromazine is giving exciting promise of being an anti-heart attack drug that can prevent the critical damage thought to be done by a blood clot.

The drug was successful in preventing experimentally caused myocardial infarcts, the heart damage suffered by President Eisenhower, Dr. Peter H. Bulle, department of pharmacology, Georgetown University, Washington, D. C., reports in *Science* (July 5).

Plans have already been made for studies of the drug's effects on human hearts, Dr. Bulle told SCIENCE SERVICE.

When blood cells disentegrate during clotting they release both serotonin and histamine into the heart muscle, and tests in isolated rabbit hearts have shown that these two agents cause extensive damage similar to that found in human hearts after an attack, he said.

The great majority of all autopsies on heart attack victims have never shown the presence of an actual blood clot, so the old theory of a mechanical obstruction in blood vessels cannot be upheld any longer. It appears that the damage may actually be caused by the release of serotonin and histamine.

The two tranquilizers, reserpine and chlorpromazine, already well-known in the mental health field, are also known to inhibit the action of serotonin and histamine, respectively.

They were washed through the rabbit hearts as possible preventives of serotonin-histamine damage.

Chlorpromazine was found to be the best of the anti-damage drugs and in low dosage was able to prevent the toxic effects of both serotonin and histamine. Reserpine was partially effective in higher doses but had the disadvantage of reducing coronary blood flow in the heart.

Whether or not the serotonin-histamine damage found in animal hearts is an exact parallel of what happens in a man's heart has yet to be determined, Dr. Bulle emphasized.

The first stage of the human studies will be to survey all persons who have received chlorpromazine for some time and determine whether the drug has lowered the incidence of infarcts among them.

Science News Letter, July 13, 1957

GENETICS

Cockroaches Used To Study Heredity

➤ SCIENTISTS have at last found a use for the pesky cockroach: make him "hot" with radioactivity and he becomes a useful tool in the quest for new knowledge about heredity and insecticides.

Drs. Anne Anderson and Max Dunn, biochemists at the University of California at Los Angeles, are using radioactive carbon to trace pathways of life chemistry in the cockroach.

In general they are seeking the ways in which these pathways differ in insects and higher animals, including humans.

The research has indicated the synthesis of nucleic acid constituents (genetic material) in cockroaches resembles that in humans much more than had been thought. This may throw new light on the chemistry of heredity.

The radioactive carbon techniques also may prove a valuable tool in the development and evaluation of new insecticides. When differences in chemical pathways of life processes in insects and mammals are found, these may suggest new ideas for insecticides. The objective is to find substances that inhibit these life processes in insects but are harmless to man and domestic animals.

In addition, a better understanding of how insects become resistant to DDT and other insecticides might be gained.

Thus the lowly cockroach may be contributing to the doom of his own kind.

Science News Letter, June 29, 1957

PUBLIC SAFETY

Flavor, Not Alcohol Makes Alcoholic Breath

➤ SMELLING alcohol on the breath is no positive proof of drinking, Dr. Herman A. Heise, Milwaukee, reported to the American Medical Association meeting in New York.

Alcohol in the concentration that occurs in the breath has no odor and one smells only the flavor of the drink. Pure alcohol could be drunk and there would be no telltale odor.

Dr. Heise, chairman of the Association's medicolegal subcommittee on chemical tests for intoxication, reported that harboring about one ounce of alcohol in the body increases the chances of having an automobile accidents by more than 1,000%. Furthermore, if no drivers drank, possibly half of the 40,000 persons doomed to die each year in highway accidents could be saved and a half million more persons would be left uninjured.

Even under the influence of some alcohol, driving is usually so mechanical few mistakes can be seen except in emergency situations and in less practiced maneuvers such as parking.

An intoxicated person may even appear sober under stress, such as being questioned by the police, only to be dead drunk after the stimulation has passed.

Science News Letter, July 13, 1957