

## BIOCHEMISTRY

**Amino Acid Injection  
Cuts Radiation Damage**

➤ RADIATION DAMAGE may be reduced by injections of methionine, an amino acid compound sometimes used in high-protein diets for the treatment of liver diseases.

Its beneficial effects in rats after heavy doses of whole body radiation are reported by a group of scientists from the Atomic Energy Establishment, Indian Cancer Research Centre, Parel, Bombay, in *Nature* (July 27).

After X-irradiation damage, the methionine is able to reduce the fall in levels of deoxyribonucleic acid (DNA) that is found in all tissues. DNA is the life substance in the nucleus of all cells that is believed to carry the mechanisms of heredity.

DNA levels in tissue in irradiated animals fell as much as 87% when they were untreated. But in methionine-treated animals, the levels dropped only about half.

If the methionine was given before the radiation, it was less effective since it was also destroyed by radiation.

The amino acid compound is known to play a part in two chemical processes which are involved in the production of DNA. Thus, its beneficial effect is probably due to its keeping this production process in order, report M. K. Nerurkar, A. J. Baxi, N. S. Ranadive, M. V. Narurkar and M. B. Sahasrabudhe.

Science News Letter, August 10, 1957

## BIOLOGY

**Ultrasonic Echoes Used  
To Detect Early Cancer**

➤ ULTRASONIC echoes from the human body can be used to diagnose early cancer, a group of Japanese researchers report in the *Journal of the Acoustical Society of America* (July).

The echoes are produced by pulsating ultrasonic waves which are beamed into the body and then bounced back from various internal structures. The technique is similar to radar detection, where reflected radar waves are used to outline an object in the

Different types of tissues give different echoes, which are recorded as wavy lines on the face of a cathode ray oscilloscope. The strength of the echo indicates the diseased state of the tissue.

Brain tumor tissue was found to dampen more of the ultrasonic waves than normal brain tissue did. Anesthetized tissue also gave a different echo than normal tissue.

The ultrasonic waves used were in the frequency range of from one to ten megacycles. They were able to indicate a brain tumor, gall stones, and abdominal and breast tumors, as well as trace the contractions of the large intestine.

An actual picture of the internal organs was made by a synchronous scanning of the body with an ultrasonic beam which traced a radar-like pattern on the face of the cathode ray tube.

This technique, called ultrasonic-tomography, gives an inside picture that is un-

obtainable by any other means, including X-ray examination, the scientists report.

An ultrasonic examination of epileptic patients showed that in almost half of them, their brains stopped less of the high frequency sound than did normal ones. A difference between the echo patterns of the right and left front portions of the brain was also noted.

Reporting the research are Yoshimitsu Kikuchi, Tohoku University, Sendai; Rokuro Uchida, Japan Radio Company, Ltd., Tokyo; and Drs. Kenji Tanaka and Toshio Wagai, department of surgery, faculty of medicine, Juntendo University, Tokyo, all of Japan.

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## PALEONTOLOGY

**Most Dinosaurs Pictured  
As Peace-Loving Animals**

➤ A PEACEFUL plant-eater is how one scientist describes the majority of awesome-looking dinosaurs.

Dr. David H. Dunkle, of the Smithsonian Institution's division of vertebrate paleontology, reports that contrary to the commonly held picture of the "terrible lizard" the majority of dinosaurs were "probably rather peaceful" and ate plants.

Nor were all dinosaurs huge, double-decker bus sized creatures. They came in all sizes, some no bigger than a chicken. Others weighed as much as 50 tons. Some walked upright, some developed suits of bony armor, and some became flesh-eaters.

One explanation for all the different kinds of dinosaurs is, Dr. Dunkle says, that the plant eaters needed either armor plate, or speed and agility, or the ability to take to the water in order to escape from their meat-eating relatives. Some modern day signs of this great variety is indicated by the fact that two very different animals, birds and crocodiles, are the nearest extant relatives of the dinosaurs.

Altogether the dinosaur, in all shapes and sizes, reigned supreme on the earth for approximately 130,000,000 years. In comparison, all human history covers little more than 10,000 years—at the most.

The earliest mammal-like creatures date back hardly more than 150,000,000 years.

Dr. Dunkle also points out that the dinosaurs' small brain may not have been the major cause of their extinction. Environmental changes caused by the violent upheaval of mountains, the enlargement and destruction of continents may have been a more important factor than intelligence in bringing about their downfall.

"Life must adapt itself to the consequent variations in climate, food supply, and other environmental conditions," says Dr. Dunkle. "When it cannot, that life vanishes. Such, scientists suppose, was the fate of the dinosaurs."

Dr. Dunkle tells the dinosaurs' story in a booklet published by the Smithsonian Institution. Entitled "The World of the Dinosaurs," the new booklet's descriptions are based partly on the fossil material in the National Museum collection, one of the best in the world.

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**IN SCIEN**

## TECHNOLOGY

**Jet Flame-Outs Stopped  
By Platinum Catalysts**

➤ A PLATINUM ALLOY rod no larger than a pencil stub can prevent hazardous jet-engine "flame-outs" that cause loss of power or even damaging explosions in the engine from becoming serious.

Jets operate like blowtorches, and can be stopped if the flaming "torch" is obstructed for even an instant by air turbulence, water or ice entering the air intake or concussions from firing guns in flight.

The platinum alloy rod, called "Instalite" by its developers, Charles Engelhard, Inc., East Newark, N. J., acts as a catalyst to re-ignite the unburned fuel gases in the stopped engine. A catalyst speeds up or slows down chemical reactions without being affected itself.

The Instalite rod speeds up the reaction of the fuel gases with incoming air. Inserted permanently in the jet engine's exhaust, the rod is always at white heat while the engine is running. Thus, when a "flame-out" occurs, the fuel gases are automatically re-ignited almost without the pilot's knowing there has been engine trouble.

The alloy requires no maintenance since it does not deteriorate at the high jet engine temperatures, and is not "poisoned," or made ineffective by chemicals in jet fuel, the company reported.

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## OPTICS

**"DVA" Tests Ability  
To Read Highway Signs**

➤ CHECK your "dynamic visual acuity"—DVA for short—if you are having trouble reading automobile highway signs.

Dynamic visual acuity refers to visual relationships in a moving situation, such as driving a car.

It is the subject of research by Slade Hulbert, Albert Berg, John Mathewson and Henry Knoll, consultant, of the Institute of Transportation and Traffic Engineering at the University of California at Los Angeles.

Suspecting that standard eye tests, which involve static charts, do not reveal all the visual factors of a moving situation, the UCLA group has devised a DVA test. Test targets are projected from a revolving slide onto a curved "Cinerama-type" screen. Subjects are asked to describe various details of the patterns as they appeared moving across the screen.

Scores on the DVA test and on a standard eye chart test were checked against the subject's ability to read highway signs in a movie filmed from a moving car. There was a higher correlation between sign-reading ability and good DVA scores than between static test scores and sign reading.

Science News Letter, August 10, 1957

# CE FIELDS

## ANIMAL PSYCHOLOGY

### Sowbug Rated Stupid, But It Does Learn

➤ A SOWBUG is pretty unintelligent when it comes to learning new behavior in response to new conditions. But it does learn.

The sowbug is the little curled-up crustacean you are likely to find when you turn over a flat rock in the woods. It is an animal without a backbone. Its ability to learn new ways was tested by Dr. Robert Thompson, psychologist of Louisiana State University, Baton Rouge.

It compares very badly with such lower vertebrate forms as newts and turtles, Dr. Thompson finds.

The test was made in a T-shaped plastic box, painted black on the outside. At one end of the cross-bar of the T was the reward which consisted of a little dark box kept moist with a wet sponge. If the sowbug went to the other end of the cross-bar, he received punishment in the form of a mild electric shock. At the point where the dark-loving sowbug had to make its choice of direction, it was urged on by a 150-watt light.

The bug was kept in training until he could turn toward the reward without error seven times in one day. The next day the direction was reversed so that the bug, to get the reward, had to turn in the opposite way. Again it was trained until it was able to go in the right direction seven times without error. Then the direction was reversed again. This was kept up to a total of eight reversals.

The amount of improvement with succeeding reversals was not great enough to indicate that it did not occur by chance.

Perhaps another kind of invertebrate might show up better than the sowbug, Dr. Thompson suggests in *Science* (July 26), but perhaps a backbone is a real help in learning to change.

*Science News Letter, August 10, 1957*

## PHYSIOLOGY

### Sex of Human Abortions Shown by Cell Studies

➤ THE SEX of human abortions can be determined by examining cells from the developing placenta, Drs. A. C. Stevenson and R. H. McClarin, The Queen's University of Belfast, Ireland, report in *Nature* (July 27).

The new technique will help answer the difficult question of whether more male or more female embryos are aborted, and at what times during the early weeks of pregnancy this is likely to happen.

The question of sex ratio in man is of more than academic interest because of present-day radiation concern, the scientists report.

Some lethal mutations from radiation exposure are sex-linked in experimental ani-

mals, and before their effects on humans can be determined, man's sex ratio in conceptions must be known.

The cell "sexing" method is an extension of the one currently used for determining the true sex of individuals born with the physical signs of both sexes. In these cases, cell scrapings are taken and examined under a microscope to determine the infant's correct sex, and what hormonal or surgical treatment may be necessary.

The majority of cells from female individuals show a characteristic mass on the nucleus of the cell, called "sex chromatin," that is absent in male cells. A number of cells must be examined, however, because each female cell does not show the special nucleus.

For determining the sex of embryos after abortion, cells are scraped from the lining of the uterus and checked for the special nucleus. These cells can remain alive for as long as three weeks after the abortion has taken place.

The cells of about 130 abortions have been identified as to sex. By the end of the year it is hoped that enough will have been studied to help determine the male-female ratio in abortion cases.

*Science News Letter, August 10, 1957*

## PUBLIC SAFETY

### Tranquilizers Not Shown Dangerous to Driving

➤ ALL PEOPLE taking tranquilizers should not be considered dangerous while driving a car, Dr. Robert Felix, director of the National Institute of Mental Health, Bethesda, Md., told *SCIENCE SERVICE*.

There is too little known about the drugs' effects on driving ability to make such a sweeping statement at the present time, he said.

However, he did advise individuals taking the drugs to consult their physicians as to driving.

From an office interview, the general physician can get a pretty good idea about the effects of the drug on alertness, coordination and caution, Dr. Felix explained.

Tranquilizers may have the same relationship to driving as alcohol. Although one drink can make a measurable difference in reaction time and coordination, this has not been considered enough evidence to prohibit driving.

Many tranquilizers sometimes make people drowsy. This possible effect should be carefully watched when driving, Dr. Jonathan Cole, chief of the Institute's psychopharmacology center, said.

But there are still too few known facts about tranquilizers and driving to draw any definite conclusions.

No specific research on drivers is now going on at the Institute although various grants for outside research in that area are being considered.

Preliminary work on the drugs and their effects on some types of physical and mental performance has shown that tranquilizers probably make better drivers out of some people and worse ones out of others, Dr. Cole added.

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## AERONAUTICS

### Slots in Airplane Wing Increase Plane's Range

➤ A WAY to reduce drag or aerodynamic friction will lead to longer-range airplanes that can carry heavier loads, the Air Force's Air Research and Development Command, Baltimore, Md., has announced.

Even the most streamlined airplane surfaces have spots where the smooth airflow "breaks," causing turbulence or drag that actually holds back the airplane.

ARDC researchers solved the problem directly by "catching" the airflow in slots or ducts placed in front of the drag areas, and conducting the air through the wing around the "trouble spots."

In wind-tunnel experiments and flight tests of a modified F-94 airplane, friction drag was reduced to as much as one-seventh its normal value, using this method.

The new design concept was evolved after seven years of intensive research in low drag boundary layer control by ARDC's Wright Air Development Center and Northrop Aircraft, Inc. "Boundary-layer control" includes the study and control of the airflow over aerodynamic surfaces.

Besides the duct method of reducing drag, ARDC is also studying methods of increasing the lift of airplane wing surfaces by blowing or sucking air over the leading edge of the wing or over the wing flaps.

The two systems would enable certain kinds of airplanes to take off and land on a short runway, and to fly much farther with heavier loads, ARDC reported.

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## TECHNOLOGY

### Magnetism Amplifies Weak Microwaves

➤ A DEVICE for amplifying extremely high frequency radio waves called microwaves depends on the material ferrite, Bell Telephone Laboratories, New York, have reported. The wavelengths of microwaves start at about 15 inches and become smaller with higher frequencies.

Ordinary radio waves can be as long as 15 miles.

The tiny experimental amplifier is mechanically simple, consisting of a magnet and coaxial cables that "pump" microwaves into and out of a tiny resonant cavity containing two very small disks of ferrite, a magnetic compound containing iron and other metallic elements in the form of metallic oxides, used for memory storage units in some electronic computers.

The new amplifier, developed by Drs. H. Suhl and M. T. Weiss of the Laboratories, amplifies radio waves by changing extremely high frequency microwaves into more powerful waves of slightly lower frequency.

This property is expected to be a tremendous help in fields dealing with weak signals such as radio astronomy, radar and microwave "relaying" that transmits many telephone conversations and television over radio beams.

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