

## GEOPHYSICS

**Gravity Measurements Made on Sea Surface**

► THE FIRST successful gravity measurements from the open ocean surface have been made from a surface ship by Dr. J. Lamar Worzel of Columbia University's Lamont Geological Observatory, New York.

The measurements were part of a program to chart gravity variations throughout the world during the International Geophysical Year, which ends Dec. 31, 1958.

To make the unprecedented readings, Dr. Worzel used a sea gravimeter recently developed by Anton Graf of Munich, Germany. It was mounted on a gyro-stabilized platform installed aboard the U.S.S. Compass Island. Previously, gravity values for ocean areas were measured from submarines submerged to quiet depths.

The difficulty of obtaining and fitting submarines for this purpose resulted in very sparse gravity data for the 80% of the earth's surface covered by water.

Gravity measurements are used to determine the earth's shape, the true direction of its center and the density of material in the top layers. When gravity and seismic readings are used together, the thickness of the earth's crust can also be determined.

Science News Letter, January 11, 1958

## INVENTION

**Devise Collision Device To Cut Traffic Accidents**

► TRAFFIC ACCIDENTS due to poor visibility caused by fog, rain or snow, could be reduced if motorists equipped their automobiles with a collision warning device being developed.

The radar-like "proximity warner" would tell a driver another vehicle was near even though the potential hazard could not be seen. It consists of a small radio transmitter and a receiver, each about the size of a cigar box. Projecting from each unit is a special ferrite antenna array that sends out and picks up radio signals reflected from approaching vehicles.

The device would be mounted immediately behind the front grill work of the automobile with the antennas projecting forward, so placed as to improve the grill's appearance.

Connected to the receiver unit, but located in a prominent position on the dashboard, would be a large red light or buzzer to warn the driver of another vehicle's approach. The entire system could be set up to indicate any failure to operate, so it would be "fail safe."

Its inventor, Dr. Richard B. Schulz of Armour Research Foundation, Chicago, suggests a "packaged unit" might be rented at toll booth stations along turnpikes, then surrendered at exit.

In quantity production, Dr. Schulz estimates, the device would cost somewhat less than a conventional automobile radio receiver.

It would operate in the frequency range of 50 to 100 kilocycles. The continuous radio energy would be sent out by the

ferrite rod, reflected from the metallic surface of a car in its path, then received to actuate another signal that would sound the warning indicator.

The device is based on the induction field principle. Such a setup would operate effectively over a distance of 100 feet, or about six car lengths. Although this distance is not great, it should reduce "pile-ups" in fog. The system does not measure distance directly, but only the presence or absence of a conducting object.

The same principle could be used for geophysical exploration, Dr. Schulz has found. It would help spot ore deposits, rock strata, water tables, underwater salt domes and other physical features of interest in geophysical, mining and civil engineering applications.

Science News Letter, January 11, 1958

## MEDICINE

**Germ-Free Mice Found Immune to Cancers**

► SIX GENERATIONS of mice that are normally highly susceptible to cancer, have been kept completely free from the disease by maintaining them in a germ-free condition.

This was reported by Drs. James A. Reyniers and Miriam R. Sacksteder, University of Notre Dame, Notre Dame, Ind., to a conference on Hodgkin's disease meeting in New York.

The experiment is still underway but so far 313 mice kept germ-free have not developed a single tumor. Other mice, closely related but not kept under germ-free conditions, almost always develop cancer, Dr. Reyniers reported.

The cancer-free animals were all descended from a litter of six females and one male that were taken from their mother by caesarian surgery done under germ-free conditions. Then they were nursed by a second generation germ-free mother belonging to a strain of mice strongly resistant to cancer.

From then on, the experimental mice remained in a completely sterile atmosphere and were fed only sterilized food.

Other mice of the same strain received the same treatment except that they were not kept in a germ-free environment. Although they were reared in the same type of container and fed the same sterilized food, 90% developed mammary cancer by the time they were 11 months old, and by the 18th month 98% had developed it.

Dr. Reyniers warned, however, that final conclusions about cancer, or even about mammary cancer in mice, cannot yet be drawn from the experiment, even though the mice are still cancer-free.

The causative factor for cancer may only be dormant, and this dormancy may later be broken by stress and genetic accidents, he said.

Dr. Reyniers suggested that germ-free research techniques might be useful in studying the cause of Hodgkin's disease. This disease is always fatal, and causes cancerous enlargement of the lymph nodes of the body.

Science News Letter, January 11, 1958

**IN SCIENCE**

## EDUCATION

**College Enrollments Hit an All-Time High**

► COLLEGE enrollments are up again for the sixth year in a row. They promise to climb even higher when schools enroll second semester students during spring registration.

A record 3,068,000 students were attending the nation's 1,890 colleges and universities in the fall of 1957, the Office of Education has reported. This is a 4.1% increase over the fall 1956 record registration.

During the remainder of the school year, Commissioner of Education Lawrence Derthick predicted, the number will climb to an all-time high of approximately 3,460,000 students.

Dr. Derthick also predicted that in the next decade the number of young people who want to go to college will double. Despite these increases, he said, there are still large numbers of able students who do not obtain a college education.

Science News Letter, January 11, 1958

## PHARMACOLOGY

**Sleeping Pill Eliminates "Hangover"**

► A SLEEPING drug claimed to be non-habit forming and free from creating a "hangover" the morning after, was exhibited by Dr. Edwin Matlin, Carlisle Hospital, Carlisle, Pa., to the American Medical Association meeting in Philadelphia. The drug, chemically named glutethimide, has been tried experimentally in 500 patients who could not sleep.

It produced normal sleep within an average of 30 minutes.

One of the advantages of the drug is that it has a relatively short time of action, about five hours, so the insomniac awakes refreshed, with none of the cloudy "hangover" experienced with other sleep-inducing drugs.

The short acting time also allows a person to take a second pill a half hour later if he is still awake.

Another advantage is that the hypnotic effect of the drug does not diminish with continued use. This is a problem with other sleep-inducers which have to be stepped up in dosage to give the same results.

Glutethimide has been used for normal, insomnia, heart attack patients and surgical cases. When given after an operation, it cannot substitute for opiates but will reduce the amount of them that is needed, Dr. Matlin reported.

It has few undesirable side effects, excepting a skin rash and nausea which appeared in only one or two people out of a hundred.

Science News Letter, January 11, 1958

# CE FIELDS

## SURGERY

### Surgery Cases Can Go Back to Work Sooner

➤ GOING BACK to work after a surgical operation is many times postponed by a person's doctor for considerably longer than it has to be, Drs. N. Henry Moss, C. W. Schwegman and F. Curtis Dohan, University of Pennsylvania, told the American Medical Association meeting in Philadelphia.

In the last ten years, the amount of time spent in a hospital after surgery has been greatly reduced, but this does not hold true for the total convalescent time.

The trouble is that no adequate criteria are available to guide doctors. After a post-operative patient gets home, his management is based upon "impression and vague concepts" instead of objective evidence.

In a nation-wide medical survey the physicians found that for the same type of uncomplicated surgery, an appendectomy, some doctors recommended convalescing for an average of 14 days, while others said it should be extended to 28 days.

Surgeons tended to recommend earlier return to work than industrial physicians and general practitioners, although there was a wide difference of opinion in each group.

The survey strongly suggested that physician "opinion" is the major reason for unnecessarily prolonged convalescence, they reported.

Recently military experience shows the time can be considerably shortened after common types of operations without creating any bad effects.

After appendectomies, otherwise healthy Air Force personnel in the 20 to 29 age group were safely put back on full duty after an average of 12 days.

The scientists also suggested a new data reporting plan for physicians that would help study the entire problem of convalescing.

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## PHYSICS

### Neutrino Found to Spiral In Left-Handed Manner

➤ THE NEUTRINO, an uncharged atomic ghost particle with a vanishingly small mass, has been found to spiral in a left-handed manner.

The first measurement of the neutrino's handedness, previously thought to be right, was reported to the American Physical Society meeting in Stanford, Calif., by Dr. M. Goldhaber of Brookhaven National Laboratory, Upton, N. Y.

The delicate experiments showing how the neutrino spirals were done in collaboration with Drs. Grodzins and A. W. Sunyar, also of Brookhaven. The elusive

neutrino occurs when certain atomic nuclei disintegrate radioactively. It is then spinning in a direction such that it is described by a left-handed screw, meaning it is spinning counter-clockwise when moving away from the observer. Its spin direction, together with its direction of motion, define a handedness, now shown to be left.

The discovery that nature makes a distinction between left-handedness and right-handedness in certain cases, the non-conservation of parity, won the Nobel Prize in Physics for Drs. T. D. Lee of Columbia University and C. N. Yang of the Institute for Advanced Study, Princeton, N. J. (See SNL, Nov. 9, 1957, p. 293.)

Science News Letter, January 11, 1958

## ASTRONOMY

### Scientists Win Prize for Unique Sun Photographs

➤ THE COVETED Newcomb Cleveland Prize has been awarded to three scientists who took the first photographs of the sun above the earth's atmosphere.

It was awarded to them by the American Association for the Advancement of Science at its meeting in Indianapolis, Ind., as an "outstanding" contribution to science during the past year. Receiving the \$1,000 prize were Drs. Martin Schwarzschild and John B. Rogers Jr. of Princeton University Observatory, and Dr. W. Evans, director of the Sacramento Peak Observatory.

The photographs showed the sun's surface has a highly cellular appearance, with individual eddies as small as 150 miles in diameter. (See SNL, Oct. 12, 1957, p. 227.)

The bright cells appear separated from each other by dark, often sharp, lines, the scientists reported to the American Astronomical Society, meeting with the AAAS.

Science News Letter, January 11, 1958

## TECHNOLOGY

### Darkroom Built Into Camera for Extra Prints

➤ A COMPLETE darkroom has been built into a camera by Waldemar A. Ayres, new-product consultant and designer, Fort Lauderdale, Fla.

The process and camera mechanism permit the immediate duplication of positive prints in the camera itself.

According to Mr. Ayres, a photographer can take a picture, develop it to produce a positive print in the camera and then place the print back in the camera as a "master picture" to make an infinite number of duplicate prints. The duplicate prints are made from unexposed film in the camera roll.

The developing of extra prints takes 60 seconds each, Mr. Ayres says, and the process itself requires no special technical knowledge.

In addition to providing duplicates, the process and mechanism have been used successfully to make black and white duplicate prints from color transparencies and color opaque prints.

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## PHYSIOLOGY

### Stomach Windows Show Insides of Fish

➤ A STOMACH window made of mica and screwed on the side of a fish to watch its internal organs at work is reported by G. Burnstock, King's College, London, England, in *Nature* (Dec. 28, 1957).

The window technique allows close observations to be made of the gut of fish which are still living and feeding under normal conditions instead of the artificial conditions existing when organs are isolated from the body.

The fish is first anesthetized, a section of the body cavity is opened, and then a window of mica is fitted over the opening to make an airtight seal. Small bolts going through the back of the fish hold the window on.

Pike make good "window" fish because they lay very still for long periods of time and a microscope can be focused on the internal organs to watch them in action.

Science News Letter, January 11, 1958

## PSYCHOLOGY

### Old and New Drugs Show How Brain Works

➤ THE BASIS of human behavior and personality is being explored by psychologists who aim at understanding so-called normal people as well as curing the mentally disturbed. Old and new drugs are being used both to treat disorders and to determine first in animals and then in humans just how the brain works.

At the American Association for the Advancement of Science meeting in Indianapolis, Ind., Dr. Roger W. Russell, executive secretary of the American Psychological Association, Washington, declared that the relations between drugs and their behavioral effects is far from complete until the mechanisms by which the drugs act have been determined.

As a result of his research at University College, London, Dr. Russell reported what happens when drugs alter the level of a brain chemical, called cholinesterase, which is essential in events associated with nerve activity. When cholinesterase activity is reduced, first there are no significant effects, then there is improved performance, then rapid loss in efficiency or "behavioral toxicity," and finally bodily toxicity ending in convulsions and death.

From such research scientists can determine which drugs to use upon mentally ill patients on the basis of specific knowledge rather than on a cut-and-try basis.

The new interest in drug effects, following the widespread use of the tranquilizing drugs in mental hospitals and among the general public, will allow basic clarification of some problems in learning, motivation, perception and sensory processes, Dr. Sherman Ross, University of Maryland psychologist, predicted.

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