

## GEOPHYSICS

## Four Instruments Ready For Satellite Launching

► **FOUR LIGHTWEIGHT INSTRUMENTS** at least are now sufficiently perfected to be shot into space aboard the earth satellites soon to be sent whirling around the world.

Dr. Herbert Friedman of the Naval Research Laboratory, Washington, said that instruments placed in the earth-circling vehicles must be limited to two or three pounds, including detectors and their circuits, telemetering equipment to relay information to the Minitrack radio system, and power supply for these items.

He told the American Institute of Electrical Engineers meeting in New York that the four instruments "capable of currently meeting the requirements" are those for the environmental, Lyman alpha, meteorite and cosmic ray experiments.

Dr. Friedman's report was the most definite yet made concerning the studies to be conducted from earth satellites, scheduled to be shot aloft within a year as part of the United States contribution to the International Geophysical Year.

Science News Letter, February 2, 1957

## ENGINEERING

## World's Fastest Engine Under Construction

► **THE WORLD'S** fastest and most powerful locomotive is under construction, the American Institute of Electrical Engineers meeting in New York learned.

Powered by a gas-turbine-electric engine, the locomotive's speed and power are measured by what it will be able to do, rather than in miles per hour. The new gas-turbine locomotive will be capable of moving 20 horsepower per ton of weight as compared to 16 for other gas-turbine-electric engines and 14 for diesel-electric freight locomotives now in use.

The new locomotive is rated at 8,500 horsepower at 6,000 feet altitude and 90 degrees Fahrenheit, F. D. Gowans and A. H. Morey of the General Electric Company, Erie, Pa., told the meeting.

The construction of the locomotive, which promises added range of operation without refueling and lower rate per horsepower, caps off the last 15 years of the "phenomenal" rise of the gas turbine.

Science News Letter, February 2, 1957

## METEOROLOGY

## Improved Radiosonde Broadcasts Information

► **AN IMPROVED WEATHER STATION** that is ejected from an airplane to determine and broadcast weather information from inaccessible regions has been developed.

The new version is more accurate and

adaptable than previous models, yet costs only \$80 instead of \$100.

The instrument is a radiosonde, a weather-sensing radio transmitter, designed for use from altitudes up to 60,000 feet and at speeds close to that of sound, compared to the limits of 30,000 feet and about one-half the speed of sound for older models.

The unit was developed by the Air Force's Air Research and Development Command. It is designed to be parachuted from airplanes. The radiosondes give a complete record of humidity, temperature and air pressure until they hit the earth.

Science News Letter, February 2, 1957

## GEOPHYSICS

## Three World Centers To Handle IGY Data

► **THREE WORLD DATA CENTERS** to handle the mountain of information collected during the International Geophysical Year that starts July 1 will be established.

One of these centers will be in the United States, one in the USSR, and the third divided between Western Europe and Japan. Dr. J. Wallace Joyce, head of the National Science Foundation's office for the IGY, told the Scientific Research Society of America meeting in Philadelphia.

The centers will store and make available the great masses of raw material gathered by scientists participating in the IGY program, a world-wide look at the earth, its seas and atmosphere scheduled to end Dec. 31, 1958.

The benefits mankind will realize depend on the rapidity and extent to which scientists have access to the observations, Dr. Joyce said.

The centers will operate as follows:

1. Each World Data Center will receive original copies of IGY data from countries choosing that particular center, usually other countries in that area. Thus all original IGY data will go to one of three centers.
2. Each center will immediately make copies for the other World Data Centers of the original data it receives and supply these copies free of charge.
3. Any institution or individual may request copies of data from a World Center, and these will be supplied at reproduction costs.

Plans for the U. S. World Data Center are now being made, Dr. Joyce said. There will probably be, he reported, a series of primary archives located at appropriate institutions and agencies, with a central coordination office for handling requests.

Dr. Joyce also outlined the latest plans for the world-wide scientific undertaking in which some 56 nations will cooperate. Equipment and supplies, he said, are now moving into distant bases, and in the Antarctic scientists have begun to man their stations in order to take advantage of the short-lived Antarctic summer.

U. S. participation is being planned and directed by the U. S. National Committee for the IGY.

Science News Letter, February 2, 1957

# IN SCIEN

## ASTRONOMY

## 40 Moonwatch Groups To Spot Satellites

► **FORTY** stations, manned by approximately 750 amateur astronomers, are now registered by the Smithsonian Astrophysical Observatory at Cambridge, Mass., for visual spotting of the satellites to be launched into the sky during the International Geophysical Year, beginning July 1.

Other Moonwatch stations are still being organized. The area of the country from southern California through Arizona, New Mexico and Texas is sparsely represented by the satellite observers, although the earth satellite is expected to pass over that area first.

Science News Letter, February 2, 1957

## PHYSICS

## Undiscovered Forces May Exist in Universe

► **YET UNDISCOVERED** forces may exist in the universe, Dr. T. Gold, Harvard University astronomy professor, told the International Conference on the Role of Gravitation in Physics at Chapel Hill, N. C.

Such forces could operate on a much larger scale than now known, and over greater distances. They would be masked, however, by Newton's law stating that the attraction of every object in the universe for every other object varies directly as the inverse square of the distance between them.

Dr. Gold said there might be forces that acted more slowly than this. He pointed out there is a range of sizes in the universe of ten to the 40th power (ten followed by 39 zeros) from the smallest atomic particle to the extent of the cosmos. Man, he said, stands about in the middle of this range.

The gravitation conference held at the University of North Carolina, also heard that gravitational forces may be growing weaker. If so, the sun was once considerably hotter than it is now. Dr. G. H. Dicke of Princeton University suggested this possibility to account for the flattening of the moon and also the different densities of the moon and the earth.

It looks, he said, as if the moon were torn out from a still-molten earth by tidal friction, then frozen when it was about one-quarter the distance to its present position. Dr. Dicke proposed this would have occurred about four billion years ago, about the time the solar system was formed.

Other scientists took issue with Dr. Dicke's picture of how the moon was formed.

Science News Letter, February 2, 1957

# CIE FIELDS

## MEDICINE

### Low Back Pain Cured by Injecting Vegetable Oil

► INJECTIONS of vegetable oil and an anesthetic cure much sciatica and other pain in the lower back, Dr. George S. Hackett, Mercy Hospital, Canton, Ohio, reports in the *Journal of the American Medical Association* (Jan. 19).

Dr. Hackett's treatment is based on his belief that more lower pain is produced by a loosening up of the ligaments that connect tissue and bone at joints than from anything else. When these ligaments are loose, normal movement stretches their fibers too much and overstimulates sensory nerves which do not stretch.

These nerves then send pain impulses to the brain which are perceived as coming from the ligament site or from some other part of the body.

The injection treatment causes new cells to be produced in bone and fiber tissue at the joints that are causing the pain. The "proliferating" solution is injected into the relaxed ligament at its junction with the bone, and usually takes a month before it produces new cells, Dr. Hackett says.

Treatment by as many as six injections is usually given in the doctor's office, but more incapacitated patients are treated in the hospital, where as many as 20 injections can be given in one day while the patient is anesthetized, Dr. Hackett reports.

Dr. Hackett has used his treatment for the last 14 years on 1,178 patients with low back pains. Almost 1,000 of the patients, or 82% of those treated, "consider themselves cured," he reports.

Science News Letter, February 2, 1957

## MEDICINE

### Brazilian Alcoholics Pick Quick, Cheap Drink

► WHEN Brazilian alcoholics have a choice, they pick a native "white lightning" called cachaca that gets them where they want to be in a hurry and with the least bad effects.

This is the conclusion of a study of 500 Brazilian alcoholics reported in New Haven, Conn., in the *Quarterly Journal of Studies on Alcohol* (Dec., 1956).

It seems likely, the study shows, that cachaca was used by the alcoholics almost exclusively, 79% using it now at the onset of a drinking episode, 89% at the peak, and 97% at the end.

Cachaca, a distilled spirits, has an alcohol content ranging between 51% and 60% by volume. This is from 15% to 35% stronger than most American whiskeys.

In addition, the native drink "is sold at

a price which makes it probably the cheapest and most easily available source of ethyl alcohol in the country," the report shows.

Volume for volume, the ethyl alcohol in other beverages available in Brazil, including beer, wines, American whiskey and Brazilian gin, costs from six to 35 times more than cachaca.

Of the 500 Brazilian alcoholics studied, 212 start with cachaca straight and 482 end up during episodes of intoxication drinking it straight.

The report concludes, "it seems likely that economic factors contribute in part but not entirely to the choice of alcoholic beverage by the individual alcoholic . . . it seems that distilled beverages in general, especially those with higher alcoholic content are beverages of choice for alcoholics; these beverages satisfy the distorted psycho-physiological needs of the alcoholic adequately, swiftly, and superficially, with the least untoward effects."

The study was made by Dr. Decio Parreiras, executive secretary of the Brazilian National Subcommittee on Alcoholism, Rio de Janeiro; Dr. Giorgio Lolli, research associate, applied biodynamics, Yale University; and Grace M. Golder, assistant clinical professor, mental health nursing, Yale University.

The authors summed up by stating, that the alcoholics studied "took advantage of the unfortunate fact that cachaca meets their anomalous needs with most effect and at least cost."

Science News Letter, February 2, 1957

## MEDICINE

### Undulant Fever Thought Heart Disease Factor

► UNDULANT fever, whose source is contact with infected animals or from drinking unpasteurized milk, may contribute to development of heart disease.

Cooperative research by doctors at the University of California Medical School, Los Angeles, the City of Hope and Long Beach Veterans Administration Hospital suggests this possibility.

The research was carried out by Drs. Charles M. Carpenter, Susumu Ohno and Benjamin E. Konwaler. Dr. Carpenter presented results of the research at the Midwinter Symposium of the Los Angeles County Heart Association in Los Angeles.

It has been found that there is a greater prevalence of positive skin tests for evidence of past infections with undulant fever among heart patients than among patients with other illnesses.

This finding led to studies in which guinea pigs were experimentally infected with undulant fever organisms (*Brucella*). The animals were observed at autopsy from one to eight months after inoculation.

At that time, pathological changes in the guinea pig hearts similar to those observed in rheumatic disease were found by the scientists.

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## MEDICINE

### Brown Bread Chemical Reduces Kidney Stones

► PHYTIC ACID, a chemical found in certain cereals and in brown bread is reported to be an effective treatment for vitamin D poisoning, sarcoid and some kidney stone conditions in which too much dietary calcium is absorbed into the blood stream from the intestines.

Given in the form of sodium phytate, the drug is the first practical one which can be used to decrease calcium absorption in the body. Between one-third and one-half of the amount given combines with dietary calcium and magnesium in the stomach and intestine, and these mixtures, cannot pass through the intestinal wall into the blood.

Research on the drug was done by Drs. Philip H. Henneman, Evelyn L. Carroll and Fuller Albright, Harvard University and Massachusetts General Hospital in Boston. The work was supported by the American Cancer Society.

Science News Letter, February 2, 1957

## MEDICINE

### Electric Shock Stops Heart Twitching

► ELECTRIC shock has stopped heart twitching during operations, a physician-engineer team told the American Institute of Electrical Engineers meeting in New York.

Electrodes are applied to the surface of the chest, in the operating room of one of the nation's leading hospitals, to halt the twitching (fibrillation) which may occur during anesthesia, Dr. W. R. Milnor of the School of Medicine and W. B. Kouwenhoven of the department of electrical engineering, Johns Hopkins University, Baltimore, Md., reported.

This method of chest "defibrillation," the doctor and the engineer said, is safe and practical from all information available.

Quick action is needed when using electric shock treatment, they explained. Using hand electrodes within one minute or less after the original shock will save the heart 90% of the time.

When sufficient current is sent through the heart, twitching stops completely. Quick action in giving artificial respiration to overcome respiratory paralysis brought on by the electric shock is also vital, they cautioned.

Shocks of 0.1 ampere may interrupt normal heart rhythm and cause twitching. A shock of several amperes, on the other hand, contracts the heart and holds it in that state until the circuit is opened.

Dr. Milnor and Mr. Kouwenhoven pointed out that currents may affect the lungs but not the heart. The action of the lungs, they explained, is controlled by the brain, but the action of the heart works involuntarily without orders from the brain.

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