

## ASTRONOMY

**Supernova May Be Cause Of Radioactive Elements**

➤ ALL the radioactive elements in the solar system could have come from a single explosion of a supernova, a star that suddenly blazes forth to 100,000,000 times the sun's brilliance.

This event could have occurred 6,700,000,000 years ago, four scientists reported to the National Academy of Sciences meeting in Washington. Their calculations are based on the present ratios of two forms of uranium, U-235 and U-238, and the relative rates at which the ancestors of these elements decayed.

They assume a supernova explosion produced an intense concentration of neutrons, which are then available for synthesizing the elements. The proportions of various elements built up by this method of calculating agree reasonably well with those found from studies of meteorites.

The scientists reporting the study are Drs. William A. Fowler, F. Hoyle, G. R. Burbidge and E. M. Burbidge of California Institute of Technology.

Science News Letter, May 4, 1957

## METEOROLOGY

**Air Safety Endangered By Bureau Funds Cut**

➤ CUTS in appropriations for the Weather Bureau endanger aircraft safety and dash hopes for revolutionary developments in hurricane and tornado forecasting.

The House of Representatives slashed nearly \$2,000,000 from the funds requested to run the Weather Bureau for the fiscal year starting next July 1. Half of this amount was slated to provide new weather services for jet aircraft operations and for increased safety of all aircraft in flight.

However, the House voted no money at all for this vitally needed service. Also eliminated was \$400,000 for rental of high-speed electronic computers to develop better methods of forecasting weather numerically. By denying funds for the new machines, Weather Bureau research plans must be deferred to later years, thus pushing even farther into the future the time when research results would be useful on a daily basis by local weather forecasters.

Tests during the past two years have shown enough promise to indicate that faster and more versatile electronic computers will bring much improved weather forecasts within a few years.

The denial of money for new weather services hits four proposed programs:

1. An improved system of inflight weather safety service to alert private, commercial and military aircraft concerning sudden weather changes;

2. Additional forecasting services to international flights departing from major inland airports;

3. An increase in the number of full

and part time weather observation stations and pilot briefing offices; and,

4. Provision of special services for commercial jet aircraft, which require unique wind and temperature forecasts, not now made, for altitudes above 25,000 feet. Jets landing under conditions of low visibility require specialized short period advices, since their fuel consumption is very high at low altitudes.

On the basis of the House action, the number of sets of special equipment for observing bad weather at the end of the runway will be reduced from 46 to 16 sets.

Science News Letter, May 4, 1957

## TECHNOLOGY

**Film Processing in One Bath in Five Seconds**

➤ A SINGLE SOLUTION for processing photographic film is on the way. Moreover, it will be ultra-rapid, less than five seconds, if films are made more sensitive.

This prospect was reported to the American Chemical Society meeting in Miami by Harry S. Keelan, research associate in Boston University's physical research laboratories.

The projected monobath would allow processing in a tenth the time and a third the space now required. Newsreels for transmission or television should be processed in 90 seconds in a single handling.

The basic problem in a monobath is a race between developer and fixer in the single bath. The developing activity must change as much of the exposed crystals as possible into silver before they are entirely removed by the fixer.

Science News Letter, May 4, 1957

## GEOLOGY

**Better Method Accounts For Water Gains, Losses**

➤ AN IMPROVED METHOD of accounting for water gains and losses was developed in a pilot study of a small drainage basin at Salisbury, Md.

The method involves periodic determination of such factors as precipitation, stream-flow, storage of water in the stream channels, ground-water level and soil moisture. It also involves mathematical analysis of factors not so easily measured, such as changes in the amount of ground-water storage and the amount of water evaporated from the soil or released to the air by vegetation.

Results of a test of the method, developed by the Geological Survey, were announced by Secretary of the Interior Fred A. Seaton. The drainage basin used was Beaverdam Creek near Salisbury, Md., which is about 20 square miles in area, but results are expected to be very useful in studies of larger drainage basins.

As a part of the mathematical analysis, a rating curve was devised that permitted an estimation of the amount contributed to a stream by seepage of ground water.

Science News Letter, May 4, 1957

**IN SCIEN**

## TECHNOLOGY

**Device Can Send 1,000 Words per Minute**

➤ A DEVICE for transferring printed material automatically from one business office to another at the rate of about 1,000 words per minute has been experimentally developed by scientists at the Bell Telephone Laboratories.

Called the "data subset," the device can transmit and receive large amounts of data over telephone lines. It can be made self-checking to provide substantially error-free communication.

When perfected, the device, together with modified office equipment, is expected to provide inter-office accuracy and speed for accounting and bookkeeping procedures.

Science News Letter, May 4, 1957

## MEDICINE

**TB Drug Found Good for Arthritis, Mental Illness**

➤ A DRUG DEVELOPED in 1952 to treat TB patients has turned out to be effective in treating psychotic and arthritic patients, scientists from the Rockland State Hospital, Orangeburg, N. Y., and the Cleveland Clinic, Ohio, reported to the American Psychiatric Association meeting in Syracuse, N. Y.

The new drug, trade named Marsilid and known chemically as iproniazid, was observed to produce euphoria in TB patients and was then tested on a group of withdrawn and depressed mental patients.

After five months of treatment with the drug, 12 out of 17 patients showed definite improvement, Dr. Nathan S. Kline, Rockland State Hospital, reported.

Two of the most impressive results were obtained with patients suffering from hebephrenic schizophrenia, a difficult-to-treat form of the disease that is marked by regression to an infantile level.

Marsilid was also tried on long-term arthritic patients by Dr. Arthur L. Scherbel, director of the department of rheumatic disease, Cleveland Clinic, because many of his patients developed varying degrees of depression, hostility and dependency due to their arthritis.

The changes in the joints were not dramatic, Dr. Scherbel said, but there was a partial relief of inflammation and definite improvement in more than two-thirds of the 30 patients.

The most consistent response was a gain in weight, he added.

Marsilid is produced by Hoffmann-La Roche, Inc., Nutley, N. J.

Science News Letter, May 4, 1957

# CE FIELDS

## BIOCHEMISTRY

### Pain Reliever Is Faster Than Morphine

➤ A SYNTHETIC PAIN-KILLER that works in ten minutes has been developed, Dr. George de Stevens, a senior research chemist of CIBA Pharmaceutical Products, Inc., Summit, N. J., reported to the American Chemical Society meeting in Miami.

Among the fastest-acting pain-killers now known, the drug is currently undergoing tests for human therapy.

In animal tests, the new compound relieved pain in 10 minutes, as against 45 minutes required for morphine to act, Dr. de Stevens said. Like morphine, the synthetic belongs to the family known as analgesics, agents which ease pain without causing the patient to lose consciousness.

In experiments with rats and mice, the synthetic appeared free from a serious side-effect encountered with morphine, the tendency to slow down the rate of breathing. In comparison with another group of analgesics called the antipyrines, the new substance showed more activity and less toxicity.

Exactly how analgesics produce their results in the body is not now known, but many scientists believe that they have a blocking effect on the central nervous system. It is hoped, Dr. de Stevens explained, that the new synthetic will relieve pain in humans without causing uncomfortable side-effects.

The description of the new drug was co-authored by Dr. Jurg A. Schneider and Heino A. Luts of CIBA.

Science News Letter, May 4, 1957

## MEDICINE

### Cow Bone Used in Mouth Surgery

➤ COW BONE for repairing defects in human jaws is being studied at the Naval Medical Research Institute and the Naval Dental School, Washington.

A report on its success in monkey jaws is made by Capt. Fred Losee of the Institute and Cdr. Philip J. Boyne, Naval Dispensary, Washington, in the British scientific journal *Nature* (April 20).

The results indicate that the "anorganic" bone may have wide application to various types of mouth surgery in humans, Capt. Losee reports.

The bone is currently being tested in human jaw bones and the results so far have been as successful as those obtained in animals, he told SCIENCE SERVICE.

Probably the most vital use of the bone will be for civil defense emergencies when

great quantities of bone will be needed immediately, he added.

The cow bone used for grafting was boiled with ethylenediamine to remove the proteins, starches, sugars and fats from the matrix of the bone. These are the substances believed to cause ill effects in cross-species grafting.

The treated bone is very white, easily shaped and extremely porous. It does not decay and can be sterilized by boiling or autoclaving.

When used in monkey jaws there was no evidence of foreign body reaction and new bone formation was found as early as 13 days after grafting, Capt. Losee reports.

Science News Letter, May 4, 1957

## MEDICINE

### Early Silicosis Spotted By X-Ray of Lymph Node

➤ A MORE ACCURATE WAY to diagnose the age-old occupational disease silicosis by X-ray diffraction was reported by John C. Soet and D. E. Van Farowe, Michigan Department of Health, Lansing, to the American Conference of Governmental Industrial Hygienists meeting in St. Louis.

The test is made by taking a small piece of tissue from a lymph node in the neck and exposing it to a stream of X-rays. If there are deposits of silica in the tissue, the X-rays will be scattered in a particular pattern.

The tissue sample needed for the test is obtained by surgical biopsy. The research was done with the cooperation of Dr. John E. Summers, Sunshine Tuberculosis Hospital, Grand Rapids, Mich.

Science News Letter, May 4, 1957

## BIOLOGY

### Vaccine Effective Against Leukemia in Mice

➤ THE FIRST successful vaccine to protect mice against leukemia was reported by Dr. Charlotte Friend of the Sloan-Kettering Institute, New York, to the American Association for Cancer Research meeting in Chicago.

The vaccine is 80% effective against a virus discovered a year ago by Dr. Friend. This virus is the only known one that consistently causes leukemia in mice, even when inoculated into adult animals.

The vaccine is prepared by mixing the leukemia virus with formalin, a solution of the antiseptic formaldehyde. The Salk vaccine against polio is produced this way.

A series of three injections of the vaccine, spaced a week apart, was given to mice which were infected with the virus at either one, two, three or four weeks after vaccination.

Approximately 80% of the vaccinated mice were protected against leukemia although they were not protected against other forms of cancer, Dr. Friend emphasized.

Science News Letter, May 4, 1957

## ENTOMOLOGY

### Pesticide Shows Promise in Many Areas

➤ A LONG LASTING pesticide that effectively fights the enemies of cotton, citrus fruit and cattle will be available to some farmers this year, the American Chemical Society meeting in Miami was told.

Called "Navadel," the new pesticide was described by Dr. William R. Diveley of the Hercules Powder Company, Wilmington, Del.

Dr. Diveley said that in addition to being useful for cotton, citrus and deciduous fruits, grapes, vegetables and ornamental plants, "Navadel" controls leaf-hoppers, thrips, leaf miners and a number of mites, including the citrus red mite. It destroys not only adult mites, he reported, but also the eggs.

Dr. Diveley prepared his report in collaboration with Drs. A. H. Haubein, A. D. Lohr and P. B. Moseley of Hercules.

Science News Letter, May 4, 1957

## ENDOCRINOLOGY

### Increase Brain Hormone To Treat Mental Illness

➤ TREATING MENTAL patients by increasing the amount of serotonin, a body hormone, in their brains has shown encouraging results, Dr. D. W. Woolley of Rockefeller Institute for Medical Research, New York, reported to the National Academy of Sciences meeting in Washington.

The technique was used in tests on victims of schizophrenia, the most widespread of the mental disorders. They were given two drugs, one to increase the amount of serotonin throughout the entire body, and another one to counteract the hormone's bad side effects. The studies suggest that the drug combination "suppresses" schizophrenia, but more trials will be needed to ascertain this, Dr. Woolley emphasized.

Dr. Woolley and a co-worker, Dr. E. Shaw, first noticed in 1954, that an experimentally induced deficiency of serotonin in the brain could bring on psychotic-like reactions in humans. This suggested that the naturally occurring mental disorders, such as schizophrenia, might also be due to a lack of serotonin.

But raising the amount of serotonin in the brain turned out to be a difficult problem. Even though quantities of the hormone were introduced into the body, no detectable amount passed into the brain.

The drug combination which causes an increase in the brain's serotonin content alone, includes 5-hydroxytryptophane, a chemical used by the body to make serotonin, and BAS, a drug that counteracts the effects of increased body serotonin.

Side effects are quite severe, causing high blood pressure, diarrhea, and contraction of smooth muscle, Dr. Woolley reported.

Science News Letter, May 4, 1957