

## ASTRONOMY

## Unique Laboratory Notes Cosmic Ray Showers

➤ COSMIC RAY showers with more than a billion atomic particles strike somewhere on the earth at the rate of ten a second, physicists at the Massachusetts Institute of Technology calculate.

They found evidence of one such shower, in which the particles bombard the earth at almost the speed of light, in a unique laboratory spread over 50 acres at Harvard University's Agassiz Observatory near Cambridge. The "laboratory" consists of 11 separate tubs containing disks of a plastic material that emits tiny flashes of light when electron showers pass through it.

The electrons, negatively charged particles, are produced when cosmic rays plunge into the earth's atmosphere. The bombarding cosmic rays have energies of nearly ten billion billion electron volts, Dr. Bruno Rossi of MIT reported.

He said that results so far may mean a "drastic revision" of previous ideas concerning the origin of cosmic rays, and of the size and shape of the Milky Way galaxy. This is a giant cluster of billions of stars in which the earth, the other planets and the sun are located. It is assumed to be shaped somewhat like a flattened disk, with a diameter of 100,000 light years and about 1,000 light years thick. A light year is the distance light, traveling at 186,000 miles a second, covers in one year.

According to the theory proposed by the late Enrico Fermi, cosmic particles gain energy while traveling through the magnetic fields of the galactic disk. The presently accepted dimensions of the Milky Way are too small to accelerate the particles observed by MIT scientists.

"Magnetic fields extend beyond the galactic disk, perhaps even through the whole of intergalactic space," Dr. Rossi suggested. It could also mean that the Milky Way has a different size and shape than now believed, he said.

Science News Letter, April 20, 1957

## MATH IS FUN

By Joseph Degrazia, Ph.D.

Here is a treasury of brain-teasers. You need not be a mathematical genius to solve these problems and puzzles. What you need is to know how to THINK LOGICALLY—how to REASON. This is practically a "course" in applied logic and reasoning—besides being an immense amount of fun that will keep you absorbed for many hours. You will find not only that MATH IS FUN, but also that learning math can be fun!

CONTENTS: Trifles—On the Borderline of Mathematics—Faded Documents—Cryptograms—How Old Are Mary and Ann?—Wolf, Goat and Cabbage—and Other Odd Coincidences—Clock Puzzles—Trouble Resulting from the Last Will and Testament—Speed Puzzles—Railroad Shunting Problems—Agricultural Problems—Shopping Puzzles—Whimsical Numbers—Playing with Squares—Miscellaneous Problems—Problems of Arrangement—Problems and Games—Solutions.

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## Questions

ASTRONOMY—When will Venezuela's new observatory be completed? p. 247.

BIOCHEMISTRY—What is the vital life substance for which scientists have found a new species? p. 247.

BIOLOGY—Who was the Russian scientist whose work paved the way for the discovery of the importance of free radicals? p. 243.

OPTICS—What kind of images do Axicons form?

Photographs: Cover, Northrop Aircraft, Inc.; p. 245, U. S. Army; p. 246, Avco Manufacturing Corporation; p. 256, Du Pont Company.

## TECHNOLOGY

## Chemists Get Cheaper Tools for Faster Work

➤ INSTRUMENTS to make chemical analysis better, faster and cheaper will soon be taking their places in laboratories. Three of these instruments and a number of new analytical techniques were described during the American Chemical Society's meeting in Miami.

One of the instruments, described by Dr. Van Zandt Williams of the Perkin-Elmer Corporation, Norwalk, Conn., makes it possible for the individual chemist to have an infrared spectrophotometer at his bench and to carry out organic chemical analyses without sending the material under study to a major analytical center housing a more expensive instrument. The new and cheaper instrument occupies little space and incorporates the desirable features of the larger instruments.

Dr. Ralph H. Muller, winner of the Beckman Award Medal for his analytical work at the University of California's Los Alamos Scientific Laboratory, told the analytical chemists the pursuit of research on instruments of analysis is "high adventure," particularly if the research is not committed and can remain objective.

Science News Letter, April 20, 1957

## WASHINGTON SCHOOL COLLECTION

This collection has been popular for years in High Schools. It includes 20 of the most important and common Rocks and also 20 common minerals. Each of the 40 specimens is about 2" in size and imbedded in cotton in a strong partitioned box size 10 1/2 x 16 1/2 x 1 1/2". A set of unlabeled small specimens for quiz and identification purposes is included without extra charge. Price \$9.00 prepaid. Booklet, Introduction to Geology for the Layman 50¢.

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## CHEMISTRY

## Radiation Fatalities May Be Reduced by Drug

➤ PRE-ADMINISTRATION of an experimental drug from England, undergoing tests at the University of California at Los Angeles, may significantly reduce fatalities from radiation exposure.

The research, which has been carried out by Dr. Thomas Haley, Anna Flesher, R. Veomett and J. Vincent of UCLA's Atomic Energy Project, has been concerned with a drug which carries the complex chemical name of quinoxaline 1,4-di-N-oxide.

Untreated irradiated mice suffered 100% mortality at the end of 16 days. Mice which had received injections of the drug just prior to irradiation had only a 65% mortality rate after 30 days. Post-irradiation treatment with the drug reduced the mortality rate only slightly.

Part of the beneficial effects of the drug was related to reduction of intestinal bacteria, which multiply rapidly following radiation injury, causing acute bacteremia. Bacteremia is a major cause of death following radiation injury.

The antibacterial effect of the drug does not appear to be the entire mechanism involved in increasing survival of irradiated mice. Further investigation may reveal other beneficial effects, the investigators said.

Science News Letter, April 20, 1957

## RADIO

Saturday, April 27, 1957, 1:45-2:00 p.m., EST. "Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. R. R. Williams, chairman, Williams-Waterman Fund for the Combat of Dietary Diseases, and synthesizer of thiamine, will discuss "Preventing Deficiency Diseases."

## EDUCATION

## Carnegie Tech Asks Fund For Expansion Program

➤ THE FIRST extensive public fund-raising effort in the 57-year history of the Carnegie Institute of Technology, Pittsburgh, has been started. The Institute has set a goal of \$24,350,000 for its expansion program to "enable the school to continue as a great seat of learning, knowledge, research and creative attainment."

Science News Letter, April 20, 1957

## "QUOTES"

"I am interested in several phases of science, so SCIENCE NEWS LETTER keeps me up-to-date on all scientific subjects without too much detail for fast reading."

Indiana