

NUCLEAR PHYSICS

Heavy Nuclei Bombard Us

Discovery of heavy particles at 18 to 20 miles above the earth was reported. Existence of heavy nuclei as well as protons in cosmic rays was demonstrated.

► THE earth is being bombarded with very heavy stuff, atomically speaking.

Nearly a third of the total mass of the projectiles in the cosmic rays from outer space consist of stripped-down hearts of heavy atoms, the University of Denver International Cosmic Ray Symposium was told in Idaho Springs, Colo. Discovery of the heavy particles at 18 to 20 miles aloft is the top news being discussed.

Two teams of scientists, one at the University of Minnesota and the other at the University of Rochester, have demonstrated that the heavy nuclei really do exist in the mysterious cosmic rays that come in from outer space. Before it was thought that they were exclusively protons, positive particles that are also one of the building blocks in atomic hearts.

Dr. Frank Oppenheimer, who has just resigned his professorship at the University of Minnesota after having told a Congressional committee of his experiments in communistic theory over a decade ago, is the leader of the Minnesota group reporting to the symposium which is sponsored by the Atomic Energy Commission and the Office of Naval Research among others. Dr. Edward Ney, also there, Dr. George and Phyllis Frier, a husband and wife team, and Dr. E. J. Lofgren were in the Minnesota group.

The Rochester experimenters are Drs. H. L. Bradt and Bernard Peters.

This spring the Navy aircraft carrier Saipan on a mission to the Caribbean launched balloons to high altitudes to see if the heavy particles came into the earth's atmosphere at the earth's magnetic equator as plentifully as they do farther north.

The heavy particles are believed to be the central mass of chemical elements, stripped of their electrons, ranging from carbon to molybdenum. They plunge toward the earth with energies that are a hundred billion electron volts, which means that the elementary particles that they carry (protons and neutrons) each have few billion electron volts. These energies are much higher than those that man with his cyclotrons has been able to create and impress upon particles here on earth.

Just now it is a puzzle as to where the particles come from and how they get their energy. That is one of the reasons for the high-powered research upon the cosmic rays. For as they are better understood, the way the universe is put together may be understood better. There may come out of this highly theoretical work with little particles that are here and there knowledge that will give us new methods of control of atomic energy for war or peace.

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MEDICINE

Stomach Cancer Detection

► FIVE "filters" that can help with mass tests for detection of stomach cancer were reported by Dr. David State of Minneapolis to the American Medical Association in Atlantic City.

The "filters" were designed to detect stomach cancer before symptoms developed and to determine persons in whom the disease is likely to develop. Instead of X-raying all persons over 50 years old, the age group in which stomach cancer is most likely to develop, the Minneapolis doctor suggests filtering out the most susceptible by tests for pernicious anemia and the stomach's production of acid in response to doses of histamine.

None of 79 persons who had a family history of stomach cancer had stomach cancer themselves, X-ray examinations showed. Neither did any of the 72 who were losing such small amounts of blood that it could only be detected by chemi-

cal tests. But of 1,206 whose stomachs failed to produce acid in response to the test, seven were shown to have stomach cancer. So did one of the 178 whose stomachs produced a little but less than the normal amount of acid in the test and three of 94 who had pernicious anemia.

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ASTRONOMY

Electronics Helps Reveal What Makes Up the Stars

► NEWEST job for electronics is to help astronomers discover what makes up stars.

Harold L. Johnson of the University of Wisconsin's Washburn Observatory described a new electronic plate-measuring machine to the American Astronomical Society in Ottawa, Canada. Plates measured by the machine are photographs of star



AIR BRAKES—The jaw-like control surfaces shown above at the outer end of the wing trailing edge on a Northrop Scorpion, twin-engine, jet-propelled, all-weather fighting airplane are known as "decelerons" because they combine the functions of ailerons, fighter brakes and landing flaps. In normal flight the jaws are closed. In dives, the jaws are opened to provide effective fighter brakes.

light, spread out into its component wavelengths to give bands of colored light crossed by numerous dark and bright "spectral" lines. These lines can reveal the chemical elements present in the stars.

The Wisconsin astronomer said that the new machine will not only give more accurate spectrogram measurements, but it will also be easier on the astronomer. It all but does away with eyestrain and fatigue and eliminates personal judgment, and personal error, plus offering increased speed.

With the electronic machine, most of the job is done automatically: the astronomer pushes a button to indicate the spectral lines to be measured, and the reading is recorded for him on photographic film. Previously astronomers have generally examined the faint lines from a star under a microscope. This, particularly in the case of a very hot star, required much practice and many measurements.

One major limitation remains the same as for direct eye measurements. This is the grain of the photographic plate on which the spectrum of a star is taken. Scientists can take some steps to get easy-to-measure lines, but sometimes stars make their own spectra with fuzzy lines.

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