ASTRONOMY

Unknown Twin Universe

To explain the balanced nature of the universe as well as observations from earth of predominantly positively charged matter, physicist postulates an "anti-cosmos."

➤ THE LATEST SPECULATION is that there is a gigantic unseen "twin" or duplicate to the immense universe around us.

This anti-cosmos is postulated in *Science* (Aug. 3) by Dr. M. Goldhaber, physicist at the Atomic Energy Commission's Brookhaven National Laboratory, Upton, N. Y.

Suggested by the recent discovery of the anti-proton, or the fundamental unit of matter in reverse, this new theory is an extension of our cosmology far beyond the reach of the biggest telescope.

What we now know as the universe resulted from the splitting of a gigantic particle, the "universon," about four and a half billion years ago. Before that, the universon held both the cosmos and its twin, the anti-cosmos.

The gigantic particle's break-up into two parts is needed to explain the balanced nature of the universe and the unbalanced part we can see.

Here on earth, in all the solar system and in all space visible from this planet, atomic cores are almost without exception positively charged. Anti-matter is rare. In the yet unseen twin, matter would be predominantly negatively charged. The kind of matter we know from here would be the exception.

In the opposite universe, there would be planets, stars and galaxies, just as there are here. They would not necessarily be exact mirror images of the solar system and Milky Way galaxy of which the earth is a part, but statistically the anti-universe would resemble this universe.

The argument that the reverse universe exists is based on earthly observations that nature is symmetrical. For every charged particle there is thought to exist a negatively charged counterpart.

Before splitting some four and a half billion years ago, the universon contained the mass and charge of both the presently known universe and its opposite number.

For many years, scientists have realized that the tiny particles of which matter is made have anti-particles, twins in all respects except for their charge. In laboratory and cosmic ray experiments they can catch brief, tantalizing glimpses of this other world. These studies show the symmetry, or balance, of nature.

Previous theories of the beginning of today's known universe, however, are based on a non-symmetrical beginning, one in which there were no anti-particles, but only the kind of matter now observed.

To explain the peculiar unbalance of particles seen from the earth, but still preserve symmetry in the beginning, Dr. Goldhaber suggests that more than four and a half billion years ago, the "universon" split in two. The positively and negatively charged universes resulting then started racing away from each other at an extremely high rate of speed. The process would be similar to the spontaneous break-up of a neutral meson into two charged mesons of opposite sign.

This, he says, is the "logical structure" of a theory of the origin of the universe that keeps a balance between particles and anti-particles.

Could this separation have been so complete, Dr. Goldhaber questions, that scientists here could not detect "occasional collisions" of galaxies and anti-galaxies, with "spectacular results?"

If matter is being continuously created in the form of elementary hydrogen atoms in space, he questions whether there should not be "considerable" background radio noise from the voids in which hydrogen atoms meet anti-hydrogen atoms.

Dr. Goldhaber's theory of a once-symmetrical universe now broken in half raises many questions, among which are the following:

1. Can the direction in space defined by the imaginary line joining the cosmos with the anti-cosmos be detected?
2. Is the anti-cosmos itself detectable and, if so, how far away is it and is it still flying away from this universe?
3. If there was once only a single "universon," what existed before that, and is there any point in asking such a question, even theoretically?
4. Is it reasonable to assume the existence of particles of such very large charge as the universon, and would they break up in the manner suggested?

Dr. Goldhaber points out that, although his ideas fit well into a universe based on Newtonian ideas, they may not fit well into a universe based on Einstein's ideas.

Science News Letter, August 18, 1956

ENGINEERING

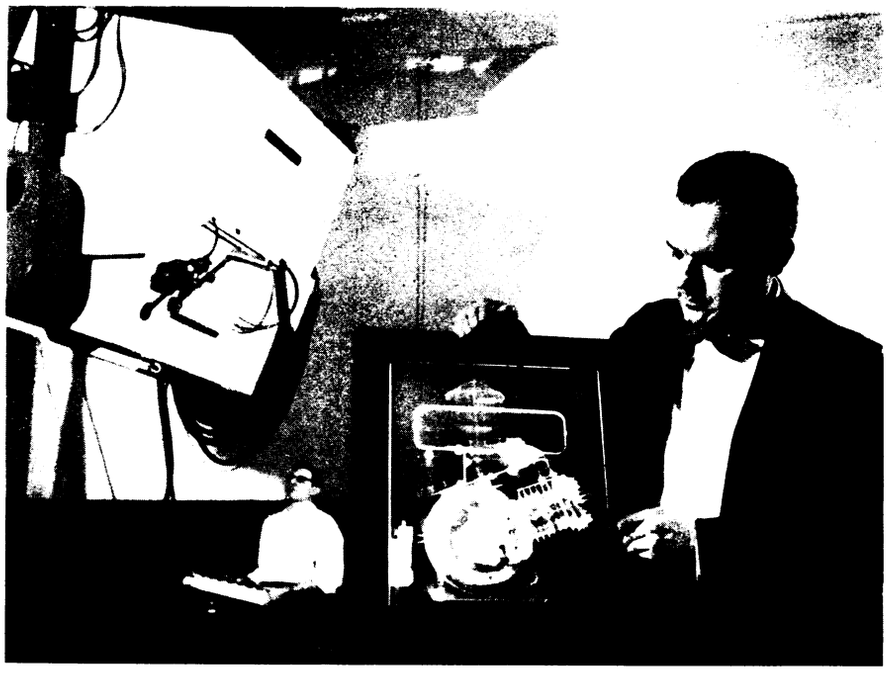
Take Pictures of Engine in Action

➤ PICTURES of the insides of engines in action are being taken by engineers at Detroit Arsenal.

The new technique, called stroboradiography, allows scientists to examine complete cycles of engine operation for faulty performance or wear. It was developed by the General Electric Company in cooperation with Detroit Arsenal.

The method involves taking thousands of very short X-ray exposures accurately timed with the moving part, superimposing the brief pictures on special film. The engine thus appears to be standing still, although it is operating at normal speed.

Science News Letter, August 18, 1956



RUNNING ENGINE X-RAYED—The inner secrets of a running engine are shown in this photograph of the equipment and resulting X-ray taken at the Detroit Arsenal. The multiple exposure, timed to coincide with the engine's pulses, was made of a two-horsepower, four-cycle gasoline engine.