

phorus had concentrated on the surfaces of these pockets. This simple camera thus furnished the information sought.

The same method, Dr. Shoupp said, can be used to reveal the location of other substances, as for example, sulfur, carbon, manganese and silicon, for any of these substances can be made into tracers with an atom-smasher.

*Science News Letter, March 7, 1942*

#### MEDICINE

## Add to Explanations of Sulfanilamide Action

**N**EW research confirming earlier evidence that sulfanilamide attacks bacteria by literally starving the germs may provide a hopeful method of "making drugs to order" for specified germs.

Until recently, pharmacologists, the scientists who develop new drugs, have worked mainly on a hit-or-miss basis. Ehrlich, for example, tried 606 times before he hit on salvarsan, the specific drug for the organism of syphilis.

The new research is reported (*Lancet*, Jan. 10) by Dr. Sydney D. Rubbo and Dr. J. M. Gillespie of the University of Melbourne, Australia. They found that a chemical called p-aminobenzoic acid is needed by a certain type of bacteria for growth. This acid is similar in its chemical structure to sulfanilamide. When the sulfanilamide is present, the bacteria are tricked into using it instead of the necessary acid. Since sulfanilamide does not promote growth, despite the similarity in chemical structure to the acid, the bacteria cannot develop.

However, only one part by weight of the acid will offset the growth inhibitory qualities of 26,000 parts of the sulfanilamide, the report states. This is a possible explanation of why such large amounts of the drug are needed in treatment of bacterial infections.

Dr. D. D. Woods and Dr. P. Fildes, British scientists, had earlier discovered evidence that the acid was necessary for bacterial growth, and that sulfanilamide inhibited growth by interfering with the bacterial use of the acid. The present research confirms their evidence, while an editorial in the same issue of the *Lancet* comments that "one new and more rational method has been added to those already available in (drug) research."

This new method is the search for compounds similar to substances known to be essential to the growth of bacteria.

*Science News Letter, March 7, 1942*

#### ASTRONOMY

# Study of Distant Galaxies Gives Hints on Milky Way

## Exploring Outward in Time and Space, We Should Be Able To Work Out Destiny of Our Own Galaxy

**E**XPLORING outwards in the time and space of the universe, Dr. Harlow Shapley, director of Harvard Observatory, in an address before the Inter-American Astrophysical Conference, declared that by studying hundreds of thousands of great systems of stars, each comparable to our own Milky Way, it should be possible to work out whence our own system of stars came and where it is going.

Already Dr. Shapley has directed a census of these galaxies out to a distance of 100,000 light years (600,000,000,000,000 miles). More than 400,000 new systems have been discovered. About a thousand million million stars are involved in this gigantic study of the whole sky, now two-thirds complete.

Mexico's new Schmidt-type telescope, just dedicated at Tonanzintla, largest of its kind reaching southern regions of the sky, is specially well suited to the study of these faint external galaxies.

Three-quarters of these great aggregations of stars have spiral arms which hitherto have been thought of as streams of stars thrown off from the central portion of the galaxy. Dr. Shapley told the conference that these arms actually appear to be condensations within the systems rather than ejections from the center masses.

Measuring photographic plates with electrical measuring instruments more sensitive than the human eye, Harvard measurements reported by Dr. Shapley show that only a fifth of the light of a spiral galaxy is in its arms and most of it is in the little-noticed background of the galaxy.

Recent Harvard studies show that our own galaxy, the nearest stars of which we see in the night sky, is larger than supposed. Variable stars, used by astronomers as yardsticks, have been found as distant as 30,000 light years on the other side of the center of the galaxy.

Evidence that the Small and Large Magellanic Clouds may be physically connected was presented by Dr. Shapley. An extension or wing of the Small Magellanic Cloud was discovered and has been

shown to be attached to it. This wing extends outward to the Large Cloud.

Out of such studies, Dr. Shapley predicted, will come more information on deeper problems, such as the age of the universe, and whether it is finite in size and material, or limitless in one or both of these quantities.

*Science News Letter, March 7, 1942*

## Meteorites Age of Earth

**E**VERYTHING on earth, even the meteoritic importations from outer space, are the same age, about two to two and a half billion years, Dr. Robley D. Evans of the Massachusetts Institute of Technology told the conference.

This suggests that the "pebbles from heaven" as well as the earthly elements themselves were formed at the same time.

Dr. Evans used a new method of determining age. He estimated ages from the relative activities of long-lived radioactive isotopes or varieties of some elements. In terrestrial samples the radioactive isotopes of uranium, potassium, carbon, oxygen and others always occur in the same proportions, suggesting that they were all formed at the same time. Measurements of meteorites show the same relative abundance of the isotopes.

This checks well with earlier age determinations upon iron meteorites and earthly rocks by measuring the amounts of helium produced as by-products of radioactive disintegration.

*Science News Letter, March 7, 1942*

## ● RADIO

*Saturday, March 14, 1:30 p.m., EWT*

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Kirtley F. Mather, of Harvard University, will predict the organization of all human beings after the war and a planned coordination of all sorts of human activities.

*Tuesday, March 10, 7:30 p.m., EWT*

Science Clubs of America programs over WRUL, Boston, on 6.04 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in high schools, throughout the Americas. Have your science group listen in at this time.