

ASTRONOMY

# Theories of Universe Shaken By Discoveries at Harvard

## Dr. Shapley Says Systems of Stars Are Scattered Irregularly, Instead of Uniformly, Throughout Space

**W**ANTED, a new theory of the universe.

Dr. Harlow Shapley, director of the Harvard College Observatory, reported to the American Association for the Advancement of Science in Cleveland, a gigantic probing of the depths of the universe which shows that the galaxies, which are immense systems of stars, are scattered irregularly instead of uniformly throughout the great sphere of space that can be reached by the astronomical telescopes of today.

And that upsets the most favored conceptions of the universe around us.

It will be interesting and disconcerting news to Prof. Albert Einstein who is visiting in California where he will undoubtedly meet the latest of universe makers, Prof. Richard C. Tolman of the California Institute of Technology, who has improved the Einstein variety of universe and made it fit more closely the actual conditions.

### Greatest Census

It will also be news to a Belgian priest, Abbé Le Maitre, who teaches astronomy and meditates fruitfully in his monastery cell. It was he who pointed out that the universe, as postulated mathematically by Einstein, would collapse if anyone in it did so much as wave his arm.

And Dr. Shapley's latest findings will also interest De Sitter and other mathematical astrophysicists who are studying the universe.

Dr. Shapley has made the greatest census of "island universes" within the universe itself that has yet been made. These great aggregations of stars, most of them larger than the great milky way group in which the sun is a very insignificant dwarf, are from a few millions to some hundred and seventy million light years away from us. In attempting to visualize these immense distances it must be remembered that light travels a hundred and eighty-six thousand miles per second.

Thousands of photographs were taken by Harvard astronomers at ob-

servatories in South America and Africa as well as at Cambridge, and a tenth of the area of the whole sky has been inspected for galaxies as faint as the powerful telescopes can photograph. Eighteen thousand new galaxies have been discovered.

The way these vast groups of stars are distributed throughout space affects the present theories of the universe. Actually Dr. Shapley finds that in one area of the sky there may be seven galaxies, while a short distance away in an equal area some forty to fifty may be counted. And the galaxies are unequally spaced as the depths of the universe are probed by the telescope from our earthly viewing point.

The results of Mt. Wilson Observatory explorations of smaller areas of the sky led to the conclusion that the galaxies were fairly evenly distributed throughout the universe, and Prof. Tolman's nonstatic conception of the universe, latest and most widely accepted, was built upon that assumption.

Dr. Shapley emphasized that his results would not completely scrap the present theories of the universe, but that further evolution of these theories will probably be demanded.

The first detailed map of a galaxy of stars was shown by Dr. Shapley. In the large Magellanic cloud he has found two hundred thousand giant and super-giant stars, each more than a hundred and fifty times as bright as the sun. Two thousand of them are ten thousand times the sun's brightness.

Great clouds of dark nebosity that obscure the nearer parts of the Milky Way were discovered by Dr. Shapley and his associates in the course of adding ninety thousand stars to the Henry Draper star catalog of the Harvard College Observatory which already contained 225,000 stars.

*Science News Letter, January 10, 1931*

The American farmer of early middle age is less subject to nervous ailments than workers in other occupations, a research study shows.



**DR. CHARLES F. ROOS**

*Who was elected permanent secretary of the American Association for the Advancement of Science.*

GENERAL SCIENCE

## Anthropologist is Elected New A. A. S. President

See front cover

**D**R. FRANZ BOAS, noted anthropologist of Columbia University, was elected President of the American Association for the Advancement of Science for 1931, during the Cleveland meeting. Dr. Boas is one of the leading figures in the field of anthropology. He has been engaged in this work throughout a very long and active career.

Dr. Charles F. Roos, now assistant professor of mathematics at Cornell University, was elected permanent secretary of the Association, succeeding Dr. Burton E. Livingston of the Johns Hopkins University, who has been made general secretary of the organization. Dr. Roos will be resident in Washington. He has been secretary of the section on social and economic sciences.

The scientists passed a resolution condemning the anti-vivisection bill now being considered by Congress, which would prevent experimental operations on dogs in the District of Columbia.

They also passed a resolution approving the proposed establishment of a national park in the Everglades of Florida, but only "under conditions that will completely exclude railway and other commercial developments and fully protect the floral and faunal associations within the limits that are to be established."

*Science News Letter, January 10, 1931*