

## ASTRONOMY

# Cosmic Collapses Held Cause Of Birth of Spiral Nebulae

Abbe Lemaitre, of Expanding Universe Fame, Expounds A New Daring Theory Supported by American Data

**W**ORLDS are, because parts of the universe collapsed. This, in a sentence shorter than a telegram, sums up a theory of the genesis of the spiral nebulae, the vast islands of suns that swim at vaster distances apart in the depths of space, as presented by the Abbé Georges Lemaitre of Louvain University before a Washington audience of scientists.

The Abbé Lemaitre, who is at present a visiting professor at the Catholic University of America, developed this theory as a part of his larger theory of an expanding universe.

The universe, the lecturer reminded his hearers, is exceedingly empty. The masses of the stars, and of their aggregations into galaxies, are impressive; but when all matter is averaged out into all the space through which it is distributed, it comes to about one atom to a cubic yard of space. How could so thin a population of particles ever become aggregated into whole whirlpools of suns?

For answer, the Abbé postulated regional irregularities in his expanding universe—regions where the rate of expansion was slowed down to a certain critical low velocity. In some of these regions, the velocity of expansion failed to accelerate again; there were "collapses," permitting the aggregation of particles, and their condensation into the spiral nebulae.

Such a moment of critically low velocity of expansion, with resultant collapse and formation of aggregates of matter, occurred for the odd millions of light-years of space with which we are familiar about a billion years ago, Abbé Lemaitre suggested. This billion years is much less time than is called for by the theory of the passing of all stars through the same stages of development, from giant globes of unimaginably hot gases to aged "dwarf" stars of relatively feeble temperature energy. The Abbé does not think it necessary to postulate this uniform evolutionary course for all stars; his theory admits of

the simultaneous and very rapid formation of stars of all classes.

His contacts with American astronomers on his present visit to this country, he said, have supplied him with data which appear to support his present daring theory.

*Science News Letter, November 25, 1933*

## AVIATION-PHYSICS

## Improved Radio Beacon To Aid Aviators

**T**HE CHANCES for an air pilot to keep on his course or to reorient himself if he should become lost are now greatly increased, thanks to the innovations brought about in the present type of radio range-beacon by F. W. Dunmore of the Bureau of Standards.

The system makes possible the sending of four different signals in four directions, namely, one dot in a westerly direction, two dots east, three dots north, and four dots south. By noting which signal is the loudest the pilot may determine his general direction.

With the radio beacon now in general use the determination of absolute direction or position on airways is difficult because the same signal is sent to

four points of the compass. When the aircraft is near the radio beacon a pilot may pass from one course to another without knowing it. If lost it may take him an hour to reorient himself and the danger in case of shortage of fuel or the importance of time lost when on an errand of mercy will be apparent. It is believed by the inventor that the present scheme obviates these difficulties admirably.

The method consists of changing the so-called figure-of-eight transmission for the courses to the unidirectional cardioid transmission by changing the point of coupling into suitable phasing sections in the transmission line feeding the antenna, or, by superimposing on a figure-of-eight radiation through a suitable hybrid coil circular radiation in phase with figure-of-eight direction.

The method has been tried out extensively at the Bureau's experimental field at College Park, Md., and has been found altogether satisfactory. No additional equipment is required for receiving the signals on aircraft.

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## SOCIOLOGY

## City Dumps Tell Story Of Present Civilization

**S**INCE the present learns more about the past from city dump heaps than from art and literature, the picture below may well represent the chief source of knowledge concerning the current civilization to archaeologists of the future. At least, this is the view of officials of Logan Museum, Beloit, Wis., who prepared the diorama shown below. In the layer representing the (*Turn Page*)



DIGGING INTO THE TWENTIETH CENTURY

Here is a laboratory-built cross-section of a typical city dump heap showing the changing variety of articles discarded since 1893.