

ASTRONOMY

Clusters of Galaxies

Greater order than previously thought is found in distribution of "island universes" by University of California scientists as by-product of sky-mapping program.

► A GREATER order to the cosmos than has been shown before is now reported by University of California astronomers and mathematicians.

This work gives a new picture of the distribution of the billion or so extra-galactic nebulae that exist in the vastness of space of the universe. These nebulae are not unlike our own Milky Way, and each contains perhaps a hundred billion stars.

In the past many scientists have believed that these "island universes" are scattered in random fashion over the sky. The University of California scientists found that the distant universes are distributed in clusters, or in clusters of clusters.

The clusters vary in size upward from six million trillion miles across. They vary in population from a few dozen to more than a thousand nebulae.

When the California scientists plotted the distribution of the clusters, they wound up with a picture that looks like a schematic drawing of eddy currents in a turbulent volume of fluid.

The scientists are unwilling to speculate on the meaning of such a configuration. One theory suggests that the universe came

into being when a very dense volume of matter "exploded" with cosmic violence and spread through space. Such an explosion could conceivably have resulted in a distribution of nebulae such as that observed by the California group.

In any event, the observed picture of the extra-galactic nebulae suggests a greater order than random distribution, even though a full explanation of that order may not yet be available.

The new findings are a by-product of a long-range sky mapping program that may not be completed until 1955. In this program, directed by Dr. C. D. Shane, director of Lick Observatory, special pains are being taken to photograph the extra-galactic nebulae. These nebulae are being used as coordinates to get a better insight into the true rotational motions of our galaxy.

Dr. Shane and Dr. Jerzy Neyman, director of the Mathematics-Statistical Laboratory on the Berkeley campus, used the photographs to study the nebular distribution. They were assisted by C. A. Wirtanen, Lick astronomer, and Dr. Elizabeth L. Scott, Berkeley mathematician.

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alike in brothers and sisters, and particularly in identical twins, than in persons of similar age who are not related.

In mature persons growth declines progressively and materially with age, Dr. Hamilton found.

Instead of using body growth in childhood, he used the growth of nails as an index of growth and replacement of body tissues throughout the lifespan.

With this index, he studied growth in 300 male and 298 female Japanese aged three to 88 years, including identical twins and members of large families, and 500 male and 250 female white persons aged five to 87 years, including identical twins.

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ENGINEERING

Radioactive Ground Glass Traces Mud Movements

► RADIOACTIVE GROUND glass can be used to trace movements of mud in river channels, knowledge of value in disposing of dredged material.

Studies made by Britain's Hydraulics Research Station and the Atomic Energy Research Establishment have shown that very finely ground glass containing radioactive scandium oxide moves with the mud when mixed with it in the River Thames.

Engineers had long suspected that mud dredged from the river channel and dock areas of the Port of London, most of which is dumped at sea beyond the estuary, was being carried back up the river by the tide. Radioactive labeling of glass particles showed this theory is probably correct, some of the material being carried at least two or three miles upstream in the first few tidal cycles.

Larger quantities of radioactive material will be needed to trace mud movements over longer distances. Amounts of radioactive glass used in the studies were too small to endanger anyone working on or near the river.

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POPULATION

Death Decline Not Chief Aging Population Cause

► OLD PEOPLE are increasing in numbers, not just because they are living longer but because with each passing year mothers are having fewer babies, Dr. Frank Lorimer of American University reported at the Population Association of America meeting in Princeton, N. J.

Reduction in deaths does tend to increase the proportions of children and the aged as compared to adults of middle age, Dr. Lorimer said, but it has comparatively little over-all effect on the age structure of the population.

A progressive reduction in the number of babies per mother is the chief reason why older people, who were born longer ago, are increasing in proportion to those born more recently.

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CYTOLOGY

Cells Adapt to Chemicals

► CHEMICALS THAT at first injure cancer cells fail after a time because the cancer cell is so very adaptable. The same factor explains why cancers that are at first sensitive to X-rays, radium and other sources of radioactivity later become resistant to radiation.

This explanation was given by Dr. E. V. Cowdry of Washington University, St. Louis, at a New York Academy of Sciences meeting.

"Similar acquired resistance may face attempts to kill off cancer cells by viruses," Dr. Cowdry said. "These particulate agents enter the cancer cells and seem to destroy them by their rapid multiplication and utilization of nutritive materials needed for survival by the cancer cells. Such viruses starve the cancer cells as the cancer cells starve the body. Time may be insufficient for adaptation."

Scientists at the meeting took a "new look" at the pre-cancer cell with the object of finding better ways to identify it so that early, preventive or curative treatment might be undertaken.

No one property of cancer cells can be singled out and labeled as the reason why

they do so much damage, Dr. Cowdry said. The cells' behavior depends on their genetic constitution and their tissue fluid environment, he said.

He gave the following five properties usually shown by cancer cells: 1. relatively high water content, 2. motility and invasiveness, 3. multiplication unregulated by the usual controls, 4. short individual lives during which cytoplasmic storage is at a minimum and 5. active protein synthesis, indicated by intense ribonuclease activity and large nucleoli, monopolizing nutritive materials needed by all other cells.

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PHYSIOLOGY

Growth More Rapid During Day Than Night

► GROWTH IS more rapid during the day than during the night, Dr. James B. Hamilton of the State University of New York College of Medicine at New York reported at the meeting of the Endocrine Society in Atlantic City, N. J.

The rate of growth tends to be more