

M0006381: Wellcome Historical Medical Museum display: "The Universe"

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I THE UNIVERSE

Modern science suggests the hypothesis of **NEBULAE** (clouds of gas and dust) as the origin of the universe. The **UNIVERSE** is finite yet unbounded, and **EXISTENCE** is composed of possible size from the mean density of the matter of space. The finds to date to be 10²⁷ times the distance from the Earth to the Sun, which means that **THE UNIVERSE** is 10²⁷ times the distance from the Earth to the Sun.

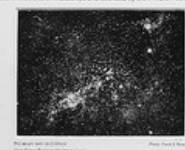
SIZE OF THE UNIVERSE

Today, according to the Theory of Relativity, **THE UNIVERSE** is finite yet unbounded, and **EXISTENCE** is composed of possible size from the mean density of the matter of space. The finds to date to be 10²⁷ times the distance from the Earth to the Sun, which means that **THE UNIVERSE** is 10²⁷ times the distance from the Earth to the Sun.

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THE STRUCTURE OF THE UNIVERSE

The structure of the universe is a great number of **NEBULAE**, separated from one another by vast distances of space. One of these known as **THE GALACTIC SYSTEM**, consists of the Sun and all the stars which revolve around it and is bounded by the **MILKY WAY**.



THE EXTRA-GALACTIC NEBULAE

Seen from the Earth through the stars of the Galactic System, other Nebulae known as **EXTRA-GALACTIC NEBULAE** resemble the Milky Way, may be grouped into one or two well-defined types according to their appearance in the telescope.

- 1. Elliptical Nebulae
- 2. Spiral Nebulae
- 3. Barred Spiral Nebulae

II FEATURES OF THE GALACTIC SYSTEM

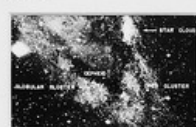
Some of which are seen in the Extra-Galactic Nebulae.

1. SIMPLE STARS

There are a great number of stars and density. **BETELGEUSE**, a giant red star, has a diameter 100 times that of the Sun, and a density equal to one-thirtieth of the air. At the opposite end of the scale is the **WHITE DWARFS**, which is a tiny approximately size of the Earth and a density about 1,000 times that of platinum. Between these two extremes is the majority of the stars.

2. CEPHEID VARIABLES

Stars giving out a regularly varying light, suggesting that they are pulsating.



3. BINARY STARS

Two stars relatively in close proximity and moving in orbits round each other.



5. STAR CLOUDS & GLOBULAR STAR CLUSTERS

These contain vast numbers of stars in comparatively close formation. They are found some within the Galactic System others lying outside it.



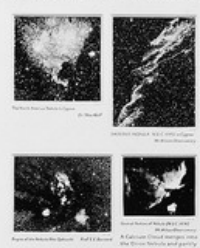
6. PLANETARY NEBULAE

Clouds of gaseous matter each surrounding a central star.



7. GALACTIC NEBULAE & CALCIUM CLOUDS

Clouds of gaseous matter. These in which calcium appear in the predominant constituent are known as **CALCIUM CLOUDS**.



8. SOLAR SYSTEMS

A Solar System, a star with Planets revolving round it, is a rare occurrence (see Section 10), and the only one of which we possess any definite knowledge is the Solar System of which the Earth is part.

III THE COURSE OF EVOLUTION OF THE UNIVERSE

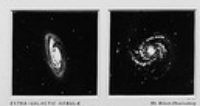
according to Modern Astronomical Cosmogony

THE ORIGINAL STATE OF THE UNIVERSE

In the beginning matter, having a measurable quantity of thermal agitation, was spread uniformly throughout the Universe.

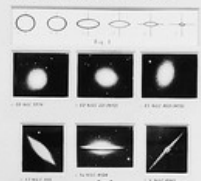
FORMATION OF NEBULAE

Uniformly distributed matter in a dynamically unstable state. As the concentration of matter became, through thermal agitation, greater in one part of the Universe than in another, the force of gravity came into action causing concentrations of matter round certain centres, such as a central nucleus. One of these concentrations gave rise to the **GALACTIC SYSTEM**. The distribution and mass of these Nebulae coincide approximately with those deduced by the Theory of Condensation of Uniformly Distributed Matter.



THE EVOLUTION OF NEBULAE

These first concentrations of matter were masses whose density was highly concentrated in their central regions. The balance of such masses rotating and shrinking under the force of gravity has been determined by mathematical investigation.

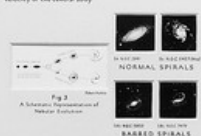


The sequence of configurations of masses, whose density is highly concentrated in their central regions, rotating under their own gravitation.

Fig. 6. Examples of Nebulae showing corresponding configurations.

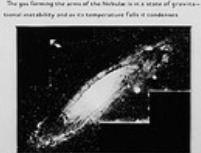
The sequence of illustrations in Figs 1 and 2 above demonstrates the normal effects of increasing rotational speed upon dividing bodies of this nature. As the body shrinks, the speed of rotation increases causing it to assume the form of a more and more flattened spheroid. When this process has caused the Nebulae to reach the critical form indicated by Figs 3a and 3b, any further increase in its rotational velocity results in the gas spilling out from the inner part of the disk continuing to revolve in the same plane as the Nebula. This stage gives place to the 'stage' of the **SPIRAL NEBULAE**, which conform to two main types: **NORMAL SPIRALS** and **BARRED SPIRALS**.

according to the shape of their arms which is determined by the velocity of the central body.



CONDENSATION OF NEBULAE INTO STAR-CLOUDS AND CLUSTERS

The gas forming the arms of the Nebulae is in a state of gravitational instability and as temperature falls it condenses.



THE SPIRAL NEBULAE EVOLVE BY AN INCREASING



Fig. 1. The sequence of configurations of masses, whose density is highly concentrated in their central regions, rotating under their own gravitation.



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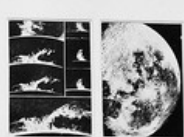
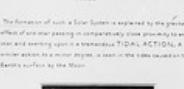


Fig. 1. The sequence of configurations of masses, whose density is highly concentrated in their central regions, rotating under their own gravitation.

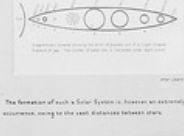


The sequence of configurations of masses, whose density is highly concentrated in their central regions, rotating under their own gravitation.

Fig. 6. Examples of Nebulae showing corresponding configurations.

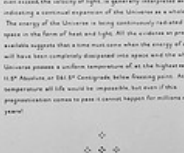
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