

# Stars Are Said to Resemble Eggs

*Astronomy*

## British Astronomer Advances New Theory

THE structure of a star is something like that of an egg—a dense yolk in the center, surrounded by lighter material. This is the new theory proposed by E. A. Milne, Rouse Ball professor of mathematics at Oxford University, in a communication to the magazine *Nature*.

In the "yolk" the temperatures are far higher than astronomers have previously calculated for the interior of a star, he says. His tentative estimate is 100,000,000,000 degrees, instead of a mere 10,000,000 degrees, a figure generally accepted at present. Furthermore this nucleus is extremely dense, as great or even greater than a star like the strange companion of Sirius, of which a pint of its material weighs 25 tons. Prof. Milne thinks that the density of the yolk may reach the maximum possible for ionized matter, that is, matter in which all the atoms are broken up into separate electrons.

Four or five hats take up quite a bit of room in a trunk, but if the hats are chopped up into small bits, the same amount of matter can be put in a much smaller space. Similarly, atoms of matter, consisting of electrons and protons, take up a certain amount of space, but if they are ionized or broken up into their constituents, the same amount of matter can be condensed far beyond anything familiar to us on earth.

### Hot, Concentrated Nucleus

The consequences of his theory, says Prof. Milne, "amount to a complete revolution in our picture of the internal constitution of the stars. In the intensely hot, intensely dense nucleus, the temperatures and densities are high enough for the transformation of matter into radiation to take place with ease. It is to this nucleus that we must look for the origin of stellar energy,

a nucleus the existence of which has previously been unsuspected."

Prof. Milne differs from the views of Sir Arthur Eddington, another famous British astronomer, as to the internal structure of a star. According to Sir Arthur, the density of a star increases towards the center, but the increase is a gradual one. Both, however, share the generally accepted view that the light and heat radiated from a star comes from an actual transmutation of the star's matter into energy, but if constructed according to Sir Arthur's ideas, states Prof. Milne, the star would not be stable.

### "Not a Speculation"

"Let the rate of internal generation of energy diminish ever so slightly," he says, "the density distribution suffers a remarkable change. The mass suffers an intense concentration toward its centre, the external radius not necessarily being changed. The star tends to precipitate itself at its centre, to cry-

stallize out so to speak, forming a core or nucleus of very dense material. The star tends to generate a kind of 'white dwarf' at its centre, surrounded of course by a gaseous distribution of more familiar type; the star is like a yolk in an egg."

In concluding his communication, he emphasizes the soundness of his views.

"The new results are not a speculation," he declares. "They are derived by taking the observed mass and luminosity of a star, and finding the restrictions these impose on the possible density distribution compatible with this mass and luminosity."

*Science News-Letter, September 27, 1930*

## Roman Child Artists

ONE family of ancient Rome would no doubt be greatly entertained if it could see archaeologists of 1930 poring over the scrawled drawings made on the walls of their house. The drawings, recently discovered, are such as children of ancient Rome, or any other time and place, enjoy scribbling on a handy piece of clean wall space.

The house stood in the famous Appian Way about the time when the Roman Republic became the Empire of Rome. Its ruins have lain buried beneath almost 40 feet of earth.

Prof. Francesco Fornari, Roman archaeologist who has been studying the mural sketches, sees in some of them pictures of fighting gladiators armed with shields, spears, and swords. Another sketch is believed to show an individual being burned. Rows of long and short lines, rising before this person, indicate flames, and there are soldier-like figures on either side who appear to be stirring up the flames with their spears.

*Archaeology*

*Science News-Letter, September 27, 1930*

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