

LETTERS TO THE EDITOR

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TWO MORE PLANETARY SYSTEMS

OBSERVATION has at last come to the aid of theory which had given conflicting verdicts on the uniqueness of the Solar System. A planetary companion to the 61 Cygni system has recently been discovered by Dr. K. Aa. Strand (Feb. 1943) from a study of parallax observations of the star. A periodic deviation from the Keplerian orbit was found for the system, and this can only be due to the presence of a third body (61 Cygni C) of small mass. 61 Cygni C is found to be sixteen times as massive as Jupiter and very feebly luminous. It can, therefore, be classified as a planet.

Reuyl and Holmberg (Jan. 1943) have about the same time discovered a non-solar planetary body of even smaller mass in the binary star system, 70 Ophiuchi. As both the stars, 61 Cygni C and 70 Ophiuchi, are within 10 parsecs of the Sun (Jeans, 1929a), it is significant that two other planetary systems have been discovered quite close to our Solar System.

These observations very much weaken the case for the tidal theories of Jeans (1919) and Jeffreys (1929), according to which planetary systems should be very rare. Jeans (1929) estimates that on his theory about one planetary system in the whole of the galactic system should be formed every 5,000 million years. This gives us at the most two planetary systems in our galactic system, if we take the age of the Universe to be between 10^9 and 10^{10} years. Planetary systems have hardly any chance of being formed on Lyttleton's binary star collision theory (1938).

Banerji's Cepheid theory (1942), on which a star passes an oscillating Cepheid at a moderate distance and disrupts it, makes the birth of planetary systems much more probable. We shall quote Banerji on this point (1942a), "One conclusion seems to be irresistible. If the theory be correct in its essentials, there may be more planetary systems than at present supposed". Banerji's conclusion is fully borne out by the recent observations.

It may be remarked that the author has

recently advanced a Cepheid theory of the origin of binary stars (Sen, 1941-42), which makes it possible for binary stars to possess planetary systems. Radiation of energy and consequent increase of angular velocity causes a Cepheid to break up into a double star system. The filamentary ribbon connecting the two stars may condense into planets.

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EFFECT ON B.H. CURVES OF ELECTRIC CURRENTS THROUGH A TRANSFORMER CORE

THE B.H. curves for ferromagnetic materials as obtained on a cathode-ray oscillograph provides a good visual and photographic method for studying the variations in the magnetic properties of these materials with various physical changes. The hysteresis loop can be obtained on the oscillograph provided only with electrostatic deflection plates (Fig. 1) if a resistance (R_1) is included in series with the primary coil of the transformer, and a suitable phasing condenser (c) and resistance (R_2) are present in the secondary circuit. The magnetising force is proportional to the primary current and thus to the voltage built in the series resistance (R_1) and this is applied after amplification for horizontal deflection of the beam, while the voltage in R_2 is proportional to B and is applied after amplification to the plates giving vertical deflection.