SCIENCE

VOL. 98 FRIDAY, OCTOBER 29, 1943 No. 2548

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL; WARE CATTELL, assistant editor. Published every Friday by

THE SCIENCE PRESS

Lancaster, Pennsylvania

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

ASTRONOMICAL PROBLEMS OF TO-DAY[1]

By Sir JAMES JEANS, F.R.S.

PROFESSOR OF ASTRONOMY, THE ROYAL INSTITUTION

THIS evening I propose to discuss a group of problems relating to the central problem of the structure of the universe. No final or definite answers have yet been found for these, so that we shall be discussing questions rather than answers.

The earliest astronomy was geocentric, the earth being supposed to be the center of the whole universe. This view was not based on astronomical evidence but had its roots in man's self-esteem, in his want of imagination and in the meagerness of his scientific knowledge. It met its end in the arguments of Copernicus and in the observations of Galileo.

It was succeeded by what we may call a heliocentric astronomy, in which the sun was supposed to be at or near the center of the galactic system and possibly also of the whole universe. This view did not result from any human frailty; there seemed to be good scientific evidence for it.

For a superficial study of the sky shows that those stars that appear brightest to us, and so are presumably nearest to us, are scattered fairly uniformly in the different directions of space, while the Milky Way divides the sky into exactly equal halves and itself looks about equally bright in all its parts. All this seemed to indicate a disc-shaped system of stars, with the sun lying in the central plane of the disc and fairly close to its center. Such a view of the structure of the galaxy appeared to find confirmation in the pioneer researches of the two Herschels and in the later investigations of Kapteyn, Seares and others.

We know now that it was entirely wrong. It was wrong because these investigators had assumed that space was entirely transparent to light. We know now that the whole galactic system is permeated by a patchy fog of obscuring matter, which is not dense enough to affect the light of the nearer stars appreciably but blots out the more distant stars entirely. This fog makes the greater part of the galactic system

[1] Abstract of lecture before the Royal Institution of Great Britain, March 26, 1943.