

BOOK REVIEW

Ten Faces Of The Universe

Fred Hoyle, W. H. Freeman and Company, San Francisco, 1977, 207pp. \$10.95 (\$6.95 in paperback).

I was delighted to have the opportunity to review Ten Faces of the Universe. Sir Fred Hoyle is a leading cosmologist, and a new book that gives insight into his latest theories could well be worth the effort. The titles of the 10 chapters (e.g. "God's Universe," "The Astrophysicist's Universe." "The Origin of the Universe", "Nobody's Universe." "The Biologist's Universe." "Everyman's Universe") seemed to confirm that here, indeed, was an effort to display modern cosmology in the wider context of science and its role in the service of mankind.

The first chapter was sufficient to dispel that notion. It consists of an odd mixture of 1) Hoyle's disavowal of religion, 2) Hoyle's critique of the educational system (particularly methods of teaching mathematics) and 3) an interesting discussion of the life and death of Galois, a French mathematician who discovered group theory. Clearly, a conventional theological view of the universe was not one of the "Faces" that interested Hoyle.

The pace picks up in the next five chapters. Hoyle introduces space-time, current views on the nature of sub-atomic particles (baryons, leptons and quarks, the four forces (gravity, electricity, weak, and strong) and relates these to nucleosynthesis and the life cycle of a star. A discussion of galaxies and galactic motions leads quite naturally to the origin of the universe. Here Hoyle displays his latest alternative to the Big Bang Theory accepted by most contemporary astrophysicists and cosmologists.

In Hoyle's theory, the redshift observed in the light from distant galaxies is a result of an historical shrinkage in the size of atoms, rather than the traditional Doppler shift. The apparent expansion of the universe is, in Hoyle's theory, due to a shrinkage of the yardstick by which distances are measured. However, Hoyle's theory requires a universe of infinite size and zero mass at the time $t = 0$, conditions hardly more palatable than that of the existence of the primordial mass prior to the "Big Bang". Hoyle's explanation of the 2.7°K background radiation from the Big Bang requires a redefinition of time. The time $t = 0$ is defined as a boundary between large scale space-time aggregates characterized as fundamentally different types of mass interaction. Is this the boundary between matter and anti-matter? Hoyle never addresses the subject in these terms, and thus ignores some of the more fascinating issues in current discussions of relativity and cosmology - e.g. white holes, worm holes, etc.

In the final chapters, Hoyle presents his view of geophysical and biological evolution, an analysis of the Earth's energy supply, and finally makes an appeal for global population control -- a strange note on which to end. It was only later, when I read the author's Preface, that I realized this was the announced intent of the book! Hoyle has been an advocate of global population control for several decades and chose this vehicle to fire another shot in that campaign.

I learned some new information in the technical parts of this book, but Hoyle's writing is not as lucid as that of many other contemporary authors. Most readers will find some prior reading in the areas of relativity and cosmology helpful. I have listed below three books that are more detailed, yet clearer, than Ten Faces of the Universe and will provide a useful foundation for understanding of Hoyle's exposition.

From a philosophical point of view, Ten Faces of the Universe falls far short of its thematic potential, and I must confess a substantial feeling of disappointment. (My standard for comparison is Bronowski's The Ascent of Man.) Ten Faces of the Universe is

directed less to broadening man's understanding of his universe than to a restatement of a position articulated more effectively in The Limits of Growth. It is unfortunate that Hoyle chose to mix his cosmological work with a somewhat weak, if well intentioned, appeal for international attention to the population control problem -- neither comes off well in the admixture.

BIBLIOGRAPHY

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