has not been well explained in this book.

There is no doubt that the average systematist should buy this book and read it and that his appreciation of the depth and breadth of systematics will be enhanced thereby.

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Galaxies

Radio Astronomy and the Galactic System. The IAU/URSI Symposium, Noordwijk, the Netherlands, 1966. HUGO VAN WOERDEN, Ed. Published for the International Council of Scientific Unions, with the financial assistance of UNESCO, by Academic Press, New York, 1967. xviii + 502 pp., illus. International Astronomical Union Symposium No. 31.

Astrophysics today is in fruitful turmoil. Pulsars and quasars are relatively new mysteries while, more than 100 years after the discovery of the spiral nebulae by Lord Rosse, there is no generally accepted theory of the dynamics and structure of spiral galaxies. One has the feeling that surely the dike will break in the next five years, giving some basic answers about objects of galactic dimension, but this volume reveals that while the observers make one breathtaking discovery after another, leading theorists cling to elaborate reworking of an old purely gravitational model for spiral galaxies that, after *four* decades, still does not fit the facts. Models in which the galactic magnetic field plays a role comparable to that of gravitation are almost ignored at this symposium, although the protests of the distinguished Soviet astronomer Pikel'ner are duly recorded.

An enormous variety of subjects are reviewed in this volume, which is the proceedings of an international symposium attended by 87 invited participants. The book consists of three parts, subdivided into 16 subsections, one part on interstellar clouds, the second on the interstellar gas, and the third on the Galaxy as a radio source and galactic magnetic fields. Actually, despite the phrase "radio astronomy" in the title, almost all the information that bears on the Galaxy as a whole, whether from the optical, radio, x-ray, or other regions of the spectrum, or from extragalactic studies, is touched upon in some fashion in this stimulating and tremendously informative volume.

Some of the extremely active and sometimes controversial topics to which subsections are devoted are interstellar molecules, physical processes in the interstellar medium, the spiral structure of the Galaxy, the galactic halo, the galactic magnetic field, the galactic nucleus, cosmic rays in the Galaxy, and x-rays in the Galaxy.

With a very active Union, astronomy is probably reviewed more thoroughly and more often than most fields of science. Unfortunately this has led to some defects. One is the custom of having the same person review a topic in one symposium after conference after "institute" after another. Inevitably those who work in the field can predict what viewpoint will be stressed. However, repetition of the conventional wisdom does not guarantee truth.

A second foible of astronomers is their tenacious devotion to purely gravitational theories. Thus, the group of papers on spiral structure does all but proclaim the success of the density wave theory whereas, in this reviewer's opinion, its success is totally illusory. In his introductory report, Prendergast actually uses most of his article to describe the Lin-Lindblad model. This paper is then followed by an article by Lin and Shu. No mention is made of the competing magnetohydrogravitational model for spiral galaxies proposed by Greyber in 1960 and refined since then, and crucial evidence that casts doubt on the density wave model, such as the careful research by M. E. Dixon which reveals the need for nongravitational forces in explaining spiral arms, is not even alluded to.

Moreover, no mention is made of the famous observations of M31 by the late Walter Baade at Palomar, who discovered a large-scale spiral pattern from about 100 parsecs from the galactic nucleus to a radius of 20 kiloparsecs, since they conflict with the density wave model which permits such a pattern only outside the Lindblad resonance, or from about 4 to 12 kiloparsecs. Another serious objection to a purely gravitational model, the "antispiral theorem" due to D. Lynden-Bell, is blithely dismissed by Prendergast with some blarney about removing symmetries.

Similarly L. Woltjer, in a poorly written final chapter of the volume, mentions the Hoyle-Ireland model of a tightly wound helical magnetic field, strongly sheared, to explain the Faraday rotation data but does not mention the much simpler model due to Greyber which fits the same data, that is, a topology where the magnetic field runs along the spiral arm in one direction above the galactic plane and in the opposite direction below the galactic plane. Additional virtues of the Greyber model are that the configuration has already been observed in the magnetotail of the earth and that star formation is simplified in the neutral magnetic field sheet.

Only a careful reading of the discussion comments by S. B. Pikel'ner (U.S.S.R.) and H. Alfvén (Sweden) can save the nonexpert from a badly one-sided impression of these vital issues.

However, the vast majority of the reports are impartial and excellent. The pair of papers on the high-velocity gas at high galactic latitudes, by Blaauw *et al.* on the observations and by Oort on the interpretation of the observations, present an important new topic with exceptional clarity. Especially worthy of praise are the reports by B. J. Robinson, J. E. Baldwin, E. M. Burbidge, and B. B. Rossi. Of course, such very recent discoveries as pulsars and the newer interstellar molecules are not reported.

With clear printing, good indexing, and an exceptionally low number of misprints the volume reflects credit on the editor. This volume is a "must" for any serious research worker in galactic structure and dynamics, and especially for those who are concerned with our Galaxy.

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Cellular Activity

Protein Biosynthesis and Membrane Biochemistry. Richard W. Hendler. Wiley, New York, 1968. xiv + 354 pp., illus. $11.95.

The literature of the last decade on protein biosynthesis can be a discouraging experience for the beginning student. All too often it conveys an atmosphere of triumphant self-satisfaction, a sense that the major problems have been solved and that current activity in the field is largely a mopping-up operation. The characteristic activity of the molecular biologist, that of performing slightly more elegant experiments to confirm the obvious, lacks the tang of adventure which inspires and motivates. Furthermore, the reader will search in vain for intimations of the origins of