

The World of Flying Saucers

Donald H. Menzel and Lyle G. BoydJ. Allen Hynek,

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remarkably lucid fashion, so that anyone who wished to embark on a detailed examination of one of the many subjects discussed in this book would be well advised to start with the presentation contained here. Inevitably, there are omissions of subject matter; in particular one regrets that the authors did not choose to give the reader the benefit of their clarity and insight in the matter of ionization phenomena.

In summary, this is an excellent account of the subject of real-gas phenomena, which should be of great value to both students and practicing aerodynamicists.

Fundamentals of Orbital Mechanics. By D. A. Pogorelov. Transl. from Russian by Morris Friedman. Transl. edited by Julius J. Brandstatter. 112 pp. Holdenday, San Francisco, 1964. Paper \$5.00. Reviewed by T. Teichmann, General Atomic Division, General Dynamics.

The orbital motion of small bodies in central (or nearly central) fields has become a topic of practical importance in recent years, with a resulting revival of interest in the computation of orbits, and the determination of orbital elements from a variety of measurements. There is a wealth of literature available dealing both with analytical and numerical techniques, which is greatly influenced by its astronomical origin. While these methods are well adapted to "exact" numerical calculations, they are often too elaborate for someone who wishes to go beyond the most general properties of the Kepler ellipse, but does not wish to compute firing tables. Pogorelov's work partially meets this need.

Starting with Newton's equation in vector form, he derives the Keplerian orbits, and shows the dependence of the orbital parameters on various initial and other conditions. The discussion is strongly oriented towards ballistic trajectories (though it is not restricted to them), and many range, altitude, velocity, and error relations are explicitly given in manageable terms.

The approach is a direct consequence of the vectorial form of the Kepler relations, and it is of interest to note that the eccentric anomaly

enters only in a rather indirect way in the treatment.

It is unfortunate that many important (if small) effects such as rotation, oblateness, and drag were not introduced even in a general way in this discussion since anyone going beyond the Kepler ellipse finds himself having to contend with them. What there is, is direct and useful, but for most readers there will not be quite enough.

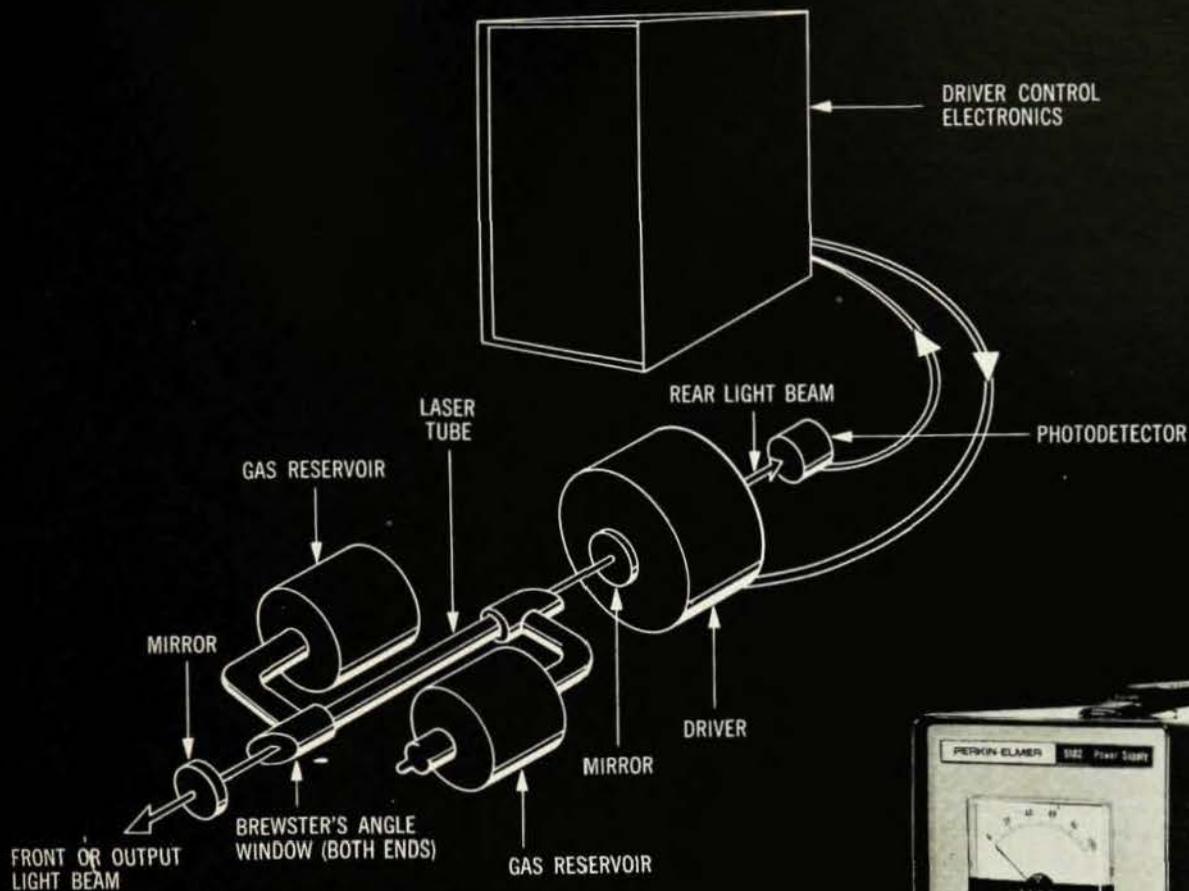
The World of Flying Saucers. By Donald H. Menzel and Lyle G. Boyd. 302 pp. Doubleday, Garden City, New York, 1963. \$4.50.

Reviewed by J. Allen Hynek, Northwestern University.

Nearly a score of years have passed since the first waves of flying saucer reports, in Sweden (1946) and in the United States (1947), but UFO's (Unidentified Flying Objects, the more technical name for flying saucers) still continue to be reported to the US Air Force at the rate of several hundreds per year. Many more are reported to the numerous UFO civilian groups and "saucer" publications in this and other countries, organizations actively on the lookout for support for the thesis that planet Earth is the unwitting host to visitations by intelligently guided craft from elsewhere.

That the flow of UFO reports has continued for these many years, is itself a phenomenon worthy of study by social as well as physical scientists. For the world of flying saucers is a world of reports.

Astronomer Menzel and his talented and witty co-author, Lyle Boyd, who subtitled their book, "A Scientific Examination of a Major Myth of the Space Age", have examined the world of reports (the complete file of the Air Force was made available to them) and ably linked that world to the world of those stimuli which very often give rise to UFO reports. They did not select merely the "easy cases", but pitched right into many controversial sightings which the "true believers" in this Myth of the Space Age regard as the mainstay of their creed. And all but those enthusiasts who, "when told there's a horse in the bathtub . . . begin speculating



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on the color of the horse" instead of first finding out whether the horse is really there, will acknowledge that the authors have done a splendid, interesting, and painstaking job. In their introductory chapters, for instance, they display a behind-the-scenes knowledge of the world of science fiction, and present a convincing account of the role science fiction, and science fiction magazine editors, played in setting the stage for the coming of flying saucers in this country.

Menzel and Boyd will cheerfully admit that not all reports of sightings of UFO's give up the ghost when the light of a scientific approach is turned on them. But, whereas the UFO aficionados will see in this support for their horse in the bathtub, most readers will recognize that when a UFO report lacks the data for a scientific evaluation—authentic photographs, spectroscopic analysis of lights, hardware, position-fixes, parallax measures, photometric data, etc.—it is futile to expect more than a reasonable conjecture, based on experience, as to the most probable stimulus that gave rise to that particular report.

There are UFO reports which one might wish were far more precise than they are, because of their probable

scientific value, those UFO reports, for instance, which have been tentatively ascribed by the authors and by the Air Force to ball lightning. Yet, as in the Levelland, the Lock Raven Dam, and other cases, the reports, if they are to be believed at all, do not describe ball lightning as commonly reported. Ball lightning is generally held to be a small-scale phenomenon, the balls generally being only a few inches in diameter and highly temporal. If the reporters of the Lock Raven case, and others, are even reasonably correct, then we have much yet to learn about ball lightning. These sightings reportedly were of large (5 to 10 feet?) luminous balls of light which had a remarkably long lifetime (5 to 10 minutes?). Such UFO reports may hold the key to controlled thermonuclear reactions!

The authors confirm the Air Force findings that the most frequent producers of UFO reports include balloons, bright meteors or fireballs, stars and planets (especially when viewed under mirage-producing meteorological conditions), artificial satellites, birds (including luminous owls, sea gulls, plover, starlings, and pelican!), migrating spiders, and refueling and other special aircraft missions. The

book is dedicated to the reasonable postulate that all UFO's have always been, are now, and probably will continue to be *usual* objects, or phenomena, seen under *unusual* conditions, such as Jupiter viewed through a contrail, or a nocturnal advertising plane which has failed to get across the advertiser's message.

The most significant thing about UFO reports is that they do not seem to pertain to any one thing but appear to be spawned by a most heterogeneous collection of stimuli. The authors establish this point but do not belabor it. Instead, they treat some of the fascinating sidelights of the Flying Saucer World—meetings with flying saucer pilots ("contacts" is the accepted word in the UFO world), and conversations with "extraterrestrials," G-Fields, Angel Hair, UFO conventions, UFO clubs, travels in flying saucers, etc.

Your reviewer, as consultant to the Air Force for many years in these matters, can heartily attest that the world of flying saucers is a wonderful, wacky world—yet one from which something can be learned. And, *The World of Flying Saucers* is a wonderfully well told story of this bizarre phenomenon which, a generation later, refuses to die out.

BOOKS RECEIVED

EXPERIMENTAL TECHNIQUES

Methods of Experimental Physics. Vol. 2, Electronic Methods. E. Bleuler and R. O. Haxby, eds. 839 pp. Academic, New York, 1964. \$24.00.

Effects of Radiation on Materials and Components. John F. Kircher and Richard E. Bowman, eds. 690 pp. Reinhold, New York, 1964. \$22.50.

Advances in Electronic Circuit Packaging. Volume 4. Conf. Proc. (Boulder, Colo., Aug. 1963). Michael A. Marrese, ed. 490 pp. Plenum Press, New York, 1964. \$17.50.

Exponential and Critical Experiments. Conf. Proc. (Amsterdam, Sept. 1963). International Atomic Energy Agency, Vienna, 1964. Vol. 1, 481 pp., \$10.00; vol. 2, 607 pp., \$12.00.

Plenum Press Handbooks of High-Temperature Materials. No. 2, Properties Index. By G. V. Samsonov. 418 pp. Plenum Press, New York, 1964. \$22.50.

GEOPHYSICS & EARTH SCIENCES

Electron Density Distribution in Ionosphere and Exosphere. (Proceedings of the NATO Advanced Study Institute, Skeikampen, Norway, April, 1963). E. Thrane, ed. 394 pp. (North-Holland, Amsterdam) Interscience, New York, 1964. \$13.50.

Cloud Physics. A. Kh. Khrgian, ed. Transl. from Russian. 392 pp. Israel Program for Scientific Translations, Jerusalem, 1963. \$15.00.

Heat Transfer in the Soil. By A. F. Chudnovskii. Transl. from Russian. 164 pp. Israel Program for Scientific Translations, Jerusalem, 1962. \$6.00.

Descriptive Physical Oceanography. An Introduction. By George L. Pickard. 199 pp. (Pergamon, Oxford) Macmillan, New York, 1964. \$4.50.

Air Survey of Sand Deposits by Spectral Luminance. By Mariya A. Romanova. 158 pp. Consultants Bureau, New York, 1964. Paper \$22.50.

HANDBOOKS, TABLES, ETC.

Infrared Absorption Spectra Index for 1958-1962. By Herbert M. Hershenson. 153 pp. Academic, New York, 1964. \$12.00.

The Universal Encyclopedia of Mathematics. 175 pp. Simon & Schuster, New York, 1964. \$8.95.

MATHEMATICS

Die mathematischen Hilfsmittel des Physikers. By Erwin Madelung. 536 pp. Springer-Verlag, Berlin, 1964. DM 49.70.

Recent Advances in Matrix Theory. Seminar Proc. (Madison, Oct. 1963) Hans Schneider, ed. 142 pp. University of Wisconsin Press, Madison, 1964. \$4.00.

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Elements of Numerical Analysis. By James Singer. 395 pp. Academic, New York, 1964. \$8.75.