BOOK REVIEWS


Reviewed by Kenneth J. Delano

Anyone with an adventurous mind and imagination will thoroughly enjoy Planets for Man, by Stephen H. Dole and Isaac Asimov. The book is well founded on scientific fact, for it is based on the Rand Corporation research study, HABITABLE PLANETS FOR MAN by Stephen H. Dole. Isaac Asimov, as co-author in this more popular presentation of Dole's study, presents a book which is very thought-provoking and a pleasure to read.

In the preface the authors tell the reader that no attempt has been made to present all points of view on controversial questions and advise him to consult HABITABLE PLANETS FOR MAN for detailed technical substantiation of the ideas presented. In addition, the authors provide a good list of related reading material.

A comparison with the well-known book, Life on Other Worlds by H. Spencer Jones, immediately suggests itself. The two books are quite different. Jones concentrates his attention largely on the planets of our Solar System, while Dole and Asimov rather quickly rule out the sun's planets and concentrate their speculations on other planetary systems.

Dole and Asimov adopt a rather strict definition of a habitable planet "as one in which large numbers of people can live comfortably and enjoyably, without needing unreasonable protection from the natural environment and without dependence on materials brought in from other planets". After offering their definition the authors set out on their three-fold plan of attack:

First, to describe the environmental conditions required to make a planet habitable, (i.e., a suitable temperature, light, gravity, atmosphere, and the absence of excessive wind velocities, dust, radioactivity, meteorite-infall, vulcanism, and electrical activity).

Second, to consider the combination of astronomical circumstances which will produce those environmental conditions, (i.e., a planet with a mass between 0.4 and 2.35 Earth masses, with a period of rotation less than 96 hours, with an equatorial inclination not between 80° and 100°, with an orbital eccentricity less than 0.2, and with a primary having a mass less than 1.43, but greater than 0.72, times the mass of our sun).

Third, to estimate the probabilities that the necessary combinations of astronomical circumstances will be found elsewhere in the galaxy.

Listing the probabilities that there is a habitable planet encircling the likely main sequence stars from F2 to G1, the authors conclude that 1 out of every 27 stars of these spectral classes will have a habitable planet, which would mean that there are about 600 million habitable planets in our galaxy alone.

Planets for Man, with its fine introductory paragraphs to each chapter and its good, concise summaries, is outstanding in its orderly presentation of its theme. Furthermore, the authors' ability to take you to these distant worlds heightens the sense of adventure, which is yours to enjoy by reading the book.

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Reviewed by William Roberts

This work is the fourth in the Middlehurst and Kuiper series on the Solar System, put together from papers contributed by highly qualified specialists in the various fields making up the subject matter. Its immediate predecessor, Planets and Satellites, has already been reviewed in these pages (Str. A., Vol. 16, Nos. 7-8, pp. 186-187), and the present work continues the series along the same lines.

One of the impressive features of this work is the alliance of celestial and terrestrial studies to create a more powerful understanding of earth and sky. This becomes evident in the first chapter, The Lunar Surface: Introduction, in which vulcanism and meteorites are considered as they affect both the lunar and terrestrial surfaces. A number of other lines of investigation are considered in this paper, which makes an excellent stimulus to the serious study of the moon. The inquisitive mind will delight in the eight-page bibliography at the end of the section. G. W. G. Arthur contributes a chapter on mathematical selenography. Most of the formulae should be within the grasp of a freshman mathematician, although one suspects that a computer would read them more appreciatively. Y. N. Lipski's article on Investigation of the Far Side of the Moon with the Aid of Rockets describes the Soviet project in relatively simple language. Even Whitaker describes his efforts to obtain further information from the Lunik photographs through photographic laboratory techniques in Evaluation of the Soviet Photographs of the Moon's Far Side. The Scattering Properties of the Lunar Surface at Radio Wave Lengths, by Evans and Pettengill, closes the lunar group with a rather stiff discussion of radio techniques in exploring the lunar surface.

The next nine chapters cover the subjects of meteorites and meteorite craters. Although this is not an A.L.P.O. field of investigation, its relation to various studies that are under the A.L.P.O. makes it very profitable reading. The articles run the gamut from non-technical to treatises on impact mechanics and carbonaceous chondrites. One of the most fascinating parts in the entire book for the reviewer is Fossil Meteorite Craters by C. S. Beals, M. J. S. Innes, and J. A. Rottenberg, describing the efforts of Canadian investigators in the field. The illustrations of possible meteorite craters as discovered on the aerial survey photos excite the imagination. The comparison of Nastapoka Island Arc in Hudson Bay to Mare Crisium can scarcely fail to delight any lunar investigator. Krinov discusses the Tunguska and Sikhote-Alin meteorites, and comet observers will be interested in the possible cometary origin of the Tunguska Meteorite.


While the chapters vary very considerably with respect to the difficulty of grasping the ideas contained therein, this reviewer does not feel that any chapter should be exempted from investigation by the curious amateur; for each has meat in it to reward the diligent. It is manifestly impossible to cover the book properly in a review of this scope: one would like to see each of the three main groups criticized by experts in the field.

This work is as up to date as it is possible to have it in this period of rapidly increasing knowledge. Ranger VII, for example, has altered many
of our ideas concerning the nature of the lunar surface. Yet the material is sufficiently fundamental to provide sound and valuable reference to the amateur for some years to come.

A.L.P.O. COMETS SECTION 1963 FINAL REPORT, PART III

By: David D. Meisel, Michael McCants, and Dennis Milon

Comet Peryra 1963e

Considerable interest was aroused with the announcement by Peryra of the discovery of a second magnitude comet in the morning sky on September 14, 1963. However, A.L.P.O. observers found the comet to be of only 6th magnitude with a tail several degrees long. A preliminary orbit was calculated by Mike McCants from positions telegraphed to him in Houston by C. F. Capen, and also from positions by Alan McClure and McCants. McCants' orbit was the first to be published but was later superseded by a more accurate one computed by Michael Candy. Since Peryra was a sun-grazer, passing only 280,000 miles above the sun's surface on August 23, 1963, quite accurate positions were needed to determine the orbital elements. Some observations of this comet by Capen were published in Str. A., Vol. 17, Nos. 9-10, pp. 178-181, 1963.

The following are Candy's orbital elements from Harvard Announcement Card 1619.

Comet Peryra 1963e

T  August 23, 1963, E.T.
3 82° 387
J 1.982
i 143.670
q .00762

Although there has been speculation that Comet Peryra might have been the faint eclipse comet reported by the N.A.S.A. team in Maine, McCants has shown that Peryra was 20 degrees from the sun on July 20, 1963 and does not fit this observation.

Reports on Comet Peryra were contributed by the following:

Rev. Leo Boethin  Pamplona, Cagayan, Philippines.
Dennis Milon  Houston, Texas
C. F. Capen  Wrightwood, California
Alan McClure  Los Angeles, California
Michael McCants  Houston, Texas

The visual stellar magnitude estimates were corrected to Bobrovnikoff's standard aperture of 2.67 inches. They were then corrected to unit geocentric distance and are plotted in Figure 16, using the values below:

<table>
<thead>
<tr>
<th>Date</th>
<th>Observed Mag.</th>
<th>Corrected Mag.</th>
<th>Corrected Mag. minus 5 log(d)</th>
<th>(\log r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>6.0</td>
<td>6.0</td>
<td>5.0</td>
<td>-0.046</td>
</tr>
<tr>
<td>20</td>
<td>6.1</td>
<td>6.4</td>
<td>5.2</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
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<td>6.3</td>
<td>5.2</td>
<td>0.009</td>
</tr>
<tr>
<td>22</td>
<td>6.0</td>
<td>6.6</td>
<td>5.5</td>
<td>0.019</td>
</tr>
<tr>
<td>24</td>
<td>7.2</td>
<td>7.0</td>
<td>5.9</td>
<td>0.038</td>
</tr>
<tr>
<td>October</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8.0</td>
<td>7.8</td>
<td>6.6</td>
<td>0.104</td>
</tr>
</tbody>
</table>

If the variation had been a power relationship with heliocentric distance, the plot in Figure 16 would have been a straight line. If the points are fitted roughly to a straight line, the following formula results for the