out of a number of popularly misused phrases, such as "beyond the Earth's gravity" and "where the atmosphere ends," for which he should be commended. His treatment of the propulsion, staging, guidance, and control, and construction of the Vanguard launching vehicles, as well as of the elementary mechanics of the orbit, is both technically correct and understandable to the uninitiated—a combination not always achieved by other writers.

A few errors will be noted—but only, I suspect, by those who are rather close to the IGY program. For example, the final velocity of the satellite is given in Table 1 as 17,000 miles per hour. Actually, this is approximately the minimum velocity which must be obtained. As Clarke himself points out a few pages later, "it is safer to aim for a speed slightly in excess of the minimum," and this is in fact being done. Thus, if all goes well, the actual velocity at third-stage burnout will be more nearly 18,000 miles per hour. The discussion of orbit precession and other perturbations is disappointingly brief and incomplete, and although the illustrations are, for the most part, well drawn, there is no good three-dimensional representation of the 35-degree inclined orbit. Further confusion is introduced, at least for me, by the statements that the "orbits of the IGY satellites will cross the Equator at about forty degrees" and as a result will swing back and forth "between the parallels of 35° North and 35° South," and by reference to the orbital period as being 90 minutes. (At the 300-mile altitude, the period should be more than 100 minutes.)

The most significant shortcomings, however, occur in the chapter entitled, "Laboratory in Space." It is implied, for example, by an unfortunate juxtaposition of paragraphs, that useful measurements of the earth's magnetic field could be made by detecting the decrease in spin rate of the satellite which will result from eddy currents generated by this field. No mention is made of the proton-precession magnetometer which will in fact be used or of any of the alternative types which have been considered. Although the relationship of solar flares to the variation in ultraviolet and x-ray intensity reaching the earth is covered briefly, there is no mention of the more interesting relationship between solar flares and cosmic rays and, particularly, of the interesting hypothesis that cosmic rays produced in the sun must somehow be stored for periods of many hours in some sort of magnetic box out in space.

There is also something lacking in the discussion of a possible relativity experiment. This discussion refers to the difference in time as measured by idealized clocks traveling at different speeds, as predicted by the special theory of relativity. However, this theory assumes no acceleration of either vehicle and therefore could not be confirmed by tests in a satellite, which of course is continually changing the direction of its velocity vector. Furthermore, the special theory of relativity is by now so well accepted that it scarcely requires any additional confirmation. What Clarke probably has in mind is a suggestion which has been made by several competent scientists to the effect that the general theory of relativity, which predicts a difference in the time measured by ideal clocks, depending on the gravity-acceleration field, might be confirmed by tests made in a satellite. Clocks having sufficient accuracy do indeed exist, and contrary to Clarke's statements, they can probably be designed in such a way as to be carried even in a relatively small, unmanned satellite.

Other surprising statements in *The Making of a Moon* are that the heart normally "has to do work against gravity, like any other pump," and that fish are "immune to gravity." Actually, any good high-school physics student is aware that both the inlet and the outlet of the heart are at the same gravitational potential and that the only work done by the heart is in overcoming the friction of the circulatory system. Also, the fish could hardly be said to be any more immune to gravity than a man sitting in a chair. Both are supported by increased pressure on the bottom side.

Despite these and other errors—for the most part trifling and occasionally amusing—the main thread of the satellite story comes through loud and clear. Many of us could benefit by a study of Clarke's simple, effective style of writing. It is to be hoped that, after the IGY is over and both United States and U.S.S.R. satellites have been launched, Clarke will write another book summing up the accomplishments.

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Bibliography of Plant Protection, 1946–1947. J. Barner. Biologische Bundesanstalt, Berlin, 1957. 460 pp.

This 1957 bibliographic volume lists more than 13,800 titles for the years 1946 and 1947. Already published are 24 previous volumes covering the phytopathological literature for the years 1914–45 and 1950–51. Volumes covering the 1948–49 period are promised in the near future. The present volume follows, in general, the format and type of content characteristic of the preceding volumes; it is paper-bound and excellently printed. The introductory parts and the principal headings under which the titles are classified (alphabetically according to author) are presented in three languages: German, English, and French. The primary divisions of the volume are "General Works," "Diseases and Causes," "Diseases and Host Plants," and "Measures of Plant Protection." There is also an index to authors.

Gmelins Handbuch der Anorganischen Chemie. *Calcium.* Occurrence, the Element, the Alloys. System No. 28, part A, section 2. xii + 420 pp. Illus. $55.68; *Zinc.* System No. 32, supplement. xxxvi + 1025 pp. Illus. $138; *Platinum.* Complex Compounds with Neutral Ligands. System No. 68, part D. liv + 638 pp. $90. E. H. E. Pietsch, Ed. Verlag Chemie, Weinheim/Bergstrasse, Germany, ed. 8, 1957.

Calcium. This section, which deals with the occurrence of calcium, calcium the element, and calcium alloys, completes part A of system No. 28. Part A, section 1, covered the history of the element.

The portion on occurrence deals with the cosmic distribution of the element, its geochemistry, its economic geography, and its minerals. That on the element itself concerns its preparation, physical properties, electrochemical and chemical behavior, physiological hazards, detection, and determination, as well as the general reactions of calcium salts. The third portion is devoted to alloys of calcium with antimony, bismuth, lithium, sodium, potassium, and beryllium. The literature is covered to 1949.

Zinc. This comprehensive supplementary volume covers the material which appeared from 1924 to 1949 and is three times the size of the first volume on zinc, which was published in 1924.

The volume features an entirely new chapter on the geochemistry of zinc, a detailed account of the metallurgy of zinc, the preparation of important zinc salts, physical properties, electrochemical and chemical behavior, zinc alloys, and compounds of zinc with other elements. It comprises the most complete account of zinc yet published.

Platinum. This new volume completes the platinum series, which includes parts A, B, and C, published between 1938 and 1951.

This last volume is devoted to complex platinum compounds involving neutral ligands and describes the chemistry of 2880 compounds. A special feature is a detailed introduction dealing with the arrangement of the material of the volume, nomenclature, formulas, and a summary of the more important ligands and their abbreviations as well as a sum-