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-

mary of Russian literature and transliteration of Russian names. Also, in the introduction, attention is centered on the *trans-effect,* discovery of which has helped to advance the state of knowledge of these compounds. The bulk of the volume is concerned with the description of individual compounds.

The Gmelin Institute was fortunate in being able to procure the entire Russian platinum literature and, in so doing, to be able to make this vast store of information on complex compounds of platinum available to the outside world. In this instance the literature search was extended through 1953.

These three volumes, prepared with painstaking care and thoroughness, maintain the high standard of excellence characteristic of the other portions of *Gmelins Handbuch.*

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Psychology in the Soviet Union. Translated by J. Ellis, M. Ellis, H. Milne, J. McLeish, N. Parsons *et al.* Brian Simon, Ed. Stanford University Press, Stanford, Calif., 1957. viii + 305 pp. Illus. $6.

This book is the result of a joint effort on the part of English educationists and Soviet psychologists to "familiarize English readers with the general direction of Soviet psychology." It includes 20 papers which appeared in Soviet journals during the period 1951–55. These cover a wide variety of topics, from discussions of theoretical concepts to applied investigations. In addition there are two appendixes. One of these, written by Luria especially for the volume, reviews Soviet research in psychopathology; the other, by Zaporozhets and Sokolov, is a report on the XIVth International Congress of Psychology. The Soviet contributions are preceded by the English editors' impartial description of the basic premises in Soviet psychology: dialectical materialism and Pavlov's theory of higher nervous activity.

The main target of Soviet investigations is the relation of language to mental functions. In a theoretical paper on the psychology of understanding, Bogoiavlensky differentiates between spoken words and other auditory stimuli. For a semanticist this is not a new distinction. A psychologist, however, may find some interesting applications of this distinction to the phenomena of generalization, transfer, and extinction.

In other papers dealing with the functions of language, Luria offers a plausible explanation for differences between human conditioning and that of lower animals; Ananiev asserts that "the cultivation of thought and speech is a key factor in sensitizing human sense organs"; Menchinskaya emphasizes its role in the operation of the "law of effect"; and Shvarts demonstrates experimentally the influence of verbal instructions on the visual threshold.

Another important concept in Soviet psychology is that of the *orienting reflex.* A definition of this in terms of phasic and tonic innervation is reminiscent of Henry Head's concept of *vigilance.* The role of orienting reflex is discussed by Sokolov in connection with perception, and by Milerian in relation to voluntary and involuntary attention. There is also a rather lengthy study of Leontiev and Rozanova, dealing with the effect of orientation on incidental learning.

The studies mentioned so far are only a sample, since there is hardly a paper in the whole collection that fails to make a reference to the importance of language or orientation in human behavior and mental activity.

Of more than theoretical interest are Menchinskaya's paper on the psychology of teaching, Lublinskaya's report on the development of thought in prekindergarten children, and Slavina's account of corrective methods used with "intellectually passive" pupils. For specialists in clinical psychology, Luria's review summarizes studies on the correction and restoration of speech and other motor disorders. The net impression from this paper is one of close collaboration between psychologists, physiologists, and medical practitioners, and its carefully annotated references will undoubtedly lead many to seek the original sources.

The weakest feature of the book is the monotonous reiteration of the Marxian-Pavlovian catechism—an obvious concession to the Party's dictum. American psychologists who scrupulously abide by the operational approach will be amused to find themselves labeled "mechanists," "idealists,' and "crude empiricists." The criterion of objectivity apparently lies in the frequency with which references are made to Pavlov's elastic concepts. Paradoxically, all references to the higher nervous activity are inferential, stemming from studies of conditioned reflexes rather than from direct investigation of cortical processes.

The English editors had a difficult task in selecting, translating, and editing the Soviet contributions, and they have accomplished their work with excellence. Comparative psychologists may regret that limitations of space have precluded reports on experiments with lower animals; apart from this omission, however, the articles are representative of a great diversity of psychological endeavor. The scrupulously accurate work of translation is marred by only a few minor typographical errors. Finally, the elegance of style and the general format of the volume will make reading it enjoyable as well as informative.

The editors' greatest contribution is, of course, the idea of producing such a volume. It acquaints English and American psychologists with some novel interpretations of psychological concepts, as well as with some original methods in attacking the problems of behavior. It is difficult to say what will be its effect on the actual program of research in this country; one may be certain, however, that it will awaken an interest in, and a demand for, more works of this type. For this the editors deserve every scientist's profound gratitude.

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Faune de France. vol. 61. *Hétéroptères Aquatiques.* Raymond Poisson. Lechevalier, Paris, 1957. 262 pp. Illus.

This volume of the *Faune de France* series reflects Raymond Poisson's thorough knowledge of the European fauna as well as his familiarity with world literature concerning the aquatic Hemiptera. In the introductory chapter he provides a brief but informative discussion of phylogeny, anatomy, and habits. The rest of the book consists of keys and individual discussions of genera and species. Each species is described and illustrated. Bionomic information of a general nature is included in the discussion of genera, and for some well-known species there are separate paragraphs concerning habits and life-history.

This and other volumes of the *Faune de France* series are models of style and content that should serve as a challenge to American taxonomists.

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Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, *but to the publisher or agency sponsoring the publication.)*

Some Observations on Soviet Industrial Growth. Occasional Paper 55. G. Warren Nutter. National Bureau of Economic Research, New York, 1957. 16 pp. $0.50.

Science in Creative Living. Science Bulletin No. 5. Athelstan Spilhaus. Science Museum, St. Paul Institute, St. Paul, Minn., 1957. 16 pp. $0.50.

El Mundo Nucleonico. Ricardo Cruz-Coke. Editorial De. Pacifico, Santiago, Chile, 1957. 124 pp.

The Fluoridation of Public Water Supplies. Report of the Commission of Inquiry. Presented to the House of Representatives by command of His Excellency. Department of Health, Wellington, New Zealand, 1957. 240 pp. 8s.