biological examples, often chosen from her own discipline. She quotes frequently from the literature of philosophy. The style is clear and precise, giving a sense of deep sincerity in a search for an understanding that will transcend appearances and find unity in the midst of diversity.

The concluding chapter, setting the theme for the whole book deals with the relationships between sensory impressions and the higher mental life. The author writes:

> Kant . . . wrote that it is essential for the achievement of abstract thought "to emancipate the mind from the despotism of the eye." To speak of "despotism" in this connection, prejudices the case from the outset; it is an unfair word, since the eye is, rather, the servant of the mind, to which it offers all its data for interpretation. . . . The activities of the sense organs, and the thinking of the brain, are all parts of an indivisible whole. . . . Whereas *Metaphysics* studies "being" as such, and *Natural Science* (of the physico-chemical type) treats of the corporeal world, *Natural Philosophy* may be so defined as to link the two; it would connote that mental activity which ceaselessly weaves connexions between the planes of intangible "essence" and tangible "existence."

The professional philosopher may find little novelty in the development of such ideas, but the biologist, usually immersed in the minutiae of observation or experiment, will do well to read this modest volume. Provisional and imperfect it surely is, as the author well knows, but it points a way toward deeper thinking about basic causes and meanings which most biologists have lost. She hopes that

> . . . its very inadequacies may stimulate others to cast an illumination, more powerful than my rushlight, upon the biologist's road to reality.

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Relative Chronologies in Old World Archaeology. Robert W. Ehrich, Ed. Univ. of Chicago Press, Chicago, 1954. xii + 154 pp. Illus. Paper, $2.50.

These papers were originally presented at a joint symposium of the American Anthropological Association and the Archaeological Institute of America. Nine specialists from different regions attempted to build up a chain of chronological equations that would enable the student of comparative archeology to estimate the relative age of various cultures and to observe the contacts between them.

The assignment was an ambitious one and difficult to follow in the original, oral presentation. The carefully edited book that has resulted is an invaluable tool for the professional archeologist and an interesting demonstration of method for outsiders. Highly recommendable is Helene J. Kantor's opening paper on the situation in Egypt, cornerstone of any chronological construction, whether relative or absolute, in the ancient world. From here we wander through Palestine along a system of safe throughways to Northern Syria and Anatolia (where R. J. Braidwood and Hetty Goldman unveil new and precious footholds). We begin to feel somewhat uncertain as we turn west into the Aegean and become lost in Europe, only to be rescued by the vigorous editor.

The other road leads east, into safe and relatively well explored Mesopotamia, on via Iran into the depths of China. Here a remarkable contrast occurs. Where contacts are rather unknown, the layman will have little trouble in following the story (China). Where precise knowledge is beginning to accumulate (Iran), the account becomes highly technical and appetizing for experts only.

Attention is focused on *relative* chronology, a wise procedure. The material used is the everyday equipment of ancient man; witness the pots all over the text and cover of the book. There are moments when one would like to see *art* introduced into the story; after all we do have sculpture to tell us about Mesopotamia and North Syria. But the everyday criterions, when handled with circumspection as they are in the best of these papers, have allowed old world archeologists to resuscitate and articulate the world of early human progress.

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Biochemistry and Human Metabolism. Burnham S. Walker, William C. Boyd, and Isaac Asimov. Williams & Wilkins, Baltimore, ed. 2, 1954. xii + 904 pp. Illus. $10.

By changing the classical order of the topics of study, placing greater emphasis on proteins and amino acids, and by accenting human biochemistry rather than organic chemistry, the authors of *Biochemistry and Human Metabolism* have successfully combined the fundamentals of biochemistry with its clinical applications. The general plan of the first edition was not altered except for some minor changes, such as the inclusion of the section on acids and bases in the first chapter rather than in the appendix. The Brønsted-Lowry concept of acids and bases is concisely explained and utilized to correct the prevalent though erroneous view among some clinicians that sodium or potassium ions are bases. Chapter 14 on "Proteins and starvation" has been completely rewritten and considerably enlarged.

Although protein and enzyme chemists may be enthusiastic about the prominent place given to these subjects, the need for a 40-page chapter on "Reproduction and heredity" and a 22-page chapter on "Cancer" in a biochemistry textbook may be questioned, especially when lipids and lipid metabolism are discussed in only 16 and 20 pages, respectively.

Typographical errors are, in general, rare. It is anomalous that *amid* is used for *amide* (p. 91), while the now outdated *tryptophane* for *tryptophan* is still

retained. Formulas for tristearin and various fatty acids are given in a "long" form, such as CH_3CH_2-$CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2$-$CH_2COOH$ for palmitic acid rather than the conventional shortened form, $CH_3(CH_2)_{14}COOH$ (pp. 119–121).

In general the book should prove to be a valuable teaching aid for instructors and a stimulating textbook for medical students. To quote from the foreword by John T. Edsall, it

> . . . has a freshness and vitality, in its general outlook and in the pattern of the presentation which give it a distinctive place among all the texts of biochemistry for medical students of which I am aware.

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The Theory of Metals. A. H. Wilson, Cambridge Univ. Press, New York, ed. 2, 1953. 346 pp. Illus. $8.50.

This edition is a new work, not only in format, but also in that it is mostly rewritten and has been considerably enlarged. This, in spite of the fact that two chapters of the former edition (the one on optical phenomena and the one on superconductivity) and also the appendix on surface phenomena, including rectification, have been eliminated. Some of the other 10 chapters follow the original outline with the ones on metallic structures and the structure of alloys now forming a special chapter each. A great deal of progress has been made in the last 10 or 15 years, particularly in the understanding, preparation, and theory of semiconductors. These are now discussed in a special chapter, but conductivity in semiconductors and thermoelectric effect, as well as magnetoresistance of semiconductors, are treated in the chapters on the formal theory of conduction and on the mechanism of conductivity. These two chapters are the core of the present work and are the most interesting and most carefully prepared. The book closes with an application of the variational principle to conduction phenomena (a method that was introduced in 1948 by Kohler and expanded by Sondheimer); although mathematically more difficult, it is more powerful. The very large amount of both experimental and theoretical material that has been accumulated in the last decade has made it necessary to limit the material discussed to a certain arbitrary selection of fields.

The British literature is discussed in some detail, but a large amount of material, particularly that of the Russian literature, such as the investigations of Pekar on effective mass, the important investigations of Gurewich on the contribution of phonons to thermoelectricity at low temperatures, and Shifrins' investigations on semiconductors, has not been discussed by Wilson.

The chapter on thermal and magnetic properties of metals contains a very careful discussion of lattice specific heat, electronic specific heat, and a comparison of the experimental data on specific heat with theory. Some of the magnetic properties, such as spin paramagnetism of free electrons and diamagnetism of free and quasi-bound electrons, as well as the rather complicated phenomena of the de Haas-alphen effect, are discussed in detail and up to date.

One may wish that in a future edition the chapter on semiconductors—for the theory of which the author has laid the foundation—would be somewhat enlarged and brought up to date. It is a surprise to read "that cuprous oxide has been given more attention than any other semiconductor." With all the past and present work on germanium it is also somewhat surprising that a numerical example chosen for germanium is one that would hardly be found in practice (10^{20} impurity centers/cm^3 and an activation energy of 0.03 ev). The author is well known for his careful and elegant mathematical deductions and considerations. The reader will find a large amount of material, particularly in the chapter on the mechanism of conductivity, that is not available in this form in other books in the field.

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Abhandlungen aus der Sowjetischen Astronomie. Folge II. Gesellschaft für Deutsch-Sowjetische Freundschaft; Otto Singer, Ed. Verlag Kultur und Fortschritt, Berlin, 1951. 223 pp. Illus. DM 12.20 ($2.93).

This volume contains 13 German translations of Russian papers published in 1950. Most of these are of cosmogonical interest which is not surprising as Russian astronomers have made important contributions in this field in recent years. The publication of these volumes, as the publication of companion volumes on Russian physics, can only be heartily welcomed since the number of Western scientists capable of easily reading Russian papers in the original is still much smaller than the number of those who can read German.

The volume opens with two papers by Schain and Hase (*Uspekhi Fiz. Nauk* **43**, 3 [1950]; *Izvest. Krimskoi Astrofiz Obs.* **5**, 24 [1950]) on the occurrence of C^{13} in stellar atmospheres.

The second group of papers is by Parenago and Massewitsch (*Astr. Zhur.* **27**, 41, 137, 150, 202, 329 [1950]). Two papers deal with the mass-luminosity-radius relation. The first paper considers the empirical data and the second tries to give a theoretical interpretation of these data. The other three papers in this group deal respectively with star velocities showing the differences between high and low velocity stars (Baade's populations are, however, nowhere mentioned!), with the gravitational potential of our galaxy, and with masses of eclipsing binaries.

Then follows a paper by Gurewitsch and Lewin (*Astr. Zhur.* **27**, 273 [1950]) on the formation of