Biological Units

The Cell. Biochemistry, physiology, morphology. vol. 4 and vol. 5, *Specialized Cells*, pt. 1 and pt. 2. Jean Brachet and Alfred E. Mirsky, Eds. Academic Press, New York. vol. 4, 1960. xv + 511 pp. vol. 5, 1961. xv + 597 pp. $20.

With these two volumes, covering more than a thousand pages, *The Cell* is well on its way. The middle volumes (2 and 3) are yet to come. There is no doubt that this is, and will remain for many years, a most important series of books and a necessity for any comprehensive biological library. There is no other collection of reviews on cell biology which covers this wide field with such thoroughness and quality.

Specialized cells are the subject of the 15 articles, which begin at the bottom of the scale with short, clear reviews on viruses by Thomas and on ciliates by Nanney and Rudzinska. Bacterial cytology, both with the light and the electron microscope, is dealt with by Robinow and illustrated by some beautiful photographs. Here one can well add a word of congratulation to the publisher on the quality of both the illustrations and the printing. Trager has written a most interesting article on intracellular parasites and symbionts—a subject which many cell biologists should know more about. One wonders, for example, how many of us are aware that the body louse appears to get vitamins from bacteria living as intracellular symbionts in a specialized organ.

Most of the reviews are concerned with the specialized tissue cells of the Metazoa—neurons by Hyden, photoreceptors by Miller, muscles by Huxley, glands by Gabe and Arvy, kidney by Forster, blood by Bessis, bone and cartilage by Lacroix, skin by Montagna, and antibody production by McMaster. Taken together, these reviews give an impressive survey of the differentiated cells of higher animals, and many of the articles deal with the physiology of the systems as well as with the morphology. But it is still striking how much less is known about cellular function than about cellular structure. In the same way that we still do not know what half of the organelles do within a typical cell, so also are we ignorant of the functions of many cell types within organs.

The last two articles deal with cancer cells. This is not an easy subject to review since much of the work on trying to differentiate tumor cells from normal cells has led to negative results. Oberling and Bernhard conclude that there is no "single morphological sign which is truly specific of cancer cells." But it is still possible to feel that more stress might have been laid on comparing cancer cells with other *growing* cells rather than with nongrowing cells of the tissue of origin.

Since *The Cell* is claimed by the publisher to be an "encyclopedic reference work," it is fair to point out that there are a number of omissions. Two of the commonest types of animal cells used in current research, gametes and amebas, are not included. Nor is there anything about plant cells, either at the level of the differentiated cells of higher plants or at the level of the cells of the lower groups, algae and yeasts.

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Essays on Genius

Some Reflections on Genius and Other Essays. Russell Brain. Lippincott, Philadelphia, 1961. 191 pp. $4.50.

Some Reflections on Genius consists of a selection of interesting essays—an initial one, from which the book derives its major title, plus 11 others that form commentaries on the lives of six men who distinguished themselves in ways that are related to the author's concept of genius. The commentary on Dr. Johnson is by far the longest, consisting of six essays. The book ends with two essays, one on symbols and images, the second on words.

In the first essay, which is the heart of the book, Russell Brain suggests that genius depends on the organization of the nervous system. He pays no more attention to the nervous system until the last two chapters, wherein he relates neurology to perception and the hemispheres of the brain to handedness and speech.

Intelligence is considered to be the most important general determinant of genius. Coupled with other specific independent abilities, it determines the character of genius. The connection between abnormality and genius is discussed in the first essay. Brain concludes that most geniuses are perfectly sane but that they tend to be emotionally unstable.

In the remaining essays the author interprets the lives of various great men and illustrates some aspects of his concept of genius.

The book suffers from disconnectedness. Had the commentaries been edited more carefully so as explicitly to illustrate the author's concept of genius, the book would have been more coherent and convincing.

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Wave Propagation

Wave Propagation in a Turbulent Medium. V. I. Tatarski. Translated by R. A. Silverman. McGraw-Hill, New York, 1961. 285 pp. Illus. $9.75.

Russian contributions to the theory of wave propagation in inhomogeneous media have been both extensive and impressive. An approach which has been consistently explored in the development of this theory is the combination of first-order perturbation theory, on the assumption of small inhomogeneities, combined with the Born, or far-field, approximation. In this book known results concerning the spectra of homogeneous turbulence are combined with these other approximations to yield a theory which gives impressive agreement with experimental data.

Tatarski gives a thorough account of the theory which results from the assumption of the validity of a perturbation approach, as well as the converse case which is amenable to analysis by the Wentzel-Kramers-Brillouin approximation. Applications are discussed in the fields of acoustic, electromagnetic, and optical propagation phenomena. The theory developed is amply documented by experimental data from studies of atmospheric turbulence and from the propagation of light and sound near the earth. Further reports are made of observations of twinkling and quivering of stellar images in telescopes, together with a theoretical interpretation along lines laid down earlier in the book.

This volume, together with the companion volume, *Wave Propagation in a Random Medium* (by Chernov), forms an important contribution to the literature because of the generality and wide applicability of the theories. American and British readers might, however, be

put off by statements in the first chapters which imply that the only significant contributions to the theory of turbulence have been made by Russian workers. Aside from this slight flaw, the book is an invaluable introduction to the field. The translation is readable both from the language and technical points of view.

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Space Travel Problems

Human Factors in Jet and Space Travel. A medical-psychological analysis. S. B. Sells and Charles A. Berry, Eds. Ronald, New York, 1961. xvi + 386 pp. Illus. $12.

The objective of this book is to present a comprehensive view of the human factors involved in operating high-performance aircraft and space vehicles. The material is well chosen to portray the joint effort of many disciplines, and it is presented in a clear, objective fashion. Although the lay reader may have difficulty with some sections, by and large those with a scientifically oriented background will find much of interest. The duplication of material, almost inevitable in a book written by 13 different authors, is very limited, and the style has a certain similarity and continuity throughout. Each chapter is well documented with factual information, and the book is relatively free of the flights of fancy so characteristic of some of the literature in the field of space exploration. There are selected bibliographies at the end of each chapter. The comprehensive subject index will be useful.

The content is primarily concerned with the human responses to the wide variety of stimuli encountered in flight at all altitudes. The medical and psychological problems of jet and space travel receive extensive treatment, but not out of proportion to their importance. The chapters range from the basic aspects of selection and skill of human operators to a detailed consideration of the tasks to be performed with safety and efficiency. Even the problems anticipated with group behavior, or the assemblage of several operators in a space vehicle, receive consideration. The area of radiobiology in space flight is analyzed extensively. The analysis of dysbarism, the symptoms resulting from evolved gases with extreme changes in pressure, constitutes an original and informative section. Preventive medicine and the control of contagious diseases are discussed, and the chapter on accidents is very informative. One of the most comprehensive chapters deals with cabin air conditioning, toxic exposures, decompression, radiation, acceleration, and noise. The engineered environment of the space vehicle, including the operational aspects of space flight, is carefully analyzed by well-qualified authorities.

In general, the book is an excellent introduction to the wide range of problems encountered thus far, and a forerunner in the area of the difficult problems remaining to be solved before travel, within and outside the earth's atmosphere, can be undertaken with safety and comfort.

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Russian Dictionary

Botanical Dictionary. Russian-English-German-French-Latin. Compiled by N. N. Davidov. F. Kh. Bakhteev, Ed. Foreign Language Scientific and Technical Dictionaries, Moscow, 1960. 335 pp. R 1.16.

Although many Russian botanical words, because of similarity to Western terms, can be translated easily by botanists who have a little familiarity with the language (beyond the alphabet) and even more words can be worked out by those who have some knowledge of the language and a little imagination, the remaining technical vocabulary bears little resemblance to its English-language counterpart and much of it is not found even in the best Russian-English dictionaries.

This botanical dictionary uses Russian as the basic language for the primary alphabetical listing and provides translations of the terms into four languages: English, German, French, and Latin. Each entry is numbered, and there are appended indexes to the four languages, which use the numerical system to locate the Russian equivalent in the main body of the work. Thus, the dictionary serves equally well for translating from the four languages into Russian. The 5806 entries are mostly in the area of gross morphology, so the dictionary will be of greatest use to plant taxonomists, anatomists, and morphologists. About 30 percent of the terms are plant names, translated into the vernacular in all languages except Latin, in which the binomial, author, and family are given. The translations of technical words are generally adequate, although frequently the English equivalents are unwieldy terms such as *dipyrenous, ramentaceous,* or *guttiflorous* which might better be translated into short descriptive phrases. There appear to be few factual errors; I find it difficult to believe that *bazidia* means *spore mother cell* as the dictionary indicates. The North American audience will object to the listing of *bergamot* as *Citrus bergamia* Risso, although this is in keeping with the Old World orientation of the dictionary terminology. *Sexless* is not the best English translation for *byezpolnii,* which is given better treatment as *geschlechtlos* and *asexuel* in German and French. Frequently, more than one equivalent is given so that some choice may be exercised in selecting the proper word. Occasionally, however, as in the choice of *rotten* or *corrupt* for *gniloi,* the user may decide upon another unlisted but more suitable word.

This dictionary will be of little use to botanists working outside the areas mentioned above, despite its title. Nevertheless, once its limitations are recognized, the dictionary will be useful to some botanists who have a minimal knowledge of Russian, and it can even be used by those who have no knowledge of the language. A comprehensive botanical, or better yet, biological Russian-English dictionary aimed at an English-speaking audience is desperately needed, but until such a dictionary is published this one will fill part of the existing vacuum.

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Anticipated Trend

Immunochemical Approaches to Problems in Microbiology. Michael Heidelberger and Otto J. Plescia, Eds. Rutgers University Press, New Brunswick, N.J., 1961. x + 402 pp.

It is probably safe to predict that in this next decade immunochemistry will be adapted to even more investigational pursuits in microbiology than during its entire first 50 years. Microbiology itself