BOTANICAL LITERATURE FOR RUSSIA

THE world's war and the following events tore Russia away from the civilized world and stopped any access to its scientific literature. Now that normal relations between our country and its neighbors are being partly restored and the scientific literature of Western Europe begins little by little to penetrate into Russia, we are still deprived of North American publications. At the same time the financial conditions of our country are such that we are unable to purchase them from booksellers. This leads me in the name of the laboratory under my supervision to address botanists of the United States and to ask for help in our scientific work by sending copies of recent papers, books, etc. We shall be glad to send in return our publications.

CONST. MEYER

BOTANICAL GARDENS,
UNIVERSITY OF MOSCOW

SCIENTIFIC BOOKS

The Biology of Death. By RAYMOND PEARL. Philadelphia: Lippincott, 1922.

In many fields of scientific research, where progress is most active, the old barriers which have so long separated men of like mind and partitioned off congruous subjects are now disappearing. This fact is widely recognized in the case of physical chemistry, of general physiology, and of atomic physics. But there could be no better illustration of it than the new monograph on experimental biology, "The Biology of Death." Professor Pearl, an experimental biologist, has not found it necessary to change either his point of view or his methods of research in taking up his duties as professor of vital statistics, and in his first book dealing with the subject of his new chair he has drawn upon a wide variety of sciences, including cytology, pathology, genetics and statistics, without sacrifice of unity and with the happiest results.

The book opens with two questions: "Why do living things die?" "Why do living things die *when* they do." Pearl's answer to the first question may perhaps be stated as follows: Single cells, whether unicellular organisms, germ cells or somatic cells, die only by chance. All cells are potentially immortal. The proof of this statement is to be found in the work of Woodruff on *Paramecium,* of Jacques Loeb on artificial parthenogenesis and especially of Harrison, Leo Loeb and Carrel on tissue culture. Normal death in the metazoa is due to the wearing out of units of a higher order than cells, it is a result of the specialization of structure and function of the highly differentiated multicellular being.

It seems to me that this is probably a sound inference. Nothing could be plainer than the fact that death from valvular disease of the heart, or from cirrhosis of the liver, or perhaps from diabetes, corresponds with Pearl's statement. The conception also has the advantage of being analogous to our ordinary view of the wearing out of useful objects. Thus we wear out our boots or their soles, but the molecules of which they are composed remain unchanged. Indeed an aggregate of aggregates must be more unstable, in certain respects, than its component aggregates, for its existence depends upon the integrity of each component and of the relations between them. But it must be confessed that, until certain phenomena of senescence such as desiccation and the more conspicuous intracellular changes can be clearly accounted for, doubt will remain regarding the complete validity of any statement concerning this question, simply because we shall continue to feel uncertain of the exhaustiveness of our analysis.

In answering the second question Pearl turns to his own researches and classifies the causes of death "under the heads of the several organ systems of the body, the functional breakdown of which is the immediate or predominant cause of the cessation of life." A statistical treatment of the data, founded upon this classification, leads to the conclusion that the causes of death operate in a very orderly and regular manner, the biological significance of the regularities being, as a rule, not difficult to understand. Thus, in the first year of life the alimentary tract is to be charged with the greatest number of deaths, for the next fifty years of life it is the respiratory apparatus which takes first place, in old age the circulatory system.

From these facts the conclusion is drawn that advancement of the physiology, pathology and hygiene of the respiratory organs should