tions. The old term "color blind" may well go with them.

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WARTIME SCIENTIFIC MANPOWER PRODUCTION

IN recent numbers of SCIENCE[1] there have appeared communications which manifest the growing demand for complete utilization of scientifically trained personnel. Through the facilities provided by the National Roster of Scientific and Specialized Personnel studies of the problems associated with utilization and assignment have been and are being studied and allocations are being made in various fields of science. The Roster is not simply an organized card file; it is proceeding as rapidly as possible in determining needs and allocating supply.

The problem it is considering at present is the mechanism by which we can supplement dwindling reserves in scientifically trained men. The process of robbing the universities to supply technically trained manpower has been carried to dangerous limits which, if pursued further, will result in the elimination of the future supply. The war has now progressed a sufficient length of time for us to realize that temporary expedients are not sufficient and that a long-range view will be necessary for the continuous replacement of scientific personnel which must be accomplished if we are to win this war.

The period of temporary expedients has enlisted the services of too great a number of scientists who are now removed from their main purpose of producing an adequate supply for future needs. This situation is inevitable at the beginning of an emergency but must now receive the thought and planning necessary for its correction.

The pressure of public and professional opinion must be impressed upon the individual to make each think of the best that he can produce for the total national good. This involves a critical self-analysis removed from social and patriotic glamor motives which almost inevitably sway the principles on which such a decision must be made. This inventory of service should have as its keystone the idea of production of an increasingly large number of scientific personnel. The schools, colleges and universities have compacted and revised their conventionalized schedules to make possible the earlier and steadier training which should produce new scientifically trained men in the minimum time and at that age when their scientific knowledge is most easily adapted to the armed services.

This war is dominantly one of ideas. It can be successfully waged only by the complete use of brains and technological *knowledge* combined with mechanical instruments of war. Peace-time methods impose artificial limitations upon production of new scientists which in view of the continuing urgency must be removed. Independence of thought and action form a requisite part of any such program—each man represents a newly modified model as he leaves the academic production line. On that production line must be applied the most skilful teaching which science has ever had. Formulae which have been rigidly adhered to must be reevaluated and discarded if they can not be fitted to new conditions. Each man on the instruction assembly line must treat his product with respect to its own particular idiosyncrasies—the assembly line expert will not exercise his own. Standards and inspections must be rigid with a degree of flexibility at all other points. It is here that real teachers are needed, and it is here that the common methods of rote instruction must give way.

Standardization of many science courses has proceeded almost to the point of freezing their content and the methods of approach. This process must be revised and unfrozen in every case in which the new needs are evaluated in the light of increased production. Emphasis must be reapplied. To-day as never before broad and fundamental patterns of factual synthesis must be placed before the receptive minds which are to be scientifically trained.

The personal inventory mentioned above must be made in the light of this statement. The breach in curricular walls and the abolition of conventional schedules have left many an academic scientist in a state of emotional upheaval resulting in a sense of lost personal security. The insecurity so produced has immediately been transferred according to a principle of human nature which antedates scientific technology, for in times like these other pastures always appear greener and old responsibilities can always be sidetracked by the assumption of new ones. It is this factor which makes many scientists feel that they should be actively engaged in war work of a recognized variety when deep in their hearts they realize that their duties in their own environment are much more important to national welfare. It is harder to fight on the home front without official recognition than to transfer to other and perhaps different fields in which service may be less effective.

The universities have taken the only standpoint that could be taken in this emergency: they have unstintingly contributed their manpower and laboratory facilities. They too, must recognize that their essential purpose in national welfare is production of an increasing number of men trained to think. They must conserve their teaching manpower if this is to succeed.

The devastation of science departments by armed

[1] SCIENCE, 95: 2472, 507–8, May 15, 1942; *Ibid.*, 96: 2479, 16, July 3, 1942.

and governmental services must be rigidly scrutinized in the light of necessity. The resultant deterioration which shows absence of planning and foresight must not be allowed to continue. The universities' own needs must be weighed against other demands. The efficient future control of the destiny of the universities themselves requires the replacement of scientific manpower. These replacements must be accelerated both in tempo and quantity while quality must be maintained. The colleges and universities can play their part only by keeping active staffs intact and maintaining the morale of their teachers by recognizing this as a dominant part of the war effort.

JOHN S. NICHOLAS,
National Research Council Representative on the National Roster of Scientific and Specialized Personnel

RUSSIAN-ENGLISH TECHNICAL DICTIONARY

THERE is an urgent demand at the present time for an up-to-date Russian-English dictionary of scientific and technical terms. It is known that a number of Russian-English glossaries of specific terms have been compiled by various scientific institutions and individuals, and it is thought that it would be extremely helpful to scientists and technical translators if copies of these glossaries could be collected together and placed in the Science Library in London where one complete set could be consulted.

Will, therefore, any institution or individual who has compiled a glossary of Russian scientific or technical terms, whether printed or in MS, please send a copy to the Secretary, Anglo-Soviet Scientific Collaboration Sub-Committee, The British Council, 3 Hanover Street, W.1, London, England, who will collect these for the Science Library.

It is hoped at a later stage to compile a large dictionary, but the immediate aim is to collect the different glossaries in one place where they can be consulted. Each glossary will be known by the name of its compiler.

E. J. RUSSELL,
Chairman, Anglo-Soviet Scientific Collaboration Sub-Committee

SCIENTIFIC BOOKS

LEUKEMIA IN ANIMALS

Spontaneous and Experimental Leukemia in Animals. By JULIUS ENGELBRETH-HOLM. 245 pages, 44 figures. Edinburgh and London: Oliver and Boyd. 1942.

THIS book of Engelbreth-Holm, published under the auspices of the Lady Tata Memorial Trust, is an authoritative and timely monograph. Leukemia, a cancer-like disease of the blood cell-forming organs, was little known until recent developments, reviewed in this book, focused the attention of increasing numbers of scientists and laymen on this disease. Leukemia is not an uncommon disease, and its incidence is seemingly rising. It arouses concern because it affects persons, young and old, who are often healthy in appearance, and the disease often follows a course of many years free of all symptoms, though it is rapidly fatal in many instances. Research men are being attracted to its study by the many avenues of investigation opened recently, making it possible to explore diverse problems of interest and significance. More than the importance of this disease itself, the hope that leukemia research will contribute to the understanding of cancer has induced most of our cancer research foundations and the National Cancer Institute to place it on their program.

The first part of the book is devoted to a historical survey of this disease, first recognized about one hundred years ago, and to a description of its occurrence and of its varied manifestations in different species of animals which contributed much to our knowledge of this disease and laid the foundation for experimental work.

The modern period of experimental leukemia dates back to 1908, when a Danish investigator, Ellermann, discovered the causation of avian leukemia by a filterable agent (virus). The discovery of Peyton Rous that chicken tumors are produced by viruses followed shortly and opened a productive period of research, during which chicken tumors and chicken leukoses and their causative filterable agents have been extensively investigated. Some twenty years later the transplantability of different mammalian leukemias was discovered. Engelbreth-Holm is among the pioneers who investigated the many problems of avian leukosis offered by the discoveries of his countryman, Ellermann; later he also contributed to the knowledge of mammalian leukemia. With the skill of a good teacher he sketches in this book the history and present status of leukemia research in a manner easily understandable to those not familiar with this disease. With the authority of an investigator he introduces research workers into the intricacies of newer knowledge, giving precise and complete reference to original articles. The field is covered in a systematic manner, and the book closes with a discussion of the nature of human and mammalian leukemia.

It is still not generally conceded that leukemia is