without saying that neither will the physicians of this Nation, nor the teachers, nor, for that matter, the plumbers or the bartenders. Nevertheless, all of these were embroiled in the recent carnage, and the physicists were in the thick of the fight. Significantly enough, Dr. Hull's paper is preceded by a description of a gigantic naval research institution (p. 237) in which some 2,000 civilians, most of them scientists, will be sharpening the modern swords of war. When the bombs fall, scientists too, as well as their children, will die. As citizens, they cannot afford to assume a holier-than-thou attitude.

Dr. Hull also takes occasion to assert that the rulers of the country are "the so-called labor leaders, who, when the situation is right, make war on the rest of the Nation and who, at times of national emergency, hold up the Nation and demand its money or its life."

Now, anyone who, in the realm of physics, made a generalization so unwarranted and so oversimplified would be dismissed as one who had failed to assimilate the most elementary principles of scientific analysis. It cannot be repeated too often that the obvious need today is as rigid thinking in sociology as that which has been so fruitful in the physical and biological sciences.

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On the Question of Russian Scientists

Why the presumptuous agitation over the status of scientists in Russia—more specifically over the fate of a small number of individuals and more particularly Vavilov? The latest installment is that of P. J. Olson (*Science*, 1946, 103, 656).

If scrutinized, our own record regarding political and social undesirables is far from savory. We have had abundant evidence that scientific endeavor is flourishing in Russia. For a recent report see the articles by Hastings and Shimkin (*Science*, 1946, 103, 605, 637) and also that by Langmuir (*Chem. eng. News*, 1946, 24, 759). The treatment received by the latter in the helium liquifying laboratory of Kapitza compares rather to our discomfiture with that accorded by Bridgman, of Harvard, to visiting Soviet scientists (*Science*, 1939, 89, 179). Can it be that the Russians are more tolerant?

It is conceivable that foreign scientists contemplating migration to Russia could with propriety make detailed inquiries at to what their status there would be. The rest of us can well leave to the Russians their struggle to devise a tolerable existence. And so doing does not preclude friendly intercourse.

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Book Reviews

Electron and nuclear counters—theory and use. **A. Korff. New York: D. Van Nostrand, 1946. Pp. vii + 212. (Illustrated.) $3.00.**

This very timely treatise on the theory of the discharge mechanism and on the operation of various types of electron nuclear counters will prove a valuable reference book to all scientists engaged in pure or applied nuclear research and a necessary text for students preparing for research in these fields. Its importance is enhanced by current interest in the utilization of atomic energy in medical and biological problems, as well as in industrial and military developments.

During the last two decades counters have been developed as ionization chambers, proportional counters, and Geiger counters. But in general their behavior has been only vaguely understood and has proved perplexing to the majority of workers, partly because no single text has heretofore existed giving a complete and systematically presented theory of their operation. Consequently, Prof. Korff's masterly presentation of practically all phases of counter operation promises to be the handbook which will clarify the operational problems of counter technicians.

The author introduces his subject through a summary of the development of counters, a description of current uses, definitions of terms, and a general description of the phenomena involved. The unique behavior of counters in the low-voltage region, in the proportional region, and in the Geiger region is clearly defined, and the types of counters used in these separate regions are treated according to their distinct characteristics.

The characteristics of counters currently employed for measuring the intensity of radiations—X-rays, gamma rays, and cosmic rays, for counting the charged particles and neutrons, both fast and slow, which are emitted in atomic transmutations and disintegrations, for the detection of radioactive deposits by the geophysicist or radioactive tracers by the biophysicist, or for the measurement of dosage in radium therapy are discussed in the text with ample detail. Included are characteristic curves for the various counters, discussions of self-quenching and non-self-quenching counters with explanations of pulse size and effects of negative ions, as well as directions for the construction of counters and of the auxiliary electronic circuits.

Particularly valuable are the numerous circuit diagrams and the discussion of the vacuum tubes employed for quenching, coincidence, scaling, and recording cir-

cuits, as well as integrating circuits and pulse amplifiers. Frequent references are made to the literature, and the final contribution is a generous bibliography on counter construction and practice.

The clarity and inclusiveness of all these discussions will be welcomed by the large body of scientific and technical workers who constantly or even occasionally employ this increasingly valuable tool.

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The effect of smallpox on the destiny of the Amerindian. **E. Wagner Stearn and Allen E. Stearn. Boston, Mass.: Bruce Humphries, 1945. Pp. 153. $2.50.**

Introduced to the New World shortly after Columbus' discovery, smallpox decimated the native population for four centuries, constituting one of the most important factors in the displacement of the American Indian by the Whites. It has been estimated that between the years 1500 and 1850 at least 3,000,000 Indians died from smallpox in the West Indies and in Central and South America. The authors of the present volume give an account of its ravages north of Mexico, where the disease claimed approximately an additional 500,000 lives of an aboriginal population of 1,150,000. The role disease plays in the history of populations cannot be overemphasized and constitutes an approach that has not received the attention it merits. The effect of smallpox was devastating on the American Indian not only in the often complete extermination of whole villages and tribes but also in the spreading of terror, the breaking of morale, and the disintegration of native cultures.

In a well-documented account the spread of smallpox is traced from tribe to tribe. It is shown that epidemics appeared in cycles and that the death rate varied, depending on the virulence of the virus, the type of smallpox, and how much care the sick received. Recurrence of high death rates depends on the growing up of nonimmune populations. With the exception of a statement in which the American Indians are referred to as a "highly susceptible, non-immune race" (p. 8), the authors make it clear throughout the book that, strictly speaking, there is no such thing as "racial immunity." Early attempts to prevent infection were generally unavailing and in many instances met with strong resistance. Control came about gradually at first (1721) through variolation, after 1797 through vaccination, until in 1905 smallpox ceased to be a menace to the Indian.

Necessary corrections are few and of only a minor nature. The population figures for the American Indian are based on the estimates of Mooney, which are the most reliable in existence. A revision of these figures is available only for California.

The authors are to be commended on having made a valuable contribution both to the history of medicine and to anthropological demography in this well-documented and readable reference work.

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Theory and practice of filtration. **George D. Dickey and Charles L. Bryden. New York: Reinhold, 1946. Pp. v + 346. (Illustrated.) $6.00.**

In this new book the co-authors of the older volume, *A textbook of filtration*, have greatly expanded the scope of the work with the introduction of much new subject matter. A brief history of filtration is followed by a comprehensive discussion of the objectives, the media, the apparatus and machinery, and many of the applications of filtration as a unit operation. In its description of filters and filter presses of all kinds and the mechanics of their operation the book is undoubtedly all that could be desired, except perhaps that, in spite of a prefatory promise, operating data on which to base plant equipment design are somewhat meager.

It is rather in the matter of filtration theory that the work falls short of meeting the implications of its title. The mathematics of the subject, such as it is, is touched lightly indeed, and the chemistry and physics of colloidal suspensions are ignored. Surely the plant engineer bedeviled with the problem of filtering a gelatinous slime would find little in this volume to comfort his misery. By the same token a history of filtration should at least mention the blood, sweat, and tears shed in developing the art of activated sludge filtration in Milwaukee in the early 1920's.

Lest the reviewer's stand be misconstrued, it should be said that filtration practice ranges on the one hand from the dewatering of granular suspensions that present no difficulty to the pretreatment and dehydration of complex slimes on the other; only the science of colloids can give much help to the solution of problems in this latter and more important phase of the subject. If the reviewer were allowed to compromise on a title such as *The practice of filtration*, he would in all sincerity call this a fine book.

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Human embryology. **Bradley M. Patten. Philadelphia-Toronto: Blakiston, 1946. Pp. xv + 776. (Illustrated.) $7.00.**

Teachers of embryology in medical schools will welcome this volume on the development of the human embryo as an addition to the literature of this special field. The emphasis on the incompleteness of our knowledge, which necessitates a changing viewpoint as more information is acquired, holds before the student the too easily forgotten idea that science cannot be learned "once for all time."

The excellent illustrations of progressive stages of histogenesis in different organs help to bridge the gap between the thin line of cells representing the organ in the embryo and the adult tissues as studied in histology. The inclusion of some gross dissections of the adult body is an excellent idea, since the steps taken by the fetus in development are better understood when the goal to be attained is clearly defined. The three stages in the descent of the testis and the schematic