

condition of a peace which is more than an armistice must be found in a democratic form of government. The subsequent steps will be arbitration tribunals, disarmament, and an international parliament. These seem far enough off at present, but it is important to make up our minds whether we really desire them, and if not, why not. Prof. Jastrow's wisely written book—careful and restrained throughout—makes for illumination.

The Strategic Geography of the Great Powers. (Based on a Lecture delivered during 1917 to Officers of the Grand Fleet and of the British Armies in France.) By Dr. Vaughan Cornish. Pp. viii+114. (London: George Philip and Son, Ltd., 1918.) 2s. net.

WITHIN the compass of a small volume Dr. Vaughan Cornish has tried, not unsuccessfully, to crowd many ideas. He describes the great States of the world as regards their sources of men and materials, and the lines of communication by which force can be concentrated. His point of view is often fresh and always geographical. The distribution of the British Empire is described, not by continents, but by oceans. The old system merely emphasises the gaps in continuity of the Empire. Dr. Cornish's method indicates an appreciation of the ocean as a highway linking together the component parts of the Empire. But land routes may also be of importance. In his treatment of Asia Dr. Cornish insists on the strategic value of southern Turkestan and northern Afghanistan as the eventual crossing-place of the chief lines of traffic from Moscow to Delhi, and from Constantinople, Cairo, and Bagdad to Peking.

The volume has small coloured maps of Europe, Asia, and the world. The last, on a Mercator projection, would have been a better illustration of the chapters if it had been on an equal-area projection. Dr. Cornish's work is an excellent introduction to the geographical conditions of national security, and should be widely read.

B.S.A. Musketry Score Book for Use in the General Musketry Course. Instructions for Short Lee-Enfield Rifle and Enfield Pattern 1914 Rifle, Using Mark VII. Ammunition. By E. J. Smyth. Pp. 47. (London: Forster Groom and Co., Ltd., 1918.) Price 3d. net.

THIS excellent little book is a combination of a book of instruction and a score record. It contains clear instructions for the sighting to be employed at higher ranges after making a group at 100 yds., so that the error of the rifle may be obtained without the long experience with the individual rifle which is desirable but cannot always be obtained. The instructions for the short Lee-Enfield rifle and for the Enfield pattern 1914 are placed together, but are indicated by distinctive borders so that no confusion can arise. The book should prove particularly useful to every Volunteer in order to enable him to know the behaviour of his own rifle on the completion of his musketry course. It is also a most useful guide to the course itself.

NO. 2557, VOL. 102]

LETTERS TO THE EDITOR.

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The Perception of Sound.

As I had the privilege of being consulted by Sir Thomas Wrightson during the later years of his "Inquiry into the Analytical Mechanism of the Internal Ear," and advising him as regards the physical nature of the cochlea and the arrangement of its parts, I may be allowed to try to clear up the various objections formulated by Prof. Bayliss (NATURE, October 17, p. 124), as they chiefly concern matters relating to anatomy or physiology. When Prof. Bayliss looks again at the title of Sir Thomas Wrightson's work, which I have quoted above, he will see that he is in error in supposing that the Wrightson theory deprives the cochlea of the analytical function postulated by Helmholtz. Helmholtz's theory presupposes that the cochlea contains an extensive series of resonators for resolving a sound complex into its component waves; Sir Thomas Wrightson's theory presupposes that the cochlea is a machine designed for the purpose of analysing sound complexes and of registering its component waves as nerve impulses. I fear it is a loose statement of mine on p. 159 of the Appendix to Sir Thomas Wrightson's book that has misled Prof. Bayliss; there I have written that "the final analysis must be done in the cortex of the brain even if Helmholtz's theory is true." That I still believe to be the case.

Prof. Bayliss demurs to the opinion I have expressed that no theory of the mechanism of the ear can be regarded as satisfactory that fails to explain the form and the arrangement of its various parts. I have found that to be an absolutely infallible law as regards every part of the animal body concerned in movement: In every bone, joint, muscle, tendon, and ligament which has been investigated the result has been the same—the material of which each is made has been found to be so placed, so shaped, and so arranged as to carry out the particular function which has been assigned to it. Whether we accept Helmholtz's explanation of the mechanism of the internal ear or Sir Thomas Wrightson's, we are dealing with a machine concerned in movement, and it is, therefore, legitimate to infer that its parts are designed to subserve its various movements. The only structural feature of the cochlea explained by Helmholtz's theory is the gradual increase of the basilar membrane from its proximal or fenestral end to its distal or helicotremlal end. The elaborate structure of the organ of Corti and the conformation of the canals of the cochlea are left unexplained, whereas in Sir Thomas Wrightson's theory all these matters receive a rational explanation. On the Helmholtz theory we must believe that the rabbit is provided with a more delicate analytical machine than man, and the sloth with a more elaborate one than the most tuneful bird. Nay, we are certain that if Helmholtz's explanation had been the right one, Nature could have secured the necessary mechanism in a much simpler way, namely, by providing the auditory hair-cells with processes or cilia of the requisite qualities and dimensions to serve as sympathetic resonators.

I now come to a very important and very difficult objection that has been raised by Prof. Bayliss. Sir Thomas Wrightson's theory certainly presumes that the fibres of the nerve of hearing are capable of carrying