giving assistance to his Majesty's government in the conduct of the war."

We notice that this resolution was sent to the First Lord of the Admiralty, the Minister of War, the Minister of Munitions and the chairman of the Inventions Board of the Admiralty, but we can scarcely suppose that each of these officers of state will act independently in making whatever use is possible of the offer. Mr. Lloyd George has announced in the House of Commons that he has made arrangements with the Secretary of State for War to take over the invention work relating to the munitions of war for the supply of which his department is responsible. He has also arranged with the First Lord of the Admiralty to take over the work relating to new expedients and inventions for purely army purposes which are at present in charge of that department. . . .

Most people assume that these services will be voluntary; and a correspondent directs our attention to the fact that in the forms circulated by the Physical Society in connection with the proposed "War Register," it is stated that: "It is to be understood that all service would be voluntary, and unpaid, being given for the good of the country during this period of emergency." He adds: "I should like to inquire how it comes about that the Physical Society is not in a position to offer remuneration for work of the character specified in the circular on a scale at least bearing a reasonable proportion to the wages paid by the government for the performance of less responsible labor. Is it really for the good of the country that this work should be unpaid?"

Government departments and statesmen find their requests for expert advice and guidance responded to so willingly by scientific men and societies that they overlook the necessity of making any recompense for work done. In the medical services every qualified practitioner receives rank and reasonable pay, while consultants are given generous retaining fees. In legal circles also no advice is expected without a retainer being attached to it; and in this connection we are interested in the announcement that "according to a statement made in the House of Commons Sir John Simon, as attorney-general, drew £18,000 as his remuneration for the past year." It should be unnecessary to urge that the laws of nature are of as much importance as the laws of the land, and that as in the present crisis men of science can be of greater service to the nation than lawyers or politicians, they should receive at least sufficient reward for it to enable them to put aside their daily work in order to take up national duties. There will be no lack of volunteer workers among scientific men, but the state should understand that its responsibility for payment on account of expert opinion is at least as great in the case of science as it is in law, medicine and engineering.—*Nature.*

SCIENTIFIC BOOKS

The Social Problem, A Constructive Analysis. By CHARLES A. ELLWOOD, professor of sociology in the University of Missouri. In the Citizens' Library of Economics, Politics and Sociology. Edited by RICHARD T. ELY, professor of political economy in the University of Wisconsin. New York, The Macmillan Co., 1915. Pp. 249. $1.25.

"The present crisis in our civilization," we are told in the preface of this book, "calls for a reconstruction of our social philosophy." The author confidently undertakes the task. Decay is noted in religious belief, moral ideals, political honor, conflict of classes, the breakdown of regulation and control, the demand for a strong man and centralization in government. "The very forces which undermined Roman civilization, viz., commercialism, individualism, materialistic standards of life, militarism, a low estimate of marriage and the family, agnosticism in religion and ethics, seem to be the things which are now prominent, if not dominant, in Western civilization." Many new problems have suddenly arisen from increase of population, increase of knowledge, intermingling of races and cultures, increasing interdependence of nations, the invention of new machines and various other developments.

Back of these problems lies *the* social problem. Reformers who emphasize special problems do not grasp it. Those whose vision is

limited to national interests or whose point of view is purely economic have not discovered it. Pacifist, eugenist and feminist all miss it. Rather is it known only by those "who are beginning to perceive that the social problem is now what it has been in all ages, namely the problem of the relations of men to one another." These relations are the outcome of concrete historical, physical, physiological, economic and ideal elements. For example, on the historical side the relations of men in western civilization are largely determined by inheritance of Greek, Hebrew, Roman and Teutonic customs and ideals. Briefly attempting to characterize some of the chief contributions of each of these factors, the author endeavors to show how various inharmonious elements in them have combined with specified unfortunate effects of physical and economic influences to produce undesirable conditions in present society. A final chapter, on "The Solution of the Social Problem," lays down a number of precepts. To "solve" the social problem we must take a synthetic view of our social life, avoid revolution and violence, develop sympathy among all classes in the population, advance education, purify family life, control heredity, inculcate social responsibility, stress reason and altruism, support science, readjust the economic system and finally as a means to all this find and train social leaders.

In covering so large a field in so short a volume Professor Ellwood has necessarily dealt in cavalier fashion with most of his topics. In consequence the cautious scientist who looks in this book for adequate proof of all positions taken will be disappointed. The discerning reader, nevertheless, may possibly draw the not-unscientific conclusion from it that the world is still full of a number of things that need careful investigation. It is to be feared, however, that not all into whose hands "The Social Problem" falls will be able to distinguish opinions from generalizations that have been established through the work of numerous investigators.

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SPECIAL ARTICLES

NEW METHODS IN SOIL PROTOZOOLOGY[1]

IN the investigation of a problem bearing on the conclusions of Russell and Hutchinson[2] who consider protozoa as one of the limiting factors of bacterial activity and consequently of soil fertility, the authors found it expedient to carry on several preliminary experiments for the purpose of establishing the value of certain newly devised methods.

In view of the fact that the methods employed for counting protozoa have been unsatisfactory even in the hands of such experienced investigators as Rahn,[3] using an application of the bacterial dilution method; Killer[4] plating on solid media; Müller[5] counting protozoa per standard loopful of solution; and numerous others counting the protozoa directly in a drop by means of a microscope; the authors have adapted the well-known blood-counting apparatus (Blutkörperzählapparat) to the counting of protozoa. The principle underlying the use of this instrument is the microscopical observation of a drop of standard size. The organisms may be examined in the stained or unstained, in the living or dead state. Picrosulphuric acid (Kleinenberg) is recommended for killing and rapid staining simultaneously.

The calculation of results is based on the use of a standard stage micrometer, the squares marked on the disc of the slide, and the constant depth of solution under observation, which is .1 mm. Thus no mechanical variation is possible. The advantages of using this apparatus for counting protozoa are as follows:

1. It is a direct method, thus eliminating many errors attending incubation, etc., and the results can be reported immediately.

[1] From the laboratories of Protozoology and Soil Bacteriology. Further results of experimentation and a bibliography on soil protozoology and soil sterilization are awaiting publication in coming issue of *Centr. f. Bakt.*, Abt. II.

[2] Russell and Hutchinson, *Jour. Agr. Sci.*, 3 (1909), 111; *ibid.*, 5 (1913), 152, etc.

[3] Rahn, O., *Centr. f. Bakt.*, II., 36 (1913), 419.

[4] Killer, *Centr. f. Bakt.*, II., 37 (1913), 321.

[5] Müller, *Archiv. f. Hyg.*, 75 (1912), 321.