ficulties in the application of the system to the war-vessel may not be fatal to employment there.

Incidentally, a fact in sociology and economics comes into view. It was found impracticable to carry on work of research with men employed under the conditions obtaining in civil life and enlisted men were necessarily put on the work. Only men who would obey orders, work when required by the exigencies of the service and faithfully attend to duty, as in army and navy, could be relied upon. The trade-union rules were found to be fatal to efficiency, and the inference seems to have been plain that, in the industrial army as in the public service, effectiveness is not promoted where the rank and file take command.

The workings of the 'personnel bill' are commented upon with the conclusion that Mr. Roosevelt's bill is correct in plan and in principle, but that it has not been executed with either zeal or faithfulness, and that the efficiency of a navy dependent upon technical knowledge and practical experience, conjoined with high scientific attainments, is being seriously jeopardized by this disloyalty to law and to the service. Junior officers, it is stated, are not given either the scientific training or the professional training as mechanical engineers which are essential to the efficient operation of the 'engineer's war-engine,' as the writer has called the modern armored vessel, with its interior crowded with steam-engines and other machinery and electrical apparatus. Without extensive practical experience and a sound scientific education high efficiency cannot be hoped for, and the safety of the nation is too serious a matter to be subject to such risks as are sure to follow lack of zeal or of training in the management of so tremendous an engine of war as the armor-clad or cruiser. An 'emphatic general order' and rigid enforcement is demanded as essential, and immediately.

National ascendency on the seas and permanent safety against foreign aggression can only be insured by a sufficient and an efficient personnel as well as an amply powerful fleet. The navy of the United States, like that of Great Britain, needs men more than ships, to-day, and every proper means should be resorted to to make the service attractive and to secure competent officers, particularly in its departments of applied science.

Admiral Melville retires presently and this is his last official report. It is wise, frank and emphatic in its discussions of the requirements of a 'new navy' in the twentieth century. The influence of this testimony should be powerful and effective. The Chief of Bureau goes out of office leaving behind him a magnificent record of accomplishment, not only in the building up of the navy, but in achievements which, in variety as in importance, have probably never been rivaled.

R. H. THURSTON.

SCIENTIFIC JOURNALS AND ARTICLES.

The Journal of Physical Chemistry, October.—'Solubility, Electrolytic Conductivity and Chemical Action in Liquid Hydrocyanic Acid,' by Louis Kahlenberg and Herman Schlundt. This is a continuation of the researches of the authors on solutions with other solvents than water. Lists of substances soluble and insoluble in liquid hydrocyanic acid are given. In the case of some solutes the electrical conductivity is greater than in water, while in other cases, notably with the acids, it is less. 'The Expansion of a Gas into a Vacuum and the Kinetic Theory of Gases,' by Peter Fireman. An abstract of this paper has already appeared in this journal (SCIENCE, N. S., XVI., 285). 'On the Displacement of Equilibrium,' by Paul Saurel. 'On the Critical State of a One-Component System,' by Paul Saurel.

SOCIETIES AND ACADEMIES.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

AT the 557th meeting of the Society, held on November 8, Mr. C. G. Abbot, of the Astrophysical Observatory, described 'a device to obtain time signals of any desired interval from a clock work of uniform motion.' A chronograph with the attachment was exhibited. Signals at equal intervals of from one half second up to ninety seconds could be obtained. An adjustment was provided by means of which the whole series