functions of government. By whatsoever road reached the ultimate if not early outcome will probably be some form of centralized control with diffused or decentralized ownership. Meanwhile, the exactions of monopoly, the feebleness of legal restraints, the heaping up of fabulous fortunes, the prejudice of the ignorant, the envy of the incapable; and through all and over all the inappeasable voice of labor demanding, not without reason, a larger share of the wealth which it produces.

That these great consolidations are wholly desirable I certainly do not pretend. On the contrary, they occasion much cause for regret and not a little for grave apprehension. The utilization of new forces, the transfer to new methods, the control of producing and distributing agencies by huge combinations, must in the nature of the case inflict many hardships and involve many surrenders. But a great principle underlies this movement, the principle of industrial peace and efficiency, the principle of cooperation. Beside all question that principle is to govern, despite all drawbacks its operation will be beneficent.

So, in the unrest and discontent around us, deep-seated and alarming here and there, I read the desperate attempt to avoid the effects of industrial competition and a tremendous protest against its savage reprisals. Every trust and combination, whether organized by capitalists or by artisans, every strike and lockout, is a repudiation of its teachings and a denial of its pretensions. The competitive theory may have answered the age of mules and sailboats and spinning-wheels, but it fails to satisfy the interlacing needs, or to sustain the interdependent activities, which are founded on modern methods of intercourse and distribution; it is a theory unsuited to the era of railways and wireless telegraphy, this era of ours, so restless in thought, so resistless in action.

I much mistake, therefore, if we are not entering upon a period of great transitions, a period of difficulty and many dangers. The whole structure of industry and social life is liable to be subjected to a strain—possibly to a shock—for which experience furnishes no guiding precedent. We have settled the administrative questions; we can collect taxes, build courthouses and pay the policeman. We have settled the political questions; the nation lives and will live, the greatest and grandest in all the earth. But the further test is now to come, the test of the ocean liner and the limited express. Can we settle the economic questions? Can we raise this wide realm of industry from selfishness to charity, from strife to friendship, from competition to cooperation, from the warring instincts of the savage state to the larger and nobler needs of associated life? This is the problem of railroad and steamship, of telegraph and telephone, of the subtle and limitless forces of modern life, the problem which will test the wisdom of statesmanship and tax the resources of public authority.

Martin A. Knapp.

SCIENTIFIC BOOKS.

A Systematic Handbook of Volumetric Analysis. By Francis Sutton, F.I.C., F.C.S., etc. Ninth Edition, revised and enlarged. Philadelphia, P. Blakiston, Son & Co.

Sutton's 'Analysis' is so well known that the highest praise that can be paid this book is the statement that it is even better than the eighth edition. But few new chapters have been added, the most important being on magnesium and the azo-dyes. The individual chapters have been but little changed. Few new methods have been added and fewer obsolete processes dropped. Conservatism is undoubtedly necessary in a work of this kind, but it may be carried too far. The book would be more valuable if the author with his large experience were more ready to discard

old methods and adopt new ones. The English journals are referred to almost entirely throughout the book and one gets the impression that the continental periodicals have been neglected. The table of contents now contains a list of the tables throughout the book. This will be found useful and will save time. On the whole this book is certainly the best of its kind in the English language and it will always occupy an important place on the table of the working chemist. F. L.

A Text-book of Quantitative Chemical Analysis. By J. C. OLSEN, A.M., Ph.D., Professor of Analytical Chemistry in the Polytechnic Institute of Brooklyn, formerly Fellow of the Johns Hopkins University. Pp. xix + 513. New York, D. Van Nostrand & Co.

As stated in the preface, Professor Olsen has not attempted to produce a reference book for experienced analysts, but rather a book for college students. Accordingly he has devoted considerable space to theory and the explanation of the various steps in an analysis and has followed the sequence in which he presents the subject to his classes. The first chapters treat of 'General Operations and the Determination of Water,' then follow chapters on 'Gravimetric Analysis of Metals, Acids, Alloys and Minerals,' 'Electrolytic Methods,' 'Volumetric Analysis,' with special chapters on 'Oxidation and Reduction' and 'Precipitation Methods,' 'Technical, Water, Oil, Fat and Gas Analysis' and finally 'Stoichiometry,' and tables. There is not such a mass of facts as in Fresenius and yet enough methods are given for the teacher to choose good and interesting work for everybody. The last few chapters are particularly important, introducing as they do technical methods into the ordinary course. It is to be regretted that the author has not given in the first chapters a fuller discussion of the application of the ionic theory. Though apparently less essential, it is as necessary to the correct understanding of ordinary gravimetric methods as to those that are purely electrolytic. Perhaps the author assumes that no student is now allowed to take up quantitative analysis until he understands the ionic theory, but a review will do no harm. The directions are clearly given throughout and the student is made to feel that there is a reason for every step. The author tries to do away with the ridiculous practise of calculating results far beyond any significant figure but goes to the other extreme when he tells the student: "If an analysis is carried out by a process or for a purpose in which an error of one per cent. may be present no pains need be taken to secure greater accuracy than this in any step of the process." If this were logically carried out and there were ten steps in the process a loss of one per cent. in each step would certainly not give a result within one per cent. The student can be taught to work with all possible care and accuracy without attributing too small an error to his results. A chapter on stoichiometry should not be necessary in a work of this kind. Students with a proper understanding of the atomic theory and the simplest mathematics should be able to make all necessary calculations. It has evidently been the experience of the author, as of all teachers of the subject, that a majority of students need special training in stoichiometry. There is a fundamental fault somewhere in the student's course either in chemistry or in mathematics. Would it not be well for the teacher to force the student to work out all these problems by himself without any aid but the atomic theory and the rule of three? The reviewer hopes that Professor Olsen will omit the chapter on stoichiometry from the next edition of his book and he feels that there will soon be a second edition of so good a work.

F. L.

SCIENTIFIC JOURNALS AND ARTICLES.

THE leading article in the *Journal of Nervous and Mental Disease* for January is a study by Dr. H. C. Gordinier of two unusual brain tumors, one a multiple cylindroma of the base of the brain, the other a neuro-epithelioma of the choroid plexus of the fourth ventricle. This is followed by Dr. Onuf, of Craig Colony, with a study of a number of cases of epilepsy presenting partly muscular atrophies, partly defective muscular action