page 43) is a fruitful source of many other fallacies that injure the book and detract from a value that might have been well-nigh complete. This error leads to the assumption that petroleum residues, however made, are identical with natural asphalts; when, as a matter of fact, they are not identical among themselves when made by different methods from petroleum out of the same well, nor are any of them identical with natural asphalt. We believe these conclusions would have been reached by the author himself had his reading taken sufficient range to have included the original memoirs of Mabery, Warren, Hunt and other American investigators who have shown the great diversity of composition observed among the different varieties of crude petroleum and the great diversity of products obtained in their technology.

We have carefully read the chapter devoted to the chemistry of natural and artificial asphalts. While this chapter contains a large amount of information of great value to both chemists and technologists, the lack of systematic and orderly arrangement makes it necessary to read the whole chapter in order to ascertain its contents, and little, if any, discrimination is exercised with reference to the use of the many different processes described. This is to be regretted as it is often impossible for the chemist to select a process suitable to special needs, after trial of a large number, simply for lack of time.

In spite of the defects to which we call attention, the book has great merit and will be found, in the hands of discriminating investigators, extremely useful in the line of asphalt determination and research. S. F. PECKHAM.

ASPHALT PAVING. REPORT OF THE COMMISSIONERS OF ACCOUNTS OF THE CITY OF NEW YORK. February 3, 1904.

That this report has a scientific as well as practical interest will be seen from an examination of the table of contents. The first, second and fifth sections cover the practical side of the subject, being devoted to a discussion of asphalt paving specifications in New York and other cities and comment upon the same by the Chief Engineer of the Commission, Otto H. Klein, and the chemist, Professor S. F. Peckham; the third and fourth sections cover experimental work of Professor Peckham on the proximate analysis

of bitumens and a discussion of the views of different authorities concerning the nomenclature of bitumens. The proximate analysis work of Professor Peckham was carried out upon Trinidad Pitch and involved the application to the sample of methyl alcohol, acetone, ethyl ether and chloroform used in succession. Professor Peckham believes that a clear line of separation is possible by means of these solvents used in the order named. The various solutions were in each case, after the first, precipitated by the preceding solvent and washed with excess of the precipitant until pure residues were obtained. These residues were thus insoluble in any solvent that preceded its own. Various chemical tests were applied to the residues thus obtained and Professor Peckham states his conclusions as to their composition as follows: "Trinidad pitch consists of hydrocarbons which hold in solution oxidized products and complex organic salts of iron and alumina, some of which are soluble in chloroform and others of which are not. To a less extent these proofs hold good respecting other asphaltums, most of which contain a very much smaller proportion of mineral salts than Trinidad pitch." Professor Peckham objects, therefore, to the use of the common terms "petrolene and "asphaltene", which are so generally availed of in asphalt analyses. The section on the nomenclature of bitumens is somewhat controversial, as Professor Peckham takes issue particularly with the classification adopted by Mr. O. H. Eldridge in the volume published by the U. S. Geological Survey in 1902 on "The Asphalt and Bituminous Rock Deposits of the United States." After a review of the definitions of various writers on the subject, Professor Peckham gives on page 103 what he entitles "A Correct Classification of Bituminous Substances" which seems very complete and is well worth study.

Among several appendices of a practical character is published Boussingault's memoir upon the composition of bitumens.

The contributions, to our knowledge, of asphalts that have been made by Professor Peckham are considerable and his views are in general, well summarized in this work. Along with the article by Clifford Richardson "On the Nature and Origin of Asphalt" that appeared some years ago in the *Journal of the Society of Chemical Industry* we have practically all that is known of their chemical composition.

SAMUEL P. SADTLER.