Summary.

The laboratory preparations here described were made from high grade commercial pancreatin.

Extraction of the pancreatin with 50% alcohol leaves a residue having about the same proteolytic activity as the original pancreatin.

The sac precipitate obtained during dialysis in 50% alcohol in the course of purification of pancreatic amylase had 15 times the proteolytic activity of the original high grade pancreatin and about 4 times that of the most active commercial trypsin which we have seen.

The final preparation of pancreatic amylase purified as described in previous papers from this laboratory has proteolytic activity fully equal to that of the high grade trypsin when tested by any of the 5 methods used for the measurement of proteolytic power.

Experiments designed to throw light upon the relation between the amylolytic and proteolytic activities of this product will be described in our next paper.

We are greatly indebted to the Carnegie Institution of Washington for grants in aid of this investigation.

NEW YORK CITY.

NEW BOOKS.

The Chemical Constitution of the Proteins. Part I. Analysis. By R. H. A. PLIMMER. Pp. xii + 174. Third Edition. Longmans, Green & Co., London, 1917. Price, $1.80.

One of the advantages alleged for the series of Monographs on Biochemistry edited by Plimmer and Hopkins, of which this volume forms a part, was the possibility of issuing new editions on each topic as rapidly as the progress in that field of the science might necessitate. In accordance with the demands of the workers in physiological chemistry it thus becomes possible to procure an up-to-date presentation of their special branches without the necessity of securing a re-issue of such chapters in the science as have not experienced equally rapid changes. The plan of publication has justified itself, if one may judge by the character of the successive editions of Dr. Plimmer's parts. The present one differs from Part I of the second edition, published in 1912, in being concerned with the *analysis* of proteins. The description of the amino acids, which is essentially cyclopedic in character and less subject to change than is the present conception of the detailed composition of the proteins and the methods applicable to its study, is now relegated to a separate part. The earlier editions have been reviewed in THIS JOURNAL. It is only necessary to add, therefore, that in the 1917 volume the important contributions of five years on the subject of the hydrolysis of proteins and the isolation and estimation of their constituent groups are included. Especially prominent is the technic of

D. D. Van Slyke's newer methods and the discussion of the data which they afford. Here is the outlook as appraised by Plimmer:

"The analytical data show that our methods of determining the composition of proteins are far from satisfactory. Some of the methods have been adapted too exclusively to the solution of one particular part of the whole protein; coördination of methods should bring about a better knowledge. The introduction of any new method has always advanced the study of the chemistry of proteins, and the final solution will probably result from the employment of new methods."

The numerous tabular summaries of the reports on the amino acid make-up of proteins and the partition of nitrogenous groups in them, which are scattered through the literature, are of unique value to students of the physiology of nutrition.

LAFAYETTE B. MENDEL.

NEW HAVEN, CONN.

An Intermediate Textbook of Physiological Chemistry with Experiments. By C. J. V. PETTIBONE, *University of Minnesota. 328 pages. C. V. Mosby Company,* St. Louis, 1917.

This book has been prepared by Professor Pettibone as an intermediate text which would cover the general field of physiological chemistry in such a way as to give students a familiarity with compounds important from a biochemical viewpoint, and to acquaint them with the fundamental processes which go on in the animal body. The author has wisely attempted to avoid confusing the beginner with lengthy discussions of debated points, and sets forth as clearly as possible the present status of our knowledge. This part of the book covers about 200 pages. The material is so chosen that the book may be used for intermediate classes, but hardly, as the author suggests, for advanced work.

The second part of the book presents a well selected list of experimental studies, to accompany the text of the first part.

At the close, there is a 4-page list of references, including the better known physiological chemical works and a few periodical references.

CLARENCE J. WEST.

The Methods of the United States Steel Corporation for the Technical Sampling and Analysis of Gases. Second Edition, 1918. 60 pages.

The revision of the first edition of this pamphlet on the technical analysis and sampling of gases was carried out by a committee consisting of Mr. W. D. Brown, chemist of the Duquesne Works, Carnegie Steel Company; Dr. J. R. Harris, chemist of the Tennessee Coal, Iron and Railroad Company, and Mr. J. V. Freeman, chemist of the central laboratory, Joliet Works, Illinois Steel Company.

The second edition differs from the first chiefly in the inclusion of methods of analysis of by-product and natural gases. The contents comprise a brief discussion of the methods of sampling gases; a description of the methods approved by the Corporation for the analysis, in a special

apparatus, of blast-furnace, producer, by-product, flue, and natural gases; the determination of benzol, total sulfur, and cyanogen in by-product gas; and tables containing properties of gases, partial pressures of water vapor at different temperatures, and correction factors for the reduction of gas volumes to dry condition at 62° F. and 30 inches mercury.

The principle underlying the preparation of the pamphlet may well be expressed by quoting from the introduction: "In the preparation of the accompanying standard methods for the sampling and analysis of gases, there has been an unwavering purpose to eliminate, so far as possible, tedious analytical procedure and the use of cumbersome forms of apparatus. It has been desired to adopt methods, inherently correct in principle, which, in conjunction with simplified apparatus, will insure the requisite expediency, at times so necessary in commercial work, without an appreciable sacrifice in accuracy of results."

In this connection it seems desirable to point out a few instances where the purpose of the authors does not appear to have been completely effected:

(*a*) The apparatus that is employed, a modified Orsat apparatus, and also its manipulation, could be simplified without any sacrifice in accuracy or speed by replacing the "bubbling" pipets used for potassium hydroxide and fuming sulfuric acid by the old-style Orsat pipets.

(*b*) The practice of filling the capillary connections either with confining liquid from the buret or reagent from the pipets, a practice recommended in the pamphlet, is a time-consuming procedure which is entirely unnecessary and undesirable in technical analysis. The errors that might be introduced by neglecting the volume of gas in a reasonable length of capillary tubing of 1 mm. bore are not important when compared with the errors necessarily resulting from the solubility of carbon dioxide in the slightly acidified 20% solution of sodium sulfate that is used as the confining liquid in the buret and explosion pipet.

(*c*) With a standardized procedure for the absorption of oxygen by phosphorus or alkaline pyrogallol, the determination of the oxygen remaining after an explosion by a second explosion with hydrogen involves an unnecessary expenditure of time.

In the analysis of natural gas, the solubility in the confining liquid of the carbon dioxide formed by the explosion causes an error in the final results when they are computed from the contraction and the volume of carbon dioxide formed. In the method suggested in the pamphlet, this error is neatly avoided by computing the results from the oxygen requirement and the sum of the contraction and carbon dioxide volume, this sum being independent of the solubility of carbon dioxide in the confining liquid.

The method of computing results in each case is clearly explained and

illustrated numerically. However, in the section dealing with the calculation of the weight and sp. gr. of gas mixtures, the correction for the presence of moisture appears to have been incorrectly applied. For example, when a gas contains 1.8% of water vapor, the weight per cubic foot is gotten by adding the weight of 0.982 cubic foot of dry gas to the weight of 0.018 cubic foot of water vapor, not by dividing the sum of the weights of one cubic foot of dry gas and 0.018 cubic foot of water vapor by 1.018. Also in view of the significance usually given to the term *moist* with reference to gases (= saturated) it is confusing to read on p. 45 that the weight of one cubic foot of moist gas at a certain temperature and pressure can be computed from the weight of one cubic foot of moist gas at another temperature and pressure merely by the use of a factor correcting for the temperature and pressure change.

Notwithstanding the defects that have been mentioned, a pamphlet of this sort is undoubtedly of considerable value in standardizing the procedure in the various laboratories of the United States Steel Corporation and in simplifying the correlation of results. R. P. ANDERSON.