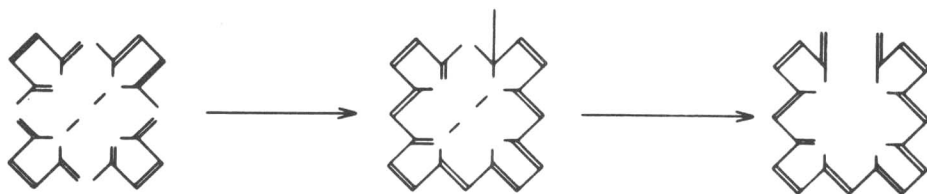


CLINICAL CHEMISTRY

PRINCIPLES AND TECHNICS



RICHARD J. HENRY, M.D.

*Director, Bio-Science Laboratories
and*

*Adjunct Professor of Biochemistry, School of Medicine, University
of Southern California, Los Angeles, California*



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To the wives of men who write books, and especially Maryon.

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Preface

The purpose of this book is to present, in a reasonably complete fashion, the principles and technics of clinical chemistry. Modern clinical chemistry is now some 50 years old and has become so extensive that there is need for comprehensive reference works in this field. This book is an attempt at such coverage. It is the author's hope that his effort will be of use to all whose work involves clinical chemistry, whether as an analyst at the bench, as one engaged in research, or responsible for direction of some phase of laboratory practice, and to those biochemists concerned with analytic problems.

This book deals almost exclusively with the analytic aspects of the tests. Early chapters are concerned with general consideration of specific analytic procedures, such as photometry, gasometry, and preparation of protein-free filtrates, and with topics such as normal values and stability of samples. The remaining chapters deal with specific substances with reviews of the various methods of determination, including where possible a discussion of the pros and cons of the various methods. The reviews are followed by a detailed presentation of one (in some cases, two) of the methods of analysis.

As can be seen from the table of contents, essentially the entire field of clinical chemistry is covered, including the determination of serum thyroxine, although other hormone analyses and toxicology have been omitted.

In regard to the choice of methods presented the author makes no claim that those selected are the only good ones or are necessarily the best available. No one can have experience with all methods and their modifications. Those presented are used at Bio-Science Laboratories and, therefore, have withstood practical everyday experience. Before a new procedure is introduced in the laboratory it is necessary to check it out thoroughly—there have been numerous times in our experience when we were unable to get published methods to work satisfactorily. Furthermore, before we accept a procedure for routine use, we want to know whether the color follows Beer's law, color stability, reagent stability, sample stability, precision, and accuracy. Many such important details are often not given in published procedures. The author has tried to answer these questions in the methods presented, thus

requiring considerable research, most of which has not been published before.

Selection of normal values was difficult. In most instances there is a rather wide spread in published normal ranges. Those presented are compromises. The general problem of delineating a normal range is discussed in Chapter 8.

This book was in preparation for over a decade and the author personally abstracted over 15,000 publications, some 7,000 of which are cited in the bibliography to serve as a reference source for those in the field of research. In the later years of this endeavor the author found he had the proverbial bear by the tail—new work was coming out nearly as fast as he could revise manuscript written in previous years. The cut-off date for literature was September, 1962. As of that date, however, the author was still finding important references previously missed. The literature coverage, therefore, is not complete. There is a wealth of material in foreign literature and the surface here was barely touched.

Chapter 28, Serum Thyroxine, was written by Dr. Vincent Pileggi of Bio-Science Laboratories who has had extensive experience in this field as head of the Iodine Division. The author is indebted to him for this contribution.

The following special items are included because the author believes they increase the usefulness of the book: (1) a "Quick Index" to methods and normal values, an abridged table of atomic weights and a table of "Useful Information about Concentrated Acids and Bases" which appear on the end papers of the volume; (2) a list of manufacturers referred to in the text as suppliers of special chemicals or apparatus; (3) an appendix containing tables of information ordinarily widely scattered, e.g., buffers, pH reference standards, adsorbants, desiccants, etc.

The author wishes to thank his associates Drs. Sam Berkman, O. J. Golub and Milton Segalove for making this book possible. Significant contributions through discussions and investigations were made by Dr. S. L. Jacobs and Charles Sobel of Bio-Science Laboratories and Dr. A. G. Ware of University of Southern California and the Los Angeles County General Hospital. Further acknowledgment is made to Dr. Golub for a complete review of the manuscript during the many years of preparation and to Dr. Jacobs for rechecking the presentations of the methods and the calculations involved. To Mr. Walter Seemayer who drew the graphs and illustrations and to Mrs. Lili Tabbush, Mrs. Robin Evanchuk and Mrs. Mary Allen, who were most helpful in the time-consuming secretarial phases of such an effort, appreciation is sincerely expressed. Finally the friendly and valuable assistance of the Hoeber Medical Division is gratefully acknowledged.

In conclusion, the author is aware that simple statistical probability makes it certain that there are many errors in such an extensive coverage. He would appreciate it if his attention were called to errors of commission and omission.

R.J.H.

Los Angeles

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