

*Clinical
Laboratory
Methods*

Bray

CLINICAL LABORATORY METHODS

BY

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WITH 119 TEXT ILLUSTRATIONS
AND 18 COLOR PLATES

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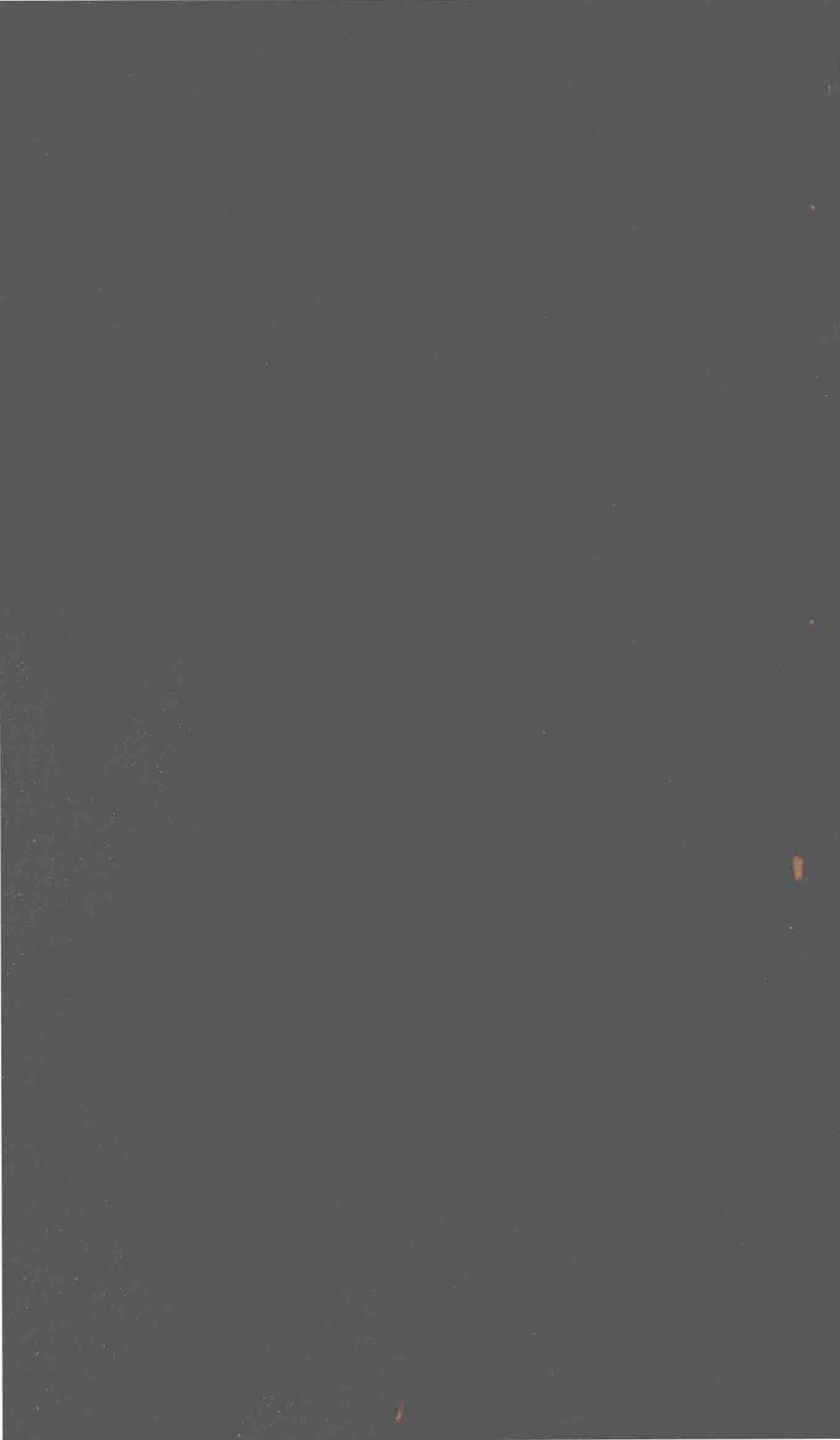
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PREFACE TO FOURTH EDITION

This edition has made it possible to include procedures selected from the many contributions recently made to the practice of Clinical Pathology, and to make many small changes reflecting the recent trends. Effort has been made to substitute new material for some of the old. New illustrations, tables and charts have been added. Portions have been rewritten or enlarged: the bone marrow findings, the Rh problem, the red blood cell series, the anemias, the mycoses and the antibiotics.

New subjects and procedures added include pseudo Bence-Jones protein; barium chloride and methylene blue tests for bile in the urine; clinical test for urobilinogen in urine and feces (Watson et al.); clinical test for chlorides in urine (Fantus) as a guide for salt replacement therapy; the lower nephron syndrome; the Kaolin method (Scott) for concentrating the A. P. L. hormone; the Spencer Hb-Meter; the new nomenclature of blood cells; the prothrombin consumption test (Quick); sodium bisulphite sickling test; action of heparin and Dicumarol; diagnosis of hemoglobinuria (Stats et al.); Coombs test for Rh-sensitized red blood cells; insulin and epinephrine tolerance tests; 17-ketosteroids and adrenocorticotrophic hormone (ACTH); Dreker's method for total serum cholesterol; copper sulphate method for serum protein; thymol turbidity test for liver function; trisodium phosphate. Clorox and oxalic acid methods for concentrating tubercle bacilli; rickettsialpox, psittacosis and ornithosis; agglutinins for the M. G. strain of streptococcus in primary atypical pneumonia; Promizole, para-amino-benzoic acid, carinamide; Papanicolaou's staining method; streptomycin, chloramphenicol (Chloromycetin), aureomycin, tyrothricin and bacitracin.

Minor additions include the use of detergents in staining methods; Nelson's culture medium for *Endameba histolytica*; Beddard's test for methylene blue; mannoheptulose; agnogenic myeloid metaplasia; and Pelger's nuclear anomaly of the granulocytes.

Again I owe much to many who have aided in the preparation of this edition. Especially am I grateful to Dr. Francis D. Smith, Dr. O. B. Bobbitt and Dr. Karl F. Menk; to my students and technicians; to my secretaries, Miss Caroline Bradshaw and Miss Martha Perkins.

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PREFACE TO THIRD EDITION

Knowledge acquired in the field of science is now being applied rapidly to the medical arts, both in diagnosis and in therapy. The relation of the Rh factor to erythroblastosis and of the classification of the streptococci to sulfonamide therapy may be given as examples. This edition has given an opportunity to include many new tests and to make additions to the section dealing with intestinal parasites, the importance of which is increased because of our closer contact with the tropics.

Small portions have been rewritten, but the form of the book has not been changed. More illustrations and charts have been added in order to aid the student and to increase the value of the book as a teaching guide. Three new color plates have been included.

The sections on blood and blood transfusion, on blood and urine chemistry, on bacteriology and on intestinal parasites particularly have been enlarged. Consideration has been given to toxoplasmosis, erythroblastosis, polycythemia, leucemoid blood pictures and to refractory and achrestic anemias; to porphyria and to phenylpyruvic oligophrenia; to Addison's disease; and to the antigenic analysis in the classification of the *Salmonella* group.

Other additions include tests for Rh factor, anti-Rh, cold agglutinins and subgroup incompatibilities; a quantitative method for urobilinogen in the urine; Sulkowitch's test for calcium in regulating the treatment of hypoparathyroidism; tests for sulfonamide crystals; the Cutler-Power-Wilder procedures, and tests for serum sodium; a test for acid phosphatase; Hanger's cephalin-cholesterol flocculation test and Quick's hippuric acid test for liver function; the diphenylcarbazine method of Letonoff and Reinhold for lead determination; the Koppányi test for barbiturates; the frog test for pregnancy; the determination of the salicylic acid blood level in the treatment of rheumatic fever with salicylates; tests for the classification of streptococci, for pathogenicity of staphylococci, for urea-splitting bacteria; and methods of identifying *histoplasma capsulatum* and other pathogenic fungi.

Grateful appreciation is acknowledged for the aid of our students and technicians whose pertinent questionings have helped much in the selection and in the arrangement of the material for the Synopsis; and for the cooperation of my assistants, Dr. Kenneth B. Grim and Dr. Francis D. Smith.

W. E. BRAY.

University of Virginia.

In reprinting the Third Edition, a section on Penicillin has been added.

PREFACE TO SECOND EDITION

Many advances have been made in clinical laboratory methods within the last two years. New methods have been introduced and older procedures have been standardized. In this edition effort has been made to adhere closely to the object and to the form of the original book, but the clinical significance of laboratory findings has been further stressed.

Description is purposely brief, but adequate if directions are followed. Unimportant details, which often add confusion and mask the orderly sequence of procedures, have been omitted again, since it may be assumed that beginners will have supervisory instruction and that the more experienced will not need such details.

Among the additional procedures in this edition are: serum phosphatase determination, titration of staphylococcus antitoxin in the blood serum, Ivy bleeding time, peroxidase-Giemsa staining method, cough plate method for diagnosis of whooping cough, opsonocytophagic test for determining the immunity status in undulant fever, the halo or diffraction method for measuring erythrocytes, vitamin C titration, determination of cyanates in the blood, 'phthalein elimination curve, determination of sulfanilamide in the blood, the differential heterophile agglutination for infectious mononucleosis, test for morphine in the urine, and the optimum dose titration of antigen for the Wassermann test.

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PREFACE TO FIRST EDITION

Clinical laboratory work in recent years has taken an important place in the practice of modern medicine. Many diseases require laboratory tests not only for definite diagnosis but also for successful therapy. New tests, or modifications of those already in use, are developing rapidly, but much of the useful information is scattered through many books and numerous journals and is not readily accessible.

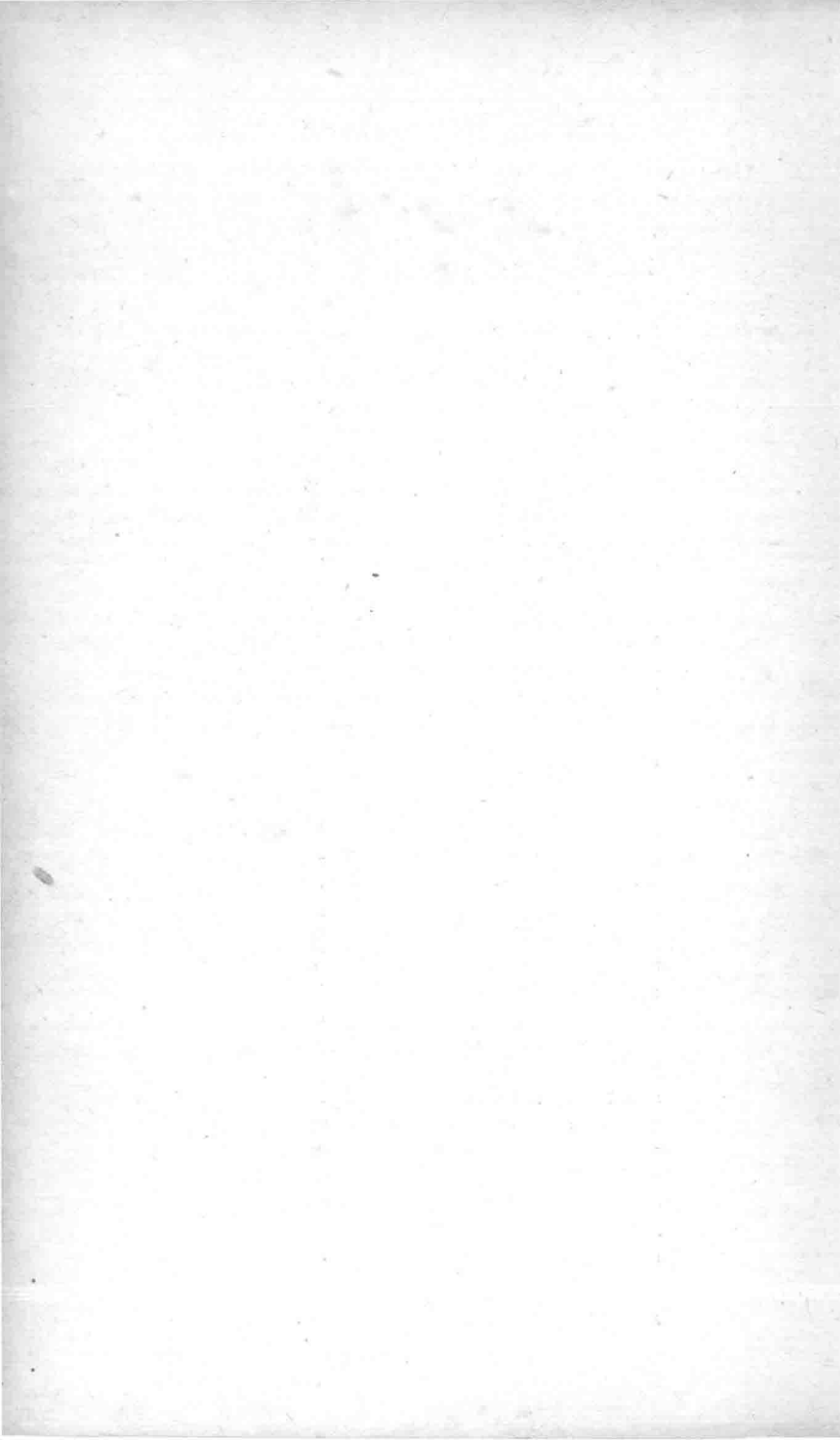
The object of this synopsis is to bring together in a small volume for ready reference the more recent information and the most frequently used methods of laboratory diagnosis.

The book is the outgrowth of long experience in teaching clinical diagnosis to medical students, and in teaching and supervising clinical laboratory technicians. The selection and arrangement of the material have resulted from a constant effort to aid these groups in solving the everyday problems that arise in their routine laboratory work.

In making a diagnosis, it is urged that laboratory findings be considered jointly with the patient's history and the physical examination.

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