

MEDICAL MICROBIOLOGY *and* INFECTIOUS DISEASES

ABRAHAM I. BRAUDE, M.D., Ph.D.

MEDICAL MICROBIOLOGY *and* INFECTIOUS DISEASES

ABRAHAM I. BRAUDE, M.D., Ph.D.

Professor of Medicine and Pathology
University of California, San Diego

Associate Editors

CHARLES E. DAVIS, M.D.

Professor of Pathology
University of California, San Diego

JOSHUA FIERER, M.D.

Associate Professor of Medicine
University of California, San Diego

1981

W. B. SAUNDERS COMPANY **Philadelphia**

London

Toronto

Mexico City

Sydney

Tokyo

W. B. Saunders Company: West Washington Square
Philadelphia, PA 19105

1 St. Anne's Road
Eastbourne, East Sussex BN21 3UN, England

1 Goldthorne Avenue
Toronto, Ontario M8Z 5T9, Canada

Cedro 512
Mexico 4, D.F. Mexico

9 Waltham Street
Artarmon, N.S.W. 2064, Australia

Ichibancho, Central Bldg., 22-1
Chiyoda-ku, Tokyo 102, Japan

Library of Congress Cataloging in Publication Data

Braude, Abraham I.

Medical microbiology and infectious diseases.

(International textbook of medicine)

1. Medical microbiology. 2. Communicable diseases.

I. Title. II. Series. [DNLM: 1. Microbiology.

2. Communicable diseases. QW4 B824m]

QR46.B68 616'.01 79-3986

ISBN 0-7216-1919-3

INTERNATIONAL TEXTBOOK OF MEDICINE

Medical Microbiology and Infectious
Diseases Vol. II

ISBN 0-7216-1919-3

© 1981 by W. B. Saunders Company. Copyright under the International Copyright Union. All rights reserved. This book is protected by copyright. No part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from the publisher. Made in the United States of America. Press of W. B. Saunders Company. Library of Congress catalog card number 79-3986.

Last digit is the print number: 9 8 7 6 5 4 3 2 1

CONTRIBUTORS

YOUSEF AL-DOORY, Ph.D.

Associate Professor of Pathology, George Washington University School of Medicine; Chief, Sections of Mycology and Serology, Division of Laboratory Medicine, George Washington University Hospital, Washington, D.C.

DEMATIACEAE: AGENTS OF CHROMOMYCOSIS

AARON D. ALEXANDER, Ph.D.

Professor of Microbiology, Department of Microbiology, Chicago College of Osteopathic Medicine, Chicago, Illinois.

LEPTOSPIRA

A. O. ANYA, Ph.D.

Professor of Zoology and Director, School of Postgraduate Studies, University of Nigeria, Nsukka, Nigeria.

NEMATHELMINTHES

DONALD ARMSTRONG, M.D.

Professor of Medicine, Cornell University Medical College; Chief, Infectious Disease Service, Memorial Sloan-Kettering Cancer Center, New York, New York

CEREBRAL ASPERGILLOSIS; CEREBRAL MUCORMYCOSIS

HOWARD ROBERT ATTEBERY, D.D.S.

Research Microbiologist, Veterans Administration Medical Center, San Diego, California.

FUSOBACTERIA; GRAM-POSITIVE COCCI: PEPTOCOCCUS, PEPTOSTREPTOCOCCUS, STREPTOCOCCUS (ANAEROBIC), AND SARCINIA; VEILLONELLA

HERMAN BAER, M.D.

Associate Professor of Pathology and Medical Microbiology; Director, Clinical Microbiology Laboratories, Shands Teaching Hospital and Clinics, Miller Health Center, University of Florida, College of Medicine, Gainesville, Florida.

CLASSIFICATION OF BACTERIA; MORAXELLA AND ACINETOBACTER

ANN SULLIVAN BAKER, M.D.

Assistant Professor of Medicine, Harvard Medical School; Assistant in Medicine, Massachusetts General Hospital; Consultant in Infectious Diseases, Massachusetts Eye and Ear Infirmary, Boston, Massachusetts.

SPINAL EPIDURAL ABSCESS; SUBDURAL EMPYEMA

JEFFRY D. BAND, M.D.

Medical Epidemiologist, Center for Disease Control, Atlanta, Georgia.

LEGIONELLOSIS

ALAN G. BARBOUR, M.D.

Fellow, Division of Infectious Diseases, Department of Medicine, University of Utah, Salt Lake City, Utah.

COLORADO TICK FEVER

LANE BARKSDALE, M.D.

Professor of Microbiology, New York University School of Medicine and Medical Center, New York, New York.

DIPHTHERIA BACILLI AND OTHER CORYNEBACTERIA

ELIZABETH BARRETT-CONNOR, M.D.,
D.C.M.T. (London)

Associate Professor, Division of Epidemiology, Departments of Community Medicine and Medicine, University of California, San Diego, School of Medicine, San Diego, California.

AFRICAN SLEEPING SICKNESS; FLUKE INFECTIONS; INTESTINAL ROUNDWORMS

JOSEPH H. BATES, M.D.

Professor of Medicine and Microbiology, University of Arkansas for Medical Sciences; Chief, Medical Service, Little Rock Veterans Medical Center, Little Rock, Arkansas.

TULAREMIA

WILLIAM R. BEISEL, A.B., M.D., F.A.C.P.

Deputy for Science, US Army Medical Research

Institute of Infectious Diseases, Fort Dietrick,
Maryland.

METABOLIC EFFECTS OF INFECTION

DONALD W. BELCHER, M.D.

Associate Professor of Medicine, University of
Washington, School of Medicine; Staff Physi-
cian, MCCU, Veterans Administration Medi-
cal Center, Seattle, Washington.

DRACUNCULIASIS

FRANCISCO BIAGI, M.D.

Professor of Medical Parasitology, National
University of Mexico, School of Medicine;
American British Cowdray Hospital, Hospital
Infantil Privado, Mexico City, Mexico.

AMEBIC DYSENTERY; CUTANEOUS AMEBIASIS

PERRY S. BINDER, M.D., F.A.C.S.

Associate Professor of Ophthalmology, Uni-
versity of California, San Diego; Chief of
Ophthalmology, San Diego Veterans Adminis-
tration Medical Center; Consultant, Naval Re-
gional Medical Center, San Diego, California.

OCULAR BACTERIAL INFECTIONS; OCULAR FUNGAL,
PARASITIC, CHLAMYDIAL, AND RICKETTSIAL INFECTIONS;
OCULAR INFLAMMATORY DISEASE

RUTH, BISHOP, D.Sc.

Principal Research Fellow (NHMRC), Depart-
ment of Gastroenterology, Royal Children's
Hospital, Melbourne, Australia.

VIRAL GASTROENTERITIS

ALAN L. BISNO, M.D.

Chief, Division of Infectious Diseases, and
Professor of Internal Medicine, University of
Tennessee Center for the Health Sciences; At-
tending Physician, City of Memphis Hospi-
tals, Memphis, Tennessee.

ROCKY MOUNTAIN SPOTTED FEVER

DONALD L. BORNSTEIN, M.D.

Associate Professor of Medicine, Chief of In-
fectious Disease Section, Department of Medi-
cine, State University of New York Upstate
Medical Center; Attending Physician, State
University Hospital, Syracuse Veterans Ad-
ministration Hospital, Crouse-Irving Me-
morial Hospital, Syracuse, New York.

BACTEROIDES SEPTICEMIA; CLOSTRIDIAL MYONECROSIS;
CLOSTRIDIAL SEPTICEMIA

PAULA BRANEFORS, M.D., Ph.D.

Assistant Professor, University of Goteborg,
Institute of Medical Microbiology, Department
of Bacteriology, Goteborg, Sweden.

EPIGLOTTITIS AND PSEUDOCROUP

ABRAHAM I. BRAUDE, M.D., Ph.D.

Professor of Medicine and Pathology, Univer-
sity of California, San Diego, California.

ACTINOMYCOSIS; THE ASPERGILLI; BACTERIAL ENDO-
TOXINS; BACTERIAL LUNG ABSCESS; BANCROFTIAN AND
MALAYAN FILARIASIS; CANDIDA AND TORULOPSIS;
COCCIDIOIDOMYCOSIS; DESCRIPTION OF ANTIMICROBIAL
DRUGS; DENGUE AND OTHER HEMORRHAGIC FEVERS;
LASSA FEVER; MECHANISMS OF ACQUIRED RESISTANCE
TO INFECTION; MECHANISMS OF ACTION OF ANTIMICRO-
BIALS; MECHANISMS OF IMMUNOLOGIC INJURY IN IN-
FECTIOUS DISEASES; MECHANISMS OF NATURAL RESIST-
ANCE TO INFECTION; MISCELLANEOUS FUNGI; THE
AGENTS OF MYCETOMA AND RHINOSPORIDIUM; NORTH
AMERICAN BLASTOMYCOSIS; POXVIRUSES; RESISTANCE
TO ANTIMICROBIAL DRUGS; SPOROTRICHOSIS; THE
ZYGOMYCETES.

RUDOLF BREZINA, M.D., Ph.D.

Head, Department of Rickettsiae, Institute of
Virology, Slovak Academy of Sciences, Bratis-
lava, Czechoslovakia.

ENDEMIC TYPHUS; EPIDEMIC TYPHUS; OTHER RICKETT-
SIAL SPOTTED FEVERS.

S. J. D. BROOKS, M.D.

Formerly Fellow in Infectious Diseases, De-
partment of Medicine, University of Califor-
nia, San Diego, California.

BACTERIAL LUNG ABSCESS

RICHARD E. BRYANT, M.D.

Professor of Internal Medicine, Director of In-
fectious Diseases Division, University of Ore-
gon Health Sciences Center, Portland, Ore-
gon.

VIRAL PNEUMONIA

ANTHONY D. M. BRYCESON, M.D.,

F.R.C.P.E., D.T.M. & H.

Senior Lecturer, London School of Hygiene and
Tropical Medicine; Consultant Physician, Hos-
pital for Tropical Diseases, London, England.

CUTANEOUS AND MUCOCUTANEOUS LEISHMANIASIS;
VISCERAL LEISHMANIASIS

JOHN J. S. BURTON, Ph.D.

University of California ICMR, Institute for
Medical Research, Kuala Lumpur, Malaysia.

ARTHROPODS OF MEDICAL IMPORTANCE

LUBOR ČERVA, RNDr, Dr. Sc.

Senior Resident Scientist, Department of Pro-
tozoology, Czechoslovak Academy of Sciences,
Dejvice, Czechoslovakia.

AMEBIC MENINGOENCEPHALITIS

BARUN DEB CHATTERJEE, M.B.B.S., Ph.D.

Professor and Head, Department of Bacteri-

ology and Serology, School of Tropical Medicine, Calcutta, India.

VIBRIOS

T. H. CHEN, M.D.

Research Microbiologist, Department of Biomedical and Environmental Health Sciences, School of Public Health, University of California, Berkeley, California.

YERSINIA, PASTEURELLA, AND FRANCISELLA

DAVID FRANCIS CLYDE, M.D., Ph.D., D.T.M. & H.

Professor and Head, Department of Tropical Medicine and Medical Parasitology, Louisiana State University Medical Center, New Orleans, Louisiana.

MALARIA

STEPHEN N. COHEN, M.D.

Clinical Professor of Laboratory Medicine, Medicine, and Microbiology, University of California, San Francisco, School of Medicine; Director of Clinical Laboratories and Attending Physician, University of California, San Francisco, Medical Center, San Francisco, California.

INFECTION WITH PNEUMOCYSTIS CARINII

RICHARD W. COMPANS, Ph.D.

Professor of Microbiology, University of Alabama Medical Center, Birmingham, Alabama.

MORPHOLOGY AND STRUCTURE OF VIRUSES

JAMES D. CONNOR, M.D.

Professor of Pediatrics, University of California, San Diego; Consultant, Mercy Hospital, Camp Pendleton, Naval Hospital (Balboa), Children's Hospital, San Diego, California.

HAND-FOOT-MOUTH DISEASE; HERPANGINA; PERTUSSIS

EUGENE H. COTA-ROBLES, Ph.D.

Professor of Biology, University of California, Santa Cruz, California.

THE STRUCTURE OF THE BACTERIAL CELL

MANUEL CUADRA, M.D.

Professor (Retired) of Infectious, Parasitic, and Tropical Diseases, Universidad Nacional Mayor de San Marcos, Facultad de Medicina, Lima, Peru; Staff Member, Robert Koch Institut, Associated with Virchow Krankenhaus, Berlin, West Germany.

BARTONELLA BACILLIFORMIS; BARTONELLOSIS

SCOTT F. DAVIES, M.D.

Assistant Professor of Medicine, University of

Minnesota Medical School; Chief, Pulmonary Section, Hennepin County Medical Center, Minneapolis, Minnesota.

HISTOPLASMOSIS

CHARLES E. DAVIS, M.D.

Professor of Pathology, University of California, San Diego, School of Medicine; Associate Director of Microbiology, University Hospital, San Diego, California.

BABESIOSIS; CLASSIFICATION AND IDENTIFICATION OF BACTERIA; CRYPTOCOCCUS; CUTANEOUS LARVA MIGRANS; ERYSIPELOTHRIX RHUSOPATHIAE; GLANDERS; PARAGONIMIASIS.

GÉRARD De CROUSAZ, M.D.

Associate Professor, Faculty of Medicine, University of Lausanne; Consultant Neurologist, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland.

TUBERCULOUS MENINGITIS

GUNTHER DENNERT, Ph.D.

Department of Cancer Biology, The Salk Institute, San Diego, California.

SCHISTOSOMIASIS

DENNIS M. DIXON, Ph.D.

Assistant Professor, Department of Biology, Loyola College of Maryland, Baltimore, Maryland.

BLASTOMYCES AND PARACOCIDIIOIDES

ALEXANDER L. DOHANY, Ph.D., Maj, MSC.

Chief, Department of Acarology, US Army Medical Research Unit, Kuala Lumpur, Department of State, Washington, D.C.

ARTHROPODS OF MEDICAL IMPORTANCE

JEAN M. DOLBY, Ph.D.

Member of the Senior Scientific Staff of the Medical Research Council, Clinical Research Centre, Harrow, Middlesex, England.

BORDETELLA

SAM T. DONTA, M.D.

Professor of Medicine, University of Iowa, College of Medicine; Director, Infectious Disease Services, University of Iowa and Veterans Administration Medical Center, Iowa City, Iowa.

FOOD POISONING

R. GORDON DOUGLAS, Jr., M.D.

Professor of Medicine and Microbiology and Head of Infectious Disease Unit, University of Rochester, School of Medicine and Dentistry;

Physician, Strong Memorial Hospital, Rochester, New York.

INFLUENZA

HERBERT L. DuPONT, M.D.

Professor and Director, Program in Infectious Diseases and Clinical Microbiology, The University of Texas Medical School at Houston; Attending Internist, Hermann Hospital, Houston, Texas.

GRANULOMATOUS HEPATITIS

WERNER DUTZ, M.D., F.R.C. Path.

Professor of Pathology, Medical College of Virginia, Richmond, Virginia.

ANTHRAX

GEORGE A. EDWARDS, M.D.

Professor of Medicine, Chief of Staff, Veterans Administration Hospital, Dallas, Texas.

LEPTOSPIROSIS

JOHN E. EDWARDS, Jr., M.D.

Assistant Professor of Medicine, University of California at Los Angeles School of Medicine; Attending Physician, Department of Medicine, and Staff Physician, Division of Infectious Diseases, Los Angeles County, Harbor/UCLA Medical Center, Los Angeles, California.

FUNGEMIA; MONILIASIS OF THE SKIN; THRUSH OF THE MOUTH AND ESOPHAGUS

SANFORD S. ELBERG, Ph.D.

Professor of Microbiology and Immunology, Department of Biomedical and Environmental Health Sciences, School of Public Health, University of California, Berkeley, California.

YERSINIA, PASTEURELLA, AND FRANCISELLA

MAKOTO ENOMOTO, M.D.

Lecturer of Pathology, St. Marianna University, School of Medicine; Consulting Pathologist, Sagamihara Kyodo Hospital, Sagamihara, Japan.

FUNGAL TOXINS

WILLIAM R. FAIR, M.D.

Professor of Surgery and Chairman, Division of Urology, Washington University, School of Medicine, St. Louis, Missouri.

PROSTATITIS

VLADIMIR FARKAŠ, Ph.D.

Researcher, Institute of Chemistry, Department of Biochemistry of Saccharides, Slovak Academy of Sciences, Bratislava, Czechoslovakia.

MORPHOLOGY AND STRUCTURE OF FUNGI

JANOS FEHER, M.D., C.Sc.

Associate Professor of Internal Medicine, Semmelweis Medical University; Attending Hepatologist, Semmelweis Medical University, 3rd Department of Medicine, Budapest, Hungary.

SPIROCHETAL HEPATITIS

JOSHUA FIERER, M.D.

Associate Professor of Medicine, University of California, San Diego, School of Medicine; Chief, Microbiology Laboratory, Veterans Administration Medical Center; Attending Physician, University Hospital, San Diego, California.

GRAM-POSITIVE COCCI; HERPESVIRUS SIMIAE ENCEPHALITIS; STREPTOBACILLUS MONILIFORMIS

ROBERT H. FITZGERALD, Jr., M.D.

Assistant Professor of Orthopedic Surgery, Mayo Medical School; Consultant, Department of Orthopedics, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

BACTERIAL ARTHRITIS; BACTERIAL OSTEOMYELITIS

DAVID W. FRASER, M.D.

Medical Epidemiologist, Center for Disease Control, Atlanta, Georgia.

LEGIONELLOSIS

LAWRENCE R. FREEDMAN, M.D.

Professor and Chairman, Department of Internal Medicine, University of Lausanne; Chief of Medicine, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland.

INFECTIVE ENDOCARDITIS AND OTHER INTRAVASCULAR INFECTIONS

STANLEY D. FREEDMAN, M.D.

Head, Division of Infectious Diseases, Scripps Clinic, Associate Clinical Professor of Medicine, University of California, San Diego, California; Attending Staff, Green Hospital of Scripps Clinic, La Jolla, California.

PSITTACOSIS; WHIPPLE'S DISEASE

CHANTAL FRELAND

Doctor in Bio-chemistry, Former Teaching Assistant in Bacteriology at the Nantes University Medical School; Chef de Service, Laboratoire de Biologie Medicale, Hôpital Médico-Chirurgical Léon Bellier, Nantes-Cedex, France.

ERYSPELOID

WESLEY FURSTE, M.D., F.A.C.S.

Clinical Professor of Surgery, Ohio State University; Senior Attending Surgeon, Riverside

Methodist and Mt. Carmel Hospitals, Columbus, Ohio.

TETANUS

ROBERT G. GARRISON, Ph.D.

Associate Professor of Microbiology, Department of Microbiology, University of Kansas Medical Center; Research Microbiologist, Veterans Administration Medical Center, Kansas City, Missouri.

SPOROTHRIX SCHENKII

O. J. A. GILMORE, M.S., F.R.C.S. (Eng.), F.R.C.S. (Ed.)

Consultant Surgeon, St. Bartholemew's Hospital, Hackney Hospital, London, England.

APPENDICITIS AND DIVERTICULITIS

ISAAC GINSBURG, M.Sc., Ph.D.

Professor of Microbiology, The Hebrew University Hadassah, Faculty of Dental Medicine Founded by the Alpha Omega Fraternity; Chairman, Department of Oral Biology, Faculty of Dental Medicine, Hebrew University; Member, Institute for Microbiology, Faculty of Medicine, Hebrew University Hadassah Medical Center, Jerusalem, Israel.

STREPTOCOCCUS

MICHAEL PIERRE GLAUSER, M.D.

Privat-Dolent and Aggregé, Faculty of Medicine, University of Lausanne; Médecin Adjoint, Division of Infectious Diseases, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland.

URINARY TRACT INFECTION AND PYELONEPHRITIS

RUTH E. GORDON, Ph.D.

Professor of Microbiology, Waksman Institute of Microbiology, Rutgers, The State University of New Jersey, Piscataway, New Jersey.

NOCARDIA AND STREPTOMYCES

MICHAEL G. GROVES, D.V.M., Ph.D.

Commander, US Army Medical Research Unit, Institute for Medical Research, Kuala Lumpur, Malaysia.

BABESIOSIS

ASHLEY T. HAASE, M.D.

Associate Professor, Department of Medicine and Microbiology, School of Medicine, University of California, San Francisco; Chief, Infectious Disease, Veterans Administration Medical Center, San Francisco, California.

SLOW INFECTIONS

NANCY K. HALL, Ph.D.

Assistant Professor of Pathology, Health Sci-

ence Center, University of Oklahoma, Oklahoma City, Oklahoma.

HISTOPLASMA CAPSULATUM

H. HUNTER HANDSFIELD, M.D.

Assistant Professor of Medicine, University of Washington, School of Medicine; Venereal Disease Control Officer, Seattle-King County Department of Public Health, Seattle, Washington.

LYMPHOGRANULOMA VENEREUM, CHANCROID, AND GRANULOMA INGUINALE

HERBERT S. HEINEMAN, M.D.

Clinical Professor of Medicine, Jefferson Medical College of Thomas Jefferson University; Attending Physician and Consultant in Infectious Diseases, Mercy Catholic Medical Center; Director, Public Health Laboratory, Department of Public Health, Philadelphia, Pennsylvania.

BACTERIAL BRAIN ABSCESS; SHOCK IN INFECTIOUS DISEASES

JUNJI H. HIGUCHI, M.D.

Instructor in Internal Medicine, The University of Texas Health Science Center at San Antonio; Attending Physician, Audie L. Murphy Memorial Veterans Hospital, San Antonio, Texas.

COMMON GRAM-NEGATIVE BACILLARY PNEUMONIAS; COMMON PNEUMONIAS DUE TO PYOGENIC COCCI

SHALOM Z. HIRSCHMAN, M.D.

Professor of Medicine and Director, Division of Infectious Diseases, The Mount Sinai School of Medicine of The University of New York; Attending Physician, The Mount Sinai Hospital, New York, New York.

HEPATITIS VIRUSES; VIRAL HEPATITIS

MONTO HO, M.D.

Professor of Medicine and Microbiology, University of Pittsburgh; Chief, Division of Infectious Diseases, Presbyterian-University Hospital, Pittsburgh, Pennsylvania.

CENTRAL NERVOUS SYSTEM INFECTIONS CAUSED BY TOGA VIRIDAE AND RELATED AGENTS; INTERFERON AND INTERFERENCE

BETTY C. HOBBS, D.Sc., Ph.D., Dip. Bact., F.R.C.Path., F.R.S.H.

Director (Retired), Food Hygiene Laboratory, Central Public Health Laboratory, London, England; Consultant Microbiologist, Christian Medical and Brown Memorial Hospital, Punjab, India.

THE CLOSTRIDIA

PATRICIA A. HOFFEE, Ph.D.

Professor of Microbiology, University of Pittsburgh, School of Medicine, Pittsburgh, Pennsylvania.

BACTERIAL GENETICS

THOMAS A. HOFFMAN, M.D.

Associate Professor of Medicine, University of Miami, School of Medicine; Chief, Division of Infectious Diseases, Jackson Memorial Hospital, Miami, Florida.

MENINGOCOCEMIA; PURULENT BACTERIAL MENINGITIS

TOR HOFSTAD, M.D.

Associate Professor of Microbiology, Faculty of Medicine, University of Bergen; Chief Physician, Department of Microbiology, Haukeland Hospital, Bergen, Norway.

BACTEROIDES

HOOSHANG HOOSHMAND, M.D.

Neurological Associates, Vero Beach, Florida.

NEUROSYPHILIS

MARIAN C. HORZINEK, D.V.M., Ph.D.

Professor of Virology and Head, Department of Virology, Veterinary Faculty, State University, Utrecht, The Netherlands.

TOGAVIRUSES

CAROLYN COKER HUNTLEY, M.D.

Professor of Pediatrics, Bowman Gray School of Medicine; Attending Physician, North Carolina Baptist Hospital, Winston-Salem, North Carolina.

VISCERAL LARVA MIGRANS

ROBERT R. JACOBSON, Ph.D.

Clinical Instructor in Medicine, Louisiana State University Medical School, New Orleans, Louisiana; Chief of the Clinical Branch and Medical Department, US Public Health Service Hospital, Carville, Louisiana.

LEPROSY

W. G. JOHANSON, Jr., M.D.

Professor of Internal Medicine, The University of Texas Health Science Center at San Antonio; Chief, Pulmonary Disease Section, Audie L. Murphy Memorial Veterans Hospital, San Antonio, Texas.

COMMON GRAM-NEGATIVE BACILLARY PNEUMONIAS;
COMMON PNEUMONIAS DUE TO PYOGENIC COCCI

ANSSI M. M. JOKIPII, M.D.

Docent in Clinical Microbiology and Immunology, University of Helsinki, Helsinki, Finland.

GIARDIASIS AND BALANTIDIASIS

LIISA JOKIPII, M.D.

Docent in Clinical Microbiology and Immunology, University of Helsinki, Helsinki, Finland.

GIARDIASIS AND BALANTIDIASIS

HARVEY S. KANTOR, M.D.

Associate Professor of Medicine and Pathology, and Director, Division of Infectious Diseases, Chicago Medical School; Chief, Infectious Diseases Section, Veterans Administration Medical Center, North Chicago, Illinois; Consultant in Infectious Diseases, Highland Park Hospital, Highland Park, Illinois; Consultant in Infectious Diseases, St. Mary of Nazareth Hospital, Chicago, Illinois.

BACTERIAL ENTERITIS

DENNIS L. KASPER, M.D.

Associate Professor of Medicine, Harvard Medical School; Chief, Division of Infectious Diseases, Beth Israel Hospital, Boston, Massachusetts.

PERITONITIS

HERBERT E. KAUFMAN, M.D.

Professor, Louisiana State Medical Center in New Orleans; Director, Louisiana State University Eye Center; Medical Director, Eye & Ear Institute of Louisiana, New Orleans, Louisiana.

VIRAL OCULAR INFECTIONS

PATRICK J. KELLY, M.D.

Professor of Orthopedic Surgery, Mayo Medical School; Consultant, Department of Orthopedics, Mayo Clinic and Mayo Foundation, Rochester, New York.

BACTERIAL ARTHRITIS; BACTERIAL OSTEOMYELITIS

GERALD T. KEUSCH, M.D.

Professor of Medicine, Tufts University School of Medicine; Attending Physician, New England Medical Center Hospitals, Boston, Massachusetts.

MALNUTRITION AND INFECTION; YERSINIA ENTERITIS

MOGENS KILIAN, D.D.S., Ph.D.

Associate Professor of Microbiology, Royal Dental College, Aarhus, Denmark.

HAEMOPHILUS

ALEXANDER L. KISCH, M.D.

Associate Professor of Internal Medicine, University of New Mexico, School of Medicine, Albuquerque, New Mexico.

PLAGUE

STEVE KOHL, M.D.

Associate Professor of Pediatrics, Program in Infectious Diseases and Clinical Microbiology, The University Medical School at Houston; Attending Pediatrician, Hermann Hospital; Pediatric Infectious Disease Consultant, M.D. Anderson Hospital and Tumor Research Institute, Houston, Texas.

GRANULOMATOUS HEPATITIS

REISAKU KONO, M.D., M.P.H., Dr. Med. Sci.
Lecturer in Virology in Tropical Medicine, Institute for Medical Science, University of Tokyo; Director, Central Virus Diagnostic Laboratory, National Institute of Health of Japan, Tokyo, Japan.

ENTEROVIRAL INFECTIONS OTHER THAN POLIOMYELITIS**HOWARD W. LARSH, Ph.D.**

Research Professor of Microbiology, University of Oklahoma, Norman, Oklahoma; Director of Research and Laboratories, Missouri State Chest Hospital, Mt. Vernon, Missouri.

HISTOPLASMA CAPSULATUM**WILLIAM LAWSON, M.D., D.D.S.**

Associate Professor of Otolaryngology, The Mount Sinai School of Medicine of the University of New York; Chief of Otolaryngology, The Bronx Veterans Administration Hospital; Attending Otolaryngologist, The Mount Sinai Hospital, New York, New York; Attending Otolaryngologist, City Hospital at Elmhurst, New York.

OTITIS MEDIA AND OTITIS EXTERNA**DONALD L. LEAKE, A.B., M.A., D.M.D., M.D.**

Professor of Oral and Maxillofacial Surgery, UCLA School of Dentistry; Professor of Surgery, UCLA School of Medicine; Chairman, Department of Dentistry, Dental Director and Chief of Oral Surgery, Harbor-UCLA Medical Center, Torrance, California; Visiting Oral and Maxillofacial Surgeon, UCLA Hospital, Los Angeles, California.

BACTERIAL PAROTITIS**D. L. LEE, B.Sc., Ph.D.**

Professor of Agricultural Zoology and Head of Department of Pure and Applied Zoology, University of Leeds, Leeds, England.

CLASSIFICATION AND ANATOMY OF PARASITES**AMORN LEELARASAMEE, M.D.**

Assistant Professor, Infectious Unit, Department of Internal Medicine, Siriraj Hospital, Mahidol University, Thailand.

DENGUE AND OTHER HEMMORHAGIC FEVERS**FRITZ LEHMANN-GRUBE, M.D.**

Professor of Virology, University of Hamburg, Hamburg, Germany.

ARENAVIRUSES; LYMPHOCYTIC CHORIOMENINGITIS**STANLEY M. LEMON, M.D.**

Assistant Professor of Medicine, Department of Virus Diseases, Walter Reed Army Institute of Research, Walter Reed Army Medical Center; Staff Physician, Walter Reed General Hospital; Staff Physician, Walter Reed Army Medical Center, Washington, D.C.

THE HERPESVIRUSES**A. MARTIN LERNER, M.D.**

Professor of Medicine and Director of Division of Infectious Diseases, Wayne State University, School of Medicine; Chief, Department of Medicine, Hutzel Hospital, Detroit, Michigan.

MYOCARDITIS AND PERICARDITIS**WILLIAM LESTER, M.D.**

Professor of Medicine, University of Chicago, Pritzker School of Medicine; Attending Physician, University of Chicago Hospitals and Clinics, Chicago, Illinois.

NONTUBERCULOUS MYCOBACTERIAL INFECTIONS; TUBERCULOSIS**ALBERTO THOMAZ LONDERO, M.D.**

Professor of Medical Mycology, Department of Microbiology and Parasitology, University of Santa Maria; Attending Medical Mycologist, University Hospital, Santa Maria, Brazil.

CHROMOBLASTOMYCOSIS; PARACOCIDIIDOMYCOSIS**W. H. RUSSELL LUMSDEN, D.Sc., M.D., F.R.C.P.E., F.R.S.E.**

Retired Professor and Head of Department, Department of Medical Protozoology, London School of Hygiene and Tropical Medicine, London, England; Honorary Research Fellow, University of Dundee, Animal Services Unit, Ninewells Hospital and Medical School, Dundee, Scotland.

TRYPANOSOMIASIS**G. PHILIP MANIRE, Ph.D.**

Kenan Professor of Bacteriology and Immunology, Vice Chancellor and Dean of Graduate School, University of North Carolina, Chapel Hill, North Carolina.

THE CHLAMYDIAE**FRANCOIS MARIAT, Dr. es Sciences (Paris)**

Professor, Institut Pasteur, Paris, France.

SPOROTHRIX SCHENCKII

MELVIN I. MARKS, M.D.

Director, Pediatric Infectious Diseases, Oklahoma Children's Memorial Hospital, Oklahoma City, Oklahoma.

MUMPS; PLEURODYNIA

HORACIO FIGUEROA MARROQUÍN, M.D.

Emeritus Professor, University of San Carlos of Guatemala.

ONCHOCERCIASIS

FRANCIS D. MARTINSON, M.B., Ch.B.

(ED), F.R.C.S. (ENG & ED).

Professor of Oto-rhino-laryngology, University of Ibadan, College of Medicine; Consultant Otolaryngologist, University College Hospital, Ibadan, Nigeria.

PHYCOMYCOSIS

WILLIAM R. McCABE, M.D.

Professor of Medicine and Microbiology, Boston University, School of Medicine; Director, Maxwell Finland Laboratory for Infectious Diseases, Boston City Hospital; Director, Division of Infectious Diseases, Boston University, School of Medicine; Consultant in Infectious Diseases, Farmingham Union Hospital; Consultant in Infectious Diseases, Carney Veterans Administration Hospital; Consultant in Infectious Diseases, Boston Veterans Administration Hospital, Boston, Massachusetts.

GRAM-NEGATIVE BACTEREMIA

RICHARD V. McCLOSKEY, M.D.

Professor of Medicine, Jefferson Medical College; Chairman of Medicine and Head, Section of Infectious Diseases, Albert Einstein Medical Center, Daroff Division, Philadelphia, Pennsylvania.

DIPHTHERIA

J. ALLEN McCUTCHAN, M.D.

Assistant Professor of Medicine, University of California, San Diego School of Medicine, Attending Physician, University Hospital, San Diego, California.

FACTITIOUS AND DELUSIONAL ILLNESSES SIMULATING INFECTION; GONOCOCCEMIA; GONORRHEA AND NON-GONOCOCCAL URETHRITIS

ZELL A. McGEE, M.D.

Professor of Medicine, Vanderbilt University, School of Medicine; Director, George Hunt Laboratory; Chief, Division of Infectious Diseases, Department of Medicine, Vanderbilt University Hospital, Vanderbilt, Tennessee.

CELL WALL-DEFECTIVE BACTERIA; MYCOPLASMAS

RIMA McLEOD, M.D.

Fellow in Infectious Diseases, Department of Medicine, Division of Infectious Diseases, Stanford University, School of Medicine, Stanford, California; Fellow in Infectious Diseases, Division of Allergy, Immunology, and Infectious Diseases, Palo Alto Medical Research Foundation, Palo Alto, California.

TOXOPLASMOSIS

GERALD MEDOFF, M.D.

Professor of Medicine, Microbiology, and Immunology and Chief of the Infectious Disease Division, Washington University, School of Medicine; Physician, Barnes Hospital, St. Louis, Missouri.

CRYPTOCOCCAL MENINGITIS; PULMONARY CRYPTOCOCCOSIS

MARIAN E. MELISH, M.D.

Associate Professor of Pediatrics, Tropical Medicine, and Medical Microbiology, John A. Burns School of Medicine, University of Hawaii; Attending Pediatrician, Consultant in Infectious Disease, Kapiolani Children's Medical Center, Honolulu, Hawaii.

IMPETIGO; KAWASAKI SYNDROME; PYOGENIC SKIN INFECTIONS; STAPHYLOCOCCAL SCALDED SKIN SYNDROME

JOSEPH L. MELNICK, Ph.D.

Distinguished Service Professor and Chairman, Department of Virology & Epidemiology, Baylor College of Medicine, Houston, Texas.

CLASSIFICATION OF VIRUSES

BURT R. MEYERS, M.D.

Professor of Medicine, Mount Sinai School of Medicine of The University of New York; Attending Physician, Elmhurst General Hospital, Elmhurst, New York; Attending Physician, Mount Sinai Hospital, New York, New York.

ENDOPHTHALMITIS; LUDWIG'S ANGINA; OTITIS MEDIA AND OTITIS EXTERNA; PULMONARY MUCORMYCOSIS

WAYNE M. MEYERS, M.D., Ph.D.

Chief, Division of Microbiology, Department of Infectious and Parasitic Diseases Pathology, Armed Forces Institute of Pathology, Washington, D.C.

MYCOBACTERIAL INFECTIONS OF THE SKIN

JOSEPH H. MILLER, M.S., Ph.D.

Professor of Medical Parasitology, Louisiana State University Medical Center; Visiting Sci-

entist, The Charity Hospital in New Orleans,
New Orleans, Louisiana.

THE PROTOZOA

DAVID L. MINKOFF, M.D.

Department of Pediatrics, University Hospital,
San Diego, California.

HAND-FOOT-MOUTH DISEASE

JOSÉ LISBÔA MIRANDA, M.D.

Professor of Dermatology, Escola Médica do
Rio de Janeiro, Universidade Gama Filho, Rio
de Janeiro, Brazil.

LOBOMYCOSIS

SAROJ K. MISHRA, Ph.D.

Chief, Serodiagnostic Division, Robert Koch
Institute, Berlin, Germany.

NOCARDIA AND STREPTOMYCES

SUSUMU MITSUHASHI, Ph.D., Dr. Med. Sci.

Professor, Department of Microbiology, and
Director, Laboratory of Bacterial Resistance,
Gunma University, School of Medicine, Mae-
bishi City, Japan.

RESISTANCE TO ANTIMICROBIAL DRUGS

PETER M. MOODIE, M.D., B.S., D.T.M. & H.

Associate Professor of Tropical Medicine, Com-
monwealth Institute of Health, The University
of Sydney, Sydney, Australia.

YAWS, PINTA, AND BEJEL

STEPHEN A. MORSE, Ph.D.

Associate Professor, Department of Microbi-
ology and Immunology, University of Oregon
Health Sciences Center, Portland, Oregon.

NEISSERIA

STEPHEN I. MORSE, M.D. (Deceased)

Professor and Chairman, Microbiology and
Immunology, State University of New York,
Downstate Medical Center, Brooklyn, New
York.

STAPHYLOCOCCAL BACTEREMIA; STAPHYLOCOCCI

MAURICE A. MUFSON, M.D.

Professor and Chairman, Department of Medi-
cine, Marshall University, School of Medicine;
Associate Chief of Staff for Research and De-
velopment, Huntington Veterans Administra-
tion Medical Center; Active Attending Staff,
Cabell Huntington Hospital and St. Mary's
Hospital, Huntington, West Virginia.

MYCOPLASMA PNEUMONIA

DANIEL M. MUSER, M.D.

Professor of Medicine, Professor of Microbiolo-

gy and Immunology, Baylor College of Medi-
cine; Chief, Infectious Disease Section, Veter-
ans Administration Hospital, Houston, Texas.
SPIROCHETES; TREPONEMA AND BORRELIA; SYPHILIS OF
THE GENITAL TRACT; SYPHILIS OF THE SKIN

HAROLD C. NEU

Professor of Medicine and Pharmacology, Co-
lumbia University, College of Physicians and
Surgeons; Chief of Infectious Diseases Colum-
bia-Presbyterian Medical Center, New York,
New York.

PHARMACOLOGY AND TOXICOLOGY OF ANTIMICROBIAL AGENTS

FRITS ØRSKOV, M.D.

Collaborative Centre for Reference and Re-
search on Escherichia (WHO), Statens Serum-
institut, Copenhagen, Denmark.

ENTEROBACTERIACEAE

IDA ØRSKOV, M.D.

Collaborative Centre for Reference and Re-
search on Escherichia (WHO), Statens Serum-
institut, Copenhagen, Denmark.

ENTEROBACTERIACEAE

MICHAEL N. OXMAN, M.D.

Professor of Medicine and Pathology, Univer-
sity of California, San Diego School of Medi-
cine; Chief, Infectious Diseases and Clinical
Virology Sections, Veterans Administration
Medical Center, San Diego, California.

GENITAL HERPES; HERPES SIMPLEX ENCEPHALITIS AND MENINGITIS; HERPES STOMATITIS; HERPES ZOSTER; PAPOVAVIRUSES; VARICELLA

JOSEPH S. PAGANO, M.D.

Director, Cancer Research Center, and Profes-
sor of Medicine and of Bacteriology and Im-
munology, University of North Carolina at
Chapel Hill School of Medicine; Attending
Physician in Medicine and Infectious Disease,
North Carolina Memorial Hospital, Chapel Hill,
North Carolina.

THE HERPESVIRUSES

ZBIGNIEW S. PAWLOWSKI, M.D., D.T.M. & H.

Professor of Medical Parasitology, Medical
Faculty, Academy of Medicine, Poznań, Po-
land; Chief, Clinic of Parasitic and Tropical
Diseases, Academy of Medicine, Poznań, Po-
land.

CESTODIASIS; PLATYHELMINTHES; TRICHINELLOSIS

LENNART PHILIPSON, M.D., Dr. Med. Sci.

Professor of Microbiology, Uppsala Univer-
sity, Uppsala, Sweden.

ADENOVIRUS

M. J. PICKETT, Ph.D.

Professor of Microbiology, University of California, Los Angeles, California.

GENUS *PSEUDOMONAS*

ALEXANDER W. PIERCE, Jr., M.D.

Professor of Family Practice, The University of Texas Medical School at San Antonio; Director, Family Health Center, Robert B. Green Hospital, San Antonio, Texas.

MYIASIS

LEO PINE, B.S., M.S., Ph.D.

Chief, Products Development Branch, Biological Products Division, Center for Disease Control, Atlanta, Georgia.

ACTINOMYCES AND MICROAEROPHILIC ACTINOMYCETES

FRANCISCO de PAULA PINHEIRO, M.D.

Director, Instituto Evandro Chagas, Fundação Serviços de Saúde Pública, Ministry of Health, Belém, Pará, Brazil; Professor of Virology, Centro Ciências Biológicas, Federal University of Pará, Brazil.

YELLOW FEVER

BOSKO POSTIC, M.D.

Professor of Medicine, University of South Carolina, School of Medicine; Chief, Medical Service, William Jennings Bryan Dorn Veterans Hospital, Columbia, South Carolina.

RABIES; RHABDOVIRUS

ROY POSTLETHWAITE, B.Sc., M.D.

Professor of Virology, University of Aberdeen Medical School; Honorary Consultant Bacteriologist, Aberdeen Royal Infirmary and Associated Hospitals, Aberdeen, Scotland.

MOLLUSCUM CONTAGIOSUM

C. R. PRINGLE, B.Sc., Ph.D.

Honorary Lecturer, University of Glasgow; Member of the Medical Research Council, MRC Virology Unit, Glasgow, Scotland.

THE GENETICS OF VIRUSES

SEPPO PYRHÖNEN, M.D.

Docent in Virology, University of Helsinki; Oncologist, Department of Radiotherapy, University Central Hospital of Helsinki, Helsinki, Finland.

WARTS

T. RAMAKRISHNAN, M.Sc., Ph.D.

Professor, Microbiology and Cell Biology Laboratory, Indian Institute of Science, Bangalore, India.

BACTERIAL PHYSIOLOGY

A. RAMACHANDRA RAO, M.B., B.S., B.Sc.

Retired Health Officer, Corporation of Madras, Madras, India.

SMALLPOX, VACCINIA, AND COWPOX

G. RAMANANDA RAO, M. PHARM., Ph.D.

Assistant Professor, Microbiology and Cell Biology Laboratory, Indian Institute of Science, Bangalore, India.

BACTERIAL PHYSIOLOGY

GARRISON RAPMUND, M.D.

Brigadier General, MC, US Army; Assistant Surgeon General (Research and Development), Department of the Army, Washington, D.C.

RICKETTSIA; RICKETTSIALPOX; SCRUB TYPHUS; TRENCH FEVER

JACK S. REMINGTON, M.D.

Professor of Medicine, Division of Infectious Diseases, Stanford University, School of Medicine, Stanford, California; Chief, Division of Allergy, Immunology, and Infectious Diseases, Palo Alto Medical Research Foundation, Palo Alto, California.

TOXOPLASMOSIS

DOUGLAS D. RICHMAN, M.D.

Assistant Professor of Pathology and Medicine, University of California, San Diego, School of Medicine; Attending Physician, Veterans Administration Medical Center, San Diego, California.

ORTHOMYXOVIRUSES AND PARAMYXOVIRUSES; TUBERCULOMAS OF THE BRAIN

DAVID L. RINGO, Ph.D.

Assistant Research Biologist, University of California, Santa Cruz, California.

THE STRUCTURE OF THE BACTERIAL CELL

LEON ROSEN, M.D., Dr.P.H.

Head, Pacific Research Section, Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, Honolulu, Hawaii.

CEREBRAL ANGIOSTRONGYLIASIS

EDWARD BROOK ROTHERAM, Jr., M.D.

Clinical Associate Professor of Medicine, University of Pittsburgh, School of Medicine; Head, Division of Infectious Diseases, Allegheny General Hospital, Pittsburgh, Pennsylvania.

LIVER AND SUBPHRENIC ABSCESS; NONVENEREAL INFECTIONS OF THE FEMALE GENITALIA

J. L. RYAN, Ph.D., M.D.

Assistant Professor of Medicine, Yale University School of Medicine, New Haven, Connecticut; Chief, Infectious Disease Section, Veterans Administration Medical Center, West Haven, Connecticut.

BITES: *P. MULTOCIDA*, *S. MONILIFORMIS*, AND *S. MINOR*

ALBERT B. SABIN, M.D.

Distinguished Research Professor of Biomedicine, Medical University of South Carolina, Charleston, South Carolina.

POLIOMYELITIS

GEORGE A. SAROSI, M.D., F.A.C.P.

Professor of Medicine and Vice-Chairman, Department of Medicine, University of Minnesota; Chief, Medical Service, Veterans Administration Medical Center, Minneapolis, Minnesota.

ASPERGILLOSIS; HISTOPLASMOSIS

HOWARD J. SAZ, Ph.D.

Professor of Biology, University of Notre Dame, Notre Dame, Indiana.

BIOCHEMISTRY OF PARASITES: HELMINTHS

FENTON SCHAFFNER, M.D.

Professor of Medicine and Director, Division of Liver Diseases, The Mount Sinai School of Medicine of The University of New York; Attending Physician, The Mount Sinai Hospital, New York, New York.

VIRAL HEPATITIS

GILBERT M. SCHIFF, M.D.

Professor of Medicine, University of Cincinnati, College of Medicine; Director of Medicine, The Christ Hospital Institute of Medical Research; Attending Staff, Cincinnati General Hospital, Holmes Hospital, Cincinnati Veterans Administration Hospital, Christ Hospital; Consultant, Children's Hospital, Jewish Hospital, Cincinnati, Ohio.

MEASLES; RUBEOLA

H. P. R. SEELIGER, M.D.

Full Professor of Hygiene and Microbiology and Director of Institute of Hygiene, Bayerische Julius-Maximilians-Universität Würzburg, Federal Republic of Germany.

LISTERIA MONOCYTOGENES

SMITH SHADOMY, Ph.D.

Professor of Medicine and Microbiology, Medical College of Virginia, Virginia Commonwealth University, Richmond, Virginia.

BLASTOMYCES AND PARACOCCIDIOSIS

KAORU SHIMADA, M.D.

Attending Staff, Tokyo University Medical School; Chief, Infectious Disease Section, Tokyo Metropolitan Geriatric Hospital, Tokyo, Japan.

CHOLECYSTITIS AND CHOLANGITIS

RUDOLF SIEGERT, M.D.

Professor of Medical Microbiology, Institute of Hygiene, Philipps-Universität, Marburg, Federal Republic of Germany.

EBOLA VIRUS DISEASE; MARBURG VIRUS AND EBOLA VIRUS; MARBURG VIRUS DISEASE

SAMUEL C. SILVERSTEIN, M.D.

Associate Professor and Physician, Laboratory of Cellular Physiology and Immunology, Rockefeller University; Physician, Rockefeller University Hospital, New York, New York.

VIRAL REPLICATION

IRVING J. SLOTNICK, Ph.D.

Chief Microbiologist, Cedars Sinai Medical Center, Los Angeles, California.

ACTINOBACILLUS AND CARDIOBACTERIUM

DONALD W. SMITH, Ph.D.

Professor of Medical Microbiology, University of Wisconsin, Madison, Wisconsin.

MYCOBACTERIA

B. A. SOUTHGATE, M.B., B.S., F.F.C.M.

Senior Lecturer in Tropical Hygiene, University of London, London School of Hygiene and Tropical Medicine; Consultant Physician, North-West Thames Area Health Authority, London, England.

LOAIASIS

STEPHEN A. SPECTOR, M.D.

Assistant Professor of Pediatrics, University of California, San Diego, School of Medicine; Assistant Professor of Pediatrics, Division of Infectious Diseases, University of California, San Diego, University Hospital, San Diego, California.

IMMUNOPROPHYLAXIS AND IMMUNOTHERAPY

WESLEY W. SPINK, A.B., M.D.

Emeritus Regents' Professor of Medicine and Comparative Medicine, University of Minnesota Medical School; Staff Member, University of Minnesota Hospitals, Minneapolis, Minnesota.

BRUCELLA; BRUCELLOSIS

SPOTSWOOD L. SPRUANCE, M.D.

Associate Professor of Medicine, Department

of Internal Medicine, Division of Infectious Diseases, The University of Utah, Salt Lake City, Utah.

COLORADO TICK FEVER

NEVILLE F. STANLEY, B.Sc., D.Sc.,
F.R.A.C.P. (Hon.), M.A.S.M.

Professor and Chairman, Department of Microbiology, University of Western Australia; Director, Clinical Microbiology Services, Queen Elizabeth II Medical Centre, Perth, Western Australia.

REOVIRIDAE PATHOGENIC FOR MAN

DAVID A. STEVENS, M.D.

Associate Professor, Department of Medicine, Stanford University, School of Medicine, Stanford, California; Chief, Division of Infectious Diseases, Santa Clara Valley Medical Center, San Jose, California.

COCCIDIOIDAL MENINGITIS; INFECTIOUS MONONUCLEOSIS

H. HARLAN STONE, M.D.

Professor of Surgery, Emory University, School of Medicine; Chief of Trauma and Burn Services, Grady Memorial Hospital, Atlanta, Georgia.

NONCLOSTRIDIAL ANAEROBIC CELLULITIS

RICHARD B. STOUGHTON, M.D.

Professor and Director, Division of Dermatology, University of California, San Diego; Attending Physician, University of California, San Diego, University Hospital, San Diego, California.

DERMATOPHYTOSIS

WILLARD ALLEN TABER

Professor, Department of Biology, Texas A & M University, College of Sciences, College Station, Texas.

CLASSIFICATION OF FUNGI

DAVID TAYLOR-ROBINSON, M.D.

Division of Communicable Diseases, M.R.C. Clinical Research Centre; Hon. Consultant Microbiologist, Northwick Park Hospital, Harrow, Middlesex, England.

MYCOPLASMAS

ROBERT NICOL THIN, M.D., F.R.C.P.E.

Recognised Teacher, University of London; Honorary Senior Lecturer, Institute of Urology; Consultant in Charge, Department of Genital Medicine, St. Bartholemew's Hospital; Consultant, St. Peter's Hospitals, London, England.

MELIOIDOSIS

DORIS A. TRAUNER, M.S., M.D.

Assistant Professor of Neurosciences and Pediatrics, University of California, San Diego, School of Medicine; Chief of Pediatric Neurology, University Hospital Medical Center of San Diego County, San Diego, California.

REYE'S SYNDROME

WALTER P. G. TURCK, M.B., F.R.C.P.

Clinical Lecturer in Medicine, University of Hong Kong; Consultant Physician, Alice Ho Miu Ling Nethersole Hospital, Hong Kong.

CHRONIC Q FEVER; Q FEVER

D. A. J. TYRRELL, C.B.E., M.D., D.Sc.,

F.R.C.P., F.R.C.Path., F.R.S.

Head, Division of Communicable Diseases, Clinical Research Centre; Consultant Physician, Northwick Park Hospital, Harrow, Middlesex, London, England.

CORONAVIRUS

HANS A. VALKENBURG, M.D., Ph.D.

Professor of Epidemiology, Erasmus University Medical School, Rotterdam, Holland.

PHARYNGITIS AND TONSILLITIS

WILLIAM EDWARD VAN HEYNINGEN,
Ph.D., Sc.D., D.Sc.

Emeritus Reader in Bacterial Chemistry, Sir William Dunn School of Pathology, University of Oxford, Oxford, England.

BACTERIAL EXOTOXINS

PANKAJALAKSHMI V. VENUGOPAL, M.D.

Associate Professor of Microbiology, Institute of Microbiology, Madras Medical College; Microbiologist, Government General Hospital, Madras, India.

MYCETOMA

TARALAKSHMI V. VENUGOPAL, M.D.

Associate Professor of Pathology, Department of Pathology, Madras Medical College; Pathologist, Government General Hospital, Madras, India.

MYCETOMA

HENRY A. WALCH, Ph.D.

Professor of Microbiology, San Diego State University, San Diego, California.

COCCIDIOIDES IMMITIS

CRAIG K. WALLACE, M.D.

Captain, MC, US Navy, Affiliated Associate Professor, Department of Medicine, Uniform Services University of Health Sciences, Beth-

esda, Maryland; Chief of Internal Medicine, Naval Regional Medical Center, Camp Pendleton, California.

CHOLERA

WARREN J. WARWICK, M.D.

Professor of Pediatrics, University of Minnesota; Attending Physician, University of Minnesota Hospitals, Minneapolis, Minnesota.

CAT SCRATCH DISEASE

TADEUSZ J. WIKTOR, D.V.M.

Member, The Wistar Institute, Philadelphia, Pennsylvania.

RABIES; RHABDOVIRUS

ROBERT P. WILLIAMS

Professor of Microbiology and Immunology, Baylor College of Medicine, Houston, Texas.

BACILLUS ANTHRACIS AND OTHER AEROBIC SPORE-FORMING BACILLI

SHELDON M. WOLFF, M.D.

Endicott Professor and Chairman, Department of Medicine, Tufts University, School of Medicine; Physician-in-Chief, New England Medical Center Hospital, Boston, Massachusetts.

FEVER

NATHANIEL A. YOUNG, M.D. (Deceased)

Head, Viral Oncology and Molecular Pathology Sections, Laboratory of Pathology, National Institutes of Health; Senior Attending Physician in Infectious Diseases, Clinical Center, National Institutes of Health, Bethesda, Maryland.

PICORNAVIRUSES

JULIUS S. YOUNGNER, Sc.D.

Professor and Chairman, Department of Microbiology, University of Pittsburgh, School of Medicine, Pittsburgh, Pennsylvania.

PERSISTENT VIRAL INFECTIONS

FOREWORD

"Medicine is the only world-wide profession, following everywhere the same methods, activated by the same ambitions, and pursuing the same ends."

SIR WILLIAM OSLER

"From the earliest time, medicine has been a curious blend of superstition, empiricism, and that kind of sagacious observation, which is the stuff out of which ultimately science is made. Of these three strands—superstition, empiricism, and observation—medicine was constituted in the days of the priest-physicians of Egypt and Babylonia; of the same strands, it is still composed. The proportions have, however, varied significantly. An increasingly alert and determined effort, running through the ages, has endeavored to expel superstition, to narrow the range of empiricism, and to enlarge, refine, and systematize the scope of observation."

ABRAHAM FLEXNER

The traditions of medicine are as old as recorded history and are interwoven into all civilizations, both past and present. Avicenna, Galen, Hippocrates, Maimonides, Harvey, Pasteur, Koch, and many others, celebrated and obscure, have created that tradition, which is still being modified in our time. Clearly, superstition in medicine is not yet expelled nor empiricism sufficiently narrowed. They remain to adulterate and diminish the science and humanism of medical practice.

The science of medicine is universal in its origins and in its relevance. In fact, universality in time and place is the bedrock of scientific observation. Human biology is basically the same in Sri Lanka as in Sweden. It is true that biological variation exists. Gene pools have been modified by mutation and natural selection. Balanced polymorphism, for example, seems to

have created a high incidence of sickle cell disease only where the associated increased resistance to falciparum malaria constitutes a significant biological advantage. Such examples of differing gene pools in ethnic groups abound. Much more impressive, however, is the constancy of human biology, representing a high conservation of the human genome and therefore close homology of gene products. Out of infinite possibilities, the same molecular species transport oxygen, capture energy from carbohydrates, and transmit nerve impulses in all humans without regard for national borders. It would be astonishing if it were otherwise in view of the recentness of the "ascent of man" from a common ancestry. It is reasonable, therefore, to present Volume I of this textbook as "international." Its discussions of cell biology, genetics, immunology, hematology,