MEDICAL VIROLOGY

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Preface

The course of infectious diseases that affect man has changed remarkably in the last century and even during the last twenty years. In the more affluent countries and, recently, also in developing countries, improved hygiene and chemotherapy have greatly reduced mortality and, to a lesser extent, morbidity due to bacterial and protozoal diseases, but have had little effect on morbidity due to viral infections. Nevertheless, the pattern of viral diseases has also changed. Immunization and other preventive measures have led to the virtual disappearance of yellow fever and smallpox; in technologically advanced countries poliomyelitis and measles are also disappearing, and rubella might soon follow. "Civilization" led first to the appearance of epidemic poliomyelitis and then to its control by vaccination. We are now witnessing a comparable increase in the incidence of infectious hepatitis, and await the laboratory isolation of the causative viruses as an essential prelude to the development of a vaccine. Urbanization and rapid intercontinental travel have lead to widespread dissemination of the respiratory viruses. The morbidity due to these viruses and the variety of viruses involved will probably increase still more in the future.

Those who will become doctors in the next few decades need to understand the nature of these changes and to know enough about the molecular biology of viral replication to take advantage of antiviral chemotherapy when practical procedures are developed and to appreciate the possible role of viruses as causative agents in cancer. The aim of this book is to provide the student of medicine with a background that will enable him to appreciate viral diseases as they afflict human beings in urbanized western society, both as problems in management at the level of the individual patient and as problems in public health. Part I summarizes the principles of animal virology in relation to human infection and disease. It is derived, in part, from a condensation and

extensive reorientation of a larger monograph, "The Biology of Animal Viruses," written by the senior author. Part II deals with the viruses of man and the diseases they cause. No attempt has been made to supplant the descriptions of disease and differential diagnosis supplied in medical textbooks. The aim has been to apply to each group of viruses the principles of human virology outlined in Part I of the book.

We considered, but finally rejected, the proposition to include chapters on chlamydiae, rickettsiae, and mycoplasmas. These agents are now known to be bacterial rather than viral in nature, and we believe that the time has come to break with tradition and exclude them from textbooks of virology.

The chapters in Part I conclude with a brief summary, but those of Part II do not lend themselves so readily to this approach since they contain much detailed information arranged in a standard format. We have selected illustrations and diagrams that will assist medical students in obtaining a clearer understanding of human viruses and viral diseases. No photographs of human patients have been included because of the difficulty of depicting signs other than skin rashes by black-and-white photography. We suggest that teachers supplement our illustrations with the excellent color photographs supplied in Swain and Dodds' "Clinical Virology."

We are grateful to the following colleagues in Australia for their comments on individual chapters: Drs. R. L. Doherty, A. A. Ferris, J. Forbes, J. R. L. Forsyth, I. H. Holmes, I. Jack, I. D. Marshall, and D. H. Watson. We are also indebted to all those, too numerous to mention here, who responded generously to our appeals for illustrative material; acknowledgments accompany the legends to the figures and plates. We owe a special debt to Ian Jack, of the Royal Children's Hospital, Melbourne, for providing so many of the photographs used.

The staff of Academic Press has given us much assistance with the production of the book and with the preparation of the figures. We are grateful to our secretaries, Mrs Margaret Mahoney and Miss Elizabeth Duff, for their devotion and skill in preparing the manuscript.

Supplementary Reading

The text contains no references, but a short "Further Reading" list is provided at the end of each chapter. For the convenience of teacher and student we list below additional books and periodicals in which review articles on virology appear. The latter are a continuing source of authoritative papers.

Books

Andrewes, C. H., and Pereira, H. G. (1967). "Viruses of Vertebrates," Second Edition. Ballière, London. A comprehensive catalogue of animal viruses.

Fenner, F. (1968). "The Biology of Animal Viruses," Volumes I and II. Academic Press, New York. References for Part I (Chapters 1–14).

Habel, K., and Salzman, N. P. (1969). "Fundamental Techniques in Virology." Academic Press, New York. An authoritative account of laboratory methods used in animal virology.

Horsfall, F. L., Jr., and Tamm, I., Eds. (1965). "Viral and Rickettsial Infections of Man," Fourth Edition. Lippincott, Philadelphia, Pennsylvania. An excellent source of information and references, especially for Part II (Chapters 15–24).

Lennette, E. H., and Schmidt, N. J., Eds. (1969). "Diagnostic Procedures for Viral and Rickettsial Infections," Fourth Edition. American Public Health Association, New York. Standard reference book for diagnostic virology.

Luria, S. E., and Darnell, J. E. (1967). "General Virology," Second Edition. Wiley, New York. Best account of general principles and bacterial virology.

Swain, R. H. A., and Dodds, T. C. (1967). "Clinical Virology." Livingstone, Edinburgh and London. Good source of color illustrations.

Review Periodicals

Advances in Virus Research (K. M. Smith, M. A. Lauffer, and F. B. Bang, eds.). Academic Press, New York. Published annually since 1953.

Supplementary Reading

Annual Review of Microbiology (C. E. Clifton, ed.). Annual Reviews, Stanford, California. Published annually since 1947.

Bacteriological Reviews. Williams & Wilkins, Baltimore, Maryland. Published quarterly.

Current Topics in Microbiology and Immunology (Ergebnisse der Mikrobiologie und Immunitatsforschung). Springer, Vienna. Published several times a year since 1967.

Modern Trends in Medical Virology (R. B. Heath and A. P. Waterson, eds.). Butterworth, London and Washington, D.C. Published irregularly since 1967.

Monographs in Virology (J. L. Melnick, ed.). Karger, Basel. Published irregularly since 1968.

Perspectives in Virology (M. Pollard, ed.). Proceedings of biennial symposia, mostly on animal virology, from 1959. Now published by Academic Press, New York.

Progress in Medical Virology (J. L. Melnick, ed.). Karger, Basel. Published annually since 1958.

Recent Advances in Medical Microbiology (A. P. Waterson, ed.). Churchill, London. Published irregularly since 1967.

Virology Monographs (S. Gard, C. Hallauer, and K. F. Meyer, eds.). Springer, Vienna. Published irregularly since 1968.

WHO Technical Report Series. World Health Organization, Geneva, Switzerland. Irregular reports include authoritative articles on practical problems in virology.

Contents

3. Viral Multiplication

4. Viral Genetics

5. Effects of Viruses on Cells

6. Pathogenesis of Viral Infections

11. Evolutionary Aspects of Viral Diseases

12. Immunization Against Viral Diseases

13. Chemotherapy of Viral Diseases

14. Laboratory Diagnosis of Viral Disease

Part II. VIRUSES OF MAN

15. Adenoviruses

17. Poxviruses

18. Picornaviruses

PART I

Principles of Virology