# Book Reviews

## Control of Pandemic Influenza

**Influenza**. Virus, Vaccines, and Strategy. Proceedings of a meeting, Rougemont, Jan. 1976. PHILIP SELBY, Ed. Published for Sandoz Institute for Health and Socio-Economic Studies by Academic Press, New York, 1976. 354 pp., illus. Paper, $19.75. Sandoz Institute Publication No. 5.

**Influenza**. The Viruses and the Disease. CHARLES H. STUART-HARRIS and GEOFFREY C. SCHILD. Publishing Sciences Group, Littleton, Mass., 1976. x, 242 pp., illus. $22.

These two books on influenza, quite different in design and emphasis, appeared just as the United States public health establishment was going through the trials and tribulations of the "swine flu" immunization program. In fact, brief chapters on that subject were added to both books as timely afterthoughts.

The volume edited by Philip Selby records the proceedings of an international working group on pandemic influenza. It stresses the methods and results of global influenza surveillance, prevention, control, and chemotherapy and the socioeconomic aspects of the public health problems posed by the pandemic character of influenza.

The entire fabric of surveillance and prevention is based on the premise that control of pandemic influenza can eventually be achieved by monitoring major changes (antigenic shifts) in one or both of the surface glycoproteins of the causative virus. These two moieties are assembled into two distinct projections associated with the lipid bilayer envelope of the virus particle. One carries the hemagglutinating (H), the other the neuraminidase (N) activity of the virus. From time to time, the H or N polypeptide of a prevailing type A influenza strain is replaced by a new one to which the human population is not immune. It is then that there is a threat of a new pandemic sweep. Both glycoproteins can be readily purified as monovalent test antigens. Antibodies against H neutralize and are protective, those against N retard viral release from infected cells and thus provide partial protection against the spread of infection. It is therefore thought feasible to prepare vaccines (containing either whole inactivated or live attenuated virus or H and N subunits) against a newly emerging antigenic strain before it has a chance to spread pandemically.

New strains are believed to arise by recombination, which is greatly facilitated by the fact that the viral genome is made up of eight independently replicating RNA segments, each coding for one nonstructural or structural viral protein. In a cell infected with two distinct strains of influenza A, new genomes arise by random reassortment of these segments. Thus it is possible to tailor-make hybrid viruses for vaccine production that contain the desired surface glycoproteins and, ideally, the characteristics that are expected to be associated with low virulence. The methodology of these procedures, the different forms of vaccine and their evaluation, and the prospects of new developments are all comprehensively discussed in the Selby book. There are also discussions of the cost of influenza as well as the social and psychological problems related to the acceptance or nonacceptance of vaccine preparations. The numerous chapters dealing with these practical aspects are singularly useful, though somewhat repetitious.

In addition, the book provides a brief chapter on viral structure and replication (by John Skehel) and a particularly provocative summary of what is known and not known about the pathogenesis of human influenza (by C. A. Mims). Despite their brevity, these two chapters, taken together as the essential backdrop to the main portions of the book, serve an important purpose: they remind the reader (i) that there are at least six genome segments other than those coding for H and N, some of which may play a critical role in the disease-producing capacity of the virus; (ii) that virtually nothing is known about cellular immunity and immunopathological mechanisms in influenza, which may conceivably involve type-specific rather than strain-specific antigens, that is, the M (matrix) protein or the capsid protein; and (iii) that invasion of the bloodstream and distant organ systems by virus or viral gene products spilling over from infected cells of the respiratory tract has received only scant investigation. The answers to the unresolved questions about these and other fundamental processes may yet prove to compromise the notion that the mere induction of some levels of anti-H or anti-N antibodies or both in the serum assures protection against all potential disease manifestations. There are precedents for unforeseen complications in other immunizations involving inactivated viruses (measles and respiratory syncytial virus) and in natural disease states caused by multiple antigenic strains of one virus (dengue hemorrhagic fever and shock syndrome).

Read with awareness of these potential pitfalls, the book edited by Selby offers an excellent résumé of the current state of knowledge and practices in an important branch of preventive medicine.

The book by Stuart-Harris and Schild is broader in its approach. It is a fairly comprehensive treatment of all aspects of influenza and its viruses. There is some advantage to the writing of such a book by only two authors. In this case the result is cohesiveness of style and emphasis and avoidance of excessive redundancy. The book is less encyclopedic than an earlier many-author one edited by Edwin D. Kilbourne (*The Influenza Viruses and Influenza*, Academic Press, 1975), but it provides a fine and readable introduction to the subject, laced with historical perspective and up-to-date bibliographic references.

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## Retinal Structure and Function

**Neural Principles in Vision**. Papers from a symposium, Munich, Sept. 1975. F. ZETTLER and R. WEILER, Eds. Springer-Verlag, New York, 1976. x, 432 pp., illus. $39.40. Proceedings in the Life Sciences.

This book of proceedings deals with recent advances in our understanding of visual function, primarily at the retinal level, in various vertebrate, arthropod, and molluscan species. The 22 chapters are generally comprehensive and up to date, and the quality of light and electron micrograph reproduction is good to excellent.

The most pervasive issue considered is whether, by knowing the geometry of the neuron, one can reliably infer its functional properties. In the section on vertebrates, lengthy contributions by Wagner, Gallego, and Scholes describe