many must be the result of using impure systems and of secondary effects
or else they are the product of a multiplicity of phenomena with similar
end results. Dr. Vilcek is a splitter; he gives the impression that no
unifying principle exists in the interferon system, but that there are several
physically diverse interferons produced by the same cell and that cells
may be induced to produce these by a variety of dissimilar substances.
In taking this stand, the author of this monograph stands with the majority
of scientists who are actually working with interferon.

Interferon is only defined by a few stability characteristics, and by its
action in inducing resistance to a wide variety of viruses in cells of the
same species as produced it. It may vary threefold in its molecular weight;
it varies in its requirements for synthesis and it varies in its kinetics of
production. It may be induced by some but not all live viruses, some but
not necessarily the same killed viuses, and an heterogeneous group of
non-viral chemicals and cell products. It is more effective against some
viruses than others, quite independent of their metabolic patterns. Vilcek
does an excellent job of guiding the reader through all these intricacies
with a prose that is lucid and coherent. Most impressively he studis his
text with a large number of references and yet avoids the impression that
he is simply listing citations.

There is, however, another approach to the subject of interferon that
Dr. Vilcek eschews. Some workers would try to find a common mechanism
that might tie together most if not all the experimental data. There is no
agreement on just what this mechanism might consist of. Interferon does
absorb very readily to many substances and there can be no guarantee
that the observed physical differences are not due to association with
variously firmly bound contaminants. Of the various interferon inducers,
double stranded RNA is much the most potent and recent findings suggest
that this substance is much more commonly encountered than originally
believed. To this reviewer, it seems incompatible with the laws of evolu-
tion that cells should exhibit such redundancy of interference producing
mechanisms, and he looks hopefully to the day when a unifying theorem
can be expounded.

Dr. Vilcek's monograph is not the only recent reference that is available
to the student of interferon, but it is probably the best for the beginner
who wishes for the first time to delve into this important field. There is
an excellent chapter with a more molecular orientation on interferon by
Levy in his book, The Biochemistry of Viruses. There are also two recent
symposia edited by Wolstenholme and by Finter, but these provide no
synthesis of the divergent points of view which they present.

FRANCIS L. BLACK

HERPES SIMPLEX AND PSEUDORABIES VIRUSES. By A. S. Kaplan. New
York, Springer-Verlag New York, Inc., 1969. 115 pp. $9.00.

This short monograph is devoted to Herpes simplex virus and Pseudorabies
virus, a related Herpes group agent prevalent and latent in swine but
named for the neurological disease it causes in other hosts. This work is
the fifth in a series of concise reviews of "established" information on
individual viruses.
BOOK REVIEWS

The greater portion and strength of this "chapter" (an apt description by the author fulfilling the intent of this series of virology monographs as a part of a growing reference handbook) is its succinct consideration of the biological and biochemical laboratory information on these viruses (largely Herpes simplex) through early 1967.

The very brief clinical section must be viewed only as a support to the laboratory studies. These clipped discussions leave major facets uncovered and the comments on clinical serology and skin testing are examples that lead to misinterpretation of their value.

The final section, "Latent and Persistent Virus," has one searching for help in plumbing the literature speculating connection between DNA viruses, Herpes-like particles, latency oncogenicity and tumors, but Dr. Kaplan remains cautious. He reviews possible models for latency but makes no comment on oncogenicity or tumor relationships, perhaps holding to the "Handbook's" admonition for presentation of proven results.

The recent explosion of publication pertinent to this final section and concerning the relationships(s) between type 2 Herpes simplex virus, genital infection and carcinoma of the cervix, follows this publication and will call for an addendum. The bibliography is extensive, supportive and easy to use. The monograph fills well its place in the "Handbook."

WALTER J. HIERHOLZER, JR.

BACTERIAL EPISOMES AND PLASMIDS (a Ciba Foundation Symposium). Edited by G. E. W. Wolstenholme and M. O'Connor. Boston, Little, Brown & Co., 1969. 268 pp. $12.50.

The principal genetic element of the bacterial cell is its "chromosome": a circular molecule of double-stranded DNA containing about $5 \times 10^8$ base pairs, sufficient to code for 5,000 polypeptides of average length. The bacterial cell may also possess one or more smaller genetic elements which replicate in harmony with the chromosome and - with rare exception - are regularly inherited at cell division. These smaller elements, which also consist of circular double-stranded DNA, are called plasmids. Most of them are one to two percent of the chromosome in length, and are thus large enough to contain 50 to 100 genes of average size. Except in certain special cases, however, plasmid genes are dispensable to the cell under at least some environmental conditions.

Some plasmids are capable of reversible attachment to the bacterial chromosome, and while the two elements are attached, they replicate as a single unit. Plasmids that are capable of such attachment have been called episomes. The attachment process takes place by a recombination event: since the plasmid and the chromosome are both circular, a single cross-over merges them into a single, larger circle of DNA.

Three main classes of plasmids have been discovered, which differ only in the properties which their genes confer on the cell: F factors, which bring about conjugation; Col factors, which cause the cell to produce colicines (proteins that kill other bacteria of the same general type); and R factors, which make the cell resistant to one or more drugs. (Actually, some Col factors and R factors also promote conjugation, so that F factors

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