

Letter to the Editor
Comments on Virus Terminology and the "Viroid"

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Several recent and significant discoveries in plant virology relate to the potato spindle tuber virus (PSTV), and to the citrus exocortis virus (CEV). After Raymer & O'Brien (11) discovered tomato to be a suitable host for the production of PSTV, and for making the bioassays, the virus became available for intensive study by biochemical methods. As a result, Diener & Raymer (4) determined the viral nucleic acid to be free of a protein coat in purified preparations, and Diener (3) determined the extremely small size of the viral RNA. Singh & Clark (14) also working with PSTV arrived at essentially the same conclusion.

Working with CEV, Semancik & Weathers (13) found this viral nucleic acid also to be free of a protein coat in purified preparations, and their evidence suggests that it also is very small. In correspondence, Semancik indicates that he now knows the virus to be a very stable RNA.

The PSTV and the CEV may be regarded as the most primitive or the most degenerate plant viruses known, depending on whether they are evolving progressively or retrogressively. Continued study of these viruses may yield experimental evidence on the origin of a virus, particularly by the postulated process of progressive evolution from a replicative endosymbiotic nucleic acid ("provirus" or "viroid").

At this point, a question is raised concerning Diener's use of the terms *replication* and *self-replication* (3). At the time the barley stripe mosaic virus (BSMV) studies (8) and my letter to the editor (7) were published, *self* did not alter the meaning of the terms *multiplication*, *perpetuation*, *reproduction*, *regeneration*, or *replication*. With or without the qualifier *self*, the meaning was the same, so far as I was aware. However, after publication of the letter, I came to the conclusion that such usage can be misconstrued to indicate a completely self-contained and independent system of reproduction, as with an independent organism. A large RNA, such as that of TMV, for example, possesses a relatively large amount of genetic information (6), but it seems reasonably evident that complete replication of TMV still requires contributions from its host. Furthermore, examination of recent text books (5, 6) dealing with virus reproduction, multiplication, or replication, revealed no case where any of these terms were qualified by *self*. In the paper by Montagnier (9), the author seems to give no clear hint that *replication* and *self-replication* have been assigned different meanings. Since it appears that *self* is redundant when used in connection with any of the several stages obtaining in the process of multiplication or replication of a virus, I submit that its use should be discontinued.

With regard to Altenburg's *viroid* (1), it is submitted that the term serves better in the capacity its author intended than it does for designating a new category to accommodate the PSTV, as proposed by Diener (3). The term seems appropriate enough for the designation of harmless nucleic acids involved in the evolution of disease-inducing nucleic acids, if or when it is established that these postulated endosymbiotic "provirus" entities do evolve (mutate) into agents of disease (virus). Involved here is a broad working theory which antedates Altenburg's paper. To abandon the theory now would be shortsighted, and tend to delay a natural confluence of exploratory efforts in two important fields of research; i.e., virology and the study of the cell's organelles—the latter, a field which illustrates well the rekindling of interest in an old subject (2, 10, 12).

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