Regulation of plant virus gene expression occurs via several mechanisms. In addition to the aforementioned divided genomes, subgenomic RNAs are commonly used to expose genes of positive-sense RNA viruses for translation in plant cells. Readthrough of amber terminators and translational frameshift are common mechanisms for downregulating translation of full-length RDRPs. Other mechanisms for regulation of gene expression include posttranslational proteolysis *in cis* or *in trans* and use of internal AUG codons to initiate translation of genes in alternative reading frames. Koonin and Dolja ***(7)*** have provided a very useful summary of positive-sense RNA virus genome structures and relationships.

5. Plant Virus Infection Cycle

The plant virus infection cycle is similar to the animal virus cycle, though there are a few major differences. Briefly, viruses enter plants through wounds by mechanical or vector transmission. They uncoat, express their genomes, and replicate within the plant cell, then move to adjacent cells through plasmodesmata. Upon reaching vascular tissue, they enter phloem and move long distances rapidly to infect the entire plant. Details of replication, movement, and transmission vary considerably among different viruses. Study of these aspects of plant virology has been greatly facilitated in recent years by the availability of infectious cDNA clones to a great number of viruses (reviewed in **ref.** ***8***).

5.1. Virus Replication

Replication of plant viruses has been notoriously difficult to study directly, because of the problems associated with obtaining synchronous infection of whole plants. Since plant cells that have had their cell walls removed enzymatically regenerate walls fairly quickly, stable cultures of plant cells without walls are not available as they are for many animal species. Therefore, experiments aimed at examining timing of events during synchronous replication of plant viruses must be performed in protoplasts isolated from whole plants, suspension cultures, or callus cultures (reviewed in **ref.** ***9***).

Direct study of plant viral replicase or replicase complexes has lagged behind study of animal virus replicases. Transcription of the animal-infecting rhabdovirus, vesicular stomatitis virus (VSV), has been studied in considerable detail for several years through use of in vitro transcription (*see* **ref.** ***10*** for review). VSV transcriptase assembled from individually purified protein components will act on exogenously added template RNA, allowing study of the role of those components. By analogy, we can infer details of transcription and replication in negative-sense RNA-containing plant viruses. Only recently has purification of several RDRP complexes capable of copying full-length posi-