Floral biology has received the attention of many investigators. Prominent among the early students were Sprengel (402), Müller (300) and Knuth (242). The monumental three-volume work by the last mentioned ably summarizes the knowledge of the nineteenth century and before; it is an immense reservoir of information on the subject. The viewpoint of these workers and of their contemporaries, as well as of some more recent workers (e.g., Jones (219), Gibbs (141), Hagerup (156)), is that of floral mechanism and structural adaptation rather than of pollination dynamics approached experimentally. Their viewpoint is fundamentally morphological instead of functional and only imperfectly represents the latter. Also one finds a thread of thought that plants ought to be cross-pollinated, stemming perhaps from the observations of Darwin (92), which lends some bias to their observations.
More recently, however, the functional viewpoint has been recognized as having greater value in understanding the pollination dynamics of populations. Plant breeders have found it necessary to measure rates of natural crossing in order to understand the breeding systems of the species with which they work; seed producers have been interested in the question of the necessity for and the degree of crop isolation; systematists have learned that reproductive behavior is a valuable key in unlocking evolutionary history and explaining evolutionary mechanisms. Consequently, the viewpoint has changed, and much work has been done from a new orientation. It is the purpose of this paper to review this work, paying particular attention to the methodology of studying population breeding structure and to summarize existing knowledge of the breeding structure of species of phanerogams.

Within the past half-century a great deal of work has been done in measuring the rates of natural cross-pollination of various species—generally species of economic interest. This material forms a major portion of the present review. In some cases the methodological techniques employed have been relatively crude; in others they have been more refined. (See pp. 143 ff.) Self-incompatibility has been the subject of intensive investigations (see reviews by Lewis (260), East 104), Bateman (30), Sears (385)), and is a subject which has a direct bearing on population breeding structure. In addition, the phenomenon of apomixis has received increasing attention since the beginning of the present century (see reviews by Stebbins (404), Gustafsson (150), Nygren (314)). Apomixis, being the absence of sexuality, is a subject of considerable importance in evaluating breeding systems. The exhaustive monograph by Gustafsson (150) is an invaluable source of references to the botanist interested in reproductive biology. The work done in these several fields has been quite extensive; it is intended that the present review bring the results of much of it together, from the viewpoint just described, and make these results more readily available to interested students.

The older “morphological” viewpoint is, of course, related to the newer “functional” approach. Thus, for example, with a species which shows a structural adaptation for entomophily (e.g., *Medicago sativa*), we also find cross-pollination to be the rule from experimental studies. It is where no such agreement is to be