

BOOK REVIEW

Concepts of Forest Entomology. Kenneth Graham. Reinhold Publishing Corp., New York, 1963. 388 p. illus. \$9.50.

Professor Graham has skillfully combined practical and theoretical concepts in one compact volume. Drawing heavily from basic ecological and population studies, the author outlines or analyzes principles in the first six chapters. Chapter 7 concerns applied control while the final chapter consists of 935 well-chosen references, many from foreign sources.

In chapter 1, applied forest entomology is related to forestry and zoology. An analytical insect case history illustrates the interpretation of biological findings. Chapter 2 concerns life processes in insects and their relation to environmental factors. Special attention is given to the theoretical spacial distributions of insect populations. Criteria for detecting conditions favoring outbreaks are discussed briefly in chapter 3 followed by host damage symptoms useful in detecting and identifying forest pests. The principal orders and families of economic forest insects are exemplified in drawings.

Chapter 4 describes population sampling procedures. Good examples are given of relations between stand or tree condition and susceptibility to insect attack. The expectation of different degrees of damage at different levels of infestation also is shown. Methods for assessing physical and economic damage are included in chapter 5. Especially valuable is a discussion of mill studies relating insect attack to lumber yield and grade. Factors in population fluctuations appear in chapter 6, with recognition that the relative importance of these factors is poorly understood. The bases for making control decisions and for determining suitable control objectives are covered in chapter 7. A wide variety of preventive and corrective treatments is considered.

Some of the details (e.g., *Ips* overwintering habits) given for British Columbia obviously do not hold for other locations. Despite such minor limitations, this work is a major contribution to the forest entomological literature. Because it incorporates basic principles drawn from world sources, it should serve entomologists, foresters, and ecologists for many years.—R. C. WILKINSON.