

PREFACE

Research on the chemical senses has been growing at a remarkable rate over the last decade. This growth has greatly expanded our understanding of the electrical properties and ultrastructure of chemosensory organs, of the role of chemoreception in the control of behavior, of the organization of higher centers in the chemosensory pathways, and of the chemical constituents of mixtures of biologic significance. But one area where advances have been especially impressive is concerned with the properties of pheromones and substances with similar biologic effects.

Pheromones are compounds, produced by certain animals, which have the effect of inducing one or more specific responses within members of the same or closely related species. Some of these substances—the “primer” pheromones—act on the endocrine system, probably through the central nervous system. The pregnancy block induced in mice by the odor of strange males is a striking example. Others, such as “signalling” or “releaser” pheromones, elicit an immediate behavioral response. Sex attractants are prominent examples of this group.

While the chemical identity of these compounds is known, in a relatively few cases (and these, mainly in insects) we now have extensive information about their impact on the receiving organism at the receptor, physiologic and behavioral levels. As a consequence, it is becoming increasingly clear that pheromones and related substances are exploited more intensively and by a far wider range of species than is generally assumed. They can transmit what is often surprisingly precise and complex information that can exert a powerful control over the relationship between an animal and its external environment.

The study of communication by chemical signals currently absorbs the activities of workers from a diverse range of disciplines, including zoology, perfumery, physiology, organic chemistry, electron microscopy, and psychology. Since this variety also reflects the diversity of approaches characteristic of the broader study of chemoreception, it is an appropriate topic for the first of a continuing series of monographs on chemoreception. It was only after the outline of this book had been prepared and authors had agreed to contribute that it became clear that many of them had not met each other or discussed their own work with more than a small group of workers in this area. At this stage the advantages of bringing them together began to emerge. A meeting was arranged and took place in Auburn, Massachusetts on June 27 and 28, 1968. A selection of the discussions which took place at that meeting is included in this book. The meeting was arranged by Clark University Biology Department, and sponsored by the U.S. Army Research Office.

THE EDITORS