

IBP. They limit distribution and activity, and organisms vary widely in ability to respond and to survive under extreme conditions. Certain kinds of stress physiology have been extensively studied in medical, military, and space science laboratories. However, a broader understanding is needed of the physiological bases in additional species, strains, and stages of life cycle.

Experiments on both acute and chronic exposure with varying rates of application of extreme conditions are needed. Responses to chronic stress may suggest the genetic potential available for the evolution of organisms with higher productivity in extreme environments.

Intraspecific and Interspecific Chemical Defense Mechanisms

Accumulating information about naturally occurring antibiotics in higher as well as lower organisms calls for expanded effort since they may play a significant role in the determination of the structure and composition of biotic communities. Thus, recent evidence has suggested that exudates into the air or the soil from one kind of plant may be selectively toxic to plants of the same species, as in the case of the germination inhibitors of the St. John's wort (*Hypericum perforatum*), which prevent seedlings from appearing in the vicinity of the parent plant as long as that plant is alive for continuation of the infestation. Such regulation of germination has profound implications for weed control.

Another body of literature is developing which documents the effects of toxic exudates from plants of one species on those of another species (allelopathy). Susceptibility to these substances appears to vary from species to species and may, therefore, affect community composition; in addition, it may be of direct importance to human welfare in situations where a crop plant reacts to a weed species. Encouragement should be given to studies which will demonstrate to what extent intra and interspecific toxicities discovered in the laboratory are effective under natural conditions.

Recent studies have called attention to a new method of insect control in which analogues of certain of the insect hormones are used. In particular, the juvenile hormone constitutes a weak spot in the physiological armor of insects which opens them to attack by agents which are nontoxic and physiologically inert for other forms of life. In the evolution of evergreen trees, substances have appeared and have