

Paragraph

**Collective Behavior**

- 1► Many types of animals combine the advantages of family association with those conferred by membership in still larger groups. Bees congregate in hives; some fish move in schools; ants gather in mounds; wolves live in packs; deer associate in herds. This type of congregational, or collective, behavior gives animals such as these distinct advantages over other species that rely on more solitary behaviors. While defense of the group is a clear benefit for animals that gather in groups, another way collective species profit is through their system of foraging for food. Congregational species have developed methods, ranging from straightforward to complex, of searching for, obtaining, and transporting nutrients back to the “home” spot.
- 2► The behavior in which a group of social animals (or insects) imitates or copies the behavior of others is referred to as allelomimesis. During this behavioral activity, one member, or a small group, of the species discovers the initial food source. Through signals already familiar to the group, the location of the nutrient source is communicated to a larger group of the community. This group follows the signal to the food source, and if required, in turn communicates the location to yet another group. For example, bee colonies often send out small groups of bees that scout—look for—flowers that contain the essential nutrients they require. These scouts then return to the hive and through a complicated “dance” communicate the location of the flowers to others in the hive that can use the scout’s information to obtain their own food. Allelomimesis is a commonly observed phenomenon in studies of insects such as bees, ants, and others.
- 3► Scientists and other experts have long assumed that certain collective species follow allelomimesis almost exclusively, but this is inaccurate. The original assumption resulted in the adoption of set parameters to describe this group behavior. Actions that fell within the parameters reinforced the notion that allelomimesis was the predominant foraging behavior, yet, this is, in fact, not the case. More recent research by scientists indicates that allelomimesis is not always the prevalent form of behavior for collective groups; individuals within these species do, at times, differ in their actions, even when working toward the common purpose of acquiring nutrients. Thus, foraging behaviors have now been more accurately categorized into what are known as explorative and sedentary strategies.
- 4► The differentiation of foraging strategies within a particular group seems to depend on factors such as the availability of adequate nutrients in the food supply. In other words, when a species detects an imbalance in nutrients, either instinctively, or through other natural mechanisms, their foraging strategy adapts in an attempt to compensate for this lack. For some members of a species, this displays itself through a more active role in searching for food, whereas in others, it results in a more passive reaction.
- 5► One species that has been studied in some detail regarding this phenomenon is the social caterpillar. When food sources are adequately balanced, the species follows the pattern of allelomimesis; each member of the group maintains a consistent level of foraging activity with others in the search for food. In contrast, when the source becomes imbalanced the species separates into two distinguishable categories of foragers: exploratory and sedentary. The observation of this phenomenon is fascinating, in that it shows behavior contradictory to what might be assumed. The more active caterpillars, the ones that take responsibility for finding food, spend less time consuming nutrients than their less active counterparts. These sedentary caterpillars move more moderately than the active caterpillars, yet they take in more food.
- 6► While it may seem that the more passive caterpillars take advantage of the active caterpillars, those that expend less energy in fact serve a vital function: maintaining

When you are reading, always practice connecting pronouns and adjectives to their referents. This helps with general comprehension as well as with answering referent questions.



group cohesion. One study, at least, suggests that colonies consisting of more active, as opposed to passive, caterpillars demonstrate less unity within their groups than when there are more passive than active ones. Apparently, because the active caterpillars tend to divide their resources among various plants to find nutrients, they lose focus on the group as a whole. On the other hand, the more sedentary caterpillars usually focus on one food source at a time. Therefore, they are able to keep the groups within the colony intact. Consequently, it seems a balanced proportion of active and passive caterpillars in a colony ensure that both the nutritional and communal needs of the colony are met.

1. The word "those" in paragraph 1 refers to
  - (A) types
  - (B) animals
  - (C) advantages
  - (D) groups
2. The word "they" in paragraph 2 refers to
  - (A) small groups
  - (B) flowers
  - (C) nutrients
  - (D) bee colonies
3. The word "others" in paragraph 2 refers to
  - (A) studies
  - (B) insects
  - (C) bees
  - (D) ants
4. The word "their" in paragraph 3 refers to
  - (A) collective groups
  - (B) species
  - (C) scientists
  - (D) individuals
5. The phrase "this lack" in paragraph 4 refers to
  - (A) imbalance in nutrients
  - (B) natural mechanisms
  - (C) foraging strategy
  - (D) attempt
6. The word "what" in paragraph 5 refers to
  - (A) foragers
  - (B) observation
  - (C) phenomenon
  - (D) behavior
7. The word "ones" in paragraph 6 refers to
  - (A) resources
  - (B) colonies
  - (C) caterpillars
  - (D) groups
8. The word "they" in paragraph 6 refers to
  - (A) active caterpillars
  - (B) resources
  - (C) groups
  - (D) sedentary caterpillars