

lates how, at the oncoming of a storm, he found on almost every one of the violet-blue spikes of the pickerel-weed (*Pontederia cordata*), a species of water hyacinth, which in countless numbers fringed the winding stream on both sides, one to several small bees. They had crept within the bilabiate flowers as far as possible, and were evidently intending to await there the passing of the storm. They were so inactive that no net was required to capture them with, and Mr. Lovell was able to knock them off into his collecting jar. On examination the insect proved to be the pickerel-weed bee, which, every season, when the pickerel-weed is in bloom, is found on its flowers. Mr. Lovell has carefully observed the visitors to many other plants in the locality, but has never found this particular bee anywhere else than on the pickerel-weed. Another instance of monotropism is found in the relationship between a small bee—the water-lily bee—and the yellow water-lily. The flower is securely anchored to the bottom of the stream by a long stem. At first the opening in the bud is no larger than a bee's body and the chamber within offers a dry and snug shelter amid the waves. It may truly be called a "haven of refuge." Directly below the entrance is a broad, many-rayed, crown-shaped stigma, as in the poppy. The petals are thick, wedge-shaped bodies, which are orange-yellow on the outer side, near the top, where they freely secrete nectar. Under a microscope both large and minute drops can readily be seen. The stamens are indefinite in number; and revelling in the pollen, their bodies completely covered, there is a large and lively company of small insects, among which is found the water-lily bee. This bee in Mr. Lovell's neighborhood is never found on any other flower, although elsewhere it is met with on other species of the water-lily family.

Kerner, the eminent botanist believed

the bees gave the preference to certain flowers because they found their odors so highly attractive. But, as Mr. Lovell remarks, "it is incredible that so many bees should be dominated in their flight to such an extent by various floral odors, and, besides, they not infrequently visit several flowers which differ in scent. No doubt, though, bees have their preferences in odors and nectars, and probably they prefer pollen that has a roughened or spined surface to that which is smooth."

A more probable explanation claims that female oligotropic bees have adopted this method of visiting flowers to avoid competition in gathering pollen for brood-rearing. This theory is only partially satisfactory, and certainly is not always applicable, even assuming that such a partition is beneficial or required. The four species of *Andrena*, which in Mr Lovell's locality visit exclusively the willows, do not thus avoid competition, nor do they thus benefit other bees. The willow aments have pollen enough for all comers. In this particular case the habit seems to have arisen because it was advantageous to these bees to restrict their visits to flowers so abundantly supplied with pollen and nectar, combined with their early and short time of flight, which lasts only about a month, and perhaps also to their nesting near these shrubs. Where bees fly only during the latter part of the season it seems very natural for them to restrict their visits to the *Compositae*. These flowers, as in the case of the golden-rods and thistles, are very common, contain ample food supplies and are easy to visit. They are actuated not by the need or desire of avoiding competition, but by the same motives which lead honey-bees to visit the white clover exclusively while it is in bloom.

Two most important influences are the season of the year and the length of time the bee is on the wing. It is clear that bees which fly only in spring

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