

Do Flowers Hear Bees?

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IN A RECENT COURSE AT THE NATURE INSTITUTE we spent time each morning for a week observing wild chicory (*Cichorium intybus*). Its flower heads open with the brightening of morning; if it remains cloudy, the flowers hardly open at all. The flowers orient themselves towards the sun and move with the sun during the course of the morning. They close and wilt by the afternoon. The way they unfold and bend their flower stalks is an expression of their connectedness with the sunlight. Many other flowers are also attuned to the light of the sun. The sunlight belongs to their lives.

Similarly, the lives of insects and flowers interpenetrate. Insects gather nectar and pollen as food and in the process pollinate the flowers, allowing them to form fruit and seeds. Nearly ninety percent of plants rely on animals (mainly insects) for pollination.

Recently, an Israeli research team made a fascinating discovery.¹ While it is well known that flowers respond to light, touch, or airborne substances, they wanted to know whether flowers would respond to sound. After all, insects make buzzing sounds with their wings when they fly to and from flowers. So the researchers recorded the buzzing of a bee and replayed the sound in close proximity to numerous flowers of an evening primrose (see photo). In other words, they mimicked the sound of bees hovering around flowers.

They then measured the sugar content of the nectar in the flowers (from which the nectar had been previously evacuated) and found that three minutes after exposure to the buzzing sounds the flowers produced nectar that was sweeter than before. Their nectar was sweeter than



Beach evening primrose (*Oenothera drummondii*) in Israel

in controls that were subject to no sound at all or to high frequency sounds (bee buzzing is a low-frequency sound).

The researchers also observed that the flowers *vibrated* when exposed to a recording of bees buzzing. So the question arises: in what way might the vibrating of the flowers be connected with the production of sweeter nectar? Whatever the connection may be, it

seems clear that the buzzing sound in some way belongs to the environment of the flowers, which means there is a connectivity between the two organisms via sound.

Does this mean flowers can hear? No. We don't say flowers are seeing the brightness of the sun, or smelling airborne scents. Nonetheless they are responsive. They are in connection with multitudinous qualities in the world. And when those qualities change, they can change in a way that is meaningful in their life and in the lives of those beings with which they are connected.

There is much research today that falls under the heading of "plant intelligence" or "plant neurobiology." Thanks to this research, a wealth of phenomena have become better known that show how wisely and actively the plant engages with its environment in countless meaningful ways. But there is a danger in using terms that suggest that plants have animal- or human-like intelligence. If the term "plant intelligence" is used to refer to their inborn connectedness with the world that allows them to flexibly relate to changing conditions, that's fine. If the term is used to imply that plants have a kind of centered consciousness through which they feel and experience in the way of a deer or mouse, then we're dealing with speculation that is not based on careful observation.

I've noticed in the literature a tendency to animalize plants as a means of giving them more credence as "substantial" beings on earth that we should be more aware of and care for. But this is not at all necessary. Plants are remarkable creatures in their own ways. We don't need to analogize them with animals, which scientists do when they refer to "neurobiology" in plants.

But there is also a more deep-seated and ingrained habit of thought that anthropomorphizes plants and animals in the guise of mechanistic science. In the article about flowers and buzzing bees, the capacity of the flowers to create sweeter nectar in response to buzzing is considered to be a strategy: by increasing sweetness, the flower would be strengthening the likelihood that bees would return to the flower, which in turn would increase the likelihood of a bee pollinating the flower. What this way of thinking does is to assume flowers and bees are separate entities. Each is engaged in an ongoing struggle to increase the likelihood of its survival and reproduction. In other words, this way of viewing posits separateness as fundamental.

This view is a reflection of our human sense of separateness — that I am here and the world is out there, separate from me. But this felt separateness is also the starting point for us, as knowing beings, to discover how we are connected with the world and how the things of the world are connected. That is our task. It does not mean that in the world separateness is fundamental.

The more we study and learn, the more we find how things that we initially considered to be separate are in



Cup plant (*Silphium perfoliatum*) with honey bee at
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fact related. The plant's existence is bound up with the sun, and in this sense the sun is not separate from the plant. Pollinators and plants are mutually dependent and they interweave. They are not in essence separate entities. And the research indicating that flowers may even have a relation to a sounding world, can help us realize that we have hardly begun to fathom how connectedness lies at the heart of life and the planet.

REFERENCE

1. Viets, Marine et al. (2019). "Flowers Respond to Pollinator Sound Within Minutes by Increasing Nectar Sugar Concentration," *Ecology Letters* vol. 22, pp. 1483-92. doi:10.1111/ele.13331

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