On the Web

"You needn't feel too badly, Wilbur," she said. "Not many creatures can spin webs. Even men aren't as good at it as spiders, although they think they're pretty good, and they'll try anything. Did you ever hear of the Queensborough Bridge?"

Wilbur shook his head. "Is it a web?"

"Sort of," replied Charlotte. "But do you know how long it took men to build it? Eight whole years. My goodness, I would have starved to death waiting that long. I can build a web in a single evening." —E.B. White, *Charlotte's Web*

The tinier a creature is, the more I marvel at its accomplishments. I assume that most human achievements can be attributed to our large brain, our most distinguishing physiological feature, yet even with thousands of years to work on it, human hunters have not made a snare to equal a spider's web. How can the expertise and materials needed to craft such elegant, symmetrical, sturdy, cunning structures, be packaged in an organism small enough to hide in the crack of a barn door?

Each spider species has its own web-spinning habits (some do not spin webs, but use silk in other ways). Although orb-shaped webs seem impressive, they are among the more primitive of spider designs, with cobwebs, funnels, and trapdoors marking advances in web effectiveness. Many spiders spin a new web each day, since the stickiness of spider silk is of limited duration. Sometimes they will ingest the old web to recycle protein. As Charlotte noted, it doesn't take an orb-weaving spider long to fashion a new web, perhaps no more than half an hour. A barn spider, the species E.B. White modeled his spider heroine after, begins work on a new web each evening.

Like the other orb spinners, she begins by releasing a light line of silk from a spinneret. When this line makes contact with another surface, the spider "reels in" the loose silk, and sets off across the tightrope, laying a stronger, non-sticky line beside it. Once she reaches the far side, she anchors the line and heads back across, allowing a third strand to droop behind her. This loose line is anchored at her original perch site. Now she sets out on the drooping line. When she reaches the low point of the sag, she affixes a new line, and then drops, feeding out another line of webbing. When she encounters something to attach it to, she has made a Y, and the first three radii of the many that will form the structure of her orb. Now she climbs back to the center and descends again along the Y, trailing another strand. When she reaches the bottom, she moves a bit to the right or left and makes a new anchor. She repeats this procedure, following a radius back to the center, towing a new line to the outside, anchoring the new line, and then skootching back to the middle. After a number of lines have been anchored, she travels from one outside anchor point to the next, laying connecting lines that can be used to attach additional spokes to her deadly wheel.

Once the framework is ready, she begins to release her gluey silk, spiraling from the outside to the inside, anchoring to each ray. Now, at dusk, her web is fresh, and she waits for the luckless insects that will flutter into her snare to meet a sticky end.

Do you ever wonder why, on some mornings, the many webs in a meadow will be oriented in the same direction? If the web is started on a strand borne by a current of air, most of the spiders within a microclimate will build from an axis oriented the same way. It's simply the prevailing wind.

Web construction is just a part of what makes spiders remarkable. They have very poor eyesight, and at least some species can function perfectly well when they can't see at all. Theirs is a world of vibration, and

the orb spinners can read vibrating silk the way we read facial expressions and road signs. Males will communicate their interest in mating, and read in the female's response the likelihood that she will eat him if they do. Mother spiders can instruct their babies to hide through web vibrations, too.

Assuming you're not afflicted with arachnophobia, I recommend finding out more about spiders by visiting that earlier version of the worldwide web. Spiders are among the easiest of our animal neighbors to observe (just don't make vibrations). Even if you don't find E.B. White's Charlotte writing "Some Pig" on the web sites in your yard, if you're patient you might discover spider talents more amazing.