

POSTER WORLD RIVERS • WATER FOOTPRINT

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# NATIONAL GEOGRAPHIC

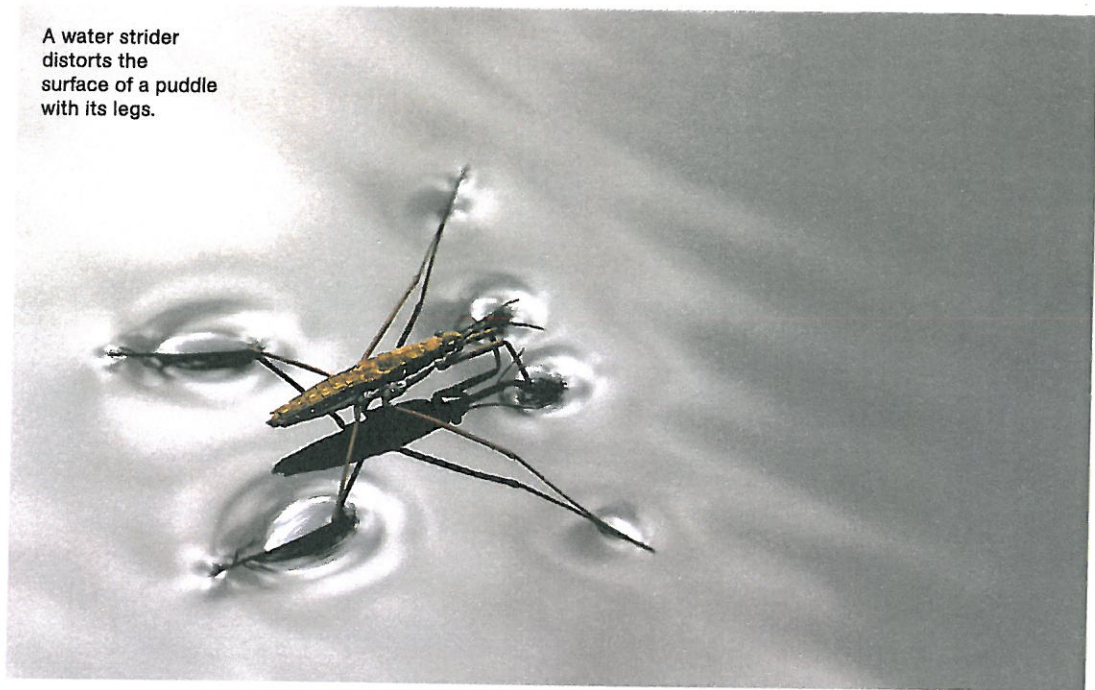
A SPECIAL ISSUE

# Water

OUR THIRSTY WORLD



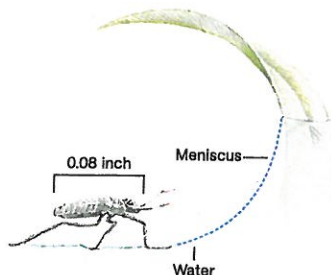
A water strider distorts the surface of a puddle with its legs.



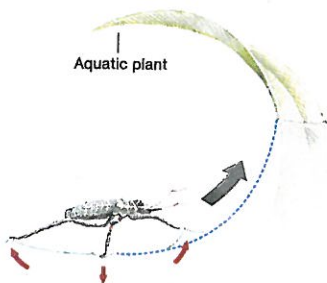
**Up a Slippery Slope** Gazing at a pond, you see a smooth surface. A tiny water-walking bug sees difficult terrain. Everywhere the water meets a leaf, a twig, or the shore, the surface curves up a fraction of an inch. The result is a meniscus, from the Greek word for “moon,” whose crescent shape is much like the water’s slope.

As you climb a hill, friction between your foot and the ground pushes you upward. But most water-walking insects skate on tiny pockets of air, making for a very slippery world. So how does such a bug scramble up a towering meniscus

to lay eggs on a leaf or escape a predator? MIT researchers John Bush and David Hu say it uses the same forces that clump breakfast cereal together in a bowl of milk. Watching high-speed videos, they saw that an insect approaching a meniscus reshapes the water surface below its body (graphics, below). Much as a trampoline gains energy when you stand on it, the surface of the water has more energy when a bug distorts it. Bugs use this energy to launch themselves up the meniscus—and away from the jaws of a hungry bass. —*Juli Berwald*



**1** The bug walks to the meniscus—the curved water surface that forms because water is attracted to the plant.



**2** To reshape the surface, water-grabbing claws on front and back legs pull up, and middle legs push down. The surface gains energy.



**3** Energy from the reshaped surface pushes the bug up the meniscus. Grabbing the leaf, it pulls itself off the water.