

DOWN TO EARTH

BY ALAN DEVOE

The Ingenious Spider

IT is an evident fact of the outdoors, although writers in the tradition of the Victorian nature moralists are still accustomed to avert their eyes from it, that a major occupation of all creatures of earth is the killing of other kinds of creatures. It is to this end that myriads of evolutionary specialisms have developed: the curved erectile fangs of vipers, the silent soft-feathered wings on which the great horned owls glide through the darkness to snap the spines of rabbits, the cushiony paws on which lynxes lope across the snow. The quietest woodland, the serene meadow drowsing under the sun, is hourly the site of uncountable scenes of carnage. To have life is to have hunger; to sustain life is to require the sacrifice of other lives. In the natural world there is always the smell of newly-spilled blood on the wind, the scarlet blood of mammals, the viscous blood of plants and roots, the yellow blood of butterflies.

The ways of killing among animals are very many. There is death

from the air, death by stalking and a final pounce, death by ambush, by swift pursuit, by cunning and agility of a thousand kinds. And there is death, most curiously, by trapping. This is the art preëminently of the arachnids, the eight-legged scuttling little predators that we call spiders. In early summer now the spiders are abroad in every hedgerow, every grass patch, busy with the work of their singular death-engineerings.

Spiders are not insects. They move on four pairs of legs — instead of on three as insects do; their bodies are divided into two sections instead of three; they grow no wings. The diet of many insects is vegetation and the sap of vegetation; but the hunger of spiders is for fresh-killed flesh. Certain of the hugest spiders, like the hairy, heavy-bodied tarantulas of Central and South America, are strong enough to capture and kill birds and make a diet of warm blood. There are other species, only slightly smaller, that can enmesh mice in their snares and kill them

instantly with a bite at the base of the brain. In our own region, spiders' food is the unwarmed pulpy flesh of insects: the abdomens of grasshoppers and crickets, the fleshy body-parts of butterflies, moths and beetles.

Spiders of all kinds, great and small, have similar endowments for their life of preying. In front of and over their mouths are pairs of jaws, each jaw bearing a thin curved fang which is attached, like a venomous snake's, by a movable joint so that it may lie flat in its furrow or be instantly extended. Near the tip of the fang is an opening, connected by a fine canal with a poison gland. Beneath the mouths of spiders are their endites: powerful jaw-like organs with which to crush the chitinous bodies of their insect prey. The spiders' heavy jaws work sidewise, not up and down, and as they spread apart laterally, the lancet-sharp poisonous fangs simultaneously come erect.

For procuring prey with which to feed this formidably-equipped maw, the spiders are endowed with that gift for intricate snare-building which makes them uniquely the trappers of the animal world. At the tip of a spider's abdomen are small finger-like organs, generally six in number, arranged in three pairs. These are the spider's

spinnerets. They are joined, by a network of ducts, with silk-glands inside the spider's body. At the tip of each spinneret is a soft area, the spinning-field, on which the ducts open; the terminus of each duct is a tiny erect spinning-tube. There are sometimes, in a single spider's body, as many as five glands for the production of five different kinds of silk — silks tough and inelastic, silks rubbery-soft and capable of tremendous stretching, silks for each various part of the spider's complicated web-building. Within the spider's storage sacs the silk lies liquid. As a liquid it passes along the internal conducting canals to the tips of the spinnerets. Only upon contact with the outer air does it harden into a fine-spun filament.

Most spiders spin a fine silken thread continuously as they creep on hairy feet about their errands. They leave a dragline, periodically fastened by tiny silken attachment disks to leaves and pebbles and blades of grass, which serves two purposes. It acts as a guide in ground-traveling, making it possible for the spider to scuttle quickly and accurately back to its lair; and it provides a means whereby the spider, when threatened with danger in a treetop or other high place, can save itself by

instantly plummeting into space and swinging suspended in mid-air, by its silken cord, until the danger has ceased to threaten. The drag-lines of the spiders are curious and ingenious; they are only a less singular achievement than the death-trap web itself which is the central preoccupation of the spider's life.

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The way of a common orb-web spider, when it sets about the manufacture of its snare, is first to spin between one support and another — such as perhaps two weed stalks, or two tall stems of grass — straight crosslines of silk to form a square. Across one corner of the square is then stretched a diagonal, and a similar diagonal across another corner; then these diagonals are joined by a third, straight thread. By repetitions of this process, in each corner, the frame is progressively reduced to the size of the web which the spider purposes to construct.

Now come the web's radii. In fashioning these, the spider first stretches a straight thread across the web's diameter. Returning, then, to the center of this thread, it anchors a new one and proceeds once more toward the periphery of

the orb. With each trip from the web's center to its circumference there is fastened in place a new radius, a new wheel-spoke; and likewise, on each trip to the center, the spider adds a silk reinforcement to the hub. When, finally, the radii are all in place (twenty-one of them, ordinarily), there begins the spinning of the cross-supports to give the radii strength. The spider starts, now, from the hub, and moves around it in an ever-widening circle. At each radius the silk strand now being secreted is fastened and drawn tight. When at last the spider's spiraling progress has brought it to the web's periphery, the radii are all joined by concentric circles of silk supports.

The web now has a finished look, to a human eye, but it is not done. The spider has been secreting, up to this point, a hard, inelastic variety of thread. It begins now to secrete, instead, a very sticky and much less brittle silk. It starts once more around the web, beginning at the outer edge this time instead of at the hub; and as it travels, it methodically breaks, one by one, the first temporary set of brittle guy-spirals and replaces them with permanent strands of the new adhesive thread. The spider works slowly and carefully now, measuring the spacings with great preci-

sion by using one of its hind legs. Finally, when it has brought its meticulous work perhaps two-thirds of the way from the web's periphery toward its center, it ceases spinning and leaves a "free zone" free of sticky crosslines. Into the free zone it now creeps and hangs head-downward, motionless. Its web is finished. The spider is ready to settle down to waiting patiently, with all eight eyes alert, for the blundering of the first victim into this death-snare, more intricate than any that man has ever made.

Not all spiderwebs are like the orb-weavers' in construction, though such are among the commonest, and are certainly the most often noticed, because of their conspicuousness. The grass spiders, common in every pasture, spin curving sheets of silk, formed in the shape of funnels. Above the main sheet of the web they place cross-threads, so fine as to be invisible, in which the passing cricket or moth or butterfly will become so hopelessly snarled that it must fall helpless into the funnel and lie there until the spider's poison fangs are plunged into its flesh. The dome spiders hide within shimmering domes of silk; the triangle spiders, watchful beside their webs, hold the thread-ends curled

between their legs and keep the web pulled taut, until, when a victim falls into the structure, they abruptly slacken the line and shake the whole web furiously, so that the victim may be the more thoroughly entangled. There is an endless variety in the traps the spiders build and operate.

The same silk-spinning skill employed by spiders in their trap-making and in the construction of their draglines is used also for other purposes — for the swathing of their eggs, for instance, and for the making of cunning leaf-roofed shelters wherein they can crouch hidden while they watch their webs. It is employed, not least importantly, for extending their predatory travels. When a spider has found the trapping poor in one region, it seeks out a new site for operations. It climbs a tree. With elevated abdomen it sends forth a filament of thread into the air, spinning the thread out longer and longer until the strand is caught by the breeze and whipped upward. The spider then looses its hold on twig or leaf, and, attached to its wind-carried thread goes ballooning across country, until the breeze deposits it in some new wood or meadow, there to spin a new ingenious web and wait patiently again for blood.

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The Double Men of Criticism

BY MARY M. COLUM

SOME of our guides to the higher intellectual and literary life seem to be going off at the deep end in a fashion that to the concerned beholder brings a new shudder and a new ennui. Opening the latest book of Archibald MacLeish, a work of selected prose entitled *A Time to Speak*,¹ we struggle with the second paragraph of the first page (we use the royal “we” for the same reason that Marshal Pétain uses it — the first person singular seems too egoistic). Archibald MacLeish is writing a challenge to those who say that poetry is dead.

Let them bury it, then. Let them bury the big bones of Yeats and the Hamlet-grinning skull of Eliot and the man-smelling shirt of Carl Sandburg and the splintered china and bright glass of Wallace Stevens and the quiet-cricket-talking of Frost in the dead leaves and the mole-rummaging under the lot of Ezra Pound.

Now we don't know a thing that could be done with bones, skulls,

smelly shirts, splintered china except to bury them, unless we burn them; we couldn't very well let them stay around. Archibald MacLeish's *saeva indignatio*, which in his *Frescoes for Rockefeller Center* is so shapely in his beautiful accomplished verse, becomes in his uncontrolled prose so dissolute that it no longer makes any communication.

The loud-mouthed, disrespectful, horse-laughing challenge to those who tell us poetry is “pure.” Those who tell us poetry is “poetry.” Those who tell us poetry is a parlor game and has no truck with the living of live men or the misery of hungry men or the politics of ambitious men or the indignation of believing men.

Well, Archibald MacLeish seems to know some queer people, and they get queerer as we go on. He tells us of people who conceive of a poem as “an embellished bit of prose,” and there are people who wonder whether poetry is an art or more than an art or less than an art, “being no more than a sort of

¹ *A Time To Speak*, by Archibald MacLeish. \$2.75. Houghton Mifflin.