



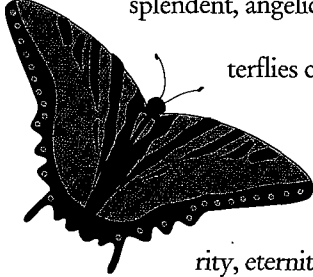


Butterfly Magic



Within specially crafted houses,
butterflies fly free, enchanting all who enter

BY GARY NOEL ROSS



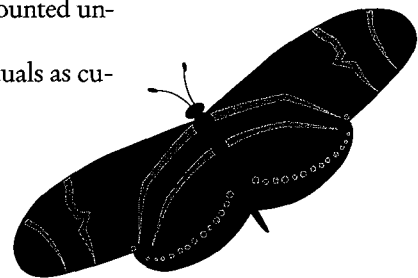
Humans harbor a passion for butterflies. Perhaps this is due to their resplendent, angelic wings. Perhaps their allure stems from the way butterflies come into this world through the miracle of metamorphosis. Or perhaps it's because butterflies are linked in our minds, whether consciously or not, with purity, eternity, rebirth, joy, magic, and even the soul itself. (The ancient Greeks used the word *psyche* for both soul and butterfly.)

Yet, butterflies elude our attempts at intimacy. Consider: They develop through stages that appear to us totally unrelated, and have brief lives, usually lasting two to three weeks. Butterflies are as light as air, denizens of the heavens, preoccupied with sunlight. And though, in the past, zoos and botanical gardens have exhibited specimens mounted under glass and even, on occasion, constrained a few live individuals as cu-

PHOTOS BY D. ROBERT FRANZ

BRIGHT AND BEAUTIFUL: Scarlet blooms of a Mexican flame vine invite a zebra longwing to sample its nectar. This butterfly ranges from the southern U.S. to Central and South America.

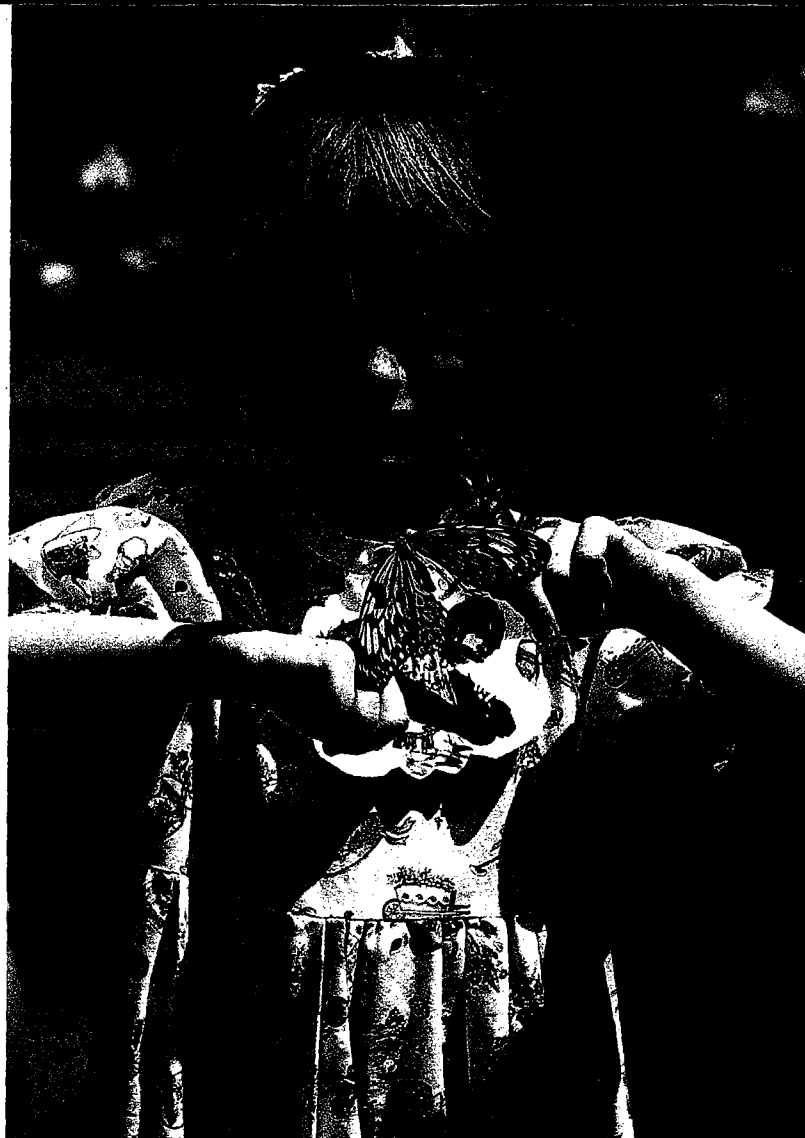
ILLUSTRATIONS BY SHARON KRAMER LOEW



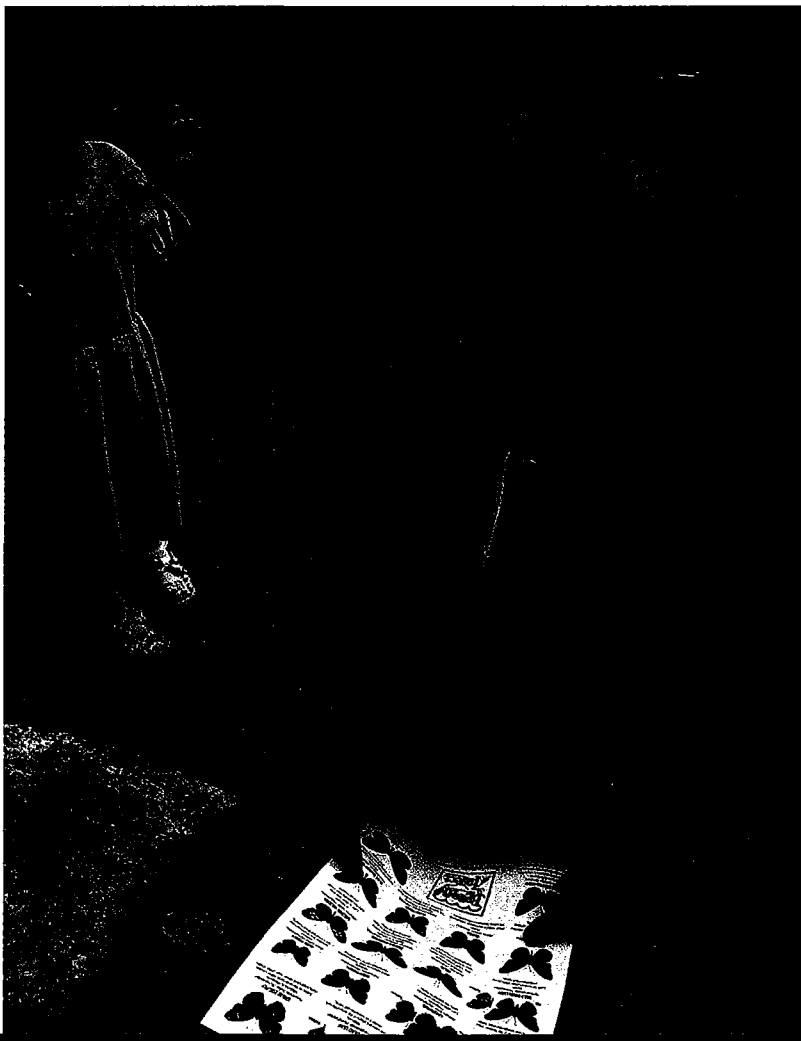
riosity, butterflies have remained proverbially and literally "free."

Free until the 1960s, that is, when Robert Goodden began experimenting with rearing and exhibiting butterflies and moths. By 1978 he had premiered Worldwide Butterflies in Compton House, near Sherborne in Dorset, England. It was enormously successful and created an unprecedented public awareness of butterflies. For the next ten years, though, butterfly houses remained for the most part a British phenomenon. Finally, in 1988, the Cecil B. Day Butterfly Center at Callaway Gardens, in Pine Mountain, Georgia, and Butterfly World, in Coconut Creek, Florida, opened to record-breaking crowds. Today, at least 150 butterfly houses exist worldwide (Great Britain has more than 60, including the still-extant Worldwide Butterflies, and North America has 24). Many stand alone as attractions; others are additions to zoos, botanical gardens, and museums. Some are open year-round; others only during the warmer months.

Unlike most exhibits of live animals, which separate viewers from subjects with wire, glass, or moat, butterfly houses offer visitors a "close encounter." Their designs depend upon location: Simple nets do fine in the tropics, but northern regions dictate elaborate glass structures with artificial climate control (as do all insects, butterflies require warm temperatures and high relative humidity because they are cold-blooded). All enclosures must be bathed in natural sunlight, because artifi-



CLOSE ENCOUNTERS: Visitors discover the magic of butterflies at the Butterfly Pavilion & Insect Center, in Westminster, Colorado, 15 minutes from downtown Denver.



cial light seems to be unacceptable to these solar-powered, gossamer-winged creations. Since sun is essential, most butterfly houses resemble giant greenhouses luxuriant with flowers. Large houses, occupying as much as 8,000 square feet, often enhance the aesthetic ambience with waterfalls and pools, mist and fog, and sounds of nature. In a few, colorful hummingbirds add exotica and offer the chance to watch a hungry bird chase a butterfly.

Enter a butterfly house and you know instantly that you are poised for an extraordinary experience. Overhead, clouds of butterflies reel and wheel to silent rhythms. Less aerobic varieties float in the windless air like improbable apparitions. Some flit gracefully among flowers, seeking hidden nectar, or perch on juicy fruits laid out on banquet trays. Others bask with wings outstretched on sun-drenched leaves and garden paths. Flaunting fluorescent reds and pinks, yellows and oranges, metallic blues and peacock greens, tropical butterflies set the air aflame. No description, no photo can convey their splendor.

If you're lucky, a special treat awaits: Sometimes a butterfly will softly alight on bare skin or hair and begin uncoiling its long, tongue-like proboscis through which it sucks up nectar, in much the same way as a child plays with a Chinese paper whistle. Children's eyes twinkle and grow to saucer-size at this "tickle" or "kiss." Adults relax accumulated inhibitions and giggle. All become lost in a timeless, whimsical fairyland.

But behind the showcase glitter, out of sight of visitors, lies a very extensive infrastructure. Butterfly houses are quite possibly the single most ambitious living exhibits ever created, for the simple reason that the delicate and ephemeral nature of butterflies means that new insects must be introduced continually. For an exhibit that tries to display between 1,000 to 2,000 butterflies on the wing at all times, the logistics are mind-boggling. Many butterfly houses maintain standing orders with far-away commercial breeders in Africa, Australia, Central and South America, and Southeast Asia. In the United States and Great Britain, a few suppliers sell native species.

The supplier harvests chrysalides, or pupae (there are four stages in the life of a butterfly: egg; caterpillar, or larva; chrysalid, or pupa; and adult butterfly). Harvested chrysalides are individually wrapped with cotton and packaged tamale-fashion in small cartons, then shipped air express. Upon arrival, each chrysalid is unwrapped, then carefully suspended with a pin or glue from a corkboard, which is usually placed in a cabinet in full view of the public. If everything goes well, within a few days each chrysalid splits and a damp, crumpled butterfly emerges. It hangs with its wings down until they expand and dry. Having mesmerized ob-

servers with the wonder of metamorphosis, the butterfly is ready to fly free into the exhibit.

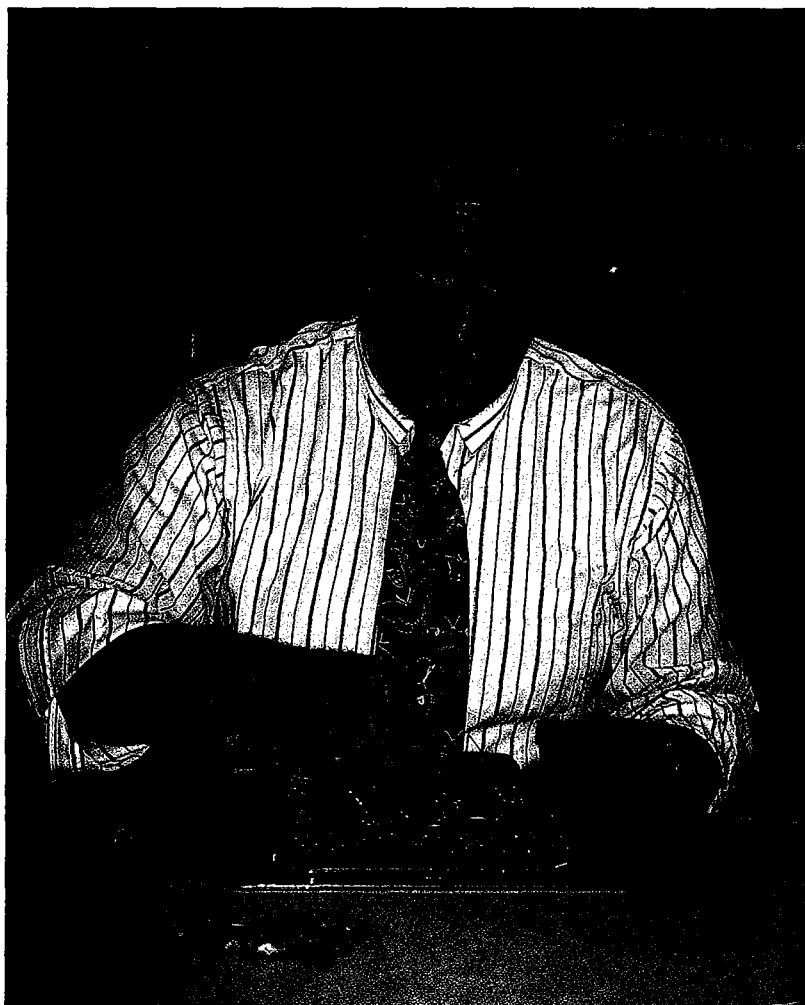
Chrysalides cost between \$1 and \$12 each, so some exhibitors cut expenses by breeding some of their own stock. Butterfly husbandry, however, has its own inherent problems. Caterpillars eat different foods and feed in a different way from the adult butterflies. Breeding requires the cultivation of specific "caterpillar plants" called hosts on a grand scale. Florida's Butterfly World cultivates some 10,000 plants, including the world's largest collection of passionvines (120 species), the hosts for all longwing (*Heliconius*) butterflies—the exhibit's specialty. Needless to say, such horticultural endeavors exact major commitments. Furthermore, since Lepidoptera (butterflies and moths) are very susceptible to diseases, parasites, predators, and chemical contaminants, there is always the potential for disaster. When breeding is successful, however, excess chrysalides can be marketed to other butterfly houses.

But that may soon change. In 1995, when Audubon Park & Zoological Garden, in New Orleans, opened *Butterflies in Flight*, the U.S. Department of Agriculture, the agency that issues the necessary operating permits, mandated the zoo to exclude all host plants—meaning no butterflies could be reared. The USDA further specified that no butterfly, dead or alive, should leave the exhibit (dead butterflies were to be disposed of after being sterilized in an autoclave). These austere regulations were prompted by fear that new agriculture pests might be accidentally introduced at large, or worse, new microbial diseases might infect native insect populations—or perhaps even vertebrates, including man. The introductions could be sparked by escaped butterflies or unscrupulous visitors pirating eggs, caterpillars, or chrysalides. How this ruling will affect future butterfly houses remains to be seen. Meanwhile, Audubon Zoo imports an average of 200 chrysalides a day to maintain its extensive gallery.

Once these chrysalides yield adult butterflies, Audubon must be ready with the specific flowers that yield the nectar each species prefers. *Buddleia* (butterfly bush), coneflower, firebush, ixora, lantana, pentas, and porterweed must be cultivated en masse all year. That requires special greenhouses, where plants are usually grown in containers then rotated in and out of the exhibit every week or so. The curators employ a trick to beef up their butterflies: They mist the flowers daily with a weak solution of water, sucrose, and amino acids. The supplements seem to act as a sort of ENSURE® for the butterfly residents.

Much more than just a "Kodak moment," a butterfly house usually offers a complement of education, research, and conservation programs as

ULTIMATE TRANSFORMERS: Ed Spevak (below, bottom), Bronx Zoo assistant curator of mammals, pins the mottled brown, spiny chrysalides from which zebra longwing butterflies will emerge onto a corkboard (opposite, bottom), which also displays the pale jade-green chrysalides of the monarch butterfly. The chrysalid is the resting stage between the caterpillar (below, an atlas moth caterpillar) and the adult moth or butterfly (right, banded peacock butterfly from southeast Asia).





well. Butterflies are exemplary teaching tools in such diverse disciplines as genetics, toxicology, behavior, virology, evolution, and animal and plant husbandry; and most houses routinely schedule seminars, workshops, and other community outreach activities extolling the virtues of butterflies and butterfly gardening.

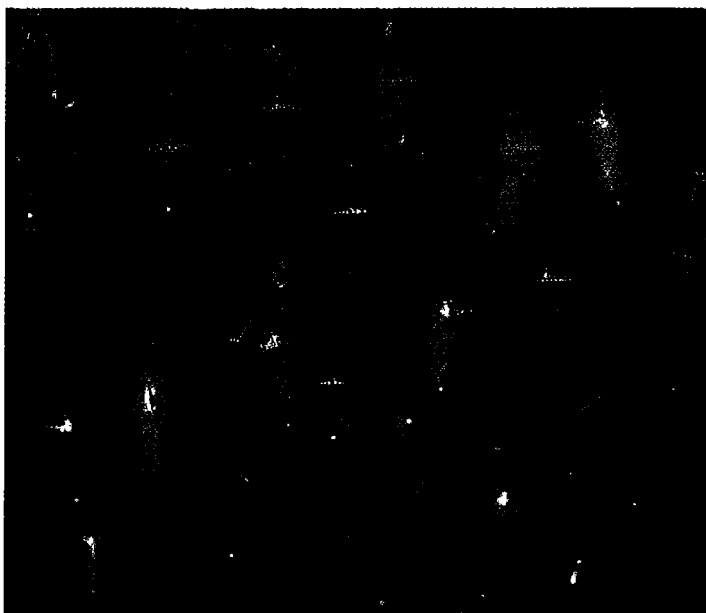
In essence a butterfly house is a mini-zoo that contributes to the global conservation of butterflies in several ways.

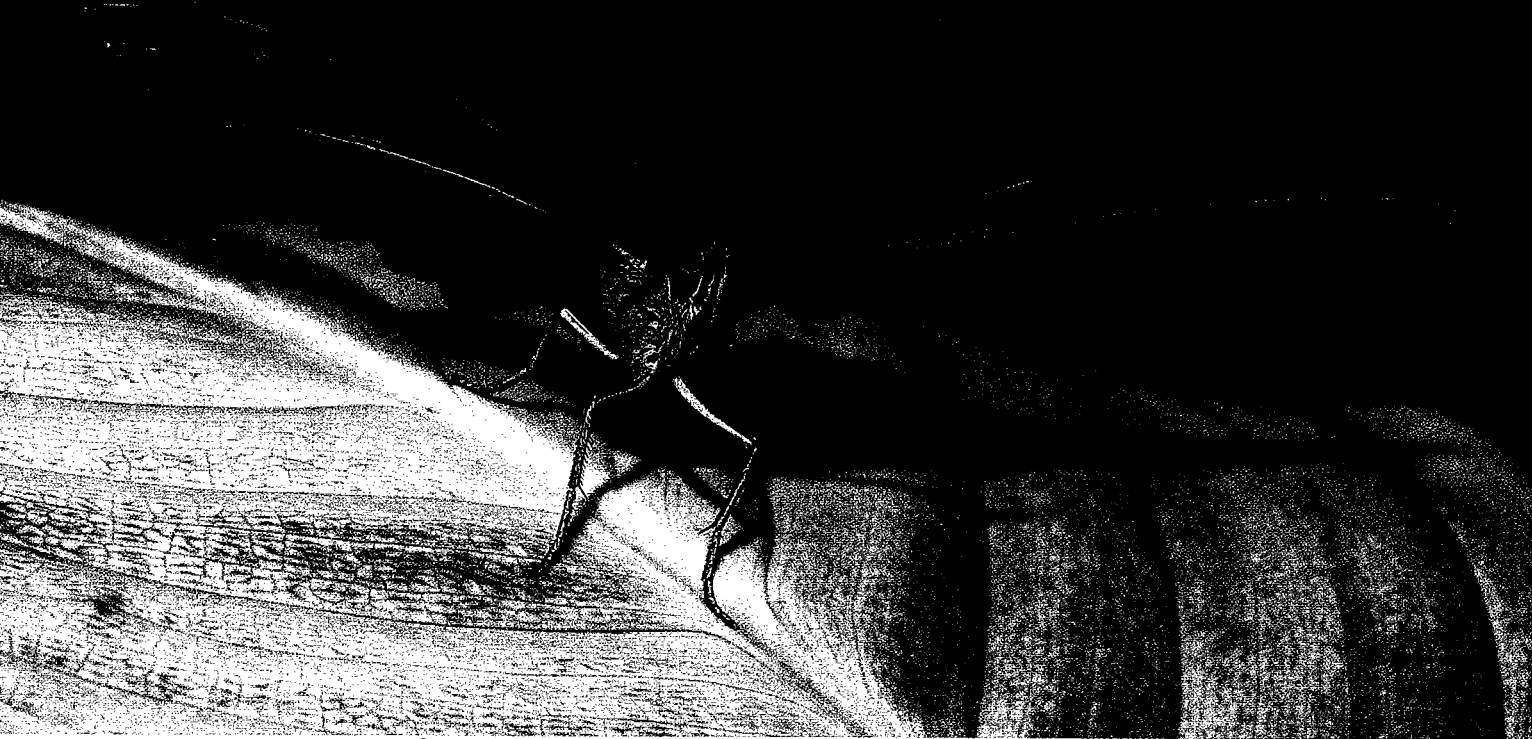
First, because exhibits rely heavily on tropical species, there is now a large and growing international bulk trade in butterflies. Although commercialization may seem to be a contentious issue, consider an exhibit's primary sources of insects—butterfly farms, which raise and harvest captive-bred butterflies, and ranches, which rely on wild adults to lay eggs within harvestable reach, such as in garden plots. A prudent businessman will harvest only 70 to 90 percent of all the chrysalides and adults that are produced. The remainder (a considerably greater percentage than would occur naturally in the "wild") are set free to become breeding stock for future generations. Butterfly husbandry, says Thomas Hanscom, a public relations manager at San Diego Wild Animal Park, is "an example of sustainable resource use—a method that helps in the recovery of endangered species and the protection of habitat."

Second, tropical suppliers often raise rare and endangered species and systematically release some of the adults into the wild. The Butterfly Farm in Costa Rica even has its own private sanctuary to safeguard its stock.

Third, sustainable cottage industries in developing countries teach rural people conservation principles firsthand, thereby lessening the threats of poaching and land abuse. And the new enterprises combat rural flight. Since people can earn substantial, regular incomes in their ancestral lands, they usually resist the popular temptation to move to urban centers where they often are forced to join the ranks of nameless, jobless refugees. Instead, people stay at home and prosper, contributing to their national economies; and that means more funding for national programs, including conservation. In Papua New Guinea, home to birdwing butterflies—at nine to 11 inches, the world's largest and most endangered species—indigenous people consistently earn 60 times the average per capita income by farming butterflies, infusing a whopping \$100 million to \$150 million per year into the economy (see "Farming the Flying Flowers," September/October 1993).

Today, we are decades into an era that began with grandiose promises of peace and prosperity for all—utopia on a global scale. Information technology vows to redefine our very existence by sup-

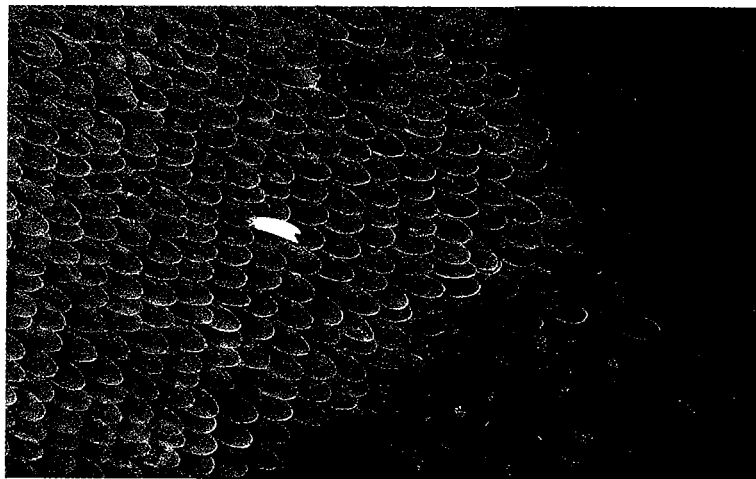




plying us with fingertip services that most of us cannot begin to imagine. Yet, the majority of *Homo sapiens* throughout the world live in abject poverty, and the fortunate rest now concede that science can give us only increased possibilities for our lives, not guarantee success or happiness. Disillusioned, many of us seek answers to life's mysteries by turning to the metaphysical, the spiritual.

In *Butterfly Cooing Like a Dove*, Miriam Rothschild muses that butterflies "provide us with a retrieval mechanism which will unlock the store of long-forgotten events and emotion" and an opportunity to recapture "the remnant of butterfly worship that lingers within us all." As we approach the new millennium, perhaps the real benefit of butterflies—their inherent mystique—is that they speak to our hearts, prompting us to rediscover our humanity and to reaffirm a personal philosophy of hope. Perhaps, just perhaps, the ancient Greeks had it right after all: Butterflies are our soul mates.

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Gary Noel Ross is professor emeritus of biology at Southern University, in Baton Rouge, Louisiana, and consultant for educational programming for Butterflies in Flight at the Audubon Park & Zoological Garden, in New Orleans. In June, he received the John Burroughs Recognition Award for an outstanding Natural History essay: "Butterfly Wrangling in Louisiana," which appeared in the May 1995 issue of Natural History.



GARY NOEL ROSS

LANDING AT GATE 4: With its wings spread open, this clipper butterfly (top) from the Philippines seems to pose for the photographer. The scales that cover the wings and bodies of butterflies give them their colorful iridescence and designs (above, wing scales of an Australian swallowtail).