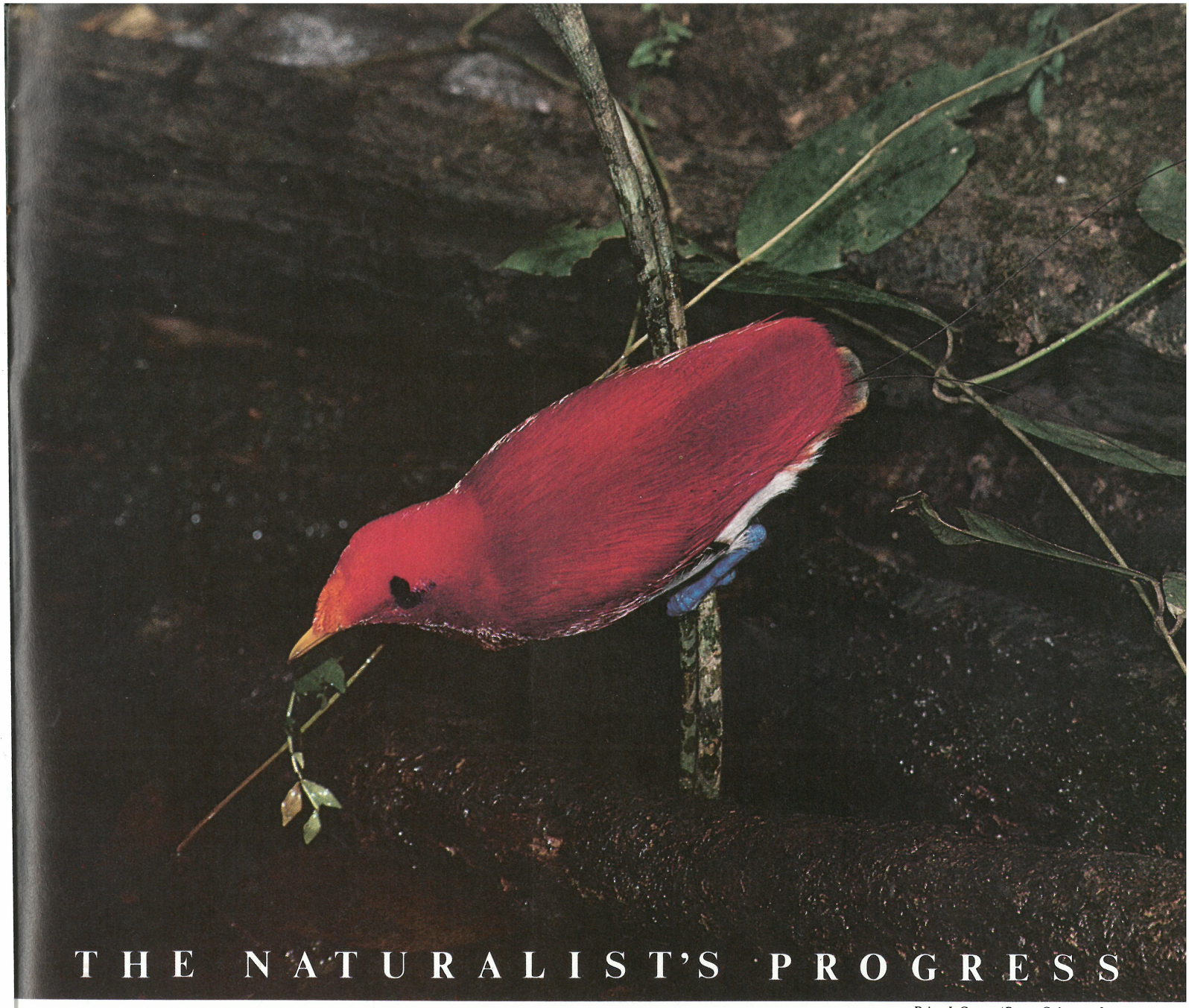


THE NATURALIST'S PROGRESS

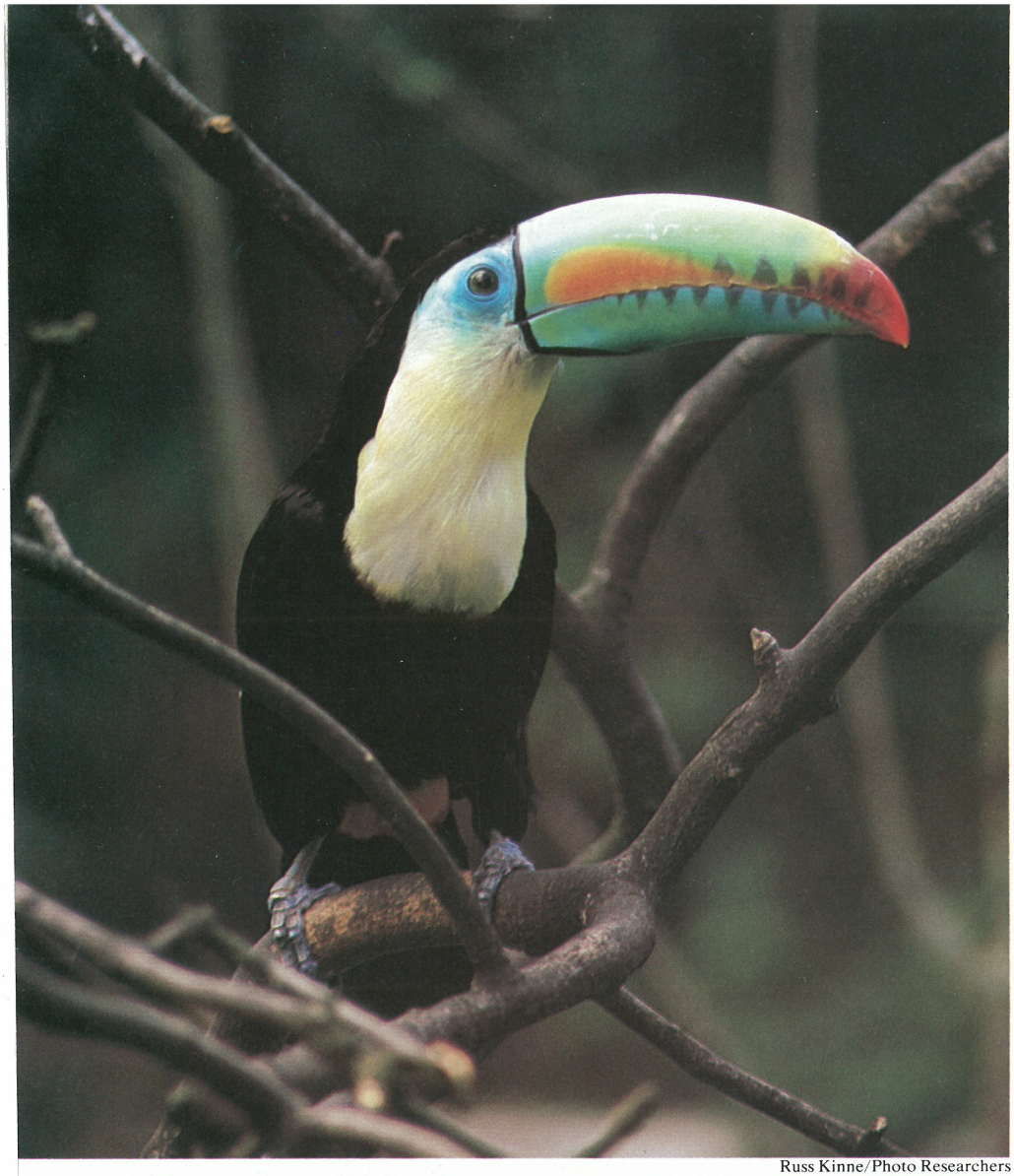
Brian J. Coates/*Bruce Coleman, Inc.*

Nature appreciation proceeds from simple collecting to concern for the preservation of wild animals and plants

by Alexander F. Skutch

PROBABLY most people who take more than a casual interest in nature began their careers as collectors. Delighted by the beautiful or strange objects on which their eyes fell as they wandered through woodland and meadow, they wished to clutch and retain them. A glittering pebble, a colorful molted feather, a brilliant flower, or a curious shell has started many a boy and girl along the naturalist's long road. Desire to possess shining objects is not peculiar to mankind; a number of birds, especially bowerbirds and members of the crow family, display it in high degree.

At this earliest stage of collecting, as among crows, jays, children, and even certain adults, little attention is paid to the wholeness of a specimen. It is not as an example of a certain class of natural productions but as a brilliant or unusual trinket that the attractive object is acquired. In the forested parts of tropical America, one often sees the bright yellow breast of a toucan, or its huge and colorful bill, cut from the bird and stuck up as an ornament on the wall of a rustic cabin. The first skins of birds of paradise to reach Europe were prepared without legs by the natives of New Guinea, who evidently thought that the whole value of the specimen lay in the gorgeous plumage, from whose beauty the quite commonplace avian legs and feet only detracted. This naive attitude was responsible for the name Linnaeus gave to one of these mutilated specimens of a brilliant bird, which, by the rules of zoological nomenclature, it still bears, *Paradisea*



Russ Kinne/Photo Researchers

The true naturalist appreciates the beautiful and exotic red-billed toucan and king bird of paradise (previous page) without wishing to possess them.

apoda, "the footless bird of paradise." Similarly, when children and amateurs collect flowering herbs, they preserve only the blossoms, with perhaps a bit of stem and a few leaves, neglecting the roots, which add nothing to the beauty of their specimens, although they tell the botanist much about the plant's mode of growth.

With those who become earnest naturalists, this kind of collecting is a transient phase, leading to a more mature interest in natural objects as wholes, all of whose parts are significant. If collecting is long and strenuously pursued, so many specimens accumulate that some system for arranging them becomes imperative. This brings us to the second stage in the naturalist's progress, the effort to classify the productions of nature. To do this intelligently, one must pay attention to the structure of the objects to be classified; the more detailed and intimate our knowledge of their structure, the sounder our system of classification will become. It is also helpful to trace the development of the animals or plants in question, for often a study of their earlier stages reveals relationships that are masked when they mature. Investigation of the functioning of the organism, its chemical constitution, and its behavior also contributes greatly to understanding its relationship. Thus anatomy, histology, embryology, physiology, biochemistry, and ethology are pressed into the service of taxonomy, or the science of classification. Many researches in these fields have been instigated by the desire to improve or substantiate a scheme of classification.

As the naturalist continues his long journey through the vast and infinitely varied realm of nature, he becomes increasingly curious about the reasons for the endless array of forms, colors, and habits that it presents to him. No longer content with admiring, possessing, or even classifying the productions of nature, he wishes to account for them; and this brings him to the third stage in his progress, the search for explanations in terms of causal factors or of utility. Every child and savage can see that the toucan's bill is extraordinarily large and brilliantly colored, but what is its significance? How does this bird of the tropical forests happen to have a beak so much bigger and more conspicuous than those of its neighbors of whatever size? How does it help him to fill his vital needs? Or is it actually a hindrance to the bird, an evolutionary freak that natural selection somehow failed to eliminate?

By what course, in response to what needs, and by the action of what agents of selection did the birds of paradise acquire their gorgeous plumage? And from asking these questions in respect of some of the more striking of the colors and structures of organisms, we proceed to ask them about those that are less obtrusive. We may wish to know the function of a little hook on the tip of a small bird's bill, or of certain curious outgrowths on the legs of a bee, or why a certain moth's wings are mottled with shades of gray rather than being as brilliant as the wings of some other moths. The attempt to answer a few of these multitudinous questions may occupy us agreeably for years and exercise our intelligence to its limits.

In making his collection, or trying to answer some of the questions that occur to him, the naturalist commonly treats living things as though they had no will or purpose of their own; and often he deals with them as though they were wholly devoid of feeling. But occasionally a more sensitive and thoughtful naturalist stops to wonder about the inner life of the creatures he studies. How do *they* look upon the world? What feelings or thoughts might they have? Do they observe us while we watch them? He may be led to such questionings at an early age by a sort of natural sympathy, or he may be more tardily brought to them by some of the investigations he has been pursuing.

Thus, the most probable explanation of the origin of the bright colors and

ornamental plumes of birds of paradise and many other beautiful animals of diverse orders is that they were acquired by the process known as sexual selection. If the females of any species mated with slightly more brilliant males in preference to duller ones, this should lead, in the course of generations, to their ever greater beauty and grace. But this explanation makes certain assumptions about the psychic life of the animals in question, for it attributes to them aesthetic responses or something quite similar, and it thereby introduces us to that vast, unexplored realm, the inner life of nonhuman creatures. The effort to enter this realm, whether by the bold exercise of imaginative sympathy or by groping analysis, constitutes the fourth stage in the naturalist's progress.

When the naturalist who began his career by regarding nonhuman creatures as hardly more than potential specimens begins to suspect that they may have feelings and thoughts, volitions and purposes of their own, he has reached, by a long, circuitous path, the attitude of every untutored child and primitive man, who never doubts that animals of all kinds, and perhaps even trees and other plants, enjoy an inner life not greatly different from his own. And when he reflects that his acts may affect their happiness, bringing them pleasure or pain, joy or sorrow, the morally mature man, be he a naturalist or otherwise, begins to ask how he should govern his dealings with them. How should he conduct his life in order to bring the minimum of pain, or the maximum of contentment, to these other sentient lives that encompass him? He desires ethical guidance, a code of morals that will regulate his relations, not merely with other members of his own society or of his own species, but with all beings that may somehow be benefited or harmed by his acts.

Obviously, moral problems, often perplexing enough even within the narrow context of human society, become vastly more complicated when extended to cover the whole living community. Nevertheless, no thoughtful and compassionate person can contemplate man's relations with the rest of the living world without ardently desiring their improvement, and perhaps detecting a number of ways in which this might be done. This desire to be moral in our dealings with all living things, this searching for ethical principles to regulate our treatment of them, marks the fifth stage in the naturalist's progress; it follows directly, almost inevitably, from the fourth stage, in which the naturalist begins to wonder about the quality of consciousness in the animals he observes. Certain other cultures reached this point millennia ago, by a route very different from that we have traced; but Western civilization, with its own peculiar background, seems most likely to attain it by the roundabout path of the naturalist.

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Of the many who take the first steps along the naturalist's long road, only a few persevere until they arrive at the fifth stage. Even fewer reach the sixth, which we enter when we ask: "What is the significance to me of this so varied world in which I find myself?" This, of course, is the supreme question that religion and philosophy have long tried to answer, each in its own manner; hence it cannot be regarded as one peculiar to the naturalist. But it seems to acquire breadth and depth when one reaches it along the route of the naturalist, who was first attracted by the beauty and strangeness of nature's productions; who laboriously collected and tried to classify them; who endeavored to explain the function and mode of origin of some of them; who speculated about the inner life of the creatures that display such a vast variety of forms and colors; who thence became concerned about his treatment of them as affecting their own welfare.

Far more than the philosopher whose days have been passed in academic cloisters, far more than the mystic who has striven to reach the Godhead by averting his gaze from the world around him and sinking into the inmost depths of his own being, the student of nature is aware of the endless diversity of creation, of the intricate interactions among its myriad forms, of the startling contrasts between supreme beauty and appalling ugliness, between tender love and violent rage, between beneficent growth and destructive fury, that this baffling world presents. He wishes to know for what purpose, if any, he has been thrust into its midst, what ultimate significance is to be found in his presence here, to what end the whole vast, confusing pageant is moving. This last question seems to include in its wide scope the answers to some of the earlier questions, so that if we could answer it convincingly, we might also know the answers to them. If, for example, one were sure of the significance of one's own life, one could better understand life's meaning for other creatures.

These final questions evidently carry us far beyond the "scientific" study of nature. We often forget that science is the deliberate effort to solve certain limited problems by limited means. The scientist investigates the phenomena manifest to his five external senses, with or without the aid of instruments that report to them; he has decided to employ in his researches only the data these senses yield to him. In the attempt to understand the relations between these phenomena, this has proved to be an efficient method; the scientist's success in his self-appointed task proves the wisdom of the limitations he has imposed upon himself. Nevertheless, these same limitations have placed vast segments of reality beyond reach of the scientific method. No one is more poignantly aware of this than the naturalist who follows his chosen path as far as it can take him.

Alexander F. Skutch, a Maryland-born naturalist who has lived for four decades in Costa Rica, was awarded the 1983 John Burroughs Medal for his book, A Naturalist on a Tropical Farm. *This essay is excerpted from* Nature Through Tropical Windows, *a companion volume being published in November by the University of California Press.*