

on an auditory as well as a visual plane. Nonstop vocalizations in the spring and foresummer form a territorial barrier using bricks of sound. Later, the male and his mate duet—exchange antiphonal calls—as a prelude to nest site selection and copulation. Duetting is a pair bonding mechanism shared by other deep forest birds who otherwise might lose contact among the living green curtains.

The need for a quality, interruption-free sound environment continues throughout the trogon breeding cycle. Both sexes take turns at incubation, and nest exchanges are heralded by the calls of the returning bird. After hatching, the young elicit feeding by calling. Whether nestling or fledgling, the parents seem to assume their offspring are sated unless they cry out for food.

The life of an Elegant Trogon is governed by both its ability to hear and to be heard. I have seen courtship stopped cold when a VW microbus sans muffler chugged past a nest hole in South Fork. I have seen nestlings starved while a road grader operated 150 yards away.

It was a typical Fourth of July weekend in 1978 at the U.S. Forest Service campground. Every site was taken and there was stereo music, generators, and fireworks. Later, I found eggshells in the nest there that I had been watching the preceding two weeks. Trogons simply cannot tolerate a polluted sound environment.

VI Ego

Because trogons lack exceptional size, speed, or other extraordinary defensive mechanisms, they must survive by their courage and wit. They cannot fly very fast or far or resort to group strength for protection.

Their problem is further compounded by a low reproductive rate. Unlike multiple brood species such as Painted Redstarts, or species with large clutches such as Montezuma Quail, Elegant Trogons only nest once per year—and then usually only raise two young. There is no margin for stupidity or cowardice in the trogon's way of life.

Psychology defines the ego as that which organizes thought, governs action, and mediates between instinct and the demands of the environment. It is the only word I know of that bridges the three highest categories of trogon mentality.

Communication

Few birds of the Arizona border ranges are as vocal as the Elegant Trogon. All facets of their life history are presaged by calls that trumpet their moods and which are plainly meant to communicate with other trogons, other animals, and even human beings. Frequently these vocalizations are accompanied by dramatic visual displays.

After years of research, I feel that there are at least eight Elegant Trogon calls that lend themselves to field interpretation:

Koink: This call, used primarily by the male to delimit its territory and to advertise for a female upon its arrival in the spring, is delivered in a series of four to six calls per round, one per second. It almost seems to rhyme with the *oink-oink* ascribed to pigs in nursery tales and has the most metallic quality of any trogon call. Occasionally, the males will tee up in tree tops while *koink-ing*, ignoring human passers-by and displaying their red breasts to full advantage. An unmated male may use this call monotonously all day long, especially if no other males challenge or females answer. If a female does fall under the hypnotic spell of the male's song, she will occasionally respond with a few bars of her own, although only sporadically. Her *koinks* are pitched deeper and sound more hoarse than her mate's, but the distinction is too subtle for most observers to recognize without considerable previous experience with the species.

Koa: Once a territory has been established, either sex may issue a series of *koas* to challenge a trespassing trogon, a flock of Gray-breasted Jays, an Apache Fox Squirrel, or a bird-watcher. But males make use of this call much more than their mates, and frequently they display on a clear perch in full sun as they croak their displeasure in a sequence of three to 50 *koas* in a row. A variation on this same call, *koy*, probably indicates a different level of intensity.

Kow: Paired birds sing this soft and plaintive note antiphonally to maintain contact while foraging in their territory. Males also seem to use this call to coax hens considerable distances up or down canyons to prospective nest trees. In this latter case, it appears to literally mean "come here," although I know it's rank scientific heresy to credit a wild bird with this sort of conscious thought.

Kuh: Low and throaty, this short, monosyllabic note is repeated without interruption until the mood of the trogon changes. Only paired birds use this call and it apparently serves a dual function. First, it shows reproductive interest.

Both sexes utter this note as a prelude to copulation, and the male delivers this call from within the confines of a tree cavity to lure his mate into a prospective nest.

Kuhs are also employed in territorial disputes between two or more males. Often there is considerable chasing and dodging through low, dense vegetation between bouts of vocalizations. Infrequently, the cocks become so aroused that a lengthy sequence of notes leads to a down-spiraling minuet, each male facing the other with its white undertail outspread until they alight on a log or on the bare ground. Here they may perch a foot apart for five minutes or more. Meanwhile, they lean at each other with breasts puffed up, mutter *kuhs*, but refrain from actual contact. Ultimately, the tension proves too great, and one of the combatants flees.

Ha! This emphatic note is the male's war cry. Seldom heard, it sounds almost like human laughter, but each note of the series is distinct and sharp. Unlike the *Kuh*, *Ha!* calls are only used by a dominant male as it drives an intruder male out of its territory.

W-k-k: Both sexes use this short, sharp, metallic flight call. It is most apt to come as a trogon explodes off a perch and it may be delivered several times at half second intervals while the bird is airborne. Each rapid utterance lasts approximately half a second. The white undertail rectrices flash fan-like during the flight and reinforce the locational purpose of the vocalization. More often than not, however, Elegant Trogons choose to fly silently.

W-kkkk: Adult trogons use this call to express alarm. Typically, the penetrating opening note trails into a series of hoarse *clucks*. When the bird is extremely agitated, the alarm call accelerates into a rapid, almost unending slur that may continue a minute or longer. This vocalization is invariably accompanied by an upward whip of the tail which reveals the red belly of either sex, before it is slowly lowered. The whole tail pump display only lasts about one second. Trogons use the *W-kkkk* before attacking another species, such as an Apache Fox Squirrel. I have heard female trogons give this shrill call before attacking an intruder female trogon. Use of the alarm indicates

either a nest or fledglings are nearby. When birders—knowingly or not—approach too close to either an active nest or young, adult birds always signal their distress with this vocalization.

Interestingly, *W-kkkk* is also the first call in the adult repertoire used by fledglings, generally beginning about a month after they leave the nest. They also accompany the call with the tail pump. When given by fledglings, it seems intended to draw the attention of the parents, to show their location, and to indicate their hunger.

Tu-u: Nestlings and young fledglings deliver an uninterrupted series of clear, evenly spaced, high pitched, bell-like notes that may continue a half hour or longer until they are fed. The *Tu-u* usually seems faintly echoic or quavering, probably because two babies are begging for food simultaneously. When the adults arrive bearing sustenance, they are greeted by an explosive, short-lived chittering that dies away as the babies receive food.

Intelligence

A variety of field experiences impressed me with the ability of *Trogon elegans* to profit from the past. I suspect trogons can remember a successful nest.

Once fledging occurs, the family unit leaves the cavity for the remainder of their stay in Arizona. Then, a minimum of six months later, some trogons apparently manage the salmon-like feat of returning to their home mountain range and even to their nativity canyon. The peg-legged trogon in South Fork used the same quarter mile stretch of canyon bed for three years, for example. But their memory must extend beyond that.

In 1977, I watched a running battle between a first-year male and his probable male parent for the last two weeks of July. The adult bird had already fledged two young before the hatching-year trogon, identified by its heavily barred undertail, even arrived. For two weeks, the cavity in the half-dead oak had been vacant.

Therefore, I was off-guard when, while showing the nest tree to Jim des Lauriers of Chaffee State College, a trogon head suddenly popped out of the hole. Seconds later, the bird caromed off through the sycamore and cypress forest with the adult male in hot pursuit. The two principals re-enacted their primal confrontation on a daily basis for the remainder of the month.

Memory offers the most satisfactory account for the young trogon's behavior—it recognized the cavity it had experienced as a nestling. Since then, I've witnessed other clashes between yearling and adult males over nest chamber proprietorship. One nest in South Fork, first shown to me by des Lauriers, yielded three generations of Elegants before disturbed by a photographer the fourth year. Whether no trogons survive who used the nest, or whether the survivors possibly do remember it, this site has not been occupied since 1977.

Another important Elegant Trogon intelligence trait is their ability to become habituated. A trogon which lives in the Hopkins Fork of Madera Canyon, South Fork Cave Creek, or any other popular locality must adapt to extraordinary birdwatching pressure. As few as a dozen Arizona trogons share the spotlight for tens of thousands of birdwatchers.

Trogons can't and don't ignore the problem; many develop elaborate dodges for fooling the public. But numbers, the birdwatchers' dogged determination, and luck all work against the campground trogon. In a comparatively short time, some bravo males do learn to entertain a certain measure of human attention. At least until they have young in the nest.

Finally—exactly analogous to trapwise mammals, to bears, coyotes, and mountain lions—some trogons become so familiar with tape recorders that they refuse to be baited into view. Here is an indisputable case of reasoning taking precedence over instinct.

Character

Near dawn on July 18, 1978, I found a nest of the Elegant Trogon in Madera Canyon of the Santa Rita Mountains. Only 35 feet away, a family of Cooper's Hawks had set up their own