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### Crane Music

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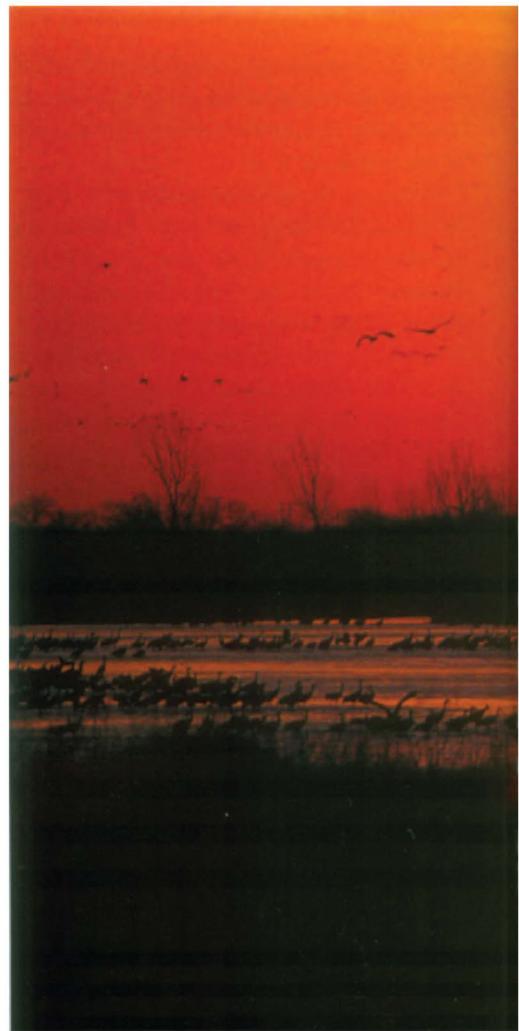
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# Crane Music

Text and Drawings by Paul A. Johnsgard

*Since human eyes first beheld a crane, their penetrating calls, dancing displays and mystical comings and goings have captured our imagination and held us transfixed. Although we know much about their biology today, cranes still seem to come from the realm of the unknowable.*

**C**ranes are the stuff of magic, whose voices penetrate the atmosphere of the world's wilderness areas, from arctic tundra to the South African veld, and whose footprints have been left on the wetlands of the world for the past 60 million years or more. They have served as models for human tribal dances in places as remote as the Aegean, Australia, and Siberia. Whistles made from their wing bones have given courage to Crow and Cheyenne warriors of the North American Great Plains, who ritually blew on them as they rode into battle. These birds' wariness, gregariousness, and regularity of migratory movements have stirred the hearts of people as far back as medieval times and probably long before, and their sagacity and complex social behavior have provided the basis for folklore and myths on several continents.

**T**he actual migratory journeys of cranes are no less interesting than they were imagined to be by the

peoples of medieval times. In recent years it has been possible to follow these movements very closely, by using radar or radiotelemetric devices or by following migrating flocks in small airplanes.

In the case of the sandhill crane, the birds prefer to fly on clear to only partly cloudy days. They normally land before dark, and usually begin to arrive at roosting sites by about sundown. Nearly all migratory flight in this species occurs at elevations below 6,000 feet, generally between about 1,000 and 3,000 feet. Such altitudes are high enough that landmarks are visible from great distances, and place the birds well above ground turbulence or obstacles. The birds also choose those days for migratory flights when they can exploit following winds rather than face crosswinds or headwinds. On the rare occasions when sandhill cranes have been observed migrating during inclement weather, barometric pressures have been rising in those areas toward which the birds were flying. Equally remarkably, sandhill cranes have been observed to

terminate a migration leg early in the day, apparently sensing the approach of bad weather well before it has actually arrived.

Flock sizes of migrating cranes vary greatly, probably influenced by factors as total population size, levels of social tolerance or gregariousness in the species, degrees of disturbance on roosting and foraging areas, and time of year. In whooping cranes, for example, spring flocks average somewhat larger than fall flocks, but in both seasons the average flock sizes are rather small, 3.1 and 2.6 birds respectively. Flock sizes of field-foraging sandhill cranes during spring migration in Nebraska are also typically small. Over three-fourths of such flocks have no more than 50 birds, with the most common social units of two or three birds probably representing individual pairs or



PHOTO BY JON FARRAR

family groups. However, the roosting flocks are much larger. At times these huge flocks of birds standing in the safety of the shallow river water number 15,000 or more. These large numbers reflect the relatively few areas of the Platte River that still comprise ideal roosting habitats, and the resultant crowding of birds into these confined stretches of the river.

The main factor affecting the daily timing of roosting flights is light level, with the majority of the birds arriving at the roost by sunset, nearly all of them within 15 minutes after sunset. Delayed returns to the roost often occur under conditions of a clear sky, moderate to high temperatures, and no wind. Similarly, morning departures from roosts are associated with sunrise; more than half of the birds usually leave the roost by a half-hour after sunrise, and nearly all will

have left during the first hour. However, heavy clouds, fog, rain, and strong winds all tend to delay morning departures. Judging from limited observations on other crane species, much the same pattern of diurnal activity seems to be typical of cranes in general.

Cranes take flight from a running start into the wind, finally springing into the air and slowly gaining altitude. In flight they present an appearance distinctly different from that of geese, in that the wingbeat is more shallow and the upstroke is noticeably more rapid than the downstroke. This rapid upstroke is especially conspicuous among frightened birds trying to gain altitude quickly. Furthermore, perhaps because of their less labored flight than that of generally heavier birds such as geese or swans, they rarely maintain a fixed formation for any

*As woodlands encroach on the shorelines and sandbars of the central Platte River, the number of sites suitable for sandhill crane night roosts has also shrunk. Sometimes 15,000 or more birds crowd onto one roost. Most cranes return to the river after sundown and begin leaving even before sunrise, though heavy cloud cover, fog, rain or strong winds may encourage them to linger later in the morning. On river roosts and when feeding in meadows and grainfields, cranes distribute themselves evenly (page 10), roughly the distance they can strike with their rapier-like bills. Cranes have a variety of calls, and the meaning of some, such as the "unison call" (page 11), varies with the context in which they are given.*



PHOTO BY DON CUNNINGHAM

length of time, except when migrating at high altitudes. Instead, the flock pattern is constantly undulating and changing, without any definite lead bird for much of the time. At fairly close range the long and trailing legs of cranes also visually set them apart from geese, although during cold weather it is not uncommon for some of the flock members, especially young birds, to tuck their legs forward into their flank feathers and thus assume a surprisingly goose-like profile. Landing is also done against the wind, with the legs dangled pendulum-like, providing for a lowered center of gravity and increased stability, as the tail is spread and the wings cupped. In this way the birds descend parachute-like almost vertically to their roost, finally breaking their descent during the last few seconds by wing flapping.

**W**hile flying, and especially during landings and takeoffs, cranes utter a constant clamoring, enabling pair and family members to maintain vocal contact amid the confusion of flock movements. Although it remains to be proven, there seems little doubt that cranes must be able to recognize their mates or other family members by their vocal traits, for it is common for pairs to maintain "conversational" contact with one another when they are out of each other's sight. When lone birds have somehow been separated from their social groups, it is common to see them flying back and forth over roosting flocks, calling almost constantly.

Indeed, it is the mutual calling of paired cranes that provides a basic key to the understanding of their social bonding, and no observer of cranes can begin to





PHOTO BY KEN BOUC





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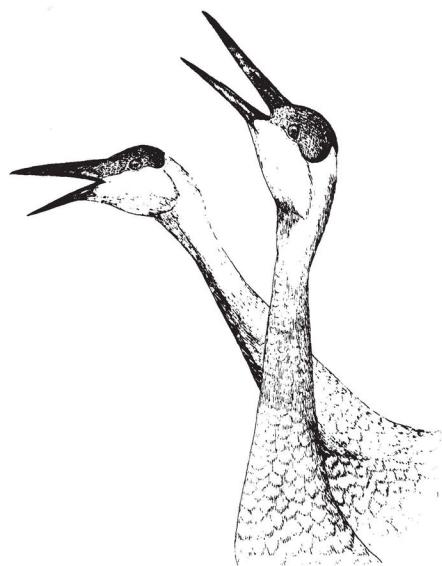
understand their interactions without some appreciation of the importance of this mutual calling behavior. Although there are several other contact calls in cranes, the most important of these is the "unison call." This call, which develops during the second or third year of life, is a complex and extended series of notes uttered by paired birds. It is uttered in a time-coordinated sequence, with the birds typically also standing in a distinctive posture and a specific spatial relationship to one another. This posture is always an erect and alert one, with the wings folded and the primaries often drooped while the inner elongated and ornamental "tertial" feathers are raised. The birds are oriented side by side or facing one another. The "unison" call sequence may last from only a few seconds to a minute or more. The associated vocalizations are typically the loudest and most penetrating of any of the species' calls.

These observations and correlations suggest that the unison call has a variety of social functions. Perhaps most importantly, it seems to be a basic mechanism for individual pair bonding and pair maintenance, and at least in some species it may also serve as an important sex-recognition device. It also serves as a territorial advertisement call and as a general threat call, as it is often stimulated by the intrusion of a potential enemy into

the breeding area of an established pair. It might also serve as a synchronizing mechanism for the pair members, helping to bring them into reproductive condition simultaneously. Recent research on sandhill cranes tends to confirm this idea. Males are evidently brought into reproductive condition by increasing day length; ovarian development in females evidently requires further stimulation through unison calling behavior with their mates.

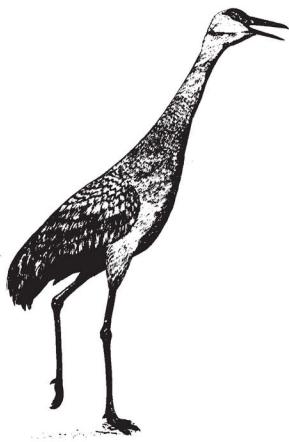
**B**esides their call similarities, cranes share a number of "egocentric" or individualistic behavior patterns that are fairly uniform throughout the entire group. All cranes older than chicks usually sleep while standing, often with one leg raised. However, both young and adult birds may sometimes rest or sleep in a sitting posture, with the legs folded underneath and the abdomen resting on the substrate. This is also of course the incubating posture, with the head resting comfortably on the breast, or lowered almost to the ground when the incubating bird is trying to avoid detection. While sleeping, the birds often tuck their bills into their scapulars, but during incubation they rarely if ever sleep, and the incubating bird seems constantly alert to danger. Occasionally, a standing crane may rest on its "heels," although this posture is not

*A pair of sandhill cranes may dance in near synchrony, one bird may dance alone (opposite), or dancing may become contagious, with a number of birds participating. The meaning of the dance depends on the context in which it is performed. Cranes dance before flying, when threatened or as part of the courtship ritual. Cranes indicate their intention to fly by extending and lowering the head and neck (above). The center crane in the photo above is an immature bird, recognizable by its brownish plumage, the absence of white on the cheeks and the dull red patch of skin above the eyes.*



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*Like most birds, a crane drinks by dipping up water in its bill, then tilting the head upward to swallow (below). When flying in cold weather, some cranes, especially young birds, tuck their legs into their flank feathers (opposite).*



nearly so common as it is among some heavier long-legged birds such as storks.

Like nearly all birds, cranes drink by quickly dipping their bills, then tilting them upward to swallow. Seeds and insects they obtain from the substrate by pecking, or by digging and probing with the tip of the bill. Prior to taking off, cranes often assume an "intention" posture in which the head and extended neck are gradually lowered to an almost horizontal position. This distinctive posture may help to coordinate flight in a group, or at least warn others nearby that one of their flock members is about to take off. Cranes also perform several stretching behaviors. These include the simultaneous stretching of one wing and the leg on the same side of the body, a double wing stretch about the back (with the head and neck simultaneously lowered and stretched forward), and a similar double wing stretch but without

the head lowering.

All cranes preen in a consistent manner. This involves extensive nibbling, drawing of the feathers through the slightly opened bill, and associated oiling behavior. In a few species of cranes (especially sandhill cranes, and to a lesser degree Eurasian cranes) there is an interesting related behavior that is performed by breeding adults immediately prior to nesting. In sandhill cranes the birds "paint" almost their entire body plumage with mud or rotting vegetation that they probe for with their bills, gradually staining their basically grayish plumage into a brownish to reddish brown color. In this way the entire bird eventually assumes an appearance that closely matches the color of their dead-grass nesting substrate. During fall and winter these stained feathers are gradually lost by molting, and so the process must be repeated annually.



Preening, feather ruffling, and similar body care activities also occur in a social or "display" context in most and probably all cranes. These movements often scarcely differ from their normal nondisplay counterparts performed in nonsocial situations, and are usually overlooked by the casual observer. However, they are among the most important of the visual signals of cranes, and careful watching will often allow the observer to gain a keen insight into the social interactions of a crane flock, as well as judge crane responses to humans or other animals.

The commonest social displays of cranes in aggressive situations consist of "ritualized" preening movements, which may seemingly be directed toward the back, wings, or elsewhere on the body. These preening movements are performed silently, but the preening bird rarely if ever takes its eyes off the individual toward whom the display is ac-



PHOTO BY JACK CURRAN



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tually directed. Sometimes the preening is interspersed with feather ruffling on the back, inner wing feathers, or the body feathers in general, and commonly the bare head skin is maximally exposed and intensely red during such behavior. A stiff-legged, march-like approach is often part of the aggressive repertoire, usually with the bill downward so that the bare crown is directed toward the opponent. In some cranes the bird may even sink to the ground in a "crouch-threat," with the wings somewhat spread and the bare crown skin greatly expanded. A very common aggressive display is to spread or variably lower both wings while facing the opponent, especially for those birds that are defending their nest site or young. This display sometimes grades into "broken wing" behavior, in which the displaying bird attempts to decoy the intruder away from the immediate vicinity.

Of all the social displays of cranes, none is more interesting or complex than

"dancing." Dancing behavior has been observed in all crane species, but it has been carefully studied in only a few, and its functions are still both controversial and perhaps manifold. Although dancing varies greatly in speed and intensity among cranes (smaller species dancing with greater speed and vigor than larger ones), it seems to have a few common components in all. The two major ones consist of a lowering of the head nearly to the ground while simultaneously lifting and spreading the wings, and a sudden return of the head upward and downstroking of the wings. Actual jumping often accompanies this return phase, in which the bird may also pick up and throw upward a stick or piece of vegetation. Sometimes two birds perform these activities in synchrony or near synchrony while facing one another or standing side by side. At other times a single bird may dance, or a large group may participate in the activity to varying degrees. The be-



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*By riding thermals, cranes minimize the effort required to soar (opposite). Similarly, cranes typically migrate on days when tailwinds prevail. Sandhill cranes become tolerant of routine human activities, and often feed in fields adjacent to farm buildings.*



PHOTO BY JON FARRAR



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*The sandhill crane is the oldest known bird species surviving to the present day, their history extending back at least nine million years. Cranes were already inhabitants of the earth when the earliest primates evolved. Through the cataclysmic shaping of the continents, they adapted and prospered, and yet, during the heartbeat of geologic time they have co-existed with man, they have not fared well. If, in the future, sandhill cranes are still gliding down across a setting sun to the safety of Platte River shallows, it will only be because we finally have come to realize that we all share one earth.*

havior tends to be contagious, and a period of intense dancing may quickly spread through a social group. Dancing sometimes leads to flying, especially when it is stimulated by a threatening outside source, such as the appearance of a potential predator. Dancing also sometimes leads to fighting among the participants. It can occur at any time of year, and among birds of all age groups. It is prevalent among birds that are forming or have recently formed pair bonds, and so its possible role in this general process cannot be dismissed. However, dancing often seems to reflect a general sense of excitement or limited aggression among cranes, and as such it has less circumscribed functions than courtship.

**T**he winds of change have since repeatedly come and gone. The cranes of Europe ignored the human repression and Black Death of the Middle Ages, those of Asia have witnessed one horde of human invaders after another across the central Asian steppes in vain dreams of glory, and the North American cranes have survived the plunder of a continent's natural resources in a minisecond of geological time. During the past century, humans have managed to put nearly half of the world's cranes at risk, at the very time that we might do well to listen to their ethereal calls, which drift out over space and time in a haunting and somehow omniscient cry that carries both the authority of his-



PHOTO BY JON FARRAR

tory and the urgency of reality. Cranes learned long ago of the need for social living in an indifferent or hostile world, of the value of prolonged and intense parental care, and of concern for the safety of the flock in the face of danger. They have seen mountain ranges rise and crumble, have watched entire civilizations rise and fall, and have observed great climatic changes that sometimes brought other animal groups to extinction. Yet each year they dance with an exuberance that gives joy to anyone with the eyes to see it, or even the imagination to visualize it. They seasonally cross entire continents with a precision that makes our best instruments seem inadequate, and fly with a breathtaking beauty

that must make every pilot more than a little envious.

Humans have assigned themselves the unique privilege of determining which of the world's endangered plants and animals are worth saving and which are not. In making such decisions, we must be able to look beyond the obvious. Cranes will never allow themselves to be fully domesticated, nor will they ever provide humankind with a source of unlimited food or eggs. They are here in part to remind us that there should always exist a few wild places on earth where only very special animals can survive. Such animals carry with them unspoken messages from those remote and wonderful places that only they can visit easily. ■

*Paul A. Johnsgard is a Foundation Professor of Life Sciences at the University of Nebraska/Lincoln and author of numerous books on birds. This article is adapted from the book **Crane Music: A Natural History of American Cranes** by Paul A. Johnsgard, published by the Smithsonian Institution Press. Copies may be ordered from the Smithsonian Institution Press, Department 900, Blue Ridge Summit, PA 17294-0900 (toll-free 1-800-782-4612). The price is \$19.95 per copy (hardcover only), plus shipping and handling (\$2.25 for the first book, and \$1.00 for each additional book). Please include the ISBN 1-56098-051-6H.*