AN ATTEMPT TO RATIONALIZE ON THE VOCALIZATIONS AND DISPLAYS OF CAPTIVE INDIAN EAGLE OWLS, *BUBO BUBO BENGALENSIS* FRANKLIN

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Abstract

Since its inception in 1975, Gratitude Avian Rehabilitation (GAR) has been involved with the care of orphaned and injured birds and their rehabilitation. In December 1996 GAR acquired an orphaned young *Bubo bubo bengalensis*. Since then two more have come into its possession. Given the birds' status (Schedule I of the Wildlife Protection Act, 1972), lack of suitable untenanted habitat and risk of releasing raptors not well schooled in the art of hunting, it was decided to establish a captive breeding population with the aim to rehabilitate future generations - as has been so successfully carried out in Germany, Sweden, etc. with the European sub-species *Bubo bubo bubo*. Meanwhile ethological and ecological field studies were undertaken to better understand the wild populations and habitats in and around the Union Territorry of Pondicherry.

Key words

Bubo bubo bengalensis, *captive behaviour, communication, auditory, visual, raptors*

Introduction

Early in 1997 it was found expedient to know details of the life history of *Bubo bubo bengalensis*. Enquiries into established literature (Ali & Ripley, 1969; Ali, 1996; Dharmakumarasinhji, 1954) left a lot to be desired. Early published information dealt almost solely with taxonomic characteristics and later accounts were brief notes of casual observations.

In the course of our studies some interesting factual behavioural aspects have come to light. This preliminary report aims to present the calls and displays employed by *B. b. bengalensis*, emphasising their casuations and functions.

I have advertently written this report for the specialists, interested naturalists, ornithologists and psychologists. As such, this paper has certain characters of a compromise. Also, I wish to state that as the natural history of any animal species is highly complex, this initial descriptive phase can by no means be considered to have been completed.

Conditions of observations

These notes are based on continuous observation of three birds (1 Male, 2 Female) from January 1997 to June 1999. During this time the birds occupied an interconnecting facility consisting of an outdoor flight area and rooms. The flight area was well planted with creepers and shrubs as well as being provided with perches, logs, posts, rocks and a wooden shelf. The indoor areas had shelves, boxes, logs and perches. Low intensity bulbs, projecting soft artificial light, permitted observation at night. On 25 June 1999 the birds were transferred to a larger, more naturalistic facility with less human disturbance, since when continuous monitoring has ceased.

Intensive field studies were concurrently carried out in Pondicherry University campus, Ousteri Lake and scrub jungles and Auroville - Kaliveli areas from March 1997 to December 1998. Intermittent observations were made in Nanmangalam scrub jungle, Chennai and Arignar Anna Zoological Park, Vandalur, Chennai.

Auditory communication

Territorrial call:

Described as "a deep, resonant *bu-bo* (accent on 2nd syllable much prolonged) repeated at intervals; not particularly loud but with a curious penetrating and far carrying quality. This call has also been rendered as a deep and solemn *dur-goon* or *to-whoot*" (Ali & Ripley, 1969).

From our observations and recordings every bird has a distinctive

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call and calls vary considerably. In general the more vocal adult male has a melodious voice, while those of the females are harsher and shorter. Everytime the call is made, the gular region is inflated making the white throat patch flash conspicously; the tail is raised then lowered and 'horns' are usually erected. This call is heard throughout the year, escalating in frequency towards dawn and dusk. Increased frequency was also observed during the courtship season in the months of September-October following the S.W. Monsoon.

Following Jim Farrell's method of locating and monitoring *Strix occidentalis* in USA (National Wildlife, 1991), pre-recorded calls of wild birds to captives and vice-versa were played. This never failed to elicit a response - the captive male was always deeply interested and would continuously answer the player, coming very close to investigate.

Recognition call

A soft, rapidly repeated "*Kuk-Kuk-Krk-rk-rk-krk....*" occurs when known birds were sighted or known keeper approached. Occassionally, in the male, this call followed the territorrial call , especially if known birds were near. As the captive male uses this call while approaching hidden dominant female, it could have features of appeasement.

Hunger call

A throaty, growl like "*Wharr*" or "*gruu*". Most often heard around the accustomed feeding time and will escalate in pitch and frequency if food is delayed. Ceases as soon as feeding commences and never occurs until owl regurgitates pellet (which occurs 14 to 23 hours after feeding).

Begging/submissive chick-like vocalizations

Produced when young owls are fed by hand, when female is offered food by male and usually during the submissive gesture; also produced when bird has to be caught or restrained.

Alarm call

A harsh, loud "*Keaou-Kak*", "*Keaa-Kak-Kak*" or "*Nyet-nyet-nyak*". Usually heard when a predator - mongoose, cat or large snake is sighted. The bird making the call is usually not unduly alarmed, but the call has a distressing effect on others out of sight. Playing this call to wild and captive owls induces apprehension. It may be employed for dual purposes - to frighten away predators and warn other owls of danger.

Aggression calls

Hiss: Denotes annoyance. A sound emitted with open beak and employed by birds of all ages. This vocalization always accompanies intimidatory and agnostic displays, and precedes bill clapping. This behaviour is documented in this sub-species (Ali & Ripley, 1969; Dharmakumarasinhji, 1954) and seems to be common to most species of owls (Austin, 1962; Burton, 1973; Grossman & Hamlet, 1964).

Bill clapping: Denotes a high degree of annoyance. The lower mandible is extended over the hook of the upper, pressed hard and withdrawn at speed to produce an audible clap. Bill clapping, also known as bill clicking or bill clacking, is used by all strigiformes and is one of their unique characteristics (Abdulali, 1947; Ali & Ripley, 1969; Austin, 1962; Burton, 1973; Grossman & Hamlet, 1964; Kumar, 1985; Lloyd & Lloyd, 1969).

Bill Clapping
A - Lower mandible extended over hook of the upper and pressed; B - Lower mandible withdrawn to produce an audible clap.

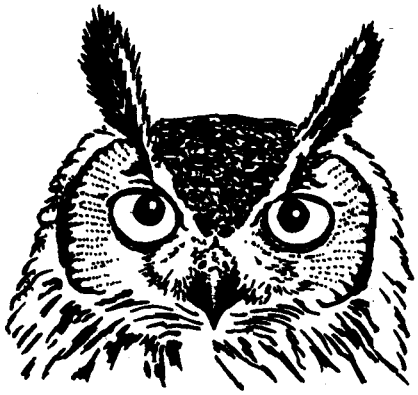
Postures and displays

Positions of 'horns'

'Horns', also known as 'ear tufts' or aigrettes adorn the heads of many species of owls. These can be erected or lowered. The degree of alertness can be ascertained by the positions of these aigrettes – the more erect, the more alert, the more drooping (as when sleeping or in repose) the more relaxed. Various intermediate stages exist, and often one 'horn' may be erected while the other droops (often the eye below the drooping aigrettes is closed).

Bob

Signifies extreme interest/inquisitiveness. The owl stares at the object of interest and 'horns' are erected. It bows low and then erects the body, often craning its neck to get a better view (owls have quite long necks in spite of their external appearance). It may shuffle from foot to foot and occassionally twist its neck so that its head is nearly upside down.



'Horns' up position

'Horns' down position

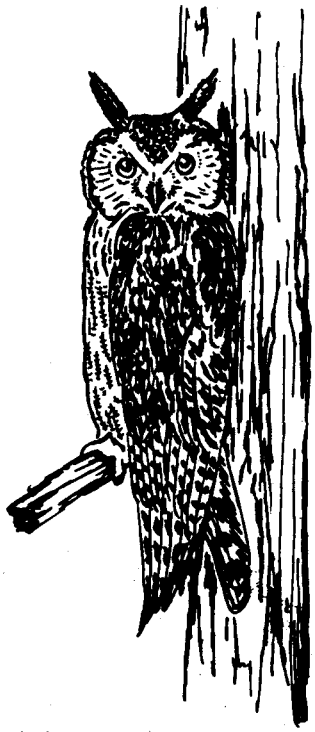
This behaviour has been recorded in other species of owls, especially those of the genus *Athene* (Ali & Ripley, 1969; Ali, 1996, Kumar, 1985; Baker, 1967; Dubois & Lesaffre, 1994), though the display of *Bubo bubo* is not as comical as that of the smaller species.

Bob

Sleeked plumage

A concealing posture adopted by species that rest outside during the day (contra. to cavity resters) and has been recorded in the European and North American species *Otus asio* (Bent, 1938; Rand, 1967), *Asio otus* (Bent, 1938; Dubois, & Lesaffre, 1994), *Asio flammeus* (Faucher, 1958; Urner, 1925), *Aegolius funereus* (Bergman, 1992), *Strix nebulosa* (Bull & Hejum, 1989), *Nyctea scandaica* (Dif, 1995) and *Otus scops* (Dubois & Lesaffre, 1994).

This posture is adopted during the daytime when resting on a branch (usually close to main trunk) or on the ground (under a bush). The feathers are drawn in tightly, giving it a sleek look. It sits motionless, relying on its perfectly marked dorsal plumage for camouflage.



Sleeked plumage while resting on branch.

Ruffled plumage

An intimidatory posture adopted by all owls (Lloyd & Lloyd, 1969) and documented in this sub species (Ali & Ripley, 1969). It is adopted to impress/intimidate other owls, possible enemies, impress partner during courtship and intimidate competitors whilst feeding.

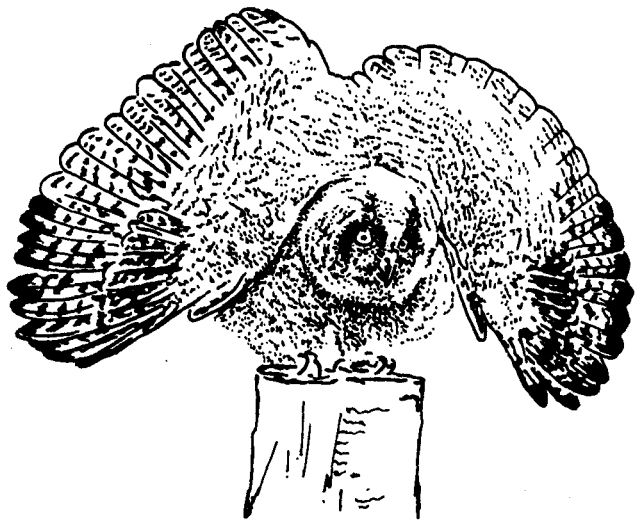
The owl stares unblinkingly at the source of annoyance and erects body plumage, making it appear larger then normal. If threathened by an intruder loud hissing/bill clapping accompanies the display. This display serves well to keep away

small predators and other owls. If annoyance persists, and depending on the source, the owl will assume one of the next two postures or simply fly away (if the 'enemy' is man).

Ruffled plumage while feeding.

Intimidatory display

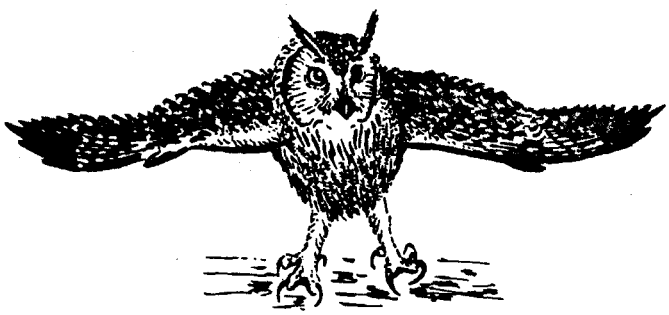
The most well known of all displays well documented in this sub-species as well as the European (Heut, 1994), and seems to be common to most, if not all the Strigiformes (Lloyd & Lloyd, 1969). A grotesque display, commonly indulged in by nestlings and juveniles; rarely by adults. The owl glares fixedly at the intruder, leans forward, swells its feathers to their full extent and opens its wings outward thus making it appear many times its usual size. Loud hissing and bill clapping further enhances the impression of ferocity. This display is a bluff – the intent being to keep the intruder at bay. Never has the displaying bird been known to attack.



Intimidatory display in young owl

Threat display

Often confused with the intimidatory display, but during this display the wings are held fully extended. Now the motive is to attack, and if stimulus persists the owl will do so unhesitatingly and quite effectively with claws and beak. It is used against other owls, usually sub-ordinates, prior to attacks on scorpions and when defending eggs or young (Ali & Ripley, 1969). Various intensity types exist – the more vertically the wings are held the less offensive is the display, the most intense threat is with the wings held roughly parallel to the ground.



Threat display

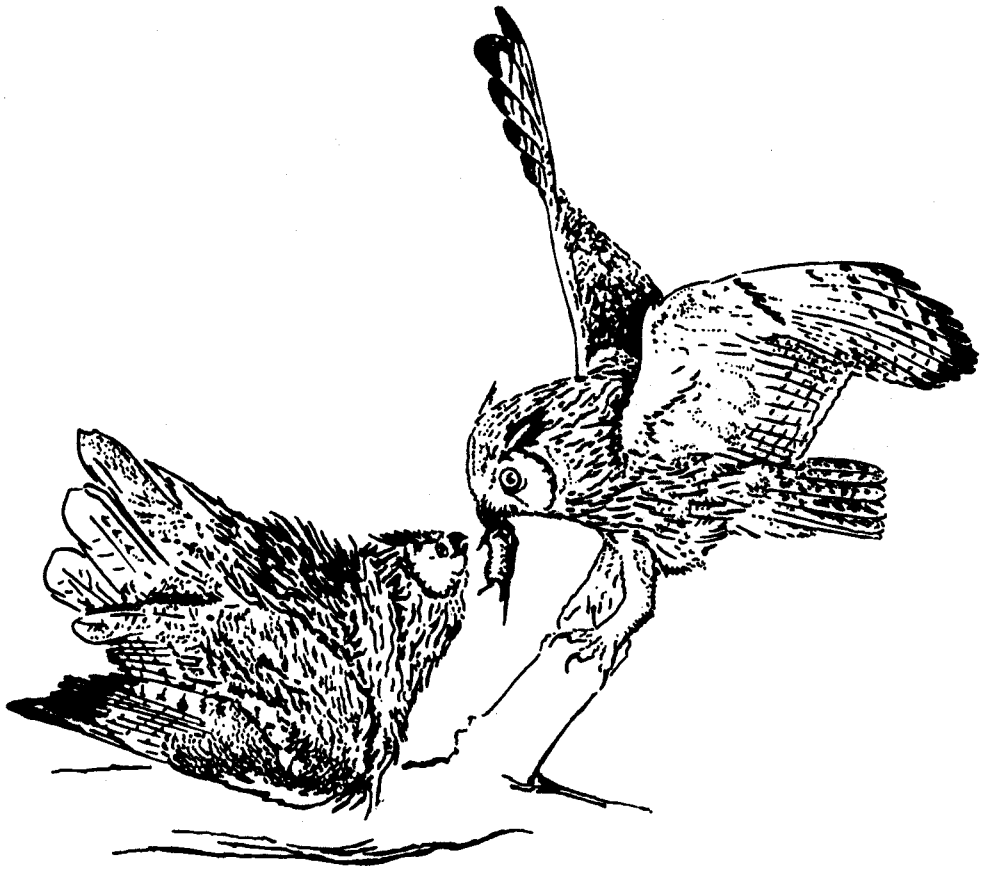
Appeasement posture

A low crouching posture adopted by the sub-ordinate bird when threatened by the dominant. It occurs both when sub-ordinate male is threatened by dominant female and when smaller nestmate is threatened by larger. A unique reversal of roles takes place during courtship when dominant female assumes this pose while accepting food from male. Often, but not always, chick-like noises accompany this display. It seems to have features of appeasement and is very important in the forming of pair bonds.

Discussion

As it is impossible to know exactly what is going on through the mind of a bird while vocalizing or displaying, it is certainly not warranted to suppose it is consciously sending out signals; its behaviour may be no more than an elaboration of emotional forces. The actions, nevertheless, serve a required purpose and thus may have become enhanced and genetically imprinted in the birds behaviour patterns.

All higher vertebrates, on occasion, must send long distance communication to others of their own species; darkness compels most nocturnal animals to communicate through sound. High pitched calls, common to most birds, are particularly inconvenient to *B. b. bengalensis* in its habitat as such calls can be doused by bushes, rocky outcrops and gullies. So these birds,



Adult female assumes appeasement posture prior to accepting food from courting male.

which have large territorries and therefore need to be heard at a distance, have territorial calls that, though not loud, have a curious penetrating and far-carrying quality (Ali & Ripley, 1969). In the dark, pairs even a few yards from one another, have difficulty in maintaining visual contact. Sound is again important, and since the calls of a pair within their territorry do not have to carry far, it can be higher pitched and more complex than long range communication. Low growls, hisses and bill clapping of inter or intra specific values serve to enforce the position and mood of the bird over very short distances.

Contrary to popular opinion, not all owls are strictly nocturnal; infact *B. b. bengalensis* is quite diurnal in habits (Ali & Ripley, 1969; Sharma & Singh, 1989). According to data collected in captivity and in the field, peak activity levels, outside the breeding season, are during the twilight hours – approximately 0430 hrs. to 0600 hrs. and 1800 hrs. to 1900 hrs. During these periods, adults, especially territorrial males, advertise their presence with a combination of both auditory and visual signals. The territorrial call is a case in point – in addition to the far carrying vocalization, the conspicuously flashing white gular region serves to advertise the position of the bird not only to other territorry holders, but also to its mate/possible mate. Still the rationale is in doubt, as has been stated by Borgia and Emlen in discussions (Wolkomir & Wolkomir, 1989).

During the breeding season day time activity is at its very peak, especially during the latter half of the nestling and fledgeling stages (at such times wild adults can be seen abroad in broad daylight in search of food for their growing young). Young birds rely on visual communication to a greater extent than do adults. For example, on our field excursions only young owls were seen to frequently indulge in the intimidatory display; never adults (in captivity, confines of space and lack of the necessary flight distance may be responsible for adults displaying thus). Still a combination of both auditory and visual signals is the most effective, especially for inter-specific values.

Visual displays vary in intensity. Also, the displays are neither solitary units, nor do they exist as such. If an owl ventures into an already occupied territorry, one or both territorry holders will try to dissuade it, first by fluffing out body plumage, hissing and bill clapping. If the intruder persists, the threat display goes into force gradually escalating from the least offensive to the

most intense. Justification for these intensity types may be that here again various types of intruders ranging from the casual visitor that approaches without any serious intention of staying to the would be settler or already established neighbour who in trying to occupy the territorry, is prepared to stand its ground. The first type flees at the slightest warning, the other requires strong language. The territorial call perceived from a distance may be useful in preventing intrusions.

The degree of similarity in displays between species is as striking as morphological similarities. This seems to confirm the theory that displays are most useful as taxonomic characters than other behaviour (Lorenz, 1935; 1941). Phylogenetically the similarities and their probable origin, together with their wide and continuous occurence in the whole group strongly support the conclusion that the Strigiformes are a monophyletic group.

Some postures have rough parallels in unrelated species for example, the appeasement posture. This hunched, cowering posture is adopted by quite a few species of birds, including the gulls *Larus argentatus* and *Larus ridibundus* (Tinbergen, 1959). Body language, in all higher vertebrates, is used to inhibit or aggravate the qualitative response of a member of the same species. Thus, if a dominant threatens a sub-ordinate, the weaker can avoid punishment by adopting the appeasement posture. Agnostic postures derive characteristics from pressure favouring conspicuousness; *vice-versa* submissive postures derive from pressure favouring inconspicuousness. Appeasement gestures also contain an element of fear and the tendency to flee is in conflict with the tendency to stay; hence it is a compromisory posture.

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