

## CORRESPONDENCE

Sir:

I would appreciate the opportunity to comment on the recent paper "A comparative study of some social communication patterns in the Pelecaniformes" by G. F. Van Tets (*American Ornithologists' Union Monographs* No. 2). In working out complex behavioral relationships within a large order in which some of the families and species had been but cursorily observed, the author attempted a difficult job. I wish only to correct some errors in the facts which he uses in the construction of his relationships without tracing any of their implications, although the author in fact uses incorrect observations in the construction of his key diagrams. Elaboration by future authors on the basis of the above paper could lead to a hopeless tangle in the literature, particularly since this group is currently receiving considerable attention. My observations are mainly on the Sulidae, the only family I have studied extensively.

In discussing (p. 11) his important categories of "in" and "out" birds he describes the neck-biting of the Gannet (*Sula bassana*) as delivered by the "out" bird to the "in" bird, but the difference is entirely one of sex; male bites female whether he is "in" or "out."

Confusion is caused by splitting the Gannet display which most authors have called "bowing" into "head wagging" and "bowing," thus giving to one part of the display the name which most authors apply to the whole performance. "Bowing" in virtually all previous terminology has included the two components (actually one or more dipping movements of the head interspersed with sideways headshaking) under the name "bowing" or "curtsying," and quite sensibly since they are entirely linked. There is no justification for calling them two separate displays, though, of course, every justification for analyzing the one display into its component parts. The author does not mention until late in the account that the two components are linked, so that anyone reading his first mention of the display would find that what he calls "head wagging" other people call "bowing"; they would then be puzzled to find later that he also describes "bowing." His figures for the duration of bowing are wildly wrong and he also says "no sound is made in the wing-bow" whereas in fact the bird calls loudly during this display. Finally he quotes me as having found a sex difference in the "head wagging" although it is in fact "bowing" for which I reported a sex dimorphism in behavior; the head wagging (or shaking) is quite indistinguishable in the sexes, though other components are not.

The major theme of Van Tets' paper is that the various displays in the Pelecaniformes are derived from: (1) pre-take-off; (2) post-landing; and (3) nest-building movements. In subservience to this admirable theme, much of which he convincingly demonstrates, he has forced several unwilling limbs onto a procrustean bed. In many sulids the post-landing acts are not what the author says they are, except in certain well-defined situations which he does not distinguish. Thus the "recovery" movements which he supposes have given rise to post-landing displays are not in fact the first movements shown after landing in many situations; they are frequently the movements occurring after a hop or during locomotion, but not after landing on the territory. In this situation nest-touching, or biting movements or displays derived from or interspersed with these, more commonly occur. This is probably because birds landing on their territory are aggressively motivated and either attack their mate (as the male Gannet does), or re-direct biting acts to the

nest or ground, or perform a ritualized version of these movements. In fact, it is very easy to see that sulids can usually land without having to perform the "pelican posture" (bill tip pressed to breast) which Van Tets interprets as a recovery movement. There is also a real possibility that the pelican posture in at least some sulids is derived from infantile beak hiding rather than post-landing recovery movements.

Nest-building derivatives form the author's third category of displays. Here there are some unfortunate comparisons of postures drawn from film sequences. Film sequences cannot "lie," but comparison of "frozen" elements from them can be very misleading, as here. Placed side by side, the postures of different species can produce an impression of great similarity in form, but in fact some of his "postures," to which he gives special names and the status of ritualized displays (e.g., front bowing of *Sula sula*, figure 31) do not exist as a stylized part of the species' repertoire. They obviously existed for the camera to record, but are not predictable, stereotyped postures comparable, say, to Gannet "bowing" or the "long call" in gulls, or to specula-touching in ducks; in other words they are not ritualized behavior and should not be used in comparisons of such.

Turning to the Great Frigatebird (*Fregata minor*), it is untrue that the advertizing display rattle is diethic; only the male does it; nor is it performed, as a display, in the air; it is confined to the display station on the ground or in a tree or bush, where it is combined with exhibition of the inflated sac and with a ritualized display. The confusion here is between the alarm rattle and the quite different noise produced during display; figure 38 almost certainly shows both these two and not three examples of the same rattle, as claimed.

On many points of interpretation I feel that there are preferable alternatives which the author does not dismiss before presenting his own, but as interpretations these will not mislead as much as factual errors. Comparative ethology is usually subjective to some degree, but it is unfortunate when conclusions of general importance, such as those in Van Tets' paper, and likely to be incorporated in behavior texts, do not make their basis absolutely clear.—J. BRYAN NELSON, *Natural History Department, University of Aberdeen, Aberdeen, Scotland.*

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