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Part I

DISTRACTION DISPLAY BY BREEDING BIRDS IN SOUTH AUSTRALIA

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The peculiar behaviour of certain birds at nesting time, in the presence of particular types of intruders, which is generally referred to as injury-feigning, appears to have been first noticed in Australia by John Gould during his collecting expedition in 1839. Gould regarded this behaviour as a deliberate effort to lure the intruder away from the nest or young. During recent years the question whether display resembling injury or juvenility is an intelligent performance calculated to deceive a possible enemy has been discussed in scientific journals in America, Europe and Australia. In 1928, Dr. Douglas Dewar postulated that injury-simulation is the manifestation of mental disturbance in the parent-bird, caused by the clash of conflicting instincts, the parental instinct opposing itself to the urge for self-preservation. Dr. Herbert Friedmann, in 1934, expounded the theory that the broken-wing ruse results from partial muscular inhibition caused by opposing instincts which lasts until the fear-emotion gains control. In 1936, Francis H. Allen considered the subject from various aspects, and concluded that injury-feigning has "a definite purpose and a survival value and that, however it may have arisen in the first place, it is not now a matter of a struggle between two emotions." P. A. Taverner, in the same year, expressed the opinion that injury-simulation is so like a decoy method of consciously leading an enemy from the nest that it is difficult to adopt a more mechanistic theory. He showed that an American Dotterel, the Killdeer (*Charadrius vociferus*), discriminates between a harmless blunderer such as a horse or cow, and an active hunter, such as man or a dog, and there is reason to think that the bird's

behaviour is more or less calculated and not the result of a blind mixture of conflicting fears. Several American observers have, however, obtained evidence indicating that injury-feigning is an instinctive reaction rather than an intelligently calculated performance.

A. H. Chisholm,⁽¹⁾ who has given more attention to the subject than any other Australian ornithologist, contends that if the displaying bird were incapable of flight it would scramble about in one spot, but in fact it carefully watches the pursuer while fluttering away from the nest, and if he does not follow it sometimes returns nearer to him and repeats the performance.

Mr. E. A. Brooks (*ms.*) describes how Black Duck (*Anas superciliosa*) have been observed by him luring a dog away from their brood for a distance of 100 yards or more by flapping along the ground a few yards ahead of the dog. When the latter got too close the Duck would rise a few feet high and come to earth again further on. Sometimes one wing would hang out as if injured, and at other times the bird would scramble along and make occasional jumps as if trying to get along with one injured wing. When the dog gave up and returned to the waterhole the Duck would rise and return and do its utmost to attract the dog's attention again. Mr. Brooks was unable to decide in the field what was the sex of the displaying bird. Disturbed suddenly by a man on horse-back, the Duck utters a startled "quack-quack" before commencing its distraction-tactics, and the Ducklings usually dive and come up near the water's edge and then make for cover on the bank. They do this whether they are only a day or two old or aged several weeks.

Chisholm sums up his views on distraction display by saying that "the bird possesses at least instinctive knowledge of the situation, and its actions thereby become instinctively purposeful." Roberts (3) recently reviewed the subject in an interesting paper, and his conclusions support Chisholm.

In most species, the spreading out of the wings and tail during the display exposes paler or white areas of plumage which are normally hidden by the protective colour scheme. The behaviour of the birds therefore counteracts the protective colouring of the plumage, and by drawing attention to themselves, distracts attention from the nest or young. It practically amounts to distraction display, even if it is not intelligently calculated to achieve this object. Other protective reactions in the same category are juvenility-feigning and simple self-advertisement.

Although most often seen in ground-nesting birds, distraction display also occurs in certain tree-nesting species. It is not usually of a stereotyped pattern in a species or even in an individual bird. Some birds discriminate between phytophagous mammals and carnivorous mammals, and again, between these and human beings. The display may be given only at an advanced stage of the incubation of the eggs in the nest, or when there are young in the nest or just out of the nest, or when flightless young are running with the parents in an especially exposed position. It obviously depends for its stimulation upon a particular action on the part of a particular type of intruder under certain limited circumstances.

Distraction display, while primarily instinctive, seems to involve also, in some species and individuals, a degree of awareness of several factors in the situation. Just as birds are not all on the same plane of evolution, anatomically considered, so the psychological characteristics of all birds are not exactly comparable.

There are, for example, the interesting phenomena of social or community display in some gregarious species. One could not dismiss such cases as resulting from conflict between the parental emotion and fear for the individual bird's own safety. Yet there is sufficient evidence to show that all distraction display cannot be explained in terms of purely rational behaviour on the bird's part.

The instinctive element is certainly always present, and sometimes seems to be paramount, with the intelligence factor limited to recognition of the intruder. A case in point involved my own experience with a pair of Yellow-plumbed Honeyeaters (*Meliphaga ornata*) which had two young in the nest. They evinced no agitation when I climbed the Mallee sapling and inspected the nest and young at a height of twelve feet from the ground, but flew casually about among trees nearby. Occasionally one bird flew to the ground and hopped about among fallen timber and small shrubs about 20 yards away. When I returned to the ground, one bird was seen at the base of a clump of Mallee saplings, but it showed no anxiety nor did it attempt any form of display. I decided that it might feign injury or juvenility if I slowly moved towards it and pursued it. The experiment proved that I was right in thinking that a particular type of stimulus was needed to produce the instinctive reaction I hoped to see, for the Honeyeater immediately trailed one wing and fluttered along the ground, continuing the performance for a distance of about 18 yards as I slowly walked after it, and away from the nesting-tree. Now, if the behaviour were purely rational the bird should have displayed when I was at the nesting-tree and so distract attention from the nest and young. But, in fact, it was my action in going *towards* the bird and in *pursuit* which caused it to display.

Dr. Lorenz, (2) whose researches and "Releaser concept" have thrown so much new light on avian psychology, says: "Since the innate coordinations of movements that we call instinctive actions are not adapted to any goal or end anyhow, it suffices that every one of them be released, much as in reflexes, by a simple combination of stimuli, if only this combination is sufficiently characteristic of the biologically 'right' situation; that is, of the one situation in which the performance of the innately coordinated movements attains its full survival value. If an instinctive action is directed toward a particular object, its successful performance is independent of the animal's perceiving this object as a 'thing,' that is, as a permanent unit in time and space as we would perceive it. All that is needed on the part of the animal is the disposition to respond with just that reaction

to certain stimuli characteristic of its particular object." "The improbability of the innate perceptory [perceptual] pattern is to guard the instinctive reaction from being released by chance through other than the biologically 'right' influences." "All such devices for the issuing of releasing stimuli, I have termed *releasers*, regardless of whether the releasing factor be optical or acoustical, whether an act, a structure, or a colour."

Here, then, we seem to have the explanation for some of the great variation in the incidence and nature of distraction display between species, and even individuals; a variation that is not explained solely by the postulation of calculated effort by the bird to decoy an intruder away from nest or young.

Distraction display may have arisen in the dim past from encounters with reptiles and small mammals, and may, indeed, have originated from conflict of emotions. But it is important to remember that in modern birds each species and even individual deserves separate study. We should not hide our limited knowledge of bird psychology under impressive mechanistic formulae or glib anthropomorphic conceptions. Rather let us steadfastly and painstakingly pursue the truth, not only because this is in itself a worthy object, but also because the better we understand our birds, their ways, and moods, and personalities, the better we shall surely love them.

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- (2) Lorenz, Konrad Z., 1937, "Auk," 54: 246-49.
- (3) Roberts, N. Z., 1944, "Proc. Royal Zool. Soc. N.S. Wales," 1943-44: 14.

APPENDIX.

Birds Indulging in Distraction Display
When Breeding in South Australia.

I. SPECIES FEIGNING JUVENILITY AND INJURY.

Little Quail (*Turnix velox*). Diamond Dove (*Geopelia cuneata*). Common Bronzewing (*Phaps chalcoptera*). Crested Pigeon (*Ocyphaps lophotes*). Black-tailed Native Hen (*Tribonyx ventralis*). Pied Oyster-Catcher (*Haematopus ostralegus*). Red-kneed Dotterel (*Erythrogonys cinctus*). Australian Spur-winged Plover (*Lobibyx novae-hollandiae*). Banded Plover (*Zonifer tricolor*). Hooded Dotterel (*Charadrius cucullatus*). Red-capped Dotterel (*C. ruficapillus*). Black-fronted Dotterel (*C. melanops*). Australian Dotterel (*Peltohyas australis*). White-headed Stilt (*Himantopus leucocephalus*). Australian Pratincole (*Stiltia isabella*). Maned Goose (*Chenonetta jubata*). Black Duck (*Anas superciliosa*). Grey Teal (*Querquedula gibberifrons*). Blue-winged Shoveler (*Spatula rhynchotis*). Australian White-eyed Duck (*Nyroca australis*). Jacky Winter (*Microeca fascians*). Scarlet Robin (*Petroica goodenovii*). Hooded Robin (*Melanodryas cucullata*). Western Yellow Robin (*Eopsaltria griseogularis*). Chestnut Quail-Thrush (*Cinclosoma castanotum*). Cinnamon Quail-Thrush (*C. cinnamomeum*). White-fronted Chat (*Epthianura albifrons*). Crimson Chat (*E. tricolor*). Orange Chat (*E. aurifrons*). Gibber-Bird (*Ashbyia lovensis*). Spotted Scrub-Wren (*Sericornis maculatus*). Redthroat (*Pyrholaemus brunneus*). Shy Ground-Wren (*Hylacola cauta*). Rusty Field-Wren (*Calamanthus isabellinus*). Brown Songlark (*Cinclorhamphus cruralis*). Little Grassbird (*Megalurua gramineus*). Black Honeyeater (*Myzomela nigra*). Eastern Spinebill (*Acanthorhynchus tenuirostris*). Tawny-crowned Honeyeater (*Gliciphila melanops*). White-fronted Honeyeater (*G. albifrons*). Pied Honeyeater (*Certhionyx variegatus*). Singing Honeyeater (*Meliphaga virescens*). White-eared Honeyeater (*M. leucotis*). Purple-gaped Honeyeater (*M. cratitia*). Yellow-plumed Honeyeater (*M. ornata*). Yellow-fronted Honeyeater (*M. plumula*). Yellow-winged Honeyeater (*Meliornis novae-hollandiae*). Spiny-cheeked Honeyeater (*Acanthagenys rufogularis*). Australian Pipit (*Anthus australis*).

II. SPECIES FEIGNING JUVENILITY ONLY.

Southern Stone-Curlew (*Burhinus magnirostris*). Spotted Nightjar (*Eurostopodus guttatus*). Red-throated Whistler (*Pachycephala rufogularis*). Gilbert Whistler (*P. inornata*). Grey Shrike-Thrush (*Colluricincla harmonica*). Western Shrike-Thrush (*C. rufiventris*). Ground Cuckoo-Shrike (*Pteropodocys maxima*). Southern Scrub-Robin (*Drymodes brunneopygia*). Banded Whiteface (*Aphelocephala nigricincta*). Brown Thornbill (*Acanthiza pusilla*). Dark Thornbill (*A. hedleyi*). Superb Blue Wren (*Malurus cyaneus*). Black-backed Blue Wren (*M. melanotus*). Blue-and-White Wren (*M. cyanotus*). Purple-backed Wren (*M. assimilis*). Black-capped Sittella (*Neositta pileata*).