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Notes on the behaviour of the Black Noddy.A

During a four-month stay on Ascension Island with the BOU Expedition, I had the opportunity to observe something of the habits of the Black Noddy Anous tenuirostris * about which very little appears to have been published (Murphy, Henshaw, Campbell & White, Macgillivray).

Like most of the seabirds of Ascension, with the notable exception of Sterna fuscata, the Black Noddy breeds more densely on the little stacks offshore than on the main island. Predation by feral cats is probably responsible for this, as will be discussed elsewhere in the expeditions's publications. While it was possible to see something of the Noddies nesting on the smaller stacks, most of these nests were practically impossible to reach, or even approach. More convenient for study were the birds breeding on Boatswain Bird Island, a large islet 300 feet high and a few hundred yards across, lying close to the east end of Ascension. While many hundreds of Noddies nest here on the seaward-facing cliffs dropping vertically into the water, others can be easily watched at a distance of a few yards and the nests were accessible, using a short ladder if necessary. Most of the observations to be described were made on a section of cliff on Boatswain Bird Island, the account being based on about 75 hours watching.

Breeding season.

One of the main purposes of the expedition was to ascertain the time of breeding of the birds of Ascension, including the famous 9.6 month cycle of Sterna fuscata. Information on this subject is still being collected by the party and will be published

* Footnote Although formerly the various races of this species were separated in to two species, tenuirostris and minutus (Peters, Murphy), Mayr and Serventy & Whittell have united them as tenuirostris.

later. During th period I was able to watch the Black Noddies (December to February) their main breeding was ~~xxxx~~ at an end. On the study area 14 pairs had young unable to fly ~~xxx~~ on 16 January; a month later all but two of these young could fly and only one new pair had laid. However there were many other birds present, at peak times in the morning and evening over a hundred (Fig .1), and much courtship and fighting was seen though ~~xxx~~ few courtship feedings and only one copulation.

Nesting.

The Black Noddy nests on Ascension on small ledges and protuberances on steep cliffs. Many of these sites are covered with a pad of dried guano, ~~dried with a little fibrous material~~, ~~and this connect ects~~ which often hangs down in curious stalactite forms beneath the ledges. As the coastal rainfall of Ascension averages only a few inches a year, the guano of each nests is not washed off ~~(except where it is within reach of spray)~~ and each occupier of a ledge adds to the accumulation, which is sometimes inches thick, and often projects beyond the original ledge. These nests sometimes break off from the underlying rock, which prevents them growing indefinitely. The guano accumulates because adults and, of course, young defaecate while standing on the nest. ~~(Murphy).~~

~~These "bracket nests" are typical of Black Noddies, though in other parts of their range seaweed is a common constituent but on Ascension it is scarce and the commonest fibrous material in the nests were~~ Imbedded : the guano one finds a few feathers, and some occasionally I see gathering them ~~which the Noddies of both sexes gather~~, one feather at a time, either from the land or the water. On returning to the nest (after th. feather is dropped and then

either ignored or picked up and dropped again. The sideways depositing action so characteristic of other Larids was not seen by me, though subsequently noticed by N.P.Ashmole.

The only other nestbuilding movement was scraping, very similar to that described for the Black-headed Gull by Moynihan. The depression of the tail while scraping was particularly striking. This actin presumably helps to produce the shallow depression in the guano platform, in which the egg lies.

Occupation of ledges.

Ledges which are in use as nests are defended by single birds or pairs against intruders, but in addition other sites are defended, even tiny knobs of rock where it seemed impossible for a Noddy to rear a family . Some individual birds could be recognised by idiosynchrasies of plumage, and there were also a few I had colour-ringed. The behaviour of these birds showed that,at the time of year I was watching, the birds, apart from those with eggs and young, were not restricting their attentions to a single ledge but often visited two or more ~~different ones~~, sometimes in different parts of the cliff. Ledges were not visited at random, however, since the same ~~two or three~~ ledges would be visited on different occasions.

Fighting and threat behaviour.

The Noddies defend their ledges by displays and by actual fighting. They attack each other with their beaks, without using wings or claws. Usually an intruder flees as soon as another threatens or advances towards it, but occasionally a proper fight develops.

Sometimes a bird who is attacked (for instance a young

bird who cannot fly but has scrambled onto a strange ledge) will neither attack nor flee, but turns its head away from the attacker and points its beak downwards, allowing itself to be pecked on the nape without resisting. The posture reduces the chance of the bird being attacked.

This turning away of the head is almost identical with what the Kittiwake (Rissa tridactyla) does in the same circumstances (Cullen), except that the Black Noddy does not tuck its beak right beneath its breast, as the Kittiwake sometimes does.

Young Noddies, both downy chicks and juveniles, have a singular method of defending their nests when an intruder lands there. They peck at its legs and feet and, even though the other bird may peck back, the young are generally successful in driving it away. It may be stressed that the young do not peck at the legs because they are the nearest part of the opponent; they clearly direct their attack towards them. Despite its effectiveness, this method is apparently used only by young birds.

When one approaches a breeding cliff the Noddies may remain on their ledges until one is a few yards away, but they usually start to utter a frog-like rolling Croak: "kik-krrrrrr", which they repeat again and again. This call may be uttered from a ledge (Fig .2) or in flight as they fly around in front of the cliff. The same call is sometimes uttered by a territory- (i.e. ledge-) owner when a strange Noddy lands nearby.

Another display which intruders evoke is the Gape (Fig.3). With neck stretched upwards, and beak pointing down and widely open to show the bright orange-yellow inside and the base of the tongue raised, the bird turns

towards or advances at the newcomer. The display may be maintained up to two seconds.

When a bird lands on an xxxxx ledge it often gapes in just the same way even if there is no other bird on the ledge. This "landing gape" occurred in all but 17 of a sample counted of 86 landings at xxx vacant ledges, though sometimes the bill was only opened slightly. Juveniles who can fly are less likely to gape when landing than adults.

Another hostile action is Clucking: with neck and beak aligned and pointing upwards (Fig.4), the bird utters a chattering "kuk-kuk-kuk..." whose frequency is about 6 syllables per second and which lasts continuously for up to three or four seconds.

These xxxx displays (apart from the landing gape) are other hostile behaviour including
commonly seen mixed with actual attacks, though the croak is the
of the three
least likely to lead to an attack. All of them xxx also occur
and more briefly
more occasionally when a pair* come together; perhaps such pairs

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* Footnote. I refer to two birds as a pair when they stand side by side on a ledge, quite relaxed.

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are relatively new acquaintances. xxx There is a further difference in detail in the gape when performed in response to the mate and to a rival. xxxxxxx Whereas the display is usually directed at the rival, in response to the mate the bird more often faces in some other direction.

There are several other gestures which xxxxxxx occur both in hostile situations and when a pair come together. Two of these are calls: a short strident "per;" and a more drawn-out "wahhhh". Neither is common, either between a pair or between rivals.

The Foot-look (Fig.5) lasts two or three seconds and is identical with the action discussed and illustrated by Goethe and

Moynihan in other Larids, where it is quite co on in agonistic situations especially, ac ording to Goethe, when the perfor or is rather frightened. Though at first I overlooked this movement it later beome clear that it was one of the commonest actions whhnever two Noddies landed near each other, whether mates or rivals or club-mates (see b elow).

Another comton gesture between mates and rivals is what I have called Nodding. I have no way of knowing whether it is this action which Watson refers to as nodding in Anous stolidus, but the word exactly describes what the birds do. With neck stretched obliquely forwards and the bill about horizontal (Fig. 6a), the head is nodded through an angle of 90 degrees or less with beak remaining closed (Fig.6b), and quickly returned to the starting position, where it is held momentarily before another nod. The rate of nodding varies but at its highest intensity is about 3 times a second and lasts for two or three seconds.

After noticing the regularity of Head-shaking when a pair of Brown Noddies come together (see below), I found I had overlooked this movement, which occurs in encounters between Black Noddies mixed with nodding and foot-locks, though it appeared to me to be less regular than in the Brown Noddy.

To give a better idea of the frequency of the different displays in the different situations I noted the actions seen in a sample of encounters when two birds came together on a ledge. These encounters were classified as Hostile, when one bird drove the other away, and Greeting, when the two birds relaxed or went

off together in a display flight (see below). The hostile encounters were further divided into the performance of the attacking and fleeing birds. In the Greeting the performances of the two birds were on the average alike and are not therefore distinguished.

The Table 4 shows the percentage of performances in each class in which a display occurred at least once. (Landing gapes are omitted because they are not part of the encounter situation. Head shakes are omitted because they were overlooked until too late.)

	Attacking	Fleeing	Greeting
Clucking	15	2	1
Croak	1	0	0
Gape (not landing gape)	21	19	3
Nodding	32	36	28
Foot-look	20	20	27
"para"	5	11	12
"kahhh"	0	0	4
Bridling	5	9	19
"kek"	0	2	6
No. of performances on which % based	75	44	221

Non-hostile displays between the pair.

One of the commonest displays when a pair are together is Bridling. One bird, with body tilted slightly forward, jerks its head rhythmically backwards and forwards. As the head is drawn back, the bill is opened (Fig. 7), and then at once closed with an audible click as the head is thrust forwards again to a position shown in Fig.8. The whole to-and-fro movement lasts ¼ to ½ of a second and the two positions alternate smoothly sometimes for minutes, with only short interruptions. The display is quite silent except for the closing of the beak, which can

only be heard close at hand.

Both mates are able to bridle and occasionally both do it together for a short time, but usually one does it while the other watches. Unlike the other displays described so far, bridling often starts without any obvious external stimulus: a pair are standing quietly on a ledge, resting or preening, when one starts bridling and the other at once stops what it was doing to watch. Bridling usually dies down to nothing and the pair relax again. At other times the bridling is set off by a particular stimulus: for instance the arrival of another bird on a nearby ledge sometimes starts a single bird bridling.

When a pair are together the bridling seems to have little effect beyond causing the mate to pay attention, though I have seen that it may make the mate approach closer to the displaying bird. ~~(I have also once seen it have the reverse effect on a rather nervous partner, but this may have been because the bridling bird pointed his head towards the other, instead of taking up the more usual lateral position.)~~ When a single bird is bridling this attracting effect is sometimes clearer, and I believe it is probably by means of this display that territory-owners attract mates and that one mate uses it to attract its partner to the nest site of its choice.

While bridling a Noddy sometimes utters a quiet, hollow "krrrrrr...", lasting for many seconds and fluctuating in intensity according as the bill is opened or closed. Typically, however, this call seems to be uttered from a special Arched Posture, with neck arched and looking curiously inflated (Fig.). This display

is much less common than the bridling but was seen in the same situations.

The bird who is not bridling may stand quietly by its mate, but it sometimes utters a short metallic "kek" every xxx seconds or two in an irregular way, from no particular posture. This may continue as long as the bridling continues and at the same time the kekking bird may show an interest in the mate's beak as if it would take any food regurgitated. I noticed this call

too late to see whether it preceded courtship feeding.

As might be expected from the behaviour of other Larids, courtship feeding closely resembles the way the parent feeds the young. I saw it too few times to do more than confirm this general resemblance, beyond adding that on one occasion the male adopted the arched posture and corresponding call before regurgitating.

On the only occasion I saw a copulation, the female assumed a hunched posture with body tilted slightly forward and with neck withdrawn, and the male preened her head for a minute or two before mounting.

This preening of the mate is not restricted to the minutes before copulation. Unlike the ground-nesting Arctic Tern, Noddies Black Kittiwakes quite often preen their mates, parents or young. A similar difference is found in the gulls between the cliff-nesting Kittiwakes, which preen each other, and the ground-nesting species, which do not.

Two other calls should be mentioned. One of them resembles the croak, except that the first, short syllable is missing and the remaining roll is rather more drawn out. It occurs in a quite different situation from the croak, when a bird leaves its nest preparatory to flying away from the colony as if to feed. It is not given in response to alarm.

The other call is a rapid "kyer-kyer-...." uttered as a bird flies in to alight, after being away from the colony. For some reason not clear to me, it often evokes an outburst of croaking from other adults present in the colony.

Aerial displays.

Like other terns the Black Noddy has an aerial display, which I saw many times. It begins when a pair are together on a ledge. There may be a false start or two, when one or both birds take little circular flights in front of the cliff and land again, but eventually the proper performance begins, consisting of an ascent followed by a return to the nesting colony. During the ascent, which may last only a few seconds or until they are tiny specks in the sky, the birds keep close together and often look at each other. Much of the time they fly with peculiar wing-beats, more regular and rather faster than in normal flight, which carry them forwards more slowly than wing beats of this speed usually do; at times the birds almost seem to rise head to wind without progressing forwards at all. As the birds climb they usually sway a little from side to side about the flight path, the swaying being more or less synchronised between the two partners. The ascent is not in large circles as is usual in some other terns.

During the ascent one often hears a prolonged tikking sound, whose frequency is about 3 syllables a second, like the clucking but each syllable is less hollow and the rhythm more regular. I do not know whether one or both birds make this call or what its significance is.

The ascent does not end abruptly, but changes gradually to the descent, with the birds flying at first horizontally or slightly forwards. After a few seconds the ascent may be resumed again for a while, before the final descent starts, at first

shallow and then more steeply, often in a fast glide, with the pair all the time keeping so close together that it is difficult to distinguish which is which as they swerve downwards.

During the ascent and descent it can often be seen that one of the pair is continually adjusting its position to keep near the other and to follow the side to side swaying movements which the other initiates. During flights I have followed for two or three minutes, it was sometimes the same individual which shadowed the other in the ascent and glide, but at other times the roles would change after a while. A rather similar swaying occurs during the glide of the aerial display (high flight) of other terns and I have suggested that it is due there to an overcompensation in the efforts of the shadowing bird to follow its partner's movements quickly enough. This is certainly not the explanation in the Black Noddy, for the swaying is initiated by the steering bird, as I call it, and not by the shadower. In this species the cause is uncertain.

At the highest point of the aerial performance one or both birds often shakes itself, just as a tern does when it flies up after bathing. To satisfy myself that this shaking was occurring at an abnormally high frequency, I watched birds flying to and from their feeding grounds, and saw only 12 shakes during observations on single birds totalling 3000 seconds (=0.4 shakes/100 secs./bird). On the other hand when I watched 1452 seconds of display flight involving two birds at a time, 47 shakes were seen (=1.6 shakes/100 secs. /bird). If it had been feasible to count shakes only during the period when the birds were at the top of the display

flight, the frequency would certainly have been much more than four times the rate in normal flight.

It was occasionally possible to watch the birds during part of their aerial display and, before or after, on the nesting cliff, so that the connection between the aerial and "ground" display could be pieced together. A display flight commonly began shortly after a pair came together on a ledge, and when it was all over the participants would return to flight in the colony again. Sometimes the two mates would land on different ledges, but if this happened one of them often started to bridle and the other would fly to it and the pair would stand together again quietly.

Parental care. Behaviour of the young.

The single egg is brooded by both sexes, as in other Laridae. There are two brood patches, the median one as Margilliviray reported, just third possessed by the Arctic Tern and many gulls is absent. Courtship feeding continues during incubation (Margilliviray).

The down of the chicks gives them an appearance very like their parents, black all over except for a white forehead. While most of the chicks of Anous stolidus are also dark, a small propertion are almost white; but I saw no such light chicks among the Black Noddies.

The juveniles are even more like the adults and most easily distinguished by their shorter beaks (Fig.10).

The young are fed by regurgitation, like those of A.stolidus (Watson). When begging for food the young peck at the beak of their parents. The feathered young withdraw the neck, tilt the body forwards and utter a plaintive piping call every second or two. Smaller young dive and peck, but the hunched posture is

less distinct.

When the parent regurgitates and a lump travels up its neck, the young bird inserts its beak between the basal halves of its parent's mandibles, usually crosswise, the tip projecting out the other side. As the bolus of food moves into the parent's beak, it passes between the chick's open mandibles and is pulled out and swallowed.

Some of the nests are connected by ledges with other parts of the cliff and before the young can fly they begin to explore around the nest. At times they get themselves to places from which they cannot return and may be severely tackled by birds onto whose ledges they find their way. At the cliff where I watched a juvenile appeared one day who must have come from higher up the cliff. It could flutter a little but could not fly well enough to regain its own nest. During the next two days the unfortunate bird scrambled about my study area sometimes managing to get quite high but always being pecked or falling off. The third morning it was dead, its scalp torn open in two places.

Usually, however, the young do not get themselves into such difficulties and will not leave the nest or the safe ledges around it until they can fly, even if one touches them. Unless one can watch the young for several hours a day it is difficult to know the exact age at which they first fly for, like the Arctic Terns, there is a short period during which they will fly "spontaneously" but crouch if approached by a human being. The only chick whose exact age I knew allowed itself to be handled up to its 36th day. My next visit

was on its 46th day, when it allowed itself to be touched by a stick without flying but flew "spontaneously" some minutes later. From the size and feathering of the other young when they flew , this individual would not seem exceptional and it seems probable that the young normally fly about their 7th week.

The young Noddies are very unsteady in their early flights & and are particularly unskillful in returning to their nests, which so ner or later they try to do. This difficulty must be partly due to the the strong wind which perpetually eddies around their nesting cliffs. Perhaps its is becauee these juveniles so often cause trouble by landing on the wrong ledge, that when one starts to fly around the cliff, it often sets the adults croaking.

Young noddies continue to depend on their parents for food after they can fly. On the three occasions when I saw colour-ringed juveniles begging after they could fly, it was always on their own nests and from the behaviour of unmarked individuals too it seems probable that while the young are at the colony they are only fed on their nests.

The young sometimes beg from adults not their parents but I doubt if they are ever fed, as the adults drive away such young if they approach, behaving quite differently to their own and to their own young.

Clubs. Sunning.

There were certain parts of the Noddy cliffs where the birds would alight but which were not defended like nest ledges, and often have half a dozen birds or more would stand together. At these neutral

areas or"clubs" the birds show relatively little reproductive behaviour, but usually rest or preen or sun themselves. Occasionally a bird whuld fly from a nesting ledge to one of these clubs to rest. Gulls and other terns have similar resting places close to the colony which are used by off-duty birds throughout the breeding season.

The sunning posture of the Black Noddies deserves special mention. The bird ~~xxxx~~ assumes this by extending one wing and the tail, and often ~~xx~~ a leg/ as well, in the stretching movement which Noddies share with so many other birds, but instead of relaxing at once, the posture is maintained for minutes at a time (Fig. 11). The bird is orientated so that the sun shines full on the spread wing and the head is inclined to the side so that it receives the full force of the sun. ~~xxxxx~~ The sunning posture is quickly given up as soon as the sun goes behind a cloud. It is clear that the behaviour is suited to absorb radiant energy, rather than to cool the bird, since the Noddies frequently resort to a sunny patch when they could sit in the shade close by if they preferred.

DISCUSSION

1. It is unfortunate that I could not sex the birds to decide whether, like other gulls and terns, it is the males which take up territories and attract mates. This may well be the case (and Macgillivray states that it is so without saying how he knows) but all that is certain is that one of the pairs does most of the ~~xxxx~~-tax bridling, is more active generally in courting and, in those instances when I have seen it, feeds the other. In other Larids it is the male who usually feeds the female and is more active in courting, so that this would lead one to expect that the same obtains in the Black Hoody. This view is confirmed by a slight size difference sometimes detectable between the mates, ~~xxx~~ On all six occasions when I noted a difference, it was the larger bird which did more of the bridling. Wing measurements of skins in the British Museum.....

Although the matter is not settled yet, it seems likely that its is the role which feeds and does more of the bridling etc.

2. On this supposition about the sexes, the course of pair formation seems to be as follows. The male occupies a ledge which he defends against intruders and bridles there to attract females. When a female lands beside him the pair display together, the displays including some which are seen during hostile encounters As in many other birds, the male sometimes shows overt signs of aggression mixed with his display towards the newly arrived female, and she may ~~xxx~~ be easily alarmed by him. The display flight, involving the cooperation of both partners, presumably cements the pair bond more firmly and after a time the mutual distrust subsides

and the pair are more relaxed together. Even after the pair has formed, the definitive nest place has not been chosen, as the pairs visit different sites together in different parts of the cliff.* The decision is evidently deferred until closer egg-laying, in which period also courtship feeding and copulation presumably become commoner.

This general pattern is not very different from the pair formation of other gulls and terns. One point may be mentioned: the selection of the actual nest site only after the pair has formed. This is what happens in the ground-nesting gulls and terns, but the Kittiwake pairs on its nest site, a difference thought to be due to the relative shortage of nest sites on cliffs. One must suppose that such sites are not in such short supply for the Black Noddy or else that "house-hunting" pairs can readily evict unmated males, when the time comes.

3. It is well known that the air-formation and "greeting" displays of many birds involve the same postures and calls as occur in fighting behaviour. In some cases however there are differences in the orientation of the displays. Thus the friendly "triumph ceremony" between a pair of victorious Greylag demonstration Geese Anser anser is like a hostile display except that the mates display past, instead of at one another (Lorenz). The Black Noddy's greet is another display which, used between the mates, tends not to be orientated at the partner as it is at a rival. The oblique and forward displays of the Black-headed Gull Larus ridibundus are more regular elements of the greeting than the Noddy's greet and the pair commonly perform them side by side.

* a point confirmed by Margilliviray who observed the species nesting a times.

3. The Black Noddy nests on cliff ledges at all its breeding stations in the Atlantic (except in the British Honduras (Salvin)) but in the Pacific and Indian Oceans it usually nests on the branches of ~~xxxxxxxxxxxxxxxxxxxxxx~~ trees. Unlike its relative, the Brown Noddy, it seems never to nest on flat ground, though sometimes resorting to low bushes in the absence of anything better (Munro). (Wilson & Evans were informed by Palmer, Rothschild's collector, that in Laysan, Nihoa and Midway the species laid its egg on the sand like the Brown Noddy, but a photo in Rothschild's Birds of Laysan shows the bird nesting in bushes.

In any case several recent papers deal with this tree make no mention of the habit and refer only to cliff-, or tree- or bush-nesting. (Richardson 1; Fisher, Munro, Fisher & Baldwin, Fisher, Richardson 2)

There appears to be a further difference between the Black and Brown Noddies, namely in the nest itself. Nest of stolidus varies from a few straws or shells to substantial pile of twigs or seaweed, but is never more than a rather shapeless pile of material, with a slight hollow on top. The nest of tenuirostris however is generally more compact, composed mainly of seaweed or the leaves of trees, and is plastered with droppings. Of 26 apparently independent accounts of the nests of tenuirostris in the literature, 14 particularly mention that the nest material is cemented together with excrement, and 2 others show it in the photo without remarking on it. On the other hand of 34 accounts of the nests of stolidus only two mention the presence of droppings (Gilbert, quoted by Gould, and Bryan). It would seem therefore that tenuirostris defaecates on its nest more than stolidus. Has the habit perhaps become an integral

part of the nest-building behaviour of the Black Noddy ? While the difference in nest structure must result from differences in behaviour, including the choice of material, the details of the nest-building behaviour of the two species is too little known for a precise comparison.

Ascension may in fact be a rather unfortunate place to try and study the nest-building of the Black Noddy, because of the shortage of nest material. There are very few plants on the coastal stretches where the birds nest, and seaweed is virtually absent. As already mentioned, feathers were collected instead, but these were a poor substitute as they often blew off the ledge again. In some ways, then, the nests and the nest-building may have been imperfect and some actions rare or missing *. For instance, in a useful little account Macgillivray says that the foundation of the nest is made by folding live Fucus leaves on a bare branch, "where they are arranged with the beak and trampled down with the feet". While one clearly cannot put too much weight on these words, it may be recalled that trampling on nest material to produce a level platform is a specialisation the Kittiwake has developed to help it to nest on cliff-ledges (Cullen). Although trampling was not seen noticed on Ascension, this might have been because suitable nest material were absent.

Footnote
* N.P. Ashmole has told me that he found a number of Black Noddies' eggs on Ascension which had rolled out of their nests.

The divergence between friendly and hostile displays has been pushed even further in the Arctic Tern, where ~~conspicuous~~ has been exaggerated ~~a~~ primary difference in orientation to produce the ~~bent display (bowing forward) and the crouch (tow rds rivals).~~

4. Some peculiarities of the Black Noddy appear to be connected with its ~~high~~ cliff-nesting habits (i.e. in caves or in trees).

Young ground-nesting terns even ~~a~~ the Arctic and Common ~~before~~ can fly by the end of their fourth week. These species are about the same size as the Black Noddy (mean weights 100, 130, 120 gms respectively), whose young do not fly till some three weeks later. Two factors must contribute to this difference (1) the necessity for the Noddy to delay its first flight until it can be sure of returning to its ledge and (2) the need for the ground nesting terns to fly as early as possible so as to avoid ground predators. A similar difference is found in the age of first flying of the cliff-nesting Kittiwake compared with ground-nesting gulls.

The absence of a cryptic plumage in the young is another feature attributable to the neat site safer from predators. One may object to this that though the young of A.stolidus are equally conspicuous, this species sometimes nests on the ground. However the observations of Watson show that stolidus will build a substantial nest in a bush given suitable material and sites. Ground-nesting is apparently forced on the species through the lack of such sites and in any case can only be permitted on small islands where ground predators are scarce.

Elsewhere I have argued that the behaviour of terns with egg-shells, whether they carry them away or not, is adapted to the

need to conceal the position of the nest from predators hunting by eyes. If a half egg-shell is presented in the nest concave up (for convenience, the eggs belonging in the nest are removed), some species will fly off with the fragment and drop it yards away, and do this long before the eggs hatch. Species which do not carry away shells brood them instead. The tests are continued until the bird either removes the shell or sits on it. Four Black Noddies were tested in this way (4 tests in all). The shell was never carried away though in one test it was picked up and dropped beside the nest so that it fell down the cliff. In the others the bird brooded the shell. In its readiness to brood an egg-shell rather than carry it away the Black Noddy again resembles the Kittiwake in contrast with most ground-nesting gulls and terns.*

While the cliff ledges of the Black Noddy may be safer in some ways, they bring dangers unknown to ground-nesters. When pecked by another bird, a young ground-nesting gull or tern either fights back or runs away. Young Kittiwakes and Black Noddies cannot run away and instead both adopts a posture which appeases the attacker.

There are two communications whose significance is not clear, namely the use of a display (the landing gape) when landing at a vacant ledge, and mutual preening, but since both Kittiwake and Black Noddy have them while the ground nesting gulls and terns do not, it seems plausible that they too are somehow connected with the nesting situation.

*The Kittiwakes' shells may remain and get trampled into the nest, or get knocked off accidentally so that they accumulate beneath the nests. Macgillivray mentions that the egg shells of the Black Noddy are found beneath the nests.

In connection with the nesting adaptations of the Black Noddy, the Brown Noddy's position is less certain, nesting as it does both on the ground and in bushes or even trees. Are all these sites equally acceptable to the species, or should it be regarded as a ground-nester which is spreading into the bushes etc, or the reverse ? In the Dry Tortugas, off Florida, one of the best known colonies, the noddies occasionally nest ont the ground (Longstreet, Dickinson) but this is quite exceptional (Sprunt). At an Australian colony Tarr noticed that the early nests were in bushes, the later ones on the ground, as if the bushes were preferred but could only accommodate a limited number. In other places where the birds nest on the ground this appears to be because there are no bushes available. But bushes are not always preferred to any other site since Gibson-Hill, discussing this matter, points out that on Christmas Island the Brown Noddy nests on cliff ledges, though dense vegetation runs right to the top of the cliff. So far as any generalisation is at present possible for the species as a whole, it appears that the bird prefers to nest off the ground, usually in bushes, but that it is much less reluctant to nest on level ground than the Black Noddy. In at least two respects, it shares some of the nesting peculiarities of the Black Noddy: the young are not cryptic and the fledging period is long (about 40 days according to Gibson Hill).

Before leaving the matter it may be pointed out that nesting in relatively inaccessible sites is not the only condition under which anti-predator adaptations such as cryptic plumage can be given up. An alternative is to nest on small islands where

~~GRAND~~
the predators are rare, and it may be this situation which is more relevent to the Brown Noddy.

In spite of these adaptations to its special life, the Black Noddy does not seem to be so accomplished a cliff-nester as the Kittiwake. For instance it apparently lacks any specialised nestbuilding behaviour to improve the nesting platform and in connection with this N.P.Ashmole tells me he has found a lot of Black Noddy eggs which had rolled off nests.

4. At first sight there appeared to be little resemblance between the displays and postures of the Black Noddy and those Sterna species with which I was familiar. One of the most similar was the food-begging, which is what might be expected as this behaviour is very stable throughout the Laridae.

The foot-look, an unritualised posture in its form, is identical in other Larids, though it is a much more regular Arctic
item in the Black Noddy's behaviour than in the ~~xtuxx~~ terns's.

~~Exkmxx~~ The existence of a complex aerial courtship display suggests that it is homologous with the aerial courtship (high flight) of other terns and closer comparison confirms that there are general features in common in spite of a difference in detail.

The erect posture, which is found in almost an identical form in all the known terns, is unexpectedly missing in the Black Noddy - at least I cannot recognise any display as homologous unless it has drastically changed the function and form.

The hostile gape might be an aggressive upright such as the gulls have, with the opening of the bill superimposed on it to increase the threatening effect. It occurs in just the situations when gulls adopt the aggressive upright.

The posture from which the croak is uttered resembles

the oblique of gulls and the corresponding posture of Sterna. The call given in this posture is much less similar when compared but it has the infectious quality of the long call of at least some gulls (Herring, Lesser Black Back, Kittiwake). Like the oblique and long call the croak is uttered in agonistic situations, though this applies to several other calls too of course. It would thus seem plausible that the croak is homologous to the long call and oblique posture of gulls and the equivalent of terns, but the matter is by no means certain.

The bridling is of particular interest as it is a peculiar and elaborate display, whose rhythmic head and neck movements are reminiscent of the choking of gulls. This resemblance is increased by the posture of the body with the breast slightly lowered. A rhythmic choking-like display has not been described in any other species of tern but this would be in line with one view of the derivation of choking, which is that it is a ritualised reduplication of the movement by which a bird drops a load of nest material. Apart from the Noddies, no other tern is known to collect beakfuls of nest material from a distance; what material the others use is picked up a piece at a time as the birds sit, or walk to and from their nests.

If the bridling has originated from the same source as the choking of the gulls, it has come to differ in several ways. Firstly it is silent (except for the mechanically-produced snap of the closing beak), lacking the muffled rhythmic call found throughout the gulls. Secondly the regular opening and closing of the beak is quite unlike the choking of any of the known gulls.

Perhaps this second peculiarity can be linked with the bright inside of the mouth, just a s the open-mouthed choking of the Kittiwake, an unusual feature for a gull, may be connected with the brilliant mouth colour of which use is made in other displays.

The beak-hiding behaviour of the ~~Kkk~~ Black Noddy has been compared with that of the Kittiwake. Though the gulls and some of the terns have rudimentary,and sometimes ritualised,forms of this turning away, it has only been develo ed so elaborately in these two "aberrant" Laridae. Since the Kittiwake is certainly not more closely related to the Noddies than to the ground-nesting gulls, this beak-hiding must be regarded as an adaptive convergence.

Other postures and calls of the Black Noddy, the clucking, "purr" etc., may also be related to displays of other Larids but one would need evidence from more intermediate species to substantiate particular relationships.

5. ~~There are two other members of the genus Anous. Almost nothing is known of the behaviour of A.tenuirostris and though various accounts have been written of A.stolidus, little advance has been made on Watson's observations which are not sufficient~~ The behaviour of the Brown Noddy has been described in Watson's classic study, and more recently by Gibson Hill, but the displays have not been investigated sufficiently the habits for a detailed comparison ~~of the~~ with the Black Noddy. In view of this the few observations I could make on the displays of *stolidus* nesting around Ascension will be reported.

There is a greeting display identical with the Black Noddy's and it is performed in identical situations - when landing alone, when landing beside the mate and before attacking an intruder. The inside of the mouth is rather less bright than the Black Noddy's.

Several times when a pair came together I saw a "greeting" display which was noticeably different from the greeting of the Black Noddy/ and something like that described by Tarr Both birds alternated a downward-looking posture, and a quick snake of the head with beak a wards. The rhythm of the two movements was about the same as the bridling of the Black Noddy . The head-shaking was just like what a bird does when its head is wet. The downward-looking posture was with closed beak, unlike Tarr's observation Here the posture is apparently what I have called the gape ~~but I do not have further data~~. After coming together, pairs were also seen to look at their feet, just like Black Noddies. (This must be the one Gibson Hill describes) Like Black Noddies they preen their mates and their mating posture is just the same.

When disturbed from their nests they fly around a human intruder uttering a frog-like call which is rather similar to the croak of the Black Noddy but lacks the initial short syllable; ~~it reminded me of a clockwork toy motor car running for half a second.~~ It has been described as a caw and is presumably the call given in the posture illustrated by Watson Pl.2 Fig.5.

Though its nesting places on Ascension are frequently visited & daily seldom by human beings, we found the Brown Noddy distinctly shyer than the Black but other accounts are not consistent in this difference (Crowfoot, Hall, Nicoll, Seventy & Whitlock).

6. All the species of gull whose behaviour is known feed their young by regurgitation but many terns carry fish held crosswise in their beaks and the young take them directly. Only the Black Noddy (described here) and the Brown Noddy and Sterna fuscata (Watson, Gibson Hill) are known to feed their young by regurgitation. The method by which the young bird's food differs from species regurgitated to species. The Black-headed Gulls often take the food from the parent'

bill tip, sometimes after it has been thrown on to the ground and picked up again. The young Kittiwake must then move its head rather its beak to take the food from the throat of the parent. The method described here for the Black Noddy is different again, with the chick's mandibles between and across the parent's. I have seen Sterna fuscata feeding its young a few times and here the method was rather like that of the ground nesting gulls, with the chick pecking at both the adults bill tips down its beak.

Extending the conclusion to the Pelecaniformes, one finds that young sometimes actually insert their beaks straight into their parents' throats, even farther than the Kittiwakes, and, at least in Sula leucogaster and dactylatra, the older young tend to rotate the head about its long axis, which perhaps prevents the lower mandible from obstructing the passage of the food. Young pelicans and anhingas also take their food from their parents' throats but in the Tropic-birds, the fifth family of Pelecaniformes, the positions are reversed and it is the adult which puts its beak between the chick's open mandibles. The tropic-birds' method seems uncommon among birds in general, for in pigeons and various seed-eating passerines it is the young who insert their beaks.

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lunata. January 3, 1957, Eastern Island

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September 29, 1955

Balboa - Panama City

Along waterfront, near sewer outlets Large flocks of Laughing Gulls Adults & immatures, apparently pre-molt, very mixed lots of juveniles

Juvenile behavior Pursuit flights, after food, apparently quite unstructured Joined in general chase flights with adults and immatures, also apparently quite unstructured

Only utterance LAU's Usual juvenile type effect "Kee-e-e-a-a-a" sort of plaintive

Adult behavior quite undistinguished Only utterance noted was Adult call. Typical hooded gull type. Monosyllabic or bisyllabic.

September 27, 1755

Many species. Ex of Grus Canadensis Falls (Falls Grande Rive Rouge Rock (appx 20) Sorel to Falls. Fairly Audubon (but was probably four hooters)

Mouth of Yamaska River. One Mountain Gull (?) (Gould Gray-headed), small flight with Mew & Wee kind. No diurnal movements, but this gull gave repeated low 33 LCN's, very reminiscent of Bonaparte's (Has kind head very little trace of hood)

Probably Gray-headed !!!

Cirrhocephalus September 28th, 1755

Gray-headed Gulls all over Yamaska river. Opposite Yamaska and perched on booms of logs. Showing very little differential coral behavior.

Several LCN's, and a fragment of LC, showing clear cut pencil. Very definitely like Bonaparte's, sort of slender wings, shorter stronger than Bonaparte's, generally like the Kadjo-Like quality

Have many pictures that look like my Ber-culmen of immature, Allegan and Toronto. Fit too much but not to be of any one accompanying fragment of LC

Note that the general effect of the head is very much like B & G. General shape & posture.

Head appears to be "cut-off", in back, not Ber. as much as Bonaparte's. Few of these heads appear to be complete. Blended over all in mud.

Bill & legs & feet appr. same color as those of B & G
Inside of mouth, in the one case I examined, appeared to be considerably that of B & G
Dull light, showing most common effect
Could not tell whether white eye lines or not. Certainly not conspicuous
Wing pattern not so different from B & G as might be expected. Separate quite distinguishable, getting darker on primaries & big coverts (-) those white from beneath

cinhocephalus October 3, 1955

One grey headed, after flying up, repeated, long 2CN's "Keeaaaa Keeaaaa Keeaaaaa....." Seen long, but somewhat more R to G - like than the other 2CN's I have heard.

2 postures
(Have never seen real diagonal anal O. Does this suggest that O of this genus is like more heliconius?)

Anal characteristics Just buff, brown, 2CN sounds

Almost all these birds are landing without any trace of a hanging dd

Have just heard Cong sound 2CN's again
Probably long, and vibrate at the end
"Keeeeaaaaaaaaaaa" ~~~~~

Just after flying up in group

Larus cirrocephalus (4)

October 2 nd, 1955

Visit to Playas. 2 new species
Numerous tern. Either *macrourus* or *elegans*. In immature plumage.
Common Gray Gull. Remarkably like photos of Heermann's in appearance.
Heard but saw nothing

October 4th, 1955

1 hooded gull of another species observed up. Either Franklin's or Franklin's. Only seen by bright. Definitely smaller than the Gray-hooded gulls it was with. Black primaries, but no other obvious signs of immaturity. Could've been my tail band) Rather pale underneath, but probably Franklin's.

cirrocephalus October 6th, 1955

Might as well set down what I know about these pictures of the Gray-hooded Gull — which is darn little. All obtained during stopovers on Pacific flights on route to Lima Peru. All observed at Lima Peru. All personally accompanied by LAN's of route to P.L.C., Callao & Pucusana beach resorts.

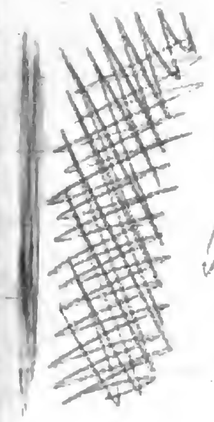
Many pictures, apparently unrelated. Another flight related opportunity came up.

ridibundus, Oct 2, 1955, II

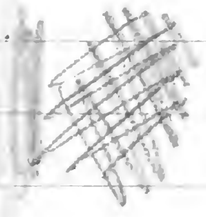
Some which look like O of Hantlaub's a few intermediate O of Bldg

Some which look like low-intermediate short-necked F's (Bondi accompanied by some ranii of megalaeus, but probably smooth-winged, probably not a real R)

White & black pattern of waved wings



Before I forget - something I noticed my first day here During disputes over perches, when the dispute becomes particularly intense, the LAN's become particularly short & harsh. Almost like Glk Reminiscent of Bondi's in similar circumstances



These gulls appear to be moulting? Does this mean breeding season is just over? ! ? ! Definitely moulting. But no juvs present

October 13, 1955

These seen, again & again, but at a great distance 3 pastels which almost certainly F's Just like Bldg

October 9, 1955

La Libertad, Ecuador 11.30 a.m.

Both juv. & adult modestus around pelicans. Mostly trying to steal food.

Juv.

Swimming O

Accompanied by typical "ready" "Keaaa" LCN's!

Flying O.

Rather plaintive, whining sound to their call!

Some of the LCN's of juvs are more like "Kleee", but still ready.

Definite, marked, HT by young bird toward adult

entire HT

HT movement by 1 of 2 adults attending pelican!

One adult does quick, slight HT movement toward another, as the latter lands nearby.

Adult Landing Call posture

moluccus, Oct. 9, 1955, II

Again, an example of adult-apparently, displaying non-nuptial plumage) HT toward adult in nuptial plumage. No sign of mal FD.

HT note of both adult & juv is soft "Rrrr" sound, i.e. typically lacrid.

As far as I can tell the LCN's of the adults are much the same as those of the juv's, (not) using bi-notation.

Common adult pattern:

Looks almost like Jaeger, short-necked, but probably accompanied by an LCN.

Adult down into hunched, then HT before attack on juv.

Adult upperside HT toward all-sorts of birds from H, with R. Even HT to a Pelican flying over head. Then V before attack. V after attack & HF — V before attack — V-HF-Cpr or Dr after attack.

Apparent parent behavior, with 9 birds & catch well. One bird elaborate LC performance, then V-HF-V-HF etc. Second bird walks around fast in H, then flies off !!!

Adult LCN is apparently "Rrrr-" Quite short. But frequently "reedy" Almost motion up into 3 or 4 short syllables.

LCN Posture

LCN posture on land, rather more forward inclination

More about adult LCN. Sometimes my cat-like "Yuaw" or "Yiaow", without a note noticeable rattle. Have also noted all sorts of intermediates between "typical" adult LCN's and "typical" immature LCN's. Must stress, again, that some of the immature LCN's are just like those of many northern gulls.

About this elaborate Long Call performance I got a beep-glimpse of — two phases of posturing, I think, one high one low, (↗ → ↙ ?) Accompanied, quite by series of very rapid (cackling?) notes, then at least one, probably several, longer trumpet-like notes.

Typical alarm posture after seen.

Alarm Call "Ha ha ha" Usually 3 syllables — this sometimes sounding like ACC of Hydrocoleus gulls. Much more similar, in general, however, to the ACC of the "typical Larus" gulls.

October 11, 1955

La Libertad Communal area.

Adult quite common. Not extreme

Mentuvalyed pre-attack posture

Juv. like other juveniles.

Also gape before attack

Apparently quite mentuvalyed Brief Inside mouth, fast thing as far as I can see

Posture during running retreat

Adults upward inclination of bill, neck only semi-stabilized upward

Juveniles do doing many of these mentuvalyed pre-attack movements (actually a movement rather than a posture), sometimes leading to a more or less oblique pecking movement. Adults in nuptial plumage occasionally doing same thing

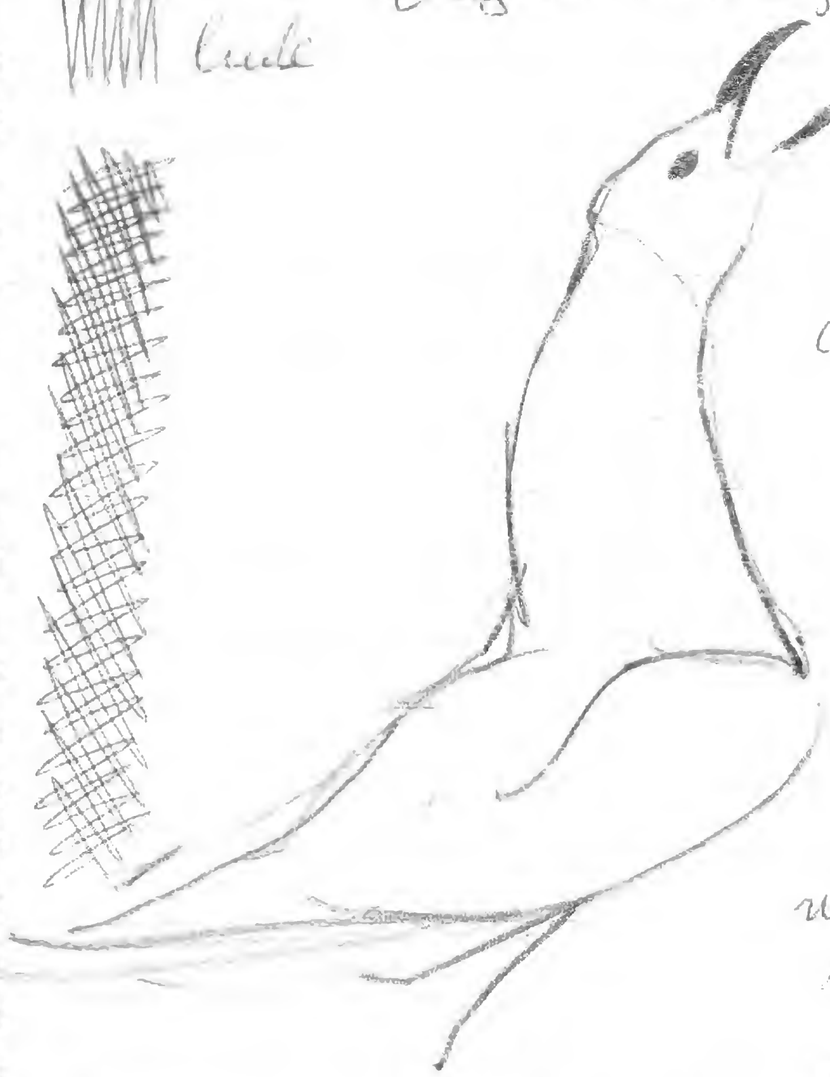
Adults, apparently toward flying end, very high O, getting a little shorter & lower as it ends, no real L or anything Accompanied by loud LL notes which I couldn't hear very well

Rough drawing

Head + neck at highest

Mendeltus, Oct. 11, 1955 II (17)

Again seen ♀, again very high, again alone, without post-



Very long-billed species

at peak

at end

Carpal joint out

Body sometimes much more oblique, more nearly vertical

MC. !! One bird O → L. L just about typical, but perhaps somewhat short-necked. Not as low-as some L's of Franklin's Gull. Other bird just U. Then both birds U-HF = L-HF etc. Carpal joints out, but not too much and not conspicuous) Feathers of nape looked ruffled, but probably due to the wind.

L.C. with this O → L (couldn't hear) but it was very noticeable that the bill was rapidly opened + closed, very rapidly, during O.

Seen again, as before.

Approximate angle + length always L.

HT from H, by adult non-nuptial, after hour, attained (attained by adult nuptial). Male may have been mate of attacker, but Dolichi-dance or certainly not followed by FB or any sign of pairing.

Adult begins O & L.C. (rapid bill movement) as another adult passes by on foot. Then does HF, twice, while continuing O, when young adult turns & approaches. Then, without any sign of L, goes into O, HF, Cpr. (This HF was very obviously an evasive movement, and the Cpr certainly seemed to develop from HF)

Bill movements rapid throughout O. Assignment be the "calling" part of call

Monday
October 17, 1955

Finally left for Galapagos today.
Just noticing a few more about the lands in Ecuador when I left

Just Contact between the lands on the river at Guayaquil, and those along the coast (Playas, Salinas and particularly La Libertad)

Along the River: ani, cuculus, Jacana, Gallinule, an occasional gull, woodstar, and one warbler gull (white, streaked on primaries, black primaries but small)

Along the coast: woodstar, Thalasseus (either elegans or maximus), a few sterna (probably fuscundata), a few dominicanus (but no terns in any where as many wanted)

Furcatus

Thursday
October 20, 1955

Saw first furcatus. Shot 240 counts on Canada Jay (Cyanocitta cristata) halfway between the pueblo Santa Elena and San Cristobal.

Monday
October 24, 1955

Shot two furcatus, on crumbling lava cliffs, at Baldera. (west coast of Floreana, c. Charles)

Breeding colony, one nest with eggs, several others building eggs. All birds apparently paired

Shot other hostile natives were attracted towards us.

1. Alarm Posture. Just like other gulls. With much side to side head-turning

2. Type. Towards us looked like "L.C.N." without sound. Same - O posture

3 Jerking. Pallid-blue noise. Quite un-bird-like. Same - O posture, just like photographs in Murphy. but sometimes with crops held slightly out, or, at least, bigger than ~~[illegible]~~ sometimes just plain Jerking ~~[illegible]~~ downturned ~~[illegible]~~ phase ~~[illegible]~~ or ~~[illegible]~~ or ~~[illegible]~~

next Jerking. Then after one Jerking, followed instantly by a two pound Jerking and Ululate simultaneously followed very shortly by a longer period when there were only hostile alert.

The Jerking is very different from any other I have heard or guessed. More like "Ack Ack" rapidly repeated or rattle in the throat. Pallid-moderately

Juncatus, Oct 24, 1955, II

Immature Matthew Juliana a more or less homologous with the L.C. + Bonaparte gulls. But it might just conceivably be more closely related to the A.L.C.

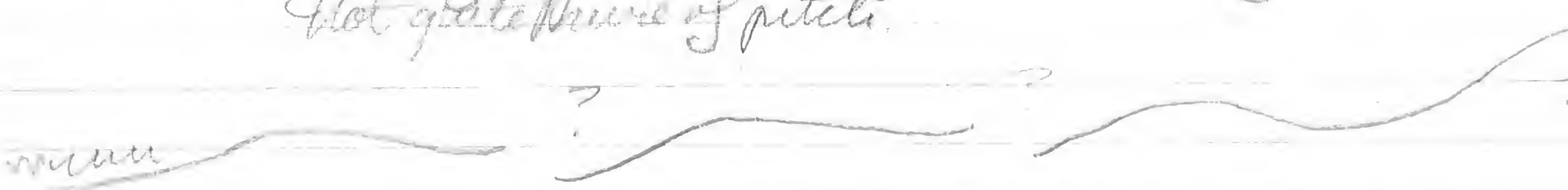
Once saw one bird quite obviously Juliana in a posture very much like a Ruff - Bill of Hudsonian Godwit posture, but without any "pumping" up + down head movements.

Most Juliana directed behavior, but none apparent eruptive 4. Whistle. "Whoooo" about as good as I can transcribe it. Quite melodious

Quiet low rew - O posture on ground. Sometimes by itself alone. Sometimes preceded by Juliana, or accompanied by Juliana during its first part.

(Has species is most peculiar, unlike any it can utter two different, equally unmelodious)

Hot plate flare of petals.

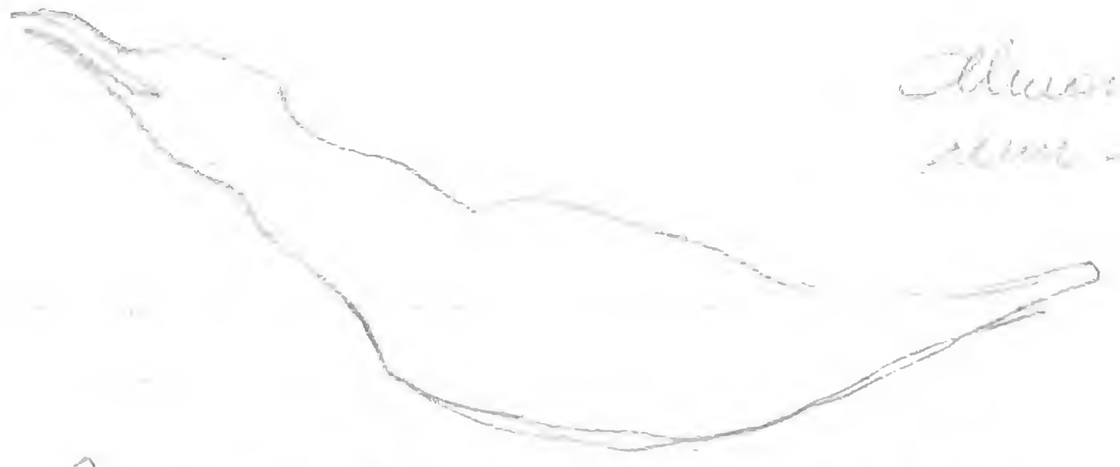


Most whistles provoked by us. Some apparently provoked neighbor or mate, certainly directed toward neighbor or mate.

All the Whistles by birds on the ground were emphatically monosyllabic. Quite peculiar. (Bell certainly usually remained on to after, in same way, the song of Clarke's, both Juliana + Juliana)

Peculiar posture adopted by one bird, probably 3 toward other bird flying nearby. Repeated during by rest nervous + excited, probably no-feeding. A real display posture.

Lancaster, Oct. 24, 1955, III



Alarm
new -1-

One thing about the usual new O accompanying typical unbroken or the normal must be noted. The culprit were probably held out feather leaving the pattern, that new after, dark still nothing like as far as usual in other hooded gulls.

Although of the new O pattern like to may other gulls.

The new-O after alternated or accompanied by side-to-side head-turning when the birds were much aroused

½ Other "alarm" or "nervous" reactions on ground OCB And a very rapid side-to-side head-shaking bout, while held in Alarm Posture, bill pointed diagonally upward

2. "Choking" One bird caught a glimpse of three like Herring Gulls in posture apparently resembling, Could not hear sound. Might have been muffled Jerking. Might have been about, just rapid pecking at the ground.

7. Aerial reactions Jerking of wheeling separate or temporarily combined, rounding just like same calls or sound. Not bouncy, more graceful, with little pendulous postures

somewhat peculiar, a little reaction (then quite strictly

furcatus, Oct. 24, 1955, IV.

Some of the longer, most quavering whistles were almost, but distinctly not, polysyllabic.

No whistled aerial manoeuvres.

When Capt D went to the nest with an egg, the excessively savage roar, but most unspectacular, and obviously unwhistled.

It is significant however, that these savage were accompanied by whistles. Perhaps particular loud long shouts, (quavering?) whistles. Means that whistles must contain an outward, strong attack drive, even if at close quarters contain a strong escape drive (which may or may not be true).

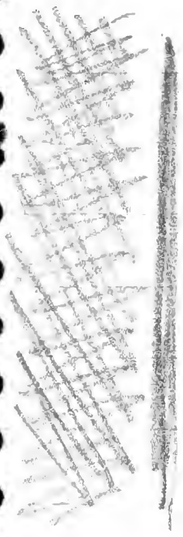
Seligmann, I.

October 24, 1955

Jackdaw

Two adult males, with territorial dispute over food

with O



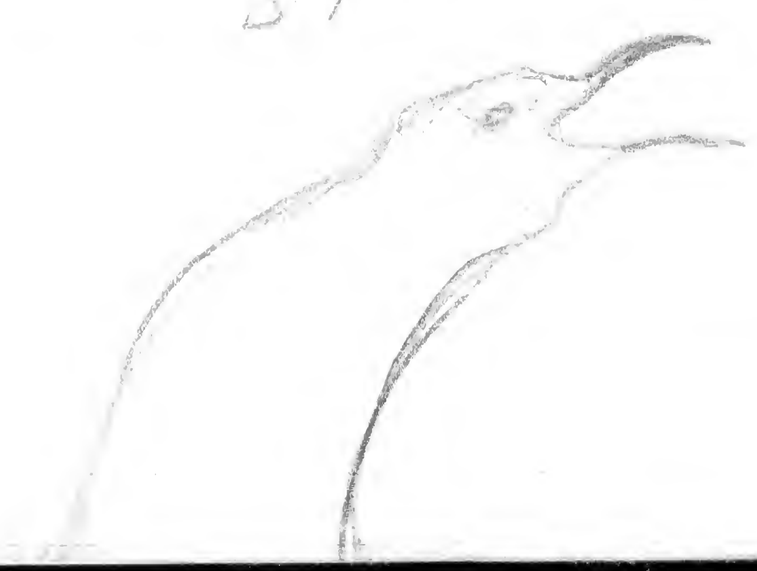
Then goes into L.C. (not too high), with unmusical rattle or trilling, then, as O → <, gives "Kow - Kow — Kow - Kow ....." twice.

Then L immediately becomes an almost horizontal stretch, and then immediately becomes something like an F (Pink an inverted arch, but head a bill almost horizontal

"F"

I think that the last L.C. note was identical in the F

Another dispute over food. Again preceding L.C. Begins with Jerking or Rattle (slightly less pronounced rolling of R's than the Jerking of Turcatus) In O High but perhaps less high than O of lucidus. Neck very much like Bill remains permanently open



Head much smooth

The gradual drawn into 1 as "Pen" sound begin. Hold 1 sound very short time. The last bit of the L and the real beginning of "Pen" sound as "F" The following T, with quite obvious "Puff" sound. Then end stroke in 1 circle, 1 pen-H position with slight tear of F. Escapulum left out as a last resort, where

Right just a small second some adventurous souls venture from the shop. Two birds, pound pair. Sometimes, when Jesus the swallow both did O-L-F-T. Once saw O-L-"F"-T-T. Usually followed by one of four options to indicate U-sing pattern. Birds HF sometimes when the birds ground one another, they both just stand in row-L-O could gain advantage by repeated LCH's

These L.C. postures are accompanied by wee little, jerky raising of carpal joints. Absolute on front edge of facing, carpal joints may be just visible.

The last dispute I saw, in which our bird did O-L-F-T, did not appear to be between the members of a pair. Just small group of four birds, one might join bendy-wing swoop here. The earlier encounter in which the O-L-"F"-T sequence appeared, however, may well have been between the members of a pair. The nerve (perhaps) two birds had earlier been seen to T from H, locked like FB. Both members of the actual O-L-"F"-T sequence were uncertain with next T from H for details of the T of the spread pen. Not to be too sure, perhaps mere flutter. Rather reminiscent of [illegible] explosion.

Now about next, expected, "How" sounds. There are very varied full type. Usually wind a cat like. But can the expressive letting go of the anchor: E A. There is time of both the L.C.H's, and the "now" part of the L.C. of facing. In other words, this species has not yet lost all of its various two sounds at once.

L. c. N.s commonly given by Young birds often rapidly repeated, but nothing like real L.C. given from the usual gull postures

One, when a Young bird was doing slight, unrestricted, swoop toward ship, & gave a series of rapidly repeated L. c. N.s which were particularly long, perhaps querulous, perhaps particularly loud PCC

Must say that the species flies a lot, and goes an awful lot of aerial L.C.N.s. Have also noted several aerial display circles. It appears significant therefore, that I have seen no ritualized aerial postures or movements.

Young birds give ABC. "Keh" or "Keh-keh" or "Ka-ka" all quite Hydrocoleus-like.

Usual Alarm Posture on ground

Juv. bird have typical gull "Kreaar" L.C.N.s

One bird gave another - probably a Young, a Young (of ♂ sex of either ♀ pair) — L - "F" — T-T — V & HF — ♀ sex L - "F" — T-T — V & HF — Ger. then separate

Adults have head, eyebrow, white ring - stage, like attwilla - type hooded gull, except that the white of both eyebrows and ring - stage is much thinner.

T-T from H, with F, after attack

Bill a slight bit to moderately open during Jealousy Flourishes alternately steady, no trace of opening or closing. Then immediately further apart during "Keho" notes, again alternately steady

Galapagos

October 25
1954

Same place 7 AM a.m.
Overcast with a light drizzle, temperature 68 and [illegible]
[illegible] like yesterday.

Bill Black, with spot of red at top of upper mandible.

Bird - shape

Dark in these Quads

Dusky-headed, grey-bodied Gull, looking much lighter and more slender-billed than Yellow-footed.

Have seen all sorts of aerial feeding. Mostly directly toward me - but sometimes deflected, or possibly directed toward other gulls, flying or sitting on ground. Have watched Feeding much like Ring-billed Gull. Attack flights. Simple flights. Circling, with or without up-and-down movements. Swoops, runs (usually flying, sometimes gliding). Soars (usually gliding, sometimes flying). All observed quite consistently.

Aerial attacked postures are similar to Gulls. L.C.'s & A.C.'s. Normal Pec. Attacks of juvs. or birds of close kind may give a relatively long, elaborate L.C. almost polysyllabic. But this seems to be an overlay of the R.B.G.'s "attack call" as of anything else.

Ad. ♀ on ground. Taunt (Jeering) Gesture. ♂ (with feeding) - L - F - T - T - Spec. Beak definitely a full adult, distinct hood. [redacted] not, yesterday, clear-cut between adults & immatures. Evidently most of the plumage L.C. performances were given by adults. But one may have been given by an immature (and the "Jeer" L.C.'s of immatures and certainly also those of adults)]

Ad. ♀, apparently attempting to repell intruding juv., gave L.C. performance without any feeling. Began in final Bright portion as if just coming out of Pec. Then → L - F - T - T