

MENTAL POWERS OF BIRDS.

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THE mental faculties of birds are admitted to be greatly inferior to those of the higher quadrupeds, and such is the case no doubt ; but, irrespective of their remarkable instincts, they display other mental qualities of no very mean order. These we shall now consider individually, along with their accompanying gestures and utterances, so that the reader may consider how far they allow of being associated with, for example, the instinctive impulses that prompt the bird to migrate, or other well-known phenomena in relation to their nests and habits.

In the first place certain mental powers in birds, as in higher animals, are improved by exercise, and many species and even individuals of the same species show a greater aptitude than others. Even instincts which are considered to be uninfluenced by teaching or example do often display variations expressive of both reason and judgment, whilst many acquired habits lapse after generations into instinctive actions. Fear is a good instance of an instinctive emotion which has been greatly strengthened by experience, and it is wonderful to observe the part man has played in increasing it in many birds. Let us compare the delineations on ancient Egyptian monuments, showing the fowler surprising flocks of water-birds among the tall papyrus swamps of the Delta, and dealing destruction among them by means of missiles made of small pieces of wood shaped like the letter S, and delivered with force and dexterity, with the practice now adopted, where, after all the caution possible, and aid of gunpowder, it is extremely difficult to get within even rifle range of such as the geese and ducks. But although these birds are much persecuted, there are others which contrast in this respect in a singular way with their brethren in other countries. The fearless habits of the kestrel of Egypt, as compared with its much oppressed brother in England, are notable. No one molests it, and in the days of the Pharaohs, as

we learn from Herodotus, it was held sacred to the extent that whoever killed a hawk was put to death;* so that it is possible the kestrel of the Lower Nile may have continued to enjoy a feeling of security up to the present day. The hooded crow is also very tame, as compared with its harassed brother in many other countries. The school-boy knows the effect produced by the report of his gun on many birds, and how other senses become sharpened in consequence; to wit, perception, as evinced by the crow and magpie perceiving the dreaded implement of destruction long before it can be brought to bear on them. Many birds acquire fear slowly; others are naturally timid. All gallinaceous birds are more or less fearless in their primordial states; and even partridges and grouse, only after weeks of constant persecution, acquire the alertness to enable them to be up and off before the sportsman gets within range. Even this lesson is forgotten during the close season. I was surprised both in the Himalayan and Canadian forests to find certain pheasants in the former and partridges in the latter quite fearless, more especially in secluded districts where they had not been molested by man. Indeed, so indifferent of danger were they, that beyond flying from the ground into the nearest branch, they seemed quite regardless of our presence. It was, moreover, a common practice with the first European settlers in many parts of America to knock the partridges off their perches by means of long wands. Then the only enemies of these birds were the sable and other martens, and the lynx, from which they escaped by simply flying into the nearest tree; however, as clearings were made, and the birds became more molested by man, they gradually took to longer flights, so that around the settlements it is somewhat difficult to shoot them. Birds that frequent mid-ocean islands, and have few enemies, are generally very tame. Such, however, as the grebes, guillemots, and awks, are low in the scale of ornithic intelligence; and probably on this account, and from its inability to fly, we might ascribe the extinction of the celebrated Northern Penguin or Great Awk, which may now be said to have disappeared, at all events from explored portions of the globe.

Again, the beautiful feathers of the monal pheasant of the Himalayas and American crested-jay have been long in request to decorate the heads of the ladies of Europe and North America; and, in consequence of constant persecution, both species have become so wild and wary, that in the case of the latter the denizens of the forest solitudes have inherited the timidity of their brethren of the settled districts. Here, no doubt, fear gradually attained has become a trait of character, seeing that

* "Euterpe," II. para. 65. The Ibis is also included; it is now extinct in Egypt.

in the instances quoted it is well known that both birds in their original state were the reverse of pusillanimous. Fear is depicted even in the nestlings of many much persecuted birds; but man also, when down-trodden for many generations, displays an inherited dread of the conqueror, as is well observed in the natives of the valley of Cashmere and other oriental races who have been long subjected to tyrannical governments. Fear of man has also changed the habits of many birds and beasts. Thus the geese on the Nile feed at night, and repair to the islands and sandbanks in the day, when they can easily observe the approach of the numerous fowlers who wage a constant warfare during the cold months; and the beaver now builds its lodge after dusk, whereas we read, in the accounts of the early settlers in North America, of the work having been executed during the day. But indeed we have only to observe the ploughman's companions in the furrowed-field, and the dread established by the presence of the gamekeeper, to become assured of the part played by man in developing fear in the lower animals.

As regards their natural enemies. The stoop and motions of the hawk are readily recognised, but the bird itself causes little or no perturbation when brought close to any of the species on which it preys; whilst cats, weasels, and the like, incite marked dread. This may be explained by the circumstance that the former is only known to them on wing, whereas the feline animal is often seen prowling in search of them. The well known danger-signals produced by many birds when the hawk hovers near their haunts, and the subdued note that breaks the dead silence in the hedgerow the moment following the stoop of the sparrow-hawk, are familiar instances of fear and dread which the long-reclaimed poultry have not forgotten, although from inexperience they sometimes mistake the swoop of the harmless pigeon for that of a rapacious bird.

Violent dread, in fact terror, is displayed in many birds. This is evinced by the widely dilated eyelids, wild excited aspect, and loud, helpless screams of wounded eagles, parrots, and the like. Anger and sorrow are evinced by plaintive cries, and redoubled efforts to drive away the plunderer of the nest; indeed, instances of prolonged grief for the loss of a mate are recorded by several naturalists. Hatred is displayed by certain species towards their foes: for example, in the flocks of swallows chasing and tormenting hawks.

The perceptive faculty is seemingly demonstrated by the following:—A German piping bullfinch, taken from a cage containing other birds, showed no particular predilection for any of the numerous inmates of a family circle, until after being caressed and spoken to by a lady for a few weeks, when it

singled her from all others by swelling out its feathers and chattering its bill whenever she came near the cage, whilst everyone else was greeted with evident signs of displeasure, as evinced by furious attacks, made with the desire to repel the intruder. On these occasions the mouth was open, and feathers adpressed, the little creature all the while digging at the wires and fluttering its wings in evident anger. The moment, however, its mistress's face appeared, all the symptoms of displeasure ceased, whilst the grotesque movements common to the wild bird during the love season took their place. These were evinced by the little creature swelling out its plumage, as, with tail awry, it fluttered from perch to perch, drawling forth the nature notes, or piping the acquired song, which consisted of a bar of "If ever I cease to love."

I tried various experiments by disguising the peculiarities of dress of its mistress, and introduced a number of female faces, but in every instance it recognised that of its benefactor. Now whether this lady had any resemblance to its original preceptor or not, the fact is that the bird showed considerable powers of perception and memory, for even the same face was at once known after a week's absence. The American Mocking-bird displays singular powers of distinguishing persons; I know an instance of one of these birds which invariably called to its owner whenever his voice was heard in the hall. I possessed a Carolina Mocking-bird, the natural call of which is so like the mew of a cat, that it is known by the name of Catbird. This individual, although reared from the nest, displayed an inordinate dislike for cats, whilst a bull-terrier never caused it any concern.

No doubt the higher animals dream, as shown by the tremulous startings and noises made by dogs when sound asleep; and birds would seem also to possess similar powers of imagination, as observed in caged individuals, which may often be observed to utter cries when the head is under the wing, and suddenly awake, as if the mental image had been the cause.

Such as the hooded crow and magpie do not break an egg to pieces, but make a small hole on the upper surface; and the same was noted by me in the case of the pine marten of India (*Martes flavigula*), which chips an opening just large enough to enable it to suck the contents. Now, in all these animals it is likely that the practice was first confined to individuals, and through example became general, and may now be instinctive; at all events it would indicate a glimmer of reason.

The excellence of bird architecture, and the efforts to conceal and place the nest in situations where enemies are not likely to rob it, furnish beautiful instances of instinctive intelligence; but surely there is also some dread of man or four-footed foes

in the case of the weaver-bird of India (*Ploceus baya*). It is very social in habits, and builds in societies; but its very conspicuous and elaborately constructed purse-shaped nest would fall an easy prey to enemies did not the little architect, with surprising intelligence, place it in situations not easily accessible: hence several may be seen suspended from the tips of branches overhanging deep wells, or from the top branches of acacia and other thorny trees.

Many such examples might be furnished, indicating powers of reasoning. One of the most intelligent, at the same time finest songsters of North America, is the Brown Thrush (*Turdus rufus*). This bird is extremely pugnacious during the breeding season, and attacks all intruders on its haunts; even snakes are assailed; and should two males be engaged, they will suspend hostilities at once, and join in alliance against the common foe. Among other traits in an individual reared from the nest, was a habit of immersing dried crusts of bread in water so as to soften them; it also carefully removed the poison of wasps before swallowing them.*

A sense of the beautiful is surely present when the peacock displays his gorgeous attire before the hen, or when the chaffinch spreads out its wings in order to show off the rich colourings of his upper parts. The battling and rivalry among the males at the commencement of the breeding season, all show that the pairing of birds is not altogether futuitous. Sometimes it would appear that the female makes a choice; in other instances, that she is won by the stronger male driving away the weaker; and, perhaps in very many cases, the pairing is accidental; at all events it is the season when the passions and mental powers of birds are at their highest.

The facts, in relation to carrier-pigeons finding their homes after many months' absence, and swifts and swallows returning to the same nest for several years in succession, indicate, as will be noticed presently, that birds possess remarkable powers of memory and perception. But the mental powers of birds are extremely various, and even this is the case with species, individuals of which excel others in intelligence. There are individual nightingales, canaries, goldfinches, and thrushes, more easily tamed and taught than others, whilst in nature there are single instances of song-birds who excel their compeers in the richness and melody of their notes. Some male birds display their attractions more efficaciously before the female at wooing times; and in a flock of wild cranes, for example, there are, just as in a herd of ibexes, a few leaders who guide the flock and are the first to signal the approach of an enemy—all these

* "The Zoological Survey of the State of Massachusetts," p. 30.

super-excellent individuals being generally the largest and most richly attired males.

Curious instances of what might be called instinctive benevolence are displayed by the young of many sorts of birds. I have frequently noticed, when rearing individuals of the Migratory Thrush of North America, that when it so happened an unfledged bird was placed along with another just taught to feed itself, there was always a strong disposition on the part of the latter to become the foster parent; and so assiduous was it in feeding its younger relative, that I had to separate them, when the elder became quite disconsolate, and would hop from perch to perch for hours with a worm in its bill, its plumage ruffled, and evincing by plaintive calls that the separation was painful. Every "bird-nester" knows the parental affection of the chaffinch, and the desperate attempts of many birds to distract his attention when in the immediate proximity of the nest. The little ruby-throated humming-bird of Canada affords a good example of simulation. When captured, it feigns death by shutting its eyes and remaining quite motionless, then suddenly it will make a vigorous attempt to escape.

Social instincts are very strong in many sorts of birds, and there is much variety, some evincing remarkable affection for each other. There are several species of Bee-eaters—the little love-birds, and others—so fondly attached, that they huddle together on the same branch, and are utterly disconsolate when separated. Many birds, such as bullfinches and parrots, display in captivity remarkable sociability by demonstrations of satisfaction when a person enters the room, and cries of regret when left alone. Certain species of eagles and smaller birds pair for years in succession. Timidity among birds has nothing to do with size. Many of the largest show little courage, perhaps for the reason that they are rarely called on to exercise it. The rivalry of males at the breeding season, no doubt, develops bravery, which becomes established in the individual who proves himself the victor in battle, whilst even the vanquished learn to estimate its value. Among small birds few display greater courage when attacked than the Blue Titmouse, whilst warblers are generally very timid. Many gallinaceous birds are very combative, whilst water birds, except the Ruff and a few more, are, as a rule, rather pusillanimous.

The mental qualities of birds are progressive, as shown by the small amount of intelligence of the young bird. They soon, however, learn to avoid danger. Bird-catchers and Canadian trappers have informed me, that a bird which has escaped a lime twig, and the mink and sables who have chanced to get out of the trap, manage by certain means to make their misadventures known to others of their own species. This is

done by some gesture or vocal expression. The cunning or intelligence of the fox has long passed into a proverb, not only applicable to the much persecuted animal of Europe, but also the unmolested species of foreign countries. Thus the red fox of the wilderness tracts of North America is just as wild and wary as its English compeer; so much so, that trappers find it useless to try and capture them alive, and therefore resort to poison.

The power of imitation, although strong in birds, is confined altogether to the voice. Every observer who has paid attention to their songs and call-notes will readily allow that they are great copyists. The piping bullfinch before referred to, when moulting, and during a serious illness, never attempted the acquired notes, nor even its native song; but afterwards, whilst the latter seemed to return without any effort, the former required days to become perfected; and after the sick attack it could not manage the two last lingering notes exactly, and used to constantly repeat inaccurate imitations, until I whistled them, when he followed my cue and seemed quite relieved that he had got into the right tune again, repeating it upwards of a score of times in rapid succession. Many of our common birds imitate call-notes of certain species, but of all others the thrush family present, in the Mocking-birds, the most perfect imitators. But although parrots are easily taught in captivity, they are not by any means given to copy the call-notes of other birds in their native woods.

The voice of birds is the nearest approach to language, and although decidedly instinctive, it is developed more or less by imitation. Indeed, although the young bird's essays are imperfect at first, and greatly assisted by hearing its own species, still a bullfinch or canary reared from the nest, and kept apart from its own kind, will sing just as perfectly as if it had been brought up in the society of its parents. It may be a question, however, if this hereditary instinct would maintain its exact character through many generations of canaries treated in the above way. No doubt birds sing from pleasure, sometimes to charm the female; at others, as in the case of the redbreast in autumn, chiefly in emulation of a rival, as may be observed when he stops to listen for the response, and then breaks forth afresh, as if he challenged all the robins within hail to equal his strains. Many birds utter certain low warbling measures to their mates, accompanied by love antics and gestures clearly indicating pleasurable excitement. Even the dirty town sparrow makes known his attachment by vocal sounds and grotesque movements. No doubt the female often looks on with indifference on such occasions, and among a flock of linnets it would seem that it is the more rosy breasted males that are the

gallants in spring ; at all events they are the most assiduous in their love gambols and songs, as compared with the less brilliantly attired members. This I have repeatedly observed in other birds which get additional colourings at the breeding season, such as the redpole, American goldfinch, and the delicately coloured trumpeter bullfinch of Egypt.

The companion calls of a flock of geese on wing, and the hen calling her chicks ; the intercommunication by means of certain notes of a flock of finches in a forest, prior to departure, has seemingly a linguistic character. The beautiful pine bullfinch (*Tyrnhula enucleator*), found in northern regions of Europe and America, retires from the arctic circle in winter to less rigorous climates. Flocks of this bird may be seen in the Canadian forests in early spring feeding on fir-cones, when the rosy-coloured males commence a series of call-notes, which are taken up by the sombre-coloured females and young birds of the year (the species breeds in very early spring, long before the snow has disappeared). These whistlings increase until the trees seem alive with bullfinches ; when suddenly, as if by some preconcerted signal, the entire flock of several hundred birds fly off in a body. The quail, when about to migrate, repairs to dense covers, often of vetch, where the flock keeps up a sort of companion whispering very curious to listen to. This, as in the last case, is varied both in tone and intensity all over the field, from bird to bird, when, from these indications or others, they depart simultaneously.

The instinctive desire which comes over the bird at the migratory seasons, and compels it to depart, although apparently a blind impulse, and not influenced by judgment or reason, is assuredly awakened by many causes more or less adverse to the well-being of the species. Take, for example, such gregarious birds as swallows. The parental duties over, the gradual or sudden transition of temperature and consequent failure of insect life necessitate a change in the mode of obtaining subsistence. The insects that were wont to ascend to high elevations have now disappeared, and what remain are confined to lower levels. Hence the crowding together and ground skimming of old and young birds, until the supplies rapidly disappear and the weather gets colder, when they depart in a body before the north winds or in the face of the balmy southern breezes which indicate the route to Africa. It has been often observed that many migratory birds have been driven, through the instinctive impulse, to abandon their second broods and leave them to perish miserably. This is the case with swallows ; and I noticed during two seasons in Canada the same in connection with the Carolina Waxwing, which arrives in the eastern provinces in June and departs abruptly in August ; but

the pressure of circumstances, to wit, sudden change of temperature and failure of subsistence, compel them to sacrifice their offspring for their own own safety.

A remarkable circumstance in connection with birds' migrations is the regularity of their comings and goings. These are well estimated on the shores and islands of the Mediterranean at the spring and autumn equinoxes, when the vast hosts of birds of passage are on the move to and from their winter retreats in Northern Africa. Then one can almost calculate on the certainty of the arrival of many species which make either a lengthy sojourn, or only wait for a few hours to rest themselves. Some never halt, and are seen steering their courses at high elevations, evidently aware that the intermediate lands, beyond a mere resting-place, are not those they are seeking. Some birds recognise persons and objects after a length of time; indeed, the same individuals have been known to return to their nests year after year, as in the case of the swifts marked by Dr. Jenner.* Such instances are all the more remarkable that they occur in a bird in no way super-excellent in other mental acquirements, and of its tribe goes furthest into the interior of Africa during the winter months. The swifts, however, besides their almost unexampled powers of wing,† have a greater range of vision; so that, supposing the English home is readily discernible by certain physical characters, such as a particular mountain range, and the distance between it and the winter retreat is travelled over in a few hours, without a stoppage on the way, all that the bird has to treasure in memory is the general feature of the district it has left. This, however, has to be retained for nearly eight months, through daily-changing fortunes; and even when the landmark is re-discovered, still another mental effort is required before it finds out the nest of the previous year. No doubt winds and temperature, in connection with coast lines, &c., assist migrating birds in finding their way to and from their summer and winter retreats, and very likely certain mental powers are acquired and improved thereby; but the crediting of such an effort as the above to instinct alone is apparently incomprehensible. The desire to change residence, and the direction of the route, are indicated by seemingly natural causes, and there may be an instinctive disposition in every migratory bird to pursue a definite extent of journey; but in the face of wind and weather on the one hand, and the

* See Yarrell's "British Birds," vol. II. p. 234.

† Spallanzani estimated the rapidity of the swift at about 276 miles an hour, or three times greater than the swallow. Thus, according to his calculation, the former would traverse the distance between Great Britain and its winter haunts in 20° lat. in less than seven hours.

length of absence, it is scarcely credible, unless by the merest chance, that the same bird can hit off the exact haunt of the previous year. The swallows that resort regularly to the same nest, or even the thrush that builds always in the same fork, or the sparrow in the hole on the housetop, are not necessarily the exact tenants of the previous year. Each species gives a preference to one sort of situation over another, and the fact of seeing an unoccupied nest is, with many birds, an inducement to appropriate it; although, no doubt, among the indigenous avi fauna of every country there are generations upon generations of rooks and sparrows, for example, that build in the same tree. Now, notwithstanding the fact that mated birds soon forget one another, there is no reason why they should not possess, as in certain higher animals, a greater capacity of memory for places.

In conclusion, it is apparent from the foregoing that birds display emotions of a varied character by well-marked vocal utterances and gestures, and that although these and other mental qualities are to a great extent instinctive, there are at the same time clear indications of reason in many instances. We may believe, therefore, that although the intellectual powers of birds are generally much inferior to quadrupeds, they show the progressive development of their class, as do their organism; and as the corporeal structure is suited for the welfare of the species, so the instincts and other mental qualities are developed and modified.