

## **How birds learn to make nests and songs.**

### **Contributors**

Miller, W. J. C. 1832-1903.  
Royal College of Surgeons of England

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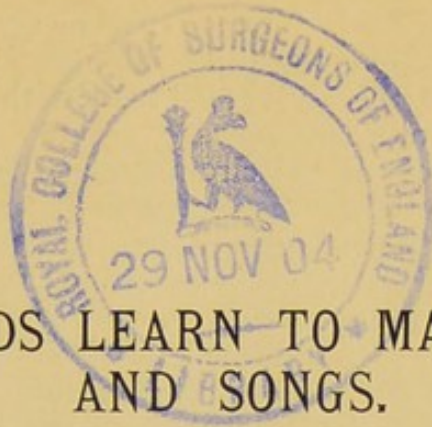
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collection**

Wellcome Collection  
183 Euston Road  
London NW1 2BE UK  
T +44 (0)20 7611 8722  
E [library@wellcomecollection.org](mailto:library@wellcomecollection.org)  
<https://wellcomecollection.org>



## HOW BIRDS LEARN TO MAKE NESTS AND SONGS.

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**A**N interesting question often arises as to how birds come to make the nests they do, and sing the several songs peculiar to their species. Many of these nests are, we know, very elaborate structures; and the songs that some of the birds sing live for ever in poetry, as well as in the memories of all who delight in country sights and country sounds. And the question arises, quite naturally, how do the birds get to do these things? Is the nest-building taught by their ancestors to thrush, chaffinch and long-tailed tit; and are the songs handed on to skylark, or blackcap, or nightingale, from one generation to another? These questions, though they press for solution, do not often, if at all, meet with the consideration that they so admirably deserve. People are fond of answering such questions, off-hand, by saying they are done by instinct; but this is a simple way of getting rid of the question altogether; and it is in much the same way that the origin of some fine structure on earth is unhesitatingly ascribed to the Druids, or to that mighty constructor, the Devil; and this habit gives us Druid's walls or dykes, and Devil's punch-bowls or bridges, in various parts of many lands. Inquirers seldom pause to consider what instinct is, wherein it differs from reason, and whether, for instance, man may be considered to possess and use this faculty. Instinct may be fairly defined, for our purpose, as the performance of complex acts, absolutely without instruction or previously acquired knowledge; and if we look to the recognized authorities to ascertain what they suppose may be accomplished by instinct, we find that they differ *toto caelo*. One very high authority, who has written on mental evolution in animals, says, very definitely, that "the singing of birds is certainly instinctive." Another is of opinion that "notes in birds are no more innate than language is in man, and depend entirely on the master under which they are bred, as far as their organs will enable them to imitate the sounds which they have frequent opportunities of hearing." Between these two dia-

metrically opposite opinions we find every intermediate view displayed and advocated. The experiments that have been made to test these opinions differ almost as widely in their results as the views themselves; thus, on this subject, we are entirely left to form our own views.

A consideration of all the circumstances may, perhaps, lead us to the conclusion that instinct may be best regarded as a plastic faculty; and that any particular action that we may consider may be looked upon as resulting in part from instinct, and in part from intelligence or reason. The sparrows used originally, no doubt, to build their nests in trees, and then, in order to be secure, they had to pay attention to structure; but when, by and by, they had learnt to make their nests in the corners of house-roofs, they soon found that they could save themselves a lot of trouble in construction by building their nest as loosely as ever they liked. And this saving of trouble in nest-building is one of the things that birds seem to learn the readiest of all. Some young chaffinches were once taken very early out of the nest, carried to New Zealand, and there turned out. At home, we know they build some of the loveliest of all nests; but in New Zealand they built a loose nest lined with feathers, in the fork of a tree, wherefrom it hung down a foot from the side of a supporting branch, thus forming a nest totally different from the compact structure that they always make in England. They had there probably imitated the nest of some New Zealand species. Such an experience as this would seem to show that birds do not make their nests by blind instinct, but by imitating some nest that they have seen near them.

If instinct means anything definite, it must mean the capacity to perform complex acts without teaching or experience; thus such a pretty piece of work as a chaffinch's nest we might surely expect to be done, if done by this faculty, in the same way in whatever part of the world it is constructed. On whichever side we approach the subject, it is beset with difficulties. We can see quite surely that birds learn much as time passes on. Since the invention of churches, jackdaws have, as we well know, got fond of the steeple. House and chimney swallows must have largely changed their habits and modes of building since the multiplication of the houses in which they love to take up their abode. This leads us to inquire whether there is much, if any, difference between the faculties exhibited by birds in building nests, and those shown by man in constructing his own dwellings; the phenomena presented in the several cases seeming to indicate no essential difference in the kind or nature of the mental faculties employed. Birds build their nests badly or in unsuitable places, just as men, we know too well, often construct houses imperfectly, or in places where they ought never to have been put. In high winds, eggs often drop out of rooks' nests; and a cat may sometimes stalk off with young birds from some unsuitably-placed nest. It would seem too elaborate, perhaps,

to cite Mill's sensationalism and the philosophy of experience, seeing that in the construction of birds' nests, no evidence can be found to show the existence of anything beyond the reasoning and imitative powers that animals are admitted to possess.

They make use of the things they find at hand, or that they may themselves be able to supply, just as we expect human beings to do. Swallows, swifts, and song-thrushes use their own saliva in building their nests; and the thrush's nest, when well built, is quite a work of art, and well worthy of notice, as I can myself testify, after having carefully watched the building of a perfect beauty of a thrush's nest, for two successive years, in my own garden on the banks of the Thames. After placing, first of all, a fundamental structure, with a hollow about the size of a teacup, largely of moss and such soft substances, wrought into a rounded form by intermingled straw, or small roots, or stems of grass, there was put in, by the thrushes, at the brim, a thicker band hooped round like the mouth of a basket. All this was carefully intertwisted and delicately fastened into proper positions here and there by the bird's own saliva, which made a nice nest of the cup itself; but at last there came the laying on of a lining, which made the finest part of the work. Within the cup, the bird first laid on, and fastened to the frame by his glutinous matter, a layer of mingled mud and horse-dung, thicker at the bottom and thinning out towards the top, all rounded with amazing smoothness by the thrush's bill. For innermost coating, short slips of rotten wood were used, firmly glued on by the same cement, and bruised flat so as to thoroughly accord with the smoothness of the surface whereon it was laid. When thus finished, the lining was like pasteboard, hard, smooth, tough, and watertight, while thoroughly warm and comfortable, furnishing a structure admirably fitted to protect the eggs during the bleak winds of early spring.

All this I observed with as much care as I could, without at all disturbing the birds. With them I had, at last, got so familiar that the hen-bird would let me stroke her back as she sat on the eggs. They had chosen a pleasant spot for their nest and as I was very careful to keep all cats away from the garden, it was a very safe one. It was the same pair that built the second nest, which was near the first one; but the birds, I noticed carefully, made no attempt to repair the former nest, as rooks would have done. And I thought the second nest was, in some respects, a little better than the first, as if the builders had learnt something in the year.

And as I watched all this, I could not help thinking that many a farm-labourer dwelt in a far worse constructed house than the one that had been built for their family by this pair of thrushes.

After these two years' nests had been built, there took place periodical illuminations of the Thames, sometimes closing with fireworks; and all this drew crowds of sight-seers from London

to the banks of the river. The wise thrushes then moved their nests farther off, at the same time that the nightingale moved away; and as I should like to have done myself, if I could have chosen my site for a dwelling as easily as these birds. Thereafter, though other birds, such as robins and tits, still built in the boxes supplied in the garden, and thrushes and blackbirds often came there to be fed in winter, or to gather snails and worms at other times, these thrushes built there no more.

It is difficult to draw an exact distinction between what we agree to call instinct and what is designated reason, in regard especially to the construction of dwellings. The most common idea seems to be that human beings act from reason, animals from instinct. If, in doing a certain thing, we adopt means to effect it, and have a clear and precise notion that those means are directly subservient to that end, we are supposed to act from reason; but if we are not conscious that the means adopted *are* subservient to that end, then we call the action instinct. Consciousness of means being subservient to end is usually regarded as the distinguishing characteristic of reason; but between the uniform performance of instinct and the conscious knowledge of reason there is a vast field of human and animal activity. Some writers are getting to portion the field into a threefold division, comprising instinct, reason, and intelligence. Men and animals, they say, come into the world with an innate capacity for response to certain stimuli. This is part of their organic inheritance. If the response be at first an accurate and adequate response, we call it instinctive. The responses often have a variable amount of inaccuracy and inadequacy; in such cases the animal has a power of selective control over the responses; and this power of selective control in the activities essential to daily life is supposed to constitute the first stage of intelligence. Unlike reason, intelligence implies no conscious knowledge of the relation between the means employed and the end attained, though it may be exercised in selective adaptation to ends novel to the individual and to that of the species.

Intelligence is considered to be the faculty by which, through experience and association, activities are adapted to, or moulded by, new circumstances; while reason has its power in the true grasping of relationships themselves. Intelligence is ever on the watch for fortunate variations of activity; it proceeds by trial and error, and selects the successes from among the failures. Reason explains the suitability; it shows wherein lies the success of the one and the failure of the other, and adapts its conduct through a clear perception of the relationships involved. Individual experience, association, and imitation are the main factors of intelligence; explanation and intentional adaptation are the goal of reason.

The activities of instinct are those in which there is no variability, and in which, therefore, there is no necessity for any intelligent acquisition of skill; thus, though animals, when acting

from instinct, adopt means subservient to the end to be attained, and are uniformly found to do so, they are not in the least degree conscious that these means *are* subservient to the ends. An instinctive action originates in the brain, and is probably accompanied by consciousness; but there is no conscious working towards an object in view.

The subject is, however, beset with difficulties, which such considerations as these do not enable us to overcome. It is very difficult to distinguish between what birds learn, and what they seem to know by some innate faculty. Pheasants have been found to feed quietly while rifle balls were passing over them; they have either learnt to distinguish between a shot-gun and a rifle, or are acting from utter greediness. Frank Buckland gives an account of a fisherman's drawing up his line suddenly and whipping out the eye of a pike, which at his next cast, the eye still on the hook, was gulped by the bleeding pike. Swifts, swallows, and martins have, in comparatively recent times, learnt how to avail themselves of barns, chimneys and house-roofs; and similar adaptabilities have been shown by other birds. The single note of the cuckoo is, no doubt, the very easiest for such a bird, as for all boys, to make, and this we may take to be a good reason why, amid all the chorus of the woods, the cuckoo adopts this cry.

Then again, we must recognize that some birds have a sense of beauty, and derive pleasure from objects that are to them, as to us, delightful to the eye. The humming-birds decorate their nests with great taste, weaving into the structure pieces of lichen; and the bower-birds collect flowers and fruits of bright and varied colours wherewith to decorate their home, and are careful to strew the ground with tender moss, and to get rid of all unsightly things from their vicinity.

Thus, save in moral matters, and such things as truth and falsehood, it is difficult to see what, in fact, it is that really *does* lie beyond the limits of animal intelligence; and even here some animals seem now and then to show themselves quite conscious that they have done wrong.

Perhaps in regard to song, we may not be far wrong in thinking that, in birds, the knowledge of it comes nearer to instinct than anything they do; that, as a rule, it needs simply to be awakened, and that the awakening is easy; if the bird hears his own parent sing, he picks up the song so soon that it seems absurd to speak of the learning as instruction; if he hears other birds sing, he no doubt learns to imitate them, but the process is often a long one, and the foreign notes are only an addition to his own proper song, which can still be clearly made out; and that when he actually learns another bird's song, his own song is in general still traceable.

After all, we shall probably find it safest to say that, in regard to the making of nests and songs, birds acquire their knowledge of both in much the same way that human beings do;

there is really little difference between the modes in which such knowledge is acquired. Caves, mud-huts, and pile-dwellings existed for ages, with little alterations or improvements; and in some countries such things continue to exist at this very day. It took men many centuries to rise from rudest music, learned perhaps at earliest from bird-songs, to the music that we now delight in; and improvements in both architecture and music are still going on. Why may it not be something the same in regard to birds? We may be quite sure that, though following some general type, songs and nests vary much in different places. The materials from which nests are formed may be far more plentiful in one place than in another; the powers of the builders as to beak, legs and feet may vary; and the organs of song in one bird may be very much more powerful than in another. And who can say that though men may, in former times, have learnt from bird-songs, the birds may not, in their turn, have learnt from the music made by men and women? German canaries, when very young, are taught to sing by musical instruments; and they become, by such training, the very best of home-singing birds; and a very slight acquaintance with cage birds shows us that a bad singer readily learns from a good one, if the training is begun in early youth.

Far too much is, in our days, referred to instinct by people who do not quite comprehend what instinct really is. Savages are often said to find their way through trackless regions by instinct, and to effect by this faculty many things which it is beyond the power of civilized man to do at all. Now the fact that savages find their way through forests they have never traversed before can be quite easily accounted for without any reference to instinct, which has nothing to do with this power. To call in the aid of a new and mysterious power to account for what could be performed by the aid of observation, memory, and imitation, is quite unnecessary, and should at once be given up.

By crediting birds with the same faculties, and the amount of reason that we cannot refuse to accord to them, we may learn that it is from these powers, and not from blind instinct, as it is usually termed, that there arise the pretty nests that some of them are able to build, and the sweet songs that we so much love to listen to.

Nestling linnets have been trained by placing them under skylark and woodlark; and in every case the young birds have invariably caught the note of their instructors. A goldfinch taken from the nest when two or three days old, was hung at a window opposite a small garden where there was a wren's nest, and it had there caught the exact notes of the wren, and had entirely lost even the very call of the goldfinch. And a common house-sparrow, whose own note is, as we know well, but a common chirp, when brought early up near a goldfinch, had entirely learnt the note of this bird. Even the nightingale is apt, in confinement, to learn the notes of other birds in place of

its own beautiful song. A redstart has been known to imitate the song of a caged chaffinch; and the bullfinch, whose natural notes are weak, harsh, and insignificant, has a wonderful musical faculty, and can, as we well know, be taught to whistle many complete tunes. Such facts as these, which may be multiplied indefinitely, lead us to suppose that birds learn their songs much as we learn languages, our own or foreign ones. Some birds learn more readily than others, just as human beings do; and some have far better organs of song than others; for the faculty of acquiring notes there seems no valid reason for assigning to birds any other faculties than those that we ourselves possess.

It is much the same with regard to the formation of nests. Experiments, such as those with the chaffinches in New Zealand, seem to show that nest-building and house-building run on pretty much alike. Birds learn to build just as we do. Some are better builders than others, they are neater in their habits, or they have stronger legs, claws, and beak, or a more compact body; thus the nests vary in structure much as houses do.

A careful consideration of the whole subject may thus, perhaps, lead us to accord to the beautiful creatures from whom we derive so much pleasure faculties which, though in some respects inferior to ours, are yet not wholly different from our own. Reason, Intelligence, Instinct have been largely and learnedly discussed, and much variation has arisen in regard to what or whom these several faculties should be accorded to. And the more of these faculties that we grant to birds, the better would be presumably the treatment they would receive at our hands. From beings gifted with intelligence we should hardly dare to pluck plumes to adorn ourselves with; and the more that we accord to birds of the faculties on which we pride ourselves, the more should we assuredly refrain from all cruelty towards them, and the more should we be ready to extend to them the claims that they so amply deserve.

In an article on "Feminine Cruelty" in a recent medical journal, it is said that "it is a piece of almost proverbial wisdom that women are more cruel than men, and certainly the callous barbarism displayed by ladies of fashion and their imitators during the present season will go far to confirm the belief. Last year it was said that they had bought their hats before they knew that the feathers in them involved the destruction—sometimes under circumstances of great cruelty—of beautiful races of birds. But birds' feathers have reappeared this year, and the excuse now given is that the feathers are 'not real.'" After citing a letter of Sir W. H. Flower's in which this "absurd subterfuge" is disposed of, the writer goes on to say that "these ladies who are priding themselves on their humanity are, as they would themselves say, monsters of cruelty, responsible for the wounding and maiming of myriads of birds, and the starving to death of countless families of nestlings." And he concludes by stating that "more suffering is produced to supply the



bonnets for one garden party than in all the physiological laboratories of the world."

Now we should be very loth to believe of women what this medical journalist has here set forth. As mother, sister, wife, we love to think of them as the gentlest and kindest of all beings; and under their influence we look to receive and learn, in such matters as these, the very best instruction. Thus, we prefer to believe that what has been complained of results merely from inattention or inadvertence. The poet who "sang the song of the shirt" wisely tells us that

"Evil is wrought by want of thought  
As well as want of heart."

We believe that it is from the merest want of thought that these dire results occur. The gentlest of all tenders of birds are women; they are the best of all feeders at trying times; and it is they that always succeed in winning the birds' best affections. When the beautiful white-winged doves of the sea were daily congregating by thousands on St. James's Lake, it was women that were the most assiduous feeders of these birds; and as one watched the pretty sight, saw some birds catch from women's hands pieces thrown from the bridge, and others standing on the ice, looking like some of Doré's groups of angels, it was no uncommon thing to remark that among those who were the most assiduous feeders, several had their hats adorned with the plumage of these very birds. It was, one may be sure, the merest inadvertence; and the incongruity did not, probably, ever occur to the wearers themselves. If we can get women to believe that these beautiful creatures who afford us so much delight have faculties somewhat like our own; that they learn song much as we do, build nests as we build houses, and sometimes, in these things, seem to surpass many of us; that they are not to be simply credited with "blind instinct," but have faculties that may rightly engage our sympathies; then it is to be hoped that women will refuse to adorn themselves with plumage plucked from gladsome parents whose progeny are, by their loss, left to hapless destruction, and that a feeling for better ways will be begun among women; and, if well begun, it will, we may feel pretty sure, be carried on to the perfection that all lovers of birds desire by a persistent energy that women are, in all things they take to heart, always proud to display.

*Richmond-on-Thames.*

W. J. C. MILLER.