

## DO BIRDS IMPROVE IN NEST-BUILDING ?

TRANSLATED FROM THE REVUE DES DEUX MONDES,

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“**A** MAN’S house,” says a learned hygienist, “is but an extension of his clothing: the tent is next-door neighbor to the mantle, and the roof is simply a big head-gear.” A house, just like the clothes we wear, is, first of all, a shelter to protect us against the medium

around us, and to shield us against the inclemency of the seasons. The animal, in this happier than man, has no need of dress—Nature supplying it with plumage or with fur—but yet is required to build for itself the dwelling-place where it is to find shelter. May we suppose that here, too, Nature provides for every thing, and that blind instinct guides the bee in the construction of her cell, and the bird in the building of its nest? Such, indeed, is the opinion of most naturalists, and their chief argument is drawn from the fact that birds always follow the same plan in building their nests, while man is ever modifying and improving bit by bit his methods of construction. But, now, is this argument based on unquestionable facts, or is the conclusion legitimate? An English naturalist, Mr. Alfred Russel Wallace, undertakes to prove the contrary, in his work on Natural Selection. According to him, the bird does not build its nest by instinct; and the mental faculties it exhibits in this operation are of an identical order with those exhibited by man when he builds a house. In short, it is claimed that these faculties are simply imitativeness, and a sort of rudimentary ratiocination, which can take account of external surroundings, whatsoever they may be. Hence it is that birds do change and improve their processes of construction, under the influence of such causes as determine progress in man; and, in turn, man is at a stand-still when he receives no impetus from without.

What is instinct? It is "the faculty of performing complex acts, absolutely without instruction or previously-acquired knowledge." Instinct, then, would enable animals to perform spontaneously acts which, in the case of man, presuppose ratiocination, a logical train of thought. But, when we test the observed facts which are usually put forward to prove the power of instinct, it is found that they are seldom conclusive. It was on such grounds that the song of birds was taken to be innate, albeit a very ready experiment would have shown that it comes from the education they receive. During the last century Barrington brought up some linnets, taken from the nest, in company with larks of sundry varieties, and found that every one of his linnets adopted completely the song of the master set over him, so that now these linnets—larks by naturalization—formed a company apart when placed among birds of their own species. Even the nightingale, whose native song is so sweet, exhibits, under domestication, a considerable readiness to imitate other singing-birds. The song of the bird is, therefore, determined by its education, and the same thing must be true as to nest-building. A bird brought up in a cage does not construct the nest peculiar to its species. In vain will you supply all the necessary materials: the bird will employ them without skill, and will oftentimes even renounce all purpose of building any thing like a nest. Does not this well-known fact prove that, instead of being guided by instinct, the bird *learns* how to construct its nest, just as man learns how to build a house? This observation might be made complete, if we were

to shut up in an enclosure, with a wire screen overhead, a pair of birds brought up in isolation from their kind, with a view to find out what manner of nest their inexperienced efforts would produce. But, even though we have not such evidence, there are plenty of other proofs which confirm Mr. Wallace's theory.

The form and structure of birds' nests are more dependent than is usually supposed upon external conditions, and consequently they vary in proportion as these conditions are changed. Each separate species employs the materials it has at hand, chooses sites most agreeable to its habits; and the shape given to the nests often betrays very definite purposes, which are not to be detected without some degree of discernment. The wren, which dwells in hedge-rows and thickets, commonly builds its nest of the moss in which it is accustomed to search for insects; but at times it departs from this custom, and employs feathers and hay, when they are to be had. The raven, which feeds on carrion, frequenting pasture-grounds and warrens, builds its nest of wool and fur; the lark builds in a furrow, employing dry twigs, interwoven with fine blades of grass, which it collects when looking for worms; the kingfisher uses the bones of fishes he has eaten. The long-legged and big-beaked flamingo, which stalks about in wet flats, builds a conical hillock of mud, and in this deposits her eggs, so as to sit easily upon them, and to keep them out of the water.

In what respect are these animals, which avail themselves of the circumstances around them for a perfectly determinate object, inferior to the Patagonian, who builds for himself a rude shelter of foliage; or to the African negro, who scoops out a hole in the ground? It will be said that man progresses: but that is not universally the case. What progress is shown in the palm-leaf huts of American savages, the tent of the Arab, the Irish mud-cabin, the stone hovel of the Scottish peasant, which appear to belong to primitive times? The art of house-building remains stationary, if it is in conformity with tastes and habits which are unalterable, because the physical conditions which determine them are ever the same. Sometimes even a habit once engendered persists, though the exterior conditions be changed. The Malays from time immemorial built their houses on piles, after the manner of the lacustrine dwellings of ancient Europe; and this mode of building has sunk so deep into the manners of tribes which have penetrated into the interior of the islands and settled on arid plains, or on rocky mountains, that they still go on prudently raising their houses above the surface of the ground. And yet, no one imagines that in these inveterate habits we have a case of instinct; and certainly no one would suppose that an Arab infant brought up in France would feel the need of dwelling in a tent of skins, or that a young Malay, if brought to Europe, would bring with him his habit of building on piles. The unvarying processes of barbarous tribes are

explained on the theory of a secular tradition, untroubled by any external influences.

But why not apply the same reasoning to the facts presented to us by the animal kingdom? The processes of nidification are determined by the physical circumstances, as well as by the conformation of the nest, and by the tools supplied by Nature, and they are modified in accordance with external conditions. An alteration of climate, any sensible change in the vegetation of a country, the introduction of new enemies, bring about architectural variations more or less marked. Several birds prefer the ends of threads which they pick up on the streets to the vegetable fibres used by them before, and of their own accord take up their quarters in boxes or hollow gourds arranged for their use, thus saving a part of their labor. The common sparrow readily adapts himself to circumstances: he takes far less pains with his work when he can avail himself of a nook in a wall, than when he is obliged to build in the open air, on the branch of a tree, for then his nest must be solidly built and well covered. The orchard oriole or bobolink, of the United States, builds his nest almost flat when he can fasten it on a stout, stiff branch, but far deeper when he has to hang it on the slender branches of the weeping-willow, where it may be swayed by the wind, and the chicks thrown out. Finally, M. J. A. Pouchet published, in 1870, some very curious observations on the progressive improvement of martins' nests. He kept for 40 years in the Rouen Museum some of these nests, which he had himself detached from the walls of old buildings in that city. Having one day got some new nests, he was amazed, on comparing them with the old, to perceive considerable differences. The new-style nests all came from a new quarter of the town, and were all built on the one plan; but on examining churches and other ancient buildings, as also certain rocks inhabited by martins, he found several nests of the old pattern, together with others constructed according to the more recent model. The figures and descriptions given by old naturalists portray only the primitive type, which is a quarter-hemisphere, having a very small circular orifice. The modern nest, on the contrary, has a width greater than its depth, and forms a segment of an oblate spheroid, the orifice being very wide. Here we see an evident progress, the new type being larger, more *comfortable*. The wider bed gives the chicks greater liberty of movement than they had in the deep and contracted nest of former times; the wider opening allows them to look out and take the air; in short, it is a sort of balcony, where two chicks find room without being in the way of the old birds. Nor is this all. Being situated nearer to the top of the nest, the opening is less exposed to rain and wind. One well-proved case of this kind is enough to show that the architecture of birds is susceptible of progress; and this would seem to overturn the hypothesis of blind instinct. Then, too, the evident imperfections observed in the nests of some species, and the awkward-

ness, not to say stupidity, of some birds, cannot be reconciled with the theory of infallible instinct.

To conclude, then, the nidification of birds exhibits phenomena which, if compared with the constructive processes of primitive man, show no essential difference in the nature of the faculties employed. We have here no innate ideas, or blind and irresistible tendencies. The bird learns how to build its nest, and each species has its own tradition, which can be modified according to external circumstances. As regards the origin of these constructive processes, it can be readily understood without supposing a special instinct, if we show that, at bottom, these processes are simpler than at first sight would appear. For we must not exaggerate the grade of intelligence needed by a bird in order to build a nest which to us appears simply marvellous, because it is so small. But this nest was first roughed out—twig on twig, fibre on fibre; next, the little architect stopped up the gaps with material easily brought in with its supple claws and its slender beak. We are charmed at the sight of this; but the rude mud wall of a peasant's hovel would, in the eyes of a giant, also appear to be fine handiwork. It all depends on perspective. Levaillant has observed the habits of an African bird which goes to work in a still more summary way. This bird gets together a heap of moss and cotton, converts it, by stamping, into a sort of felt, then hollows it out in the middle, and trims off the edge. Thus the inside of the nest becomes as smooth and compact as a piece of cloth. Why not admit that this process is the work of an inventor, whose invention benefits his posterity, they in turn improving it, and handing it down to succeeding generations, just as we say in the case of human discoveries, of which we are so vain? In studying the rise of architecture, we meet with many a type which attracts the eye, but which answers but imperfectly the needs for which it was produced, and which shows less rational foresight than do the nests constructed by sundry birds.

