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THE MIGRATION OF BIRDS

THE "silly season" has this year been marked by some discussion in the newspapers on the migration of birds. The various letters published have shown the normal want, if not of knowledge, yet of profundity; and I fear lest the subject, which really deserves the best attention from naturalists, should suffer in repute by the absurdities lavished upon it.

The discussion began, if I am not mistaken, with a theory of migration set forth by a Scandinavian poet, which treated that wonderful movement as an attempt on the part of birds to attain "more light." It proceeded on the hypothesis that the birds which are summer-visitors to northern climes, finding that the days grow shorter as summer advances, retire southwards to find "more light," and that the same desire prompts their return northwards in spring. To show the fallacy of this hypothesis it is sufficient to observe that the southward movement not only begins, but is with many species in great part accomplished, long before the autumnal equinox, when consequently the birds are journeying to increasingly shorter days; and in like manner their northward movement is set on foot before the vernal equinox, with of course the same result. Whether this theory was ever intended in earnest or was only a poetic fancy I do not know, nor is it really worth while to inquire. It is enough that it contains its own refutation.

I have no intention of commenting upon the whole discussion. Few, if any, of the letters which followed contain anything to the purpose either way. But one published in the *Times* of Friday, Sept. 18, seems to require special notice, since it professes to give "the latest accepted theory" on the subject; and the writer, without actually saying that it is received by a very great authority, whom he names, intimates that it does not meet with his disapproval. Of this "latest accepted theory" I must confess I never before heard; and now that it is before me, it seems to be not only unsupported by facts, but to amount to no explanation at all. After briefly touching upon the difficulty which the shorter-winged Birds of Passage must have in effecting their voyages, the writer says:—

"I believe it was only some twenty or thirty years ago that anything like a practical solution of the difficulty was arrived at. The birds congregating about the south coast are seized with a sudden impulse or mania to fly upwards. This is caused by some atmospheric change coinciding with a warm south wind moving in a high stratum, into which the birds soar with an involuntary motion of their wings. This motion (involuntary like that of the heart) is continued for many hours, and the birds fly blindly along until the paroxysm passes off, when they at once begin to descend, making many a fatal drop into the sea.

"The same phenomenon occurs in Africa and southern countries, where the migratory birds congregate for a northern flight about April. Experiments were tried here and in Africa which tended to corroborate the above facts. Migratory birds were kept in cages along the coast, and it was found that each was seized with a prolonged paroxysm coinciding with the time that the wild birds disappeared. Cages were constructed with silk at top and bottom to prevent the birds from killing them-

selves; and it was noticed that after the paroxysm had passed away, the birds began to look about them, to plume themselves, and eat and drink, apparently with a notion that they had arrived at their new home."

On reading these wonderful paragraphs, some questions naturally arise. How does the writer account for his "birds congregating about the south coast?" What brings them there, that they may be "seized with a sudden impulse or mania to fly upwards?" Who has ever observed the "atmospheric change" and coincident "warm south wind moving in a high stratum?" Do these remarkable meteorological phenomena occur but once in the whole season of migration, or is there a succession of them to suit the convenience of each migratory species? Who, moreover, has seen the birds soar into this peculiar current of air? and who of such fortunate persons knows that the motion of their wings under such conditions is "involuntary like that of the heart?" Finally, what is the cause of the "paroxysm"? for, without knowing that, to attempt to explain the observed facts of migration is an attempt to explain *obscurum per obscurius*.

When a satisfactory answer is given to these questions, it will be time to inquire whether this "latest accepted theory" of migration sets the matter in any clearer light, or whether it is not as arrant nonsense as was ever foisted upon an innocent public, even at the height of the "silly season." The last paragraph of the writer's letter, I may remark, has nothing in it of consequence. Granting that the migratory impulse is instinctive, it is, like other instinctive practices, followed as far as circumstances will allow.

Permit me now to point out to those interested in the solution of this mystery of mysteries the chief matters to which the attention of observers and theorists should be directed.

I. *The original Cause or Causes of Migration.*—In some cases scarcity of food would seem to be a sufficient cause, and it is undoubtedly the most obvious one that presents itself to our mind. As food grows scarce towards the end of summer in the most northern limits of the range of a species, the individuals affected thereby seek it in other countries. Thus doing, they press upon the haunt of other individuals; these in like manner upon that of yet others, and so on, until the movement which began in the far north is communicated to the individuals occupying the extreme southern range of the species at that season; though, but for such an invasion, these last might be content to stay some time longer in the enjoyment of their existing quarters. When we consider, however, the return movement, at the end of winter, it is doubtful, I think, whether scarcity of food can be assigned as its sole or sufficient cause. But here we feel the want of knowledge. At present we are far too little acquainted with the physical peculiarities of those more equatorial regions, which in winter are crowded with emigrants from the north, to come to any final decision. It seems not too violent an assumption to suppose that though such regions are well fitted for the winter resort of the bird-population of the north, they may be deficient in certain necessaries for the nursery; and it seems still less of an assumption to suppose that even if such necessaries are not wanting, yet that the

regions in question would not supply food sufficient for both parents and offspring—the latter being, at the lowest computation, twice as numerous as the former—unless the numbers of both were diminished by the casualties of travel. But another point must not be overlooked. The most sedentary of birds year after year occupy the same quarters in the breeding season. In some instances this may be ascribed, it is true, to the old haunt affording the sole or the most convenient site for the nest in the neighbourhood, but in so many instances such is not the case, that we are led to believe in the existence of a real partiality, while there are quite enough exceptions to show that a choice is exercised. The same may equally be said of the most migrant of birds, and perhaps the strongest instance that has ever come to my knowledge refers to one of the latter. A pair of Stone Curlews (*Edicnemus crepitans*)—a very migratory species, affecting almost exclusively the most open country—were in the habit of resorting for many years to the same spot, though its character was entirely changed. It had been part of an extensive rabbit warren, and was become the centre of a large and flourishing plantation. It seems to me, therefore, that among the causes of migration the desire of returning to old haunts must be included.

II. *The Mode or Modes of Migration.*—This heading is capable of much subdivision. The means of transition are of course found in the bird's wings, but do all birds migrate in the same manner? Nay, more, does the same species of bird migrate in the same manner at all times? And how is its return to the old haunt accomplished with a degree of certainty that in most cases may be called unerring?

That all birds do not migrate in the same manner is pretty plain. Some, as the swallows, conspicuously congregate in vast flocks, and so leave our shores in a large company, while the majority of our summer visitors slip away almost unobserved, each apparently without concert with others.

It is also pretty nearly certain that the same species of bird does not migrate in the same manner at all times. Mr. St. John tells us of the arrival of skylarks on the coast of Norway:—"They come flitting over in a constant straggling stream, not in compact flocks." Yet it is notorious that a little later these same birds collect in enormous flocks, which prosecute their voyage in company. As tending to the same conclusion, I need hardly do more than refer to the excellent observations of Mr. Knox on the movements of the Pied Wagtail ("Ornithological Rambles," third edition, pp. 81—86) and, indeed, to the whole of his remarks on migration, because they must or ought to be known to everyone who takes an interest in the subject. But more than this, it is pretty nearly certain that of the majority of northward migrants in spring the males take the lead, and anticipate the advent of their mates by some days, not to say weeks—a fact which may possibly indicate the existence of another cause of migration to which I have not before alluded—while this peculiarity has never been observed in the autumnal movement.

Then comes the question, How is it that birds find their way back to their old home? This seems to me the most inexplicable part of the whole matter. I cannot even offer an approach to its solution. There was a time

when I had hopes that what is called the "homing" faculty in pigeons might furnish a clue, but my good friend Mr. Tegetmeier has cruelly deprived me of that consolation, declaring that knowledge of landmarks obtained by sight, and sight only, is the sense which directs these birds, with which he is so conversant; while sight alone can hardly be regarded as much of an aid to birds—and there is some reason to think that there are several such—which at one stretch transport themselves across the breadth of Europe. Here I have no theory to advance, no prejudice to sustain. I should be thankful indeed for any hypothesis that would be in accordance with observed facts. They leave no room for chance and not much for counteracting forces. Occasionally the return of the nightingale, the swallow, or other land birds, may be somewhat delayed, but most sea-fowl can be trusted as the almanack itself. Were they satellites revolving around this earth, their arrival could not be more surely calculated by an astronomer. Foul weather or fair, heat or cold, the puffins repair to some of their stations as regularly on a given day as if their movements were timed by clock-work. Whether they have come from far or from near we know not, but other birds certainly come from a great distance, and yet they make their appearance with scarcely less exactness. Nor is the regularity with which certain species disappear much inferior; every observer knows how abundant the swift is up to the time of its leaving its summer home, and how rarely it is seen after that time is past. Yet all this, marvellous as it may seem, is far less marvellous than the instinct, or whatever else we may call it, which guides the birds in their voyages, and gives them the power of directing their flight year after year to the same spot. The solution is probably simple in the extreme—possibly before our eyes at this moment if we could but see it—but whosoever discovers it will assuredly deserve to have his name remembered among those of the greatest discoverers of this or any age.

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COMPETITIVE EXAMINATIONS

IN so universally substituting Competitive Examination for the much less perfect systems of patronage and favouritism previously adopted for filling appointments and distributing emoluments, no doubt the step has been in the right direction; but as with all novel systems, the necessary details of its working have not been fully mastered, and we have complaints,—such as from many who have no other recommendations upon which to make selections in scientific appointment, and from the India Civil Service,—that the results are not, in the long run, so successful as could be wished. Many of the objections which were at the outset thought to be insurmountable, have been proved to be insignificant and remediable; whilst others, unforeseen and more difficult to overcome, are daily becoming more and more conspicuous.

The most important of these objections depends on the fact that it is impossible, from the list of successful candidates, even when they are classed according to the number of marks they have obtained, to determine whether they belong to the one or the other of two very different qualities of mind. There are certain students whose chief capacity consists of a very excellent memory