

Perception and Instinct in the Lower Animals

I HAVE waited some time in the expectation that some of your readers would have asked Mr. Wallace a very obvious question with regard to the incident he adduces of a dog finding his master five months after having been lost, and in a house which the latter "had not contemplated going to or even seen before the loss of the dog." (*NATURE*, vol. viii. p. 66.) In seeking to account for this thoroughly authentic and highly remarkable case, Mr. Wallace observes: "Could it have obtained information from other dogs . . . ? Could the odour of persons and furniture linger two months in the streets? These are almost the only conceivable sources of information; for the most thorough-going advocates for a "sense of direction" will hardly maintain that it could enable a dog to go straight to his master, wherever he might happen to be." Now, there is yet a third supposition open to us, and it is one which, in the absence of information, is certainly the most probable. Can Mr. Wallace's friend remember whether he had been walking in the vicinity of his new house during the day upon which the dog returned? *i.e.* can he be sure the dog did not trace his footsteps? That a keen-scented terrier is able to distinguish and to follow his master's track in a public thoroughfare, however densely it may be crowded, I know from the success of searching experiments.

With regard to dogs communicating information to one another, I may mention that I have often observed them doing so. According to my experience, the dogs must be much above the average in intelligence, and the gesture they invariably employ is a contact of heads with a motion between a rub and a butt. It is quite different from anything that occurs in play, and is always followed by some definite course of action. I must add, however, that although the information thus conveyed is always definite, I have never known a case in which it was complex—anything like asking or telling the way being, I believe, quite out of the question; so far, at least, as this action is concerned. One example will suffice. A Skye terrier (not quite pure) was asleep in the room where I was, while his son lay upon a wall which separates the lawn from the high road. The young dog, when alone, would never attack a strange one, but was a keen fighter when in company with his father. Upon the present occasion a large mongrel passed along the road, and, shortly afterwards, the old dog awoke and went sleepily down stairs. When he arrived upon the door-step his son ran up to him and made the sign just described. His whole manner immediately altered to that of high animation, and, clearing the wall together, the two animals ran down the road as terriers only can when pursuing an enemy. I watched them for a mile and a half, within which distance their speed never abated, although the object of their pursuit had not, from the first, been in sight.

As the instinct question seems to have come to a close it is desirable to observe that the only outcome of its discussion has been to intensify the previous belief in the existence of some unexplained faculty, which may be provisionally termed a sense of direction. Mr. Wallace, in his general reply, avowedly ignores all those cases adduced by your correspondents in which his theory cannot possibly apply; *e.g.* dogs describing the third side of a triangle, or returning by land whence they had been taken by sea. He says: "Several of the writers argue as if I had maintained that in all cases dogs, &c. find their way, wholly or mainly, by smell; whereas I strictly limited it to the case in which their other senses could not be used" (vol. viii. p. 65). Now, whether or not Mr. Wallace originally intended his letter to raise the general issue as to the presence in dogs of a sense of direction, this has certainly been its effect, so that the instances he here refers to are not in any way beside the question which immediately arose. I have much too high an esteem for Mr. Wallace to say anything that might lead to a discussion with him, but it is evident that these remarks have no such tendency; for, if he admits, as he candidly does in the sentence just quoted, that his theory cannot apply to all cases, it necessarily follows that, even could he prove it to be true in some, the fact, although of considerable psychological interest, would leave the question as to a sense of direction just where it was before.

It should be borne in mind that dogs are not the only animals

in which this sense appears to be present. It is popularly believed to occur in members of at least two orders of Insects, viz. white ants and bees, but I am not aware that any authentic cases have been recorded. Horses and cats seem to possess it in a high degree, and sheep must either have wonderful memories, or owe their return, in numerous cases, to the faculty in question. Still more wonderful, if we deny them this faculty, must be the memory of migratory birds, some of which return, after months of absence and over thousands of miles, to the same nests in successive seasons. If we allow them this faculty it is not, from analogy, improbable that migratory mammals and even fishes are likewise endowed with it. The most conspicuous example, however, is perhaps that afforded by carrier pigeons. To take one case: two or three years ago some of these birds were flown from the Crystal Palace to Brussels, and it stands, if I remember correctly, upon the authority of Mr. Tegetmeier, that they arrived within a few minutes of a telegram despatched from the Palace at the moment they were liberated. Now, in this case, even the extravagant supposition sometimes made that carrier pigeons are guided by the sight of their destination is excluded, for, as these birds are not high-flyers, the curvature of the earth between London and Brussels would prevent them from seeing the latter. And, even if we imagine that these particular pigeons occasionally towered to obviate this difficulty, yet the curvature of the intervening clouds would have imposed another quite as effectual.

There is still one important point which has not been noticed during the discussion of this subject. We possess indications that this sense of direction, like other mental capacities, admits of cultivation by exercise, and, indeed, that it may remain altogether latent and useless until thus developed. If these indications represent generalities we have at once an adequate explanation of the apparently capricious manner in which this faculty occurs.* As this communication is already too long, I shall here be brief.

It is, I believe, a recognised doctrine among fanciers that carrier pigeons, however purely bred, must be educated by flying short distances before they can be depended upon for long ones. I remember having myself lost a valuable bird by flying him, for the first time, at a distance of 500 yards from his nest. Although in full view of it he became utterly confused, taking long flights in various directions, and ultimately went straight out to sea.

Here is an analogous case in a mammal:—I kept a terrier, of highly intelligent parentage, enclosed in a yard with high walls from the time of its birth until it was eighteen months old, and then took it out for the first time, along the sea-shore. The experiment elicited several facts of psychological interest, and one of them has bearing upon the present subject. Part of the coast over which we went and returned was rough with large shingle, and the terrier's locomotive power being very limited, it was unable, on the homeward journey, to keep up with my pace. Desiring to see what it would do if left alone, I continued for half a mile, and waited to see it come up. As it did not do so, I returned, and found that the animal had actually reversed its direction and gone fully a quarter of a mile from the place where I had left it. After having been taken out short distances seven or eight times, it was inadvertently lost in a neighbouring wood. Now, it had only been in the wood once before, yet its appreciation of direction had made so great an advance that it returned an hour afterwards. As this terrier never evinced any disposition to track footsteps, I do not think its return was due to scent. Anyhow, in a few weeks it became an inveterate wanderer, roaming over the country far and wide.

GEORGE J. ROMANES

Dunskait, Ross-shire, July 7