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英語長文プラス記述式トレーニング問題集-問題編

東北大学 770語 ②35分



次の英文を読み、設問に答えなさい。

How do migrating birds find their way? First we must ask, what possible clues are there? If birds are flying over land, where there are features below that are distinct and stay the same for year after year — rivers, roads, forests, coastlines — then, of course, they can use their eyes. There is plenty of evidence that birds do just this. Many, for example, follow coastlines and thread their way through straits and mountain passes.

When they get very close to where they want to be, many use their sense of smell. Homing pigeons give a clue to this. ("Homing" is not the same as migration. It suggests that pigeons can find their way home when taken by train or truck to some far-distant place and then released. But homing surely has some of the same mechanisms as migration does, and so can give clues to how it works.) It seems that as pigeons get fairly close to their home, they first pick up general smells that tell of bird dwellings — perhaps the general tempting stink of ammonia. As they get nearer, the smells become more specifically pigeon-like. Finally, as they get very close, they recognize the very particular odor of their own flock in its own space. More and more evidence is revealing that humans, too, have a wonderful awareness of odor, even if they do not consciously recognize it, such that they find particular men or women attractive or disgusting according to their primitive substances such as sweat: no doubt a cooling thought for those who like to suppose that (1) human beings have risen above such things. We do not normally think of birds as creatures that attach importance to smell, but many of them do, in many contexts.

But $_{(2)}$ what use are visual clues when a bird is above some apparently boundless ocean? What value is smell when it is a thousand miles from where it wants to be? What else is there?

Quite a lot, is the answer. On the visual front, there is the sun by day and the moon and stars by night. These are hard to make good use of unless the bird also has some sense of time, so it knows where the sun or the moon ought to be at a particular time; but birds do have a sense of time.

Human beings navigate by the heavenly bodies, too, but we make a great science of it. The skills of the navigator were among the most complex

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and prized in all the world's navies until well into the nineteenth century, when sailors in danger could find out where they were by radio. Traditional long-distance sailors needed telescopes and charts, and pages and pages of tables, to help them work out where they were. Birds have to do all this in their heads, in their bird brains, on the wing. The problem conceptually is the same as we meet in discussing the diving of fish-eating seabirds (how they always fold their wings at exactly the right time). In each case the math is immensely complicated, once you spell it out. But presumably birds on the wing, not familiar with mathematics, don't spell it out. (3) They must have some practical rules that instantly translate the cues that are offered by the sun and stars and moon into directives for purposeful action.

Again, there are clues and stories that seem to be throwing some light. For instance, many kinds of birds are known to use star maps. In the early weeks of life the baby birds sit in their nests and study the night sky — and are somewhat confused if those early weeks are too cloudy. But they do not, as human amateur astronomers might do, spend their time learning the individual constellations* — how to recognize Orion* or trace the fanciful outline of Taurus*, or whatever. Instead, they focus on the part that does not move as the night progresses, which in the Northern Hemisphere means the North Star. They can see, if they look at it long enough, that as the night progresses, all the stars in the sky, including the mighty Orion and the notional Taurus, seem to revolve around the Pole Star, which sits in the middle like the central part of a giant cartwheel. (4) Once they recognize the central part, the most fundamental problem is solved. The creature that can do this knows where north is and everything else can be figured out. I don't know what the equivalent would be in the Southern Hemisphere, but undoubtedly there is one. Navigation simply does not seem to need the details of astronomy.

*constellation「星座」 Orion「オリオン座」 Taurus「牡牛座」

英語長文プラス記述式トレーニング問題集-問題編

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