Elephants in conference on the point of breaking up.

Communication among higher animals

Introducing a serial by the noted naturalist

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1. Senses and perceptions

WE are distinguished from other mammals, in spite of so many anatomical, physiological, behaviouristic and even emotional affinities, in many ways. Chief among these distinctions, it has often been pointed out, are the vast development of the human intellect (and with it, the much greater substitution of instincts by reason and intelligence), and the development and everyday use of a highly evolved and intricate language, through which the most profound and complex, as well as the most trivial, ideas and information can be communicated, both orally and through writing.

The cynic may question both these great advances of humanity over the higher animals. In moments of stress and excitement, and in our deepest emotional involvements, we do tend to behave instinctively rather than intelligently—mob hysteria, panic behaviour, deep attachments and sudden antipathies, and sexual behaviour are examples of the dominance of instincts over intelligence in our lives. And as for the much vaunted intellectual advance evidenced by our spoken and written languages, it may be pointed out that an Eskimo and a Hottentot, meeting a Japanese poet and an Oxford don with no interpreters, can only employ a crude and confusing language of signs and gestures in attempted mutual communication. But such an argument is really a sidetracking—it only goes to show that though born with a brain immeasurably superior to that of the highest animals, most human skills are acquired and not inherited, especially our skills in communication.

It is more rewarding to realise that in spite of the immense development of our languages, with all their nuances and precision of expression, we often use gestures and signs as adventitious aids or substitutes for speech, especially under excitement, as when we beckon someone to come in addition to calling him urgently, or shake a fist in anger when uttering threats.

In all studies of animal communications, the axiom is widely recognised that the very development of an organ to express or receive some communication presupposes the existence of communication through that medium. The fact that a bird has a song argues the ability of other birds of its kind to hear the song, and the presence of well-developed visual organs argues the ability to see things. This truth, which seems self-evident, is more complex than it may appear at first sight. For example, because we know that an animal possesses acute vision, hearing and smell, we are apt to presume that its ability to communicate or to receive communications is limited to these senses in a given situation, which might be quite misleading, and worse still, to interpret its powers of vision, hearing and smell in the terms with which we are most familiar, our own experience of these senses.

Senses familiar to us, sight, hearing, smell, taste and tactile perceptions, are also possessed by most animals, but their apprehension through the medium of these senses may be very different from ours, and the dominance of these senses in their lives is often notably different from the sensual dominance values obtaining in our largely audiovisually governed lives; moreover, they may possess perceptions unknown to us. All this, I realise, sounds like a lot of words, but a few examples will make things clear.

Male moths are able to sense the presence of a female moth from over a mile away, not through olfactory perception as known to us, but through their

intricate and delicate antennae and the smell given out by the female; among reptiles, the tongue acts as a conveyor of scent perception to a Jacobson's organ located in the roof of the mouth (this organ consists of highly scent-perceptive pits)—the tongue is flicked out and then retracted into the mouth, and conveys scent particles to this organ, and in this manner, an indirect scent-perception of the environment and the proximity of prey is effected; among some snakes, there are special heat sensitive organs which are able to detect delicate thermal variations. There are many other examples among animals of such specialised sensory perceptions through organs unknown to the higher mammals.

Even among the higher mammals, endowed with sensory organs similar to ours, the acuity and delicacy of perception may be superior to ours, or may be of a different order altogether; it is not that these animals are superior to men in all their sense perceptions, but that often their perceptions are of a different kind or degree. A brief comparison of the main senses of men and the higher animals will be useful, at this stage.

Human vision is acute, colour-sensitive, and being binocular is well able to appreciate depth in perspective, and to distinguish stationary objects: the angle of field of our eyes is limited to about 25°, but the head can be turned quickly in any desired direction to widen this angle—as it also can be, by most animals. Many animals have eyes at the sides of an elongated, deep face (as distinct from our flattened face), so that they can have binocular vision only when looking at things right in front of them but are well able to see things on either side with their laterally located eyes, though their lateral vision is necessarily flattened in depth, because it is seen through each eye independently of the other. Cattle, deer, antelopes and most rodents are examples of such animals; in hares, the eyes are placed so high on either side of the head that they can even see what is slightly behind them. Many forest living animals have poorer vision than we have, elephants and gaur, for instance, but vision is still important to them. Moreover, most of the mammals lack our ability to see colours—they are colour blind, and reds and greens and blues appear to them as shades of grey, much as they do to panchromatic black-and-white photographic emulsions. The phrase, "the red rag to a bull" is purely symbolic, and has no literal truth in it, since cattle are colour blind. Some animals, such as monkeys, blackbuck, and the greater cats, have acute vision. At night, when light levels are so low that we do not refer to the existing light as "light", but only as "darkness", even our colour-sensitive eyes are unable to see colours distinctly — even by bright moonlight, we cannot judge colours surely. Nocturnal animals are able to see much better than we can by such dim, low levels of light—the greater and even the lesser cats,

lorises, and some kinds of deer are examples of mammals with specially good night vision. Of course, no animal can see anything in total darkness.

Our powers of hearing are good and our vocal capacity unrivalled: no animal can produce so many distinct, articulate sounds or indulge in such sustained vocalisation. However, many mammals have a greater acuity, or a greater range, of audition. Most animals of the cat family can pinpoint sounds with an accuracy beyond our powers, and dogs can hear sounds pitched too high to reach the human ear. As everyone knows, snakes have no organs for hearing airborne sounds, but are sensitive to ground vibrations—among aquatic animals, notably the dolphins, the ability to apprehend high-frequency vocalisations and vibrations through the water has been established. Some bats have a marvellous radar system to guide their flight; they emit high frequency squeaks which are reflected back to their ears by the objects in their line of flight.

All sounds produced by animals are not vocal. Many animals (chital and sambar are examples of such animals) when alarmed and uneasy stamp their forefeet on the ground, as a signal of alarm short of flight. Elephants produce a metallic thud by rapping the incurved tips of their trunks sharply on the ground, when alarmed and in doubt—the sudden impact, vibrating the column of air inside the trunk, produces the sound. Even we produce such nonvocal sounds on occasion, applause being probably the best example.

Smell, little developed and mainly in association with the sense of taste in us, is one of the most important senses of most mammals, and the dominant perception of some. Dhole and wolves follow their quarry by ground-scent, and some gregarious animals, such as elephants and deer, are also able to follow trails by ground-scent—this is something of which we have no personal experience whatever. The extraordinary powers of detecting the presence of predators and intruders through airborne scents possessed by many animals (such as deer, gaur and elephants) are also unknown to us. A hunting dog can scent pig a mile away, wind being right, or a herd of deer a hunter. Some animals which have exquisite noses appear to be near-scented; a sloth bear or a pangolin can detect subterranean prey surely, but both appear to be near-scented.

Smell plays an important part in the breeding of most mammals and also in the identification of individuals. A mother and her infant are able to identify each other by body-scent in a diversity of mammals. A dog can instantly spot its master by body scent in darkness—even a blind dog can—and the utilisation of police dogs to track criminals depends entirely on the ability of the dogs to identify individual scents.

Tactile communications are not unknown to us. We feel our way about when, for any reason, sight

cannot clearly guide us, and in drawing the attention of another quietly to something, we touch that other lightly. However, tactile perceptions are developed to a much higher degree among many animals. It is well known that any cat can go where its whiskers can, and these thick, sensitive hairs are specially characteristic of the cat family—other predators, too, have well-developed vibrissae, otters, for instance. Touch serves an important function in the intraspecific gregariousness of most animals—they huddle together at times, and apparently find a measure of reassurance in their close togetherness. The tongue is mainly an organ of taste and sound production in us, and is highly proficient in both ways. Licking, as a means of cleaning, surface stimulation and social intimacy, is an important use to which many animals put their tongues. Cats lick their coats all over with their rasping, cleansing tongues, and so do many herbivores. Among most mammals, the infant young are assiduously licked, and on occasion even the adults. Among herbivores, the mother licks her young soon after giving birth to it with long, strong, steady strokes of her tongue; no doubt this stimulates surface circulation, acting as a massage, a lingual massage, and helps it to rise to its feet; licking is also used to direct the infant to suckle. On occasion, it is also used as a compulsive direction to the young to follow its mother, when no other direction will serve. An infant gaur calf once left its herd and mother and came bounding up towards the riding elephant on which I was seated; apparently the great beast, which it had never seen before, fascinated the calf. The mother cow tried mooing softly to her calf to attract it back to her, and when this urgent summons failed and the calf came still nearer to the elephant, she walked up to it and licked it strongly, and then turned and walked back to the herd, when the calf followed her. Incidentally, the elephant, an adult tusker, was positively nervous at the gambolling approach of the little calf, and kept shifting his feet and blowing spittle at the calf from his trunk to drive it away!

The fascinating question of extra-sensory perception has excercised the minds of men from time immemorial. It has been asserted by many hunters that on occasion their quarry seemed to possess a 'sixth sense'—why, the hunters themselves have sometimes claimed this mysterious faculty that had warned them in the nick of time, when they were not aware of any danger sensed through their normal perceptions! I shall say nothing of this 'sixth sense' or E S.P. here, but sometimes animals do behave in a rather queer way, as if they had means of communication (most probably through the recognised channels of their normal senses) that we do not know of. For instance, a herd of elephants grazing in the open will, at times, suddenly congregate in a tight circle, heads to the centre and tails to the periphery, and seem to spend a few minutes in a silent

Gaur cow licking her calf to recall it from the proximity of a riding elephant and men.

conference, where, except for small movements of the trunks and ears, there is no overt gesticulation or attitudinal communication; then the herd (or party) turns silently round, as if at a pre-arranged signal, and moves away purposefully in a definite direction. I do not know what communication is effected at these silent conferences or how there is any communication, but have often observed this phenomenon. The truth is that it is very difficult to know the truth in such matters, without having the miraculous power that we have lost since the days of Vikramaditya to transform oneself temporarily into an animal.

(*To be continued*)