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HISTORY OF ANIMALS

by Aristotle

translated by D'Arcy Wentworth Thompson

Book I

1

OF the parts of animals some are simple: to wit, all such as divide into parts uniform with themselves, as flesh into flesh; others are composite, such as divide into parts not uniform with themselves, as, for instance, the hand does not divide into hands nor the face into faces.

And of such as these, some are called not parts merely, but limbs or members. Such are those parts that, while entire in themselves, have within themselves other diverse parts: as for instance, the head, foot, hand, the arm as a whole, the chest; for these are all in themselves entire parts, and there are other diverse parts belonging to them.

All those parts that do not subdivide into parts uniform with themselves are composed of parts that do so subdivide, for instance, hand is composed of flesh, sinews, and bones. Of animals, some resemble one another in all their parts, while others have parts wherein they differ. Sometimes the parts are identical in form or species, as, for instance, one man's nose or eye resembles another man's nose or eye, flesh flesh, and bone bone; and in like manner with a horse, and with all other animals which we reckon to be of one and the same species: for as the whole is to the whole, so each to each are the parts severally. In other cases the parts are identical, save only for a difference in the way of excess or defect, as is the case in such animals as are of one and the same genus. By 'genus' I mean, for instance, Bird or Fish, for each of these is subject to difference in respect of its genus, and there are many species of fishes and of birds.

Within the limits of genera, most of the parts as a rule exhibit differences through contrast of the property or accident, such as colour and shape, to which they are subject: in that some are more and some in a less degree the subject of the same property or accident; and also in the way of multitude or fewness, magnitude or parvitude, in short in the way of excess or defect. Thus in some the texture of the flesh is soft, in others firm; some have a long bill, others a short one; some have abundance of feathers, others have

only a small quantity. It happens further that some have parts that others have not: for instance, some have spurs and others not, some have crests and others not; but as a general rule, most parts and those that go to make up the bulk of the body are either identical with one another, or differ from one another in the way of contrast and of excess and defect. For 'the more' and 'the less' may be represented as 'excess' or 'defect'.

Once again, we may have to do with animals whose parts are neither identical in form nor yet identical save for differences in the way of excess or defect: but they are the same only in the way of analogy, as, for instance, bone is only analogous to fish-bone, nail to hoof, hand to claw, and scale to feather; for what the feather is in a bird, the scale is in a fish.

The parts, then, which animals severally possess are diverse from, or identical with, one another in the fashion above described. And they are so furthermore in the way of local disposition: for many animals have identical organs that differ in position; for instance, some have teats in the breast, others close to the thighs.

Of the substances that are composed of parts uniform (or homogeneous) with themselves, some are soft and moist, others are dry and solid. The soft and moist are such either absolutely or so long as they are in their natural conditions, as, for instance, blood, serum, lard, suet, marrow, sperm, gall, milk in such as have it

flesh and the like; and also, in a different way, the superfluities, as phlegm and the excretions of the belly and the bladder. The dry and solid are such as sinew, skin, vein, hair, bone, gristle, nail, horn (a term which as applied to the part involves an ambiguity, since the whole also by virtue of its form is designated horn), and such parts as present an analogy to these.

Animals differ from one another in their modes of subsistence, in their actions, in their habits, and in their parts. Concerning these differences we shall first speak in broad and general terms, and subsequently we shall treat of the same with close reference to each particular genus.

Differences are manifested in modes of subsistence, in habits, in actions performed. For instance, some animals live in water and others on land. And of those that live in water some do so in one way, and some in another: that is to say, some live and feed in the water, take in and emit water, and cannot live if deprived of water, as is the case with the great majority of fishes; others get their food and spend their days in the water, but do not take in water but air, nor do they bring forth in the water. Many of these creatures are furnished with feet, as the otter, the beaver, and the crocodile; some are furnished with wings, as the diver and the grebe; some are destitute of feet, as the water-snake. Some creatures get their living in the water and cannot exist outside it: but for all that do not take

in either air or water, as, for instance, the sea-nettle and the oyster. And of creatures that live in the water some live in the sea, some in rivers, some in lakes, and some in marshes, as the frog and the newt.

Of animals that live on dry land some take in air and emit it, which phenomena are termed 'inhalation' and 'exhalation'; as, for instance, man and all such land animals as are furnished with lungs. Others, again, do not inhale air, yet live and find their sustenance on dry land; as, for instance, the wasp, the bee, and all other insects. And by 'insects' I mean such creatures as have nicks or notches on their bodies, either on their bellies or on both backs and bellies.

And of land animals many, as has been said, derive their subsistence from the water; but of creatures that live in and inhale water not a single one derives its subsistence from dry land.

Some animals at first live in water, and by and by change their shape and live out of water, as is the case with river worms, for out of these the gadfly develops.

Furthermore, some animals are stationary, and some are erratic. Stationary animals are found in water, but no such creature is found on dry land. In the water are many creatures that live in close adhesion to an external object, as is the case with several kinds of oyster. And, by the way, the sponge appears to be endowed with a

certain sensibility: as a proof of which it is alleged that the difficulty in detaching it from its moorings is increased if the movement to detach it be not covertly applied.

Other creatures adhere at one time to an object and detach themselves from it at other times, as is the case with a species of the so-called sea-nettle; for some of these creatures seek their food in the night-time loose and unattached.

Many creatures are unattached but motionless, as is the case with oysters and the so-called holothuria. Some can swim, as, for instance, fishes, molluscs, and crustaceans, such as the crawfish. But some of these last move by walking, as the crab, for it is the nature of the creature, though it lives in water, to move by walking.

Of land animals some are furnished with wings, such as birds and bees, and these are so furnished in different ways one from another; others are furnished with feet. Of the animals that are furnished with feet some walk, some creep, and some wriggle. But no creature is able only to move by flying, as the fish is able only to swim, for the animals with leathern wings can walk; the bat has feet and the seal has imperfect feet.

Some birds have feet of little power, and are therefore called Apodes. This little bird is powerful on the wing; and, as a rule, birds that resemble it are weak-footed and strong winged, such as the swallow and the drepanis or (?) Alpine swift; for all these

birds resemble one another in their habits and in their plumage, and may easily be mistaken one for another. (The apus is to be seen at all seasons, but the drepanis only after rainy weather in summer; for this is the time when it is seen and captured, though, as a general rule, it is a rare bird.)

Again, some animals move by walking on the ground as well as by swimming in water.

Furthermore, the following differences are manifest in their modes of living and in their actions. Some are gregarious, some are solitary, whether they be furnished with feet or wings or be fitted for a life in the water; and some partake of both characters, the solitary and the gregarious. And of the gregarious, some are disposed to combine for social purposes, others to live each for its own self.

Gregarious creatures are, among birds, such as the pigeon, the crane, and the swan; and, by the way, no bird furnished with crooked talons is gregarious. Of creatures that live in water many kinds of fishes are gregarious, such as the so-called migrants, the tunny, the pelamys, and the bonito.

Man, by the way, presents a mixture of the two characters, the gregarious and the solitary.

Social creatures are such as have some one common object in view; and this property is not common to all creatures that are

gregarious. Such social creatures are man, the bee, the wasp, the ant, and the crane.

Again, of these social creatures some submit to a ruler, others are subject to no governance: as, for instance, the crane and the several sorts of bee submit to a ruler, whereas ants and numerous other creatures are every one his own master.

And again, both of gregarious and of solitary animals, some are attached to a fixed home and others are erratic or nomad.

Also, some are carnivorous, some graminivorous, some omnivorous: whilst some feed on a peculiar diet, as for instance the bees and the spiders, for the bee lives on honey and certain other sweets, and the spider lives by catching flies; and some creatures live on fish. Again, some creatures catch their food, others treasure it up; whereas others do not so.

Some creatures provide themselves with a dwelling, others go without one: of the former kind are the mole, the mouse, the ant, the bee; of the latter kind are many insects and quadrupeds.

Further, in respect to locality of dwelling place, some creatures dwell under ground, as the lizard and the snake; others live on the surface of the ground, as the horse and the dog. make to themselves holes, others do not

Some are nocturnal, as the owl and the bat; others live in the daylight.

Moreover, some creatures are tame and some are wild: some are at all times tame, as man and the mule; others are at all times savage, as the leopard and the wolf; and some creatures can be rapidly tamed, as the elephant.

Again, we may regard animals in another light. For, whenever a race of animals is found domesticated, the same is always to be found in a wild condition; as we find to be the case with horses, kine, swine, (men), sheep, goats, and dogs.

Further, some animals emit sound while others are mute, and some are endowed with voice: of these latter some have articulate speech, while others are inarticulate; some are given to continual chirping and twittering some are prone to silence; some are musical, and some unmusical; but all animals without exception exercise their power of singing or chattering chiefly in connexion with the intercourse of the sexes.

Again, some creatures live in the fields, as the cushat; some on the mountains, as the hoopoe; some frequent the abodes of men, as the pigeon.

Some, again, are peculiarly salacious, as the partridge, the barn-door cock and their congeners; others are inclined to chastity, as the whole tribe of crows, for birds of this kind indulge but rarely in sexual intercourse.

Of marine animals, again, some live in the open seas, some near

the shore, some on rocks.

Furthermore, some are combative under offence; others are provident for defence. Of the former kind are such as act as aggressors upon others or retaliate when subjected to ill usage, and of the latter kind are such as merely have some means of guarding themselves against attack.

Animals also differ from one another in regard to character in the following respects. Some are good-tempered, sluggish, and little prone to ferocity, as the ox; others are quick tempered, ferocious and unteachable, as the wild boar; some are intelligent and timid, as the stag and the hare; others are mean and treacherous, as the snake; others are noble and courageous and high-bred, as the lion; others are thorough-bred and wild and treacherous, as the wolf: for, by the way, an animal is highbred if it come from a noble stock, and an animal is thorough-bred if it does not deflect from its racial characteristics.

Further, some are crafty and mischievous, as the fox; some are spirited and affectionate and fawning, as the dog; others are easy-tempered and easily domesticated, as the elephant; others are cautious and watchful, as the goose; others are jealous and self-conceited, as the peacock. But of all animals man alone is capable of deliberation.

Many animals have memory, and are capable of instruction; but no

other creature except man can recall the past at will.

With regard to the several genera of animals, particulars as to their habits of life and modes of existence will be discussed more fully by and by.

2

Common to all animals are the organs whereby they take food and the organs where into they take it; and these are either identical with one another, or are diverse in the ways above specified: to wit, either identical in form, or varying in respect of excess or defect, or resembling one another analogically, or differing in position.

Furthermore, the great majority of animals have other organs besides these in common, whereby they discharge the residuum of their food: I say, the great majority, for this statement does not apply to all. And, by the way, the organ whereby food is taken in is called the mouth, and the organ whereinto it is taken, the belly; the remainder of the alimentary system has a great variety of names.

Now the residuum of food is twofold in kind, wet and dry, and such creatures as have organs receptive of wet residuum are invariably found with organs receptive of dry residuum; but such as have organs

receptive of dry residuum need not possess organs receptive of wet residuum. In other words, an animal has a bowel or intestine if it have a bladder; but an animal may have a bowel and be without a bladder. And, by the way, I may here remark that the organ receptive of wet residuum is termed 'bladder', and the organ receptive of dry residuum 'intestine or 'bowel'.

3

Of animals otherwise, a great many have, besides the organs above-mentioned, an organ for excretion of the sperm: and of animals capable of generation one secretes into another, and the other into itself. The latter is termed 'female', and the former 'male'; but some animals have neither male nor female. Consequently, the organs connected with this function differ in form, for some animals have a womb and others an organ analogous thereto.

The above-mentioned organs, then, are the most indispensable parts of animals; and with some of them all animals without exception, and with others animals for the most part, must needs be provided.

One sense, and one alone, is common to all animals-the sense of touch. Consequently, there is no special name for the organ in which

it has its seat; for in some groups of animals the organ is identical, in others it is only analogous.

4

Every animal is supplied with moisture, and, if the animal be deprived of the same by natural causes or artificial means, death ensues: further, every animal has another part in which the moisture is contained. These parts are blood and vein, and in other animals there is something to correspond; but in these latter the parts are imperfect, being merely fibre and serum or lymph.

Touch has its seat in a part uniform and homogeneous, as in the flesh or something of the kind, and generally, with animals supplied with blood, in the parts charged with blood. In other animals it has its seat in parts analogous to the parts charged with blood; but in all cases it is seated in parts that in their texture are homogeneous.

The active faculties, on the contrary, are seated in the parts that are heterogeneous: as, for instance, the business of preparing the food is seated in the mouth, and the office of locomotion in the feet, the wings, or in organs to correspond.

Again, some animals are supplied with blood, as man, the horse, and all such animals as are, when full-grown, either destitute of

feet, or two-footed, or four-footed; other animals are bloodless, such as the bee and the wasp, and, of marine animals, the cuttle-fish, the crawfish, and all such animals as have more than four feet.

5

Again, some animals are viviparous, others oviparous, others vermiparous or 'grub-bearing'. Some are viviparous, such as man, the horse, the seal, and all other animals that are hair-coated, and, of marine animals, the cetaceans, as the dolphin, and the so-called Selachia. (Of these latter animals, some have a tubular air-passage and no gills, as the dolphin and the whale: the dolphin with the air-passage going through its back, the whale with the air-passage in its forehead; others have uncovered gills, as the Selachia, the sharks and rays.)

What we term an egg is a certain completed result of conception out of which the animal that is to be develops, and in such a way that in respect to its primitive germ it comes from part only of the egg, while the rest serves for food as the germ develops. A 'grub' on the other hand is a thing out of which in its entirety the animal in its entirety develops, by differentiation and growth of the embryo.

Of viviparous animals, some hatch eggs in their own interior, as creatures of the shark kind; others engender in their interior a live foetus, as man and the horse. When the result of conception is perfected, with some animals a living creature is brought forth, with others an egg is brought to light, with others a grub. Of the eggs, some have egg-shells and are of two different colours within, such as birds' eggs; others are soft-skinned and of uniform colour, as the eggs of animals of the shark kind. Of the grubs, some are from the first capable of movement, others are motionless. However, with regard to these phenomena we shall speak precisely hereafter when we come to treat of Generation.

Furthermore, some animals have feet and some are destitute thereof. Of such as have feet some animals have two, as is the case with men and birds, and with men and birds only; some have four, as the lizard and the dog; some have more, as the centipede and the bee; but allsoever that have feet have an even number of them.

Of swimming creatures that are destitute of feet, some have winglets or fins, as fishes: and of these some have four fins, two above on the back, two below on the belly, as the gilthead and the basse; some have two only,-to wit, such as are exceedingly long and smooth, as the eel and the conger; some have none at all, as the muraena, but use the sea just as snakes use dry ground-and by the way, snakes swim in water in just the same way. Of the shark-kind some have