



Environment & Society Portal



The White Horse Press

Full citation:

Lee, Keekok, "An Animal: What is it?"
Environmental Values 6, no. 4, (1997): 393-410.
<http://www.environmentandsociety.org/node/5730>

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An Animal: What is it?

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ABSTRACT: This paper will argue that posing the question ‘what is an animal?’ is neither irrelevant nor futile. By looking more closely at four conceptions of what is an animal as held implicitly by the general public, by certain philosophers of animal liberation, by apologists for zoos and by the community of zoologists – it will attempt to show that the first three are partial and decontextualised. On the other hand, the zoological account is obviously more comprehensive, and it will be argued that, if suitably teased out, it involves a properly contextualised conception set against the notions of species, habitat, ecosystem and of evolutionary processes in the past (as well as the future). Such a rounder and more historical characterisation will transcend the usual polarisation between so-called individualism and holism in environmental philosophy. The transcendence of this perceived dichotomy is shown also to have practical implications for environmental policy-making with regard to issues like biodiversity and the saving of animals from extinction.

KEYWORDS: animal, zoology, animal liberation, zoos, the public, natural evolution

I.

The title of this article may at first sight seem either silly or rhetorical, as it is surely obvious what an animal is. But is it? Closer examination of the matter shows that there are different implicit answers to the question depending on the type of enquiry and the kind of preoccupation, whether theoretical or practical, in which the answers are embedded. At least four different accounts may be identified, that given by (a) scientists as zoologists, (b) the ordinary person in the street, (c) philosophers or writers concerned with animal liberation and/or animal rights, (d) apologists for zoos.

This article attempts to (i) explore more fully each of these accounts, (ii) bring out the overlapping concerns and relationships, if any, between them, (iii) make clear, whenever relevant, their respective hidden agenda and assumptions, and (iv) discuss what an adequate answer to the question might be in the light of

certain crucial issues in environmental philosophy, such as maintaining biodiversity and the polarised controversy involving individualism and holism (or biocentrism and ecocentrism).

II.

Zoology is commonly understood as the scientific study of animals; one of the Greek words composing the term itself – *zoon* – is usually translated to mean ‘animal’, although it has a wider denotation referring to living things.¹ Of course, zoology in turn is part of biology, the study of life itself – the Greek word *bios* means life.

So how does zoology answer the question ‘what is an animal?’ It will soon be obvious that as far as it is concerned, there is no simple and quick reply. Any systematic answer, no matter how schematic, starts with the by no means easy problem of first distinguishing between life and nonlife. Although both the living and the nonliving are subject to the same laws of physics and chemistry as well as the law of the conservation of energy, the crucial differences between them lie in the fact that the former is very differently organised and structured from the latter – unlike the latter, it is capable of metabolism, growth, adaptability, irritability and interaction with the environment.

But how in turn is animal life to be distinguished from plant life? As the terms ‘zoology’ and ‘botany’ themselves indicate, we, lay people, take for granted that there are two recognisable kingdoms to which all organisms are said to belong: plant or animal. We instinctively know to classify mosses, ferns, and trees as plants on the one hand and mammals, birds and fishes as animals on the other. Yet this time-honoured Aristotelian schema may be said to have outlived its usefulness in the light of more up to date understanding of the various forms of life on Earth. Complexities appear straightaway. The central point to grasp is that, unfortunately, no single criterion exists which can serve to distinguish all animals from all plants. Take the presence or absence of chlorophyll as an obvious distinguishing mark. Chlorophyll is a necessary condition for photosynthesis to take place. We unhesitatingly associate chlorophyll with plants but not with animals; an oak has it but not a hedgehog. Under photosynthesis, green plants produce organic compounds from sunlight and atmospheric carbon dioxide and, at the same time, restore free energy to the biosphere. These photoautotrophic organisms in converting inorganic substances into organic materials not only sustain their own functioning integrity but also provide food for heterotrophic organisms, mainly animals, which live on them as these themselves lack the capability for photosynthesis. Yet some organisms, for example, *Euglena*, display photosynthesis under some conditions but not others – in the light, it functions like a plant, in the dark, like an animal. So is it an animal or a plant? They are considered to be animals by zoologists and plants by

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phycologists. Another borderline group is the slime moulds – zoologists call them Mycetozoa and botanists Myxomycophyta. Furthermore, not all plants possess chlorophyll – the higher parasitic plants and a large plant group, Fungi, also do not have it. So the presence of chlorophyll cannot identify and include all plants; neither does its absence identify all animals.

Another distinguishing mark may be said to be motility. We commonsensically believe that animals have the ability to move about in their environment (and some even travel between very different environments depending on the season) at some stage in their life history, whereas plants are stationary. Yet movement is not restricted solely to animals – a good many of the thallophytes such as *Oscillatoria*, several bacteria and colonial chlorophytes are quite motile.

In biology today, scientists, as we have seen, no longer regard the two kingdom schema to be all that illuminating; instead, they attach greater significance to the procaryote/eucaryote distinction. 'Procaryote' literally means 'before the nucleus'. The genetic material of such organisms is not enclosed in a well-defined nucleus, but located in a nuclear region (nucleoid). In contrast, the genetic material of eucaryotes is contained within a well-defined cell nucleus with a protein coat. However, besides this crucial difference, there are others. All living organisms, except viruses, bacteria and blue-green algae (cyanobacteria) are eucaryotic.

The problems mentioned above, amongst others, led to a proposal in 1969 for a five-kingdom system which incorporates the procaryote-eucaryote distinction. The procaryotes are assigned to the kingdom Monera while the eucaryotes are divided into four kingdoms. The kingdom Protista includes the unicellular eucaryotic organisms (protozoa and unicellular eucaryotic algae). The multicellular eucaryotic organisms are in turn organised into three kingdoms according to their mode of nutrition and other significant organisational differences. The kingdom Plantae contains multicellular photosynthesing organisms, higher plants and multicellular algae. The kingdom Fungi includes yeast, moulds and fungi that get their food through absorption. Finally, the kingdom Animalia comprises the invertebrates (except the protozoa) and the vertebrates.

Traditionally, the animal kingdom has included the unicellular protozoa, but the new schema excludes them. Yet they share many characteristics with so-called animals, such as ingestion of food, advanced locomotory systems, sexual reproduction, etc. For this reason, books on zoology regard the protozoa as animals and have a chapter on them.

To sum up a very complex set of issues, it may be fair to say, that zoologists today clearly identify all invertebrates and vertebrates as animals while agreeing that the protozoa, too, be considered as such.

One should also be reminded that the consensus which emerges takes place against a background of theoretical ideas and assumptions which have developed since the nineteenth century, of which the most salient are (a) the Darwinian theory of evolution in terms of natural selection, (b) the Mendelian theory of

particulate inheritance and the gene/chromosome theory, (c) developments in cell theory, (d) DNA genetics and molecular biology, (e) animal ecology, (f) ethology.

The larger framework is still basically neo-Darwinian. As such, it necessarily excludes as bogus contenders either so-called Creation-Science or Vitalism. A further point which is more germane to our purpose here, is that it is mainly informed by the theory of natural selection as the mechanism of evolution. Its primary object of study is, therefore, animals in the wild, to understand their ancestry, how they come to have the characteristics they do possess through certain fundamental concepts and principles that govern the understanding of organic life in general and animal life in particular. This basic orientation, as we shall see later, presupposes an ecocentric philosophy which focuses on the survival of animal species rather than of individual animals, irrespective of whether or not they are charismatic, exotic, capable of suffering pain or of mental activity.

III.

Ordinary people are very concerned with animals, but their preoccupation is obviously quite different from that of the zoologists. So one expects their conception of an animal to be also different. By and large, they stick to a commonsensical understanding of the traditional two-kingdom schema and would have no difficulty classifying squirrels as animals and conifers as plants. They would not have heard of protozoa and if asked whether bacteria or fungi are plants or animals, they would have no opinion because of their total ignorance about such matters.

In general, society's interest in certain animals was/is dictated by the roles they play in human lives – these animals have either religious/cultural, culinary, economic or personal significance for the social group or individual in question. For instance, some groups have chosen even rats (vertebrate) and snakes (invertebrate) as objects of religious worship. Some cherish the bald eagle as a symbol of national (tribal) virility, others the lion. Which animals are good to eat and which are not, clearly, vary according to culture and to historical period. Dogs are good to eat for the Dayaks while cows, for Hindus, are not for eating at all. Tigers, rhinoceroses and some whales, today, are in danger of being hunted to extinction for economic reasons.

Beyond identifying animals which belong to these main categories of concern, people remain in ignorance of those not encompassed. 'Animals', as a generality, is not all that pertinent to their lives. Particular types of animals may, outside these categories, catch their attention because they are exotic (in which case they go to the zoo to see them or watch them in a television programme), charismatic like the lion, or cuddly like the panda. As far as lay people are

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concerned, birds seem to be the only class which commands a sizeable minority of followers dedicated to watching and studying them; and amongst ornithologists, knowledge of them can be thorough and comprehensive.

As most societies have long left the hunter/gatherer stage of existence behind, the only animals which enter their immediate experience and consciousness are domesticated animals – cows, pigs, sheep, goats, chickens (which are good to eat), horses, bullocks, camels (which are, in general, good for traction and transportation) and dogs and cats (which are good for companionship, guarding the house or catching mice). Except for chickens, ducks and latterly turkeys which are birds, the rest are mammals. In other words, the word ‘animal’ would, in the context of utility derived from domestication, typically conjure up either of these two classes of the phylum chordata. In some cultures, some species of fish have been domesticated and increasingly today, salmon and trout are also being cultivated. However, domestication throughout world history has been confined to only a few species of these vertebrate classes.

In contemporary consciousness, the image or idea of what an animal is has become even more circumscribed, as increasingly in urban contexts domesticated animals are not directly confronted with. Some children even have difficulty associating pork with an animal called the pig, or milk with the cow, as pork and milk are just packaged items the family purchases from the supermarket. This means that animals as domestic pets occupy centre stage, especially in developed countries, cats and dogs being the most prevalent. Children, increasingly, are taught to identify animals via these as exemplars. For them, the denotation as well as the connotation of the term ‘animal’ is paradigmatically given and determined by the varieties of dogs and cats they find in households. If asked whether they share their homes with animals, they will confidently say no provided they keep no cats, dogs, budgerigars, goldfish or hamsters. If reminded that most homes, and therefore, theirs would have a mouse or two, they would feel justifiably shocked. But to them, if compelled to acknowledge their presence, mice are not animals in the way pets are animals – they are at best animals only in some technical sense. To them they are just pests. And if told that mites live in the detritus of their scalp or upon their skin or in their carpets, they would be horrified; but unlike mice or rats, they would even have difficulty accepting or understanding these as animals at all.

To sum up, increasingly, the lay consciousness is confined to grasping animals in terms of a few domesticated species of mammals which are regarded as friends to humans or a few exotic and/or charismatic animals which they see in zoos occasionally. The latter, we shall see, are themselves, in the main not caught from the wild to live in captivity but merely the descendants of such animals, often a few generations removed. This means that domestication in one form or another looms large in the animals people are likely to experience at first hand. At least one clear difference then has emerged between the account of what is an animal as understood by zoologists and that as understood by ordinary

people in general – the former are primarily interested in natural evolution and, therefore, in all species of animals in the wild (the number of known species are said to be just over a million and those unknown, several millions more, even on a conservative estimate), whereas the latter are essentially preoccupied with a relatively small number (probably a few dozens at best) of domesticated species of animals whether encountered at first hand frequently in the home or occasionally at the zoo.²

IV.

The defence of animals against human cruelty is a protest against the ways in which they are (a) kept and then slaughtered for food, (b) used in scientific research and experimentation whether for the serious purpose of saving human lives or the trivial one of improving the appearance of human bodies, (c) hunted, hounded or killed for human pleasure.

This defence is capable of being grounded in two very different types of philosophical perspectives:

1. The more traditional justification, derived from philosophers like Kant, is that the duty not to be cruel to animals is in reality an indirect duty to humans, as the infliction of cruelty upon animals could dispose us to be callous towards fellow human beings. But of late, this highly anthropocentric standpoint has been powerfully challenged by two contemporary philosophers – Peter Singer and Tom Regan – who, in spite of the obviously different philosophical stances each has adopted, nevertheless, are united in repudiating the dominant humanist tradition of Kant and the Enlightenment, at least regarding the treatment of animals.

2A. A minimalist reconstruction of Singer's philosophy of animal liberation includes the following:

- (a) the hedonic postulate – pleasure and pain as mental states are respectively intrinsically good and evil;
- (b) the consequentialist/utilitarian postulate – one ought always to maximise pleasure and minimise pain in one's actions;
- (c) the boundaries of sentience postulate – (a) and (b) are 'blind' to the kind of being which is capable of feeling pleasure and pain. Humans clearly are sentient but empirically it can be shown that humans are not the only sentient beings. Other mammals, too, clearly are sentient. Birds are as well. Erring on the side of caution and charity, the boundary should then be drawn somewhere around shrimps and, possibly, lobsters; and

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(d) the consistency postulate – as we, today, believe that we have a moral duty not to keep and eat fellow humans for food, to perform vivisection on them with or without their consent, to hunt, maim or slaughter fellow humans for entertainment, then equally, we have a moral duty not to do likewise to fellow sentient beings.

2B. A minimalist reconstruction of Regan's philosophy of animal rights includes the following:

(a) the rights postulate – (i) an entity is intrinsically (or inherently, in Regan's terminology) valuable if and only if it is capable of being a subject of a life, that is to say, possessing memory, beliefs and desires as well as other mental states, and (ii) an entity is a rights holder if and only if the entity is capable of being a subject of a life;

(b) the conceptual postulate – to be a subject of a life, to experience mental states like beliefs and desires, conceptually speaking, it is not necessary to possess language at all or human language as we understand it to be;

(c) the boundaries of subject-of-a-life postulates – (a) and (b) are 'blind' to the kind of entity which can satisfy the criterion of being subject of a life, Humans (or at least the majority of them) are clear candidates, but empirically it can be shown (once (b) has been conceded) that mammals, too, are candidates. Erring on the side of caution and charity, the boundary of eligibility should then be drawn at birds; and

(d) the consistency postulate – as we, today, hold the view that human beings have a right not to be kept and eaten by fellow humans, to have vivisection performed on them with or without their consent, to be hunted, maimed or slaughtered by fellow humans for entertainment, then equally, other mammals (and possibly birds) have a right not to be treated likewise by us humans.

In spite of the obvious difference in the philosophical foundations provided by Singer and Regan and the debate which ensues between them – one anchored in moral duties understood in the context of hedonic consequentialism, the other in moral rights deontologically understood in the context of certain characteristics of mental life in humans and closely related mammalian others – the two do have certain things in common, apart from their agreed common goal to end cruelty and suffering to animals. Their respective implicit conceptions of what is an animal are given by the criterion they each have chosen as the most fundamental postulate of their philosophy of animal liberation – the hedonic postulate in the case of Singer and the rights postulate in the case of Regan.

In either, the paradigmatic animal is the human animal. Although Bentham, as a founding father of modern utilitarianism, had acknowledged that certain

nonhuman animals also come within the purview of his fundamental postulate, nevertheless, utilitarianism as propagated and inspired by him has chosen to concentrate on humans as the paradigmatic sentient beings. Similarly, the concept of rights – either understood as natural or as contractual rights – has long been conducted, until very recently, within an exclusively human domain.

Singer himself uses the image of the expanding (moral) circle, in order to draw certain other beings, so far excluded by Western philosophy, into its orbit. Regan endorses this implicitly. However, both proceed on the assumption that there is a limit to which this circle may be enlarged – Singer's fundamental postulate allows him to redraw it with a somewhat wider radius than Regan's. But in the centre of their circles is the human. The further a being is from that centre, the more difficult it would be to make a case for extending moral considerability to it. The human is, of course, a mammal. Hence, extending moral duties or rights to other fellow mammals is their most obvious target. This has prompted some commentators to say, especially of Regan's account, that it is really about mammalian rights.

In general, it might not be too unfair to say that both philosophies are underpinned by an overarching postulate, namely, the search for similarities and likenesses between humans and certain animal others. As such, the more an animal resembles humans in certain specified ways, the easier it is to admit them into the moral circle. Of the mammals, the Great Apes come closest to us – indeed, this class is held to consist of the gorillas, the orang-utangs, the chimpanzees and then ourselves as the long missing fourth Great Ape.

While those animals within the pale are accorded a dignity befitting their newly acquired status of being morally considerable, those outside, as a result, are dealt a double blow – first, they are owed no moral duties or denied moral rights, and second, the term 'animal liberation' or 'animal rights' itself goes even further and serves implicitly to deny them the status of animality itself. In other words, only those beings which qualify to be the bearers of rights or to be the object of our moral duties are 'proper' or 'true' animals. The denotation and connotation of the word 'animal' has surreptitiously and subtly been revised so that even on Singer's more hospitable expansion of the moral circle, worms, molluscs and many more are debarred. The similarities postulate has forcefully challenged human chauvinism, the view which sets humans apart from other animals, assigning to themselves a superior status of privilege and domination. It attempts to force human consciousness to concede that humans, as mammals, are really fellow animals. They (together with those others admitted into the expanded circle) and us are all owed duties not to be tortured or held to enjoy rights to life, etc. Strictly speaking, in Singer's moral/political philosophy, a single hedonic consequentialist theory is postulated to embrace all sentient beings, from mammals down the evolutionary scale to possibly some crustaceans like lobsters, just as in Regan's moral/political philosophy, a single unified theory of rights is postulated, covering all mammals and possibly birds. But the

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price for this revision is the construction of a new demarcation line between the in-group and the out-group. Members of the latter are pariahs because they are unlike us in the crucial respects and, therefore, cannot be animals, a category to which we, ourselves, now belong. But a hierarchical or class system remains in place – the franchised and the privileged against the nonfranchised and the disadvantaged – it is just that the former now includes not simply us but those beings which are like ourselves in certain selected aspects. Human chauvinism may have been vanquished but its spirit has not been challenged by either Singer or Regan and remains unexorcised in their respective philosophies.

V.

Zoos are said to exist for the following reasons:

- (a) to entertain and amuse the public;
- (b) to educate the public;
- (c) to advance scientific knowledge;
- (d) to save endangered animal species from extinction.

It will be shown, all things considered, that the goal of entertainment is fundamental and every zoo has to bear it in mind if it is to survive. Chimpanzees may no longer take part in tea-parties, a practice which London Zoo, a zoo noted for its claim to advance science rather than entertainment, only ended in 1972. But it remains true that animals in many zoos today are still expected to perform strenuously to earn their keep, and even the most highly regarded zoos in the world indulge this demand to some extent. Animals may not be expected to do it relentlessly the whole day; instead, they are carefully trained and managed to do it in shifts as in Happy Valley Zoo in Minnesota. In any case, families would not want to visit zoos, as a day out, unless they can see animals doing something, be it eating, grooming one another, swinging from post to post, etc. Visitors do not, as a matter of course, find dozing or snoozing animals really fascinating or compelling. Zoos keep civilised office hours, but their inmates do not. For instance, bats which are nocturnal animals would not be active during zoo visiting times unless their nights are artificially turned into days and *vice versa*.

From the educational point of view, zoos, in one respect are obviously deficient; traditionally, they have not stocked and still do not, in the main, stock domesticated animals. It is simply assumed that the public by and large have either first hand experience of them or know about them already and so are not interested in seeing them. But as we saw in section III, this assumption increasingly holds less and less except for cats and dogs which are kept in the home as pets. Perhaps, zoos in the near future may come to stock other

domesticated animals, like horses, cows and goats, as the urbanised population comes to find these unfamiliar and, therefore, 'exotic'. But in any case, not all zoos take the educational purpose over seriously. Furthermore, not many members of the public are over eager to be properly educated about the animals they look at beyond observing them feed their young perhaps, or playing with one another, and occasionally retaining one or two facts about their place of origin or their mating habits. More crucially, to stand any chance of being put across at all the educational message has to be packaged as part of entertainment or the public will be turned off.

As for advancing scientific research, not many zoos are equipped or even pretend to aspire to such a goal. But in so far as it is pursued, its studies fall into two principal areas – animal anatomy and pathology on the one hand and animal behaviour on the other. The latter is particularly controversial, with some critics claiming that observing the behaviour of captive animals is an irrelevancy as far as behaviour of animals in the wild is concerned. At best, it would be a kind of laboratory for observing their behaviour when crucial factors like predation have been suspended and controlled. Some zoos, however, are also in a position to make contributions to veterinary science.³

But of late, another *raison d'être* has been added to the scientific justification, namely, to prevent the extinction of endangered species. Advocates are keen to emphasise that their first priority is still to save the habitats of endangered species. But living in the real world, they claim that such an ideal is not often achievable. As a fall back and a second best, they favour using zoos to undertake breeding programmes in captivity (but with the ultimate aim of returning them to the wild if and when suitable habitats can be found for them). Such a programme is feasible given, it is said, the recent advances in scientific understanding in disciplines like DNA genetics, population genetics, and engineering possibilities like building and maintaining cryotoria, etc.

However, the whole breeding programme is regarded by its critics to be problematic in spite of the seemingly strong arguments normally advanced in its favour. One of the most crucial reservations lies in the potentiality of domestication in generating such animals. (However, there is no room here to pursue this critique in great detail.) But in any case, only very few zoos in the world have the resources, financial, intellectual and political, to undertake such a complex task, which requires a very long term commitment.

The first justification, namely, that zoos are in the business of entertainment and amusement, is the most anthropocentric in orientation whilst the fourth is the most nonanthropocentric. However, the seemingly most lowly of human motives and the most noble motive, namely, to save the species for their own sakes not for our own pleasure, agree on this – their implicit conception of what an animal is.

It is a conception which is also shared by the person in the street in all respects except one, namely, that it excludes domesticated animals, while the lay public

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includes them. In the words of one prominent apologist for zoos, particularly advocating their use to implement captive breeding programmes, zoos deal in the main with animals like ‘the rhinos, the tigers, leopards, primates, parrots, ... the Asian elephants, many an antelope, many a bird of prey, various cranes and so on; all the creatures of our childhood; what most people mean by the word “animal”’ (Tudge, *Last Animals at the Zoo*, p. 46). In other words, various exotic birds and several large charismatic (land) mammals.

The zoo image, then, powerfully reinforces the lay image of what counts as an animal. As one of the purposes of zoos is to educate the public, such a goal, in so far as it is achieved, is at best partial as necessarily it has nothing to say about those organisms and their species which the public does not mean by the word ‘animal’ and which *ipso facto* are not zoo residents.⁴ Furthermore, zoos, as already commented on, also claim to advance scientific research. But again, in so far as this is achieved, the objects of study are entirely confined to the favoured and the selected which are necessarily few in number. As for the fourth justification – zoos saving endangered species – Colin Tudge is quite happy to admit, as we have seen, that what zoos ultimately can save may turn out to be no more and no less than those animals which zoos have, in the main, always kept to ‘pull the punters in through the gates’. To put the point in a slightly different way, it seems fair to say that zoos, at the end of the day, are sustained and maintained by what the public wants to see for their entertainment and amusement.

What ordinary people and zoos mean by the word ‘animal’ and the species the animals belong to, refers then to a minuscule fraction of the total animal species known today to science; that number stands at 1,032,000 species, of which insects account for nearly three quarters, standing at 751,000 species. Mammalian species only total 4,000, with birds slightly more than double that at 8,600 species.

Conservation biologists estimate that about 2,000 species of land vertebrate would need captive breeding in the next 200 years if they are to be saved from extinction. But according to estimates about what zoos could do in this rescue programme, there are about 1,000 or so zoos in the world considered suitable for the task, which, between them, could take care of 800 species. The breakdown is as follows: 100 or so out of the 900 species of bats, all the 35 living dogs including wolves and foxes, 60 out of 72 cats, the 2 living elephants, all 4 of the sirenians, the manatees and dugongs, 100 of the 172 even-toed ungulates including antelopes, deer and giraffes, all 15 species of odd-toed ungulates including the rhinoceroses, horses and tapirs and all 160 species of living primate including the apes, monkeys, lemurs and their relatives. The animals targeted for saving are mammals, or land mammals to be precise, as it is not envisaged that sea mammals like whales and dolphins could be saved at all through captive breeding in watery equivalents of zoos. Yet given this severe limitation, Colin Tudge’s recent scientifically serious, though popular book, *Last Animals at the*

Zoo has for its subtitle: *How mass extinction can be stopped*, which is highly misleading and scientifically, totally, inaccurate.

It appears that for the lay person, for animal liberationists, for zoo apologists in general, animals as mammals feature crucially, even if not exclusively. The further down the (historical) evolutionary scale an animal or species is, the less it is perceived to be an animal. Today, the pride of place traditionally occupied by humans has been challenged, but mammals have been installed centre stage instead. The rest of the animal kingdom (or at least what counts as belonging to it according to scientific consensus today), deemed neither to be interesting nor charismatic, but infinitely far more numerous, remains unenfranchised; indeed, not even perceived as animals, and certainly owning no rights to be claimed against humans and owed no duties by humans towards them.

VI.

Today's philosophical sensibility is not hospitable even to the posing of the very question 'what is an animal?' as it seems to imply a static essentialist answer. However, the object of this paper is not so much to indulge in arid verbal definitions passing off as essences, but (a) to clarify how various groups of people who have interests of one sort or another in animals themselves explicitly or implicitly understand what they mean by the term 'animal'; (b) to see how adequate such meanings might or might not be when judged against a much more comprehensive conception given by the community of zoologists; and (c) to explore the zoological framework a bit more fully in order to work out if its implicit account of what an animal is will be of help in elucidating certain issues which are the common preoccupations of environmental philosophy and conservation biology, such as concern with biodiversity and the saving of endangered animals. The earlier sections of the paper have looked at (a) and (b); this section is concerned with (c).

At the end of section II, it is briefly mentioned that the study of zoology (indeed of biology in general) is carried out within a larger framework which is basically neo-Darwinian in orientation, the main components of which include the theory of evolution resting on natural selection as the mechanism to account for change, classical gene/chromosome theory which of late has been reinforced by DNA genetics and DNA biology, population genetics, cell theory, ecology and ethology.

Once upon a time, nearly four billion years ago, Earth was more or less devoid of life. When life did appear, it was first in water as microbial mats. The first organisms were procaryotic and single-celled. Then the 'higher' eucaryotic organisms appeared about 1.8 billion years ago, at first as single-celled, later as multi-cellular. It was not until the Cambrian explosion, 540 to 500 million years ago, that macroscopic animals appeared in abundance to give rise to the types

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which still exist today. Apart from the protozoans, as already observed in section II, the Kingdom Animalia comprises the vertebrates and the invertebrates, dating largely from the Cambrian period.

However, this historical fact of evolution hides two very different types of phenomena which ought to be distinguished – vertical evolution where there is change but without speciation and vertical evolution which involves speciation. According to E. O. Wilson, Darwin was primarily concerned with the former, not the latter – for instance, a genetic mutation in a population of white moths which happens to bestow survival advantage could end up by being one with predominantly black moths. There has been change but no speciation; you start and end with one species.

Furthermore, Darwin is often cited by theorists sympathetic to the philosophy of animal liberation or animal rights as a scientist who held that only individual animals exist and are real, but not species – James Rachels is a prominent holder of such a view. But to understand biodiversity, as it stood historically and as it stands today, scientists are interested primarily in evolution leading to speciation – for instance, a single species of wasps which came to Hawaii 100,000 years ago has given rise to hundreds of species as the members of the original colonising population spread out, changed and evolved in response to the distinctive environments they found themselves, which were peculiar to a particular island, mountain ridge or valley. As such, the scientists are interested, not so much in the individual animal (or organism) but in the species and in the mechanisms of speciation, namely, how changes in a population of individual organisms lead eventually to the emergence of two or more populations which no longer exchange genetic material with one another. To make empirical and conceptual sense of this kind of phenomenon, their work requires the so-called biological-species concept⁵ which may briefly be defined as follows: ‘a species is a population whose members are able to interbreed freely under natural conditions’ (Wilson, 1992, p. 36).

This has fed into a polarisation in environmental philosophy between those who endorse an individualist framework based on the individual animal (organism) and those who argue for the centrality of the species, and in turn of the habitat and ecosystems of which species are a part (a view often referred to as holism). However, this paper is not concerned with evaluating the arguments and counter arguments which constitute this controversy; rather it will focus on an aspect of it which is not usually commented upon, namely, the by and large ahistorical decontextualised character of the individualist perspective and the implicit historical contextualised character of the holist approach.

The former appears to be involved primarily with the individual animal as it is confronted; its implicit account of what is an animal is governed by this outlook. For want of a better term, one could call this kind of individualist approach ‘the phenomenalist account’ or less solemnly, ‘the what you see is what it is’ account. Singer’s sentientism could be interpreted in this light – mammals,

in particular, could be observed to exhibit pain behaviour when they find themselves in certain situations, such as when their legs are caught and mangled by traps. From their behavioural symptoms, we infer that they feel pain and are in pain, just as in the case of humans who are fellow sentient beings, one similarly infers from the behavioural symptoms that other humans also feel pain and are in pain. Their sentience, therefore, constitutes their saliency if not their essence and gives the ground for their moral considerability. Regan's subject-of-a-life criterion could likewise be interpreted. Mammals could be observed reacting in the way humans do in certain situations – for instance, a cat would scratch at its owner's legs and/or miaow loudly until its owner opens the door to let it out, just as someone might persistently knock on the window until the person within hears the knocking and opens the door for one to come in. In the case of humans, the persistent knocking is taken to be the acting out of, and upon, certain desires and beliefs. Analogously, the cat is held, too, to be acting out of, and upon, certain desires and beliefs, the only difference – though deemed not to be relevant – is that while human desires and beliefs can be linguistically expressed, those of mammals are not and can not be thus expressed. The display of mental activity constitutes their only saliency and the grounds for their moral considerability.

Such an approach takes no account of any other aspect of animal existence including even the numerous obvious differences between all those that are identified and classified as animals according to the respective criterion of animality endorsed by Singer or Regan. Take any two animals, a cheetah and a human. A cheetah can run at a top speed of 70mph, but a human, at best, can run a mile between 3 and 4 minutes. Yet this salient difference cannot be accounted for in terms of the individual animals concerned. No amount of training, pumping steroid, eating large helpings of steak or taking ginseng by the mouthful could lead a human to perform in the same way a cheetah does. The difference can only be satisfactorily understood and explained in terms of their species characteristics.

In other words, behind the individual animal stands the species. What one observes of individual animals cannot be properly comprehended except in relationship with their species, whether one is thinking of cases which are inter species or intra species. The cheetah/human example is an illustration of the former. But consider the following intra species instance: a human suffers from severe brain damage because of an accident at birth and, so, leads a so-called vegetable existence. We lament this and regard it as a tragedy. Conceptually speaking, a sense of the tragic is only appropriate because the individual in question had the potential to speak, although that potentiality was never realised because of the accident. But the potential can only meaningfully be invoked because the individual is a member of the human species, one of its species attributes being the power of speech. It is not meaningful to say it is tragic that a cheetah or a lion cannot speak, no more than it is meaningful to say it is tragic that a human cannot sprint as fast as a cheetah.

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An individual is but a very transient member of a species.⁶ A species, as Rolston puts it, is a historical lineage. It comes to possess the characteristics it does as the outcome of an extended period of evolution which sometimes spans several thousand years. Hence an individual animal properly understood against the background of its species is not an ahistorical being – it is the product and an embodiment of evolutionary history itself. In other words, in observing a particular animal, one is not merely observing an individual being displaying whatever characteristics it does possess, but through it, one grasps the whole historical dimension of its evolutionary past. This aspect of public education, as earlier intimated, is impossible, not merely extremely difficult, to achieve in the context of a zoo; zoos, by their very nature, decontextualise the animal, having deliberately excluded it from that very context which embodies its evolutionary past, substituting for it an environment, so different from its original, that its evolutionary future may also be said to be more or less doomed.⁷

Evolution of species means that a population responds not merely to genetic variations but to such variations in the context of specific environments. Over time, variations which prove to be adaptive may ultimately lead to the emergence of two or more species, as we know. This means that ecology in general, and habitats and ecosystems in particular, play a vital part both in the emergence and the maintenance of a species. Going back to the Hawaiian example, the original colonising population of wasps would not have diverged and diversified into hundreds of different species thousands of years later if there had not been obvious or subtle, but in either case importantly different environments as provided by the numerous islands in the archipelago, the numerous valleys and mountain ridges on each particular island.

The philosophy of animal rights and animal welfare is also necessarily blind to the historical and evolutionary dimensions of the animals it is interested in. Furthermore, this is hardly surprising given its failure to distinguish between domesticated and wild animals; whereas as far as zoology is concerned, its very object of study is wild animals and the context they imply. A concern with biological diversity is also in the main a concern with species diversity in the wild. To save species (in the wild) from threatened extinction is necessarily to save not only individual members of the endangered species, but the species themselves, together with the habitats and the ecosystems of which the species are members. To save the tiger is not to capture a few individual tigers and put them in a zoo or a secure enclosure of some kind – it is to save the tigers-in-the-forests. But one is told that this is unrealistic and instead to rely on zoos to engage in captive breeding programmes of some 800 mammals for the next 200 years while waiting for an opportunity to return them to the wild. However, to believe this may turn out to be unrealistic, or at least, just as unrealistic as it is to aspire here and now to save the numerous identified endangered species *in situ*, for the following reasons:

(a) The major cause of species extinction today is habitat destruction and fragmentation caused by humans. It is assumed that (i) the impetus behind such destruction is pressure of human population, and (ii) in time to come, within the next 200 years or so, the human species would have come to control its population growth and indeed, drastically to reduce its numbers in global terms, releasing back to the captive animals the space now denied them. But these assumptions may be ill founded – (ii) may be no more than a pious hope and a declaration of faith, while (i) may be a misdiagnosis of the human impulse to destroy the habitats of fauna (and flora). It is true that human numbers as such put great pressure and stress on the natural environment; but one should not ignore another extremely powerful motivation at work which is altogether independent of the numbers of humans around as well as of the aspiration to increase human welfare and comfort. This is the urge and tendency to make over Earth according to the human image, which is greatly enhanced and encouraged in modern times through our ever- increasingly powerful technology. By such means, *homo faber* sets out systematically to transform the natural to become the artefactual.

(b) It assumes that 200 years of suspending natural evolution and the processes at work which sustain such evolution is not really equivalent to deliberate domestication. Although the genetic composition of the group of animals may be carefully monitored, so that an analogue of the genetic pattern and structure of a population in the wild could be replicated, no remotely plausible simulation of the habitat and ecosystem of the endangered species could be mounted under captive conditions.

(c) Nor is there any real guarantee that in 200 years time, when optimistically space is once more made available to return such animals to the wild, the new habitat would resemble in crucial ways the original of which their wild ancestors were a part. To assume otherwise is to subscribe to what may be called the additive/subtractive notion of causation⁸ – consider a watch which has stopped working, but which upon examination shows up a defective spring. Remove the broken part, and replace it with a new functioning substitute. Wind up the watch and it should continue working exactly as it had done before. The stoppage brought about by the malfunctioning part, its removal and its subsequent replacement at any later moment in time makes no relevant ostensible difference to the watch whatsoever. A habitat or an ecosystem is not like a watch – the removal of a component (not even necessarily a keystone species) may lead to very significant new changes so that after a period of time, it is no longer in crucial respects the same habitat or ecosystem.

In the light of the discussion above, it seems fair to conclude that the dichotomy between individualism and holism may be misleading in one respect, namely,

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that a proper characterisation of the individual animal has to go beyond what I have called the phenomenalist approach to the species of which the individual is a member, and in turn to the evolutionary past which has produced the species as well as the present habitat and ecosystem which sustain the species and its continuing evolution by sustaining the individual members which live their lives within it. The individual animal is the nexus in which all these strands cohere for a limited period of time. To ignore this larger, 'holistic', historical background is to distort the nature of the individual animal by decontextualising it.

VII.

By looking behind the respective accounts of what is an animal implicitly given by the four different groups which have an interest in animals, this paper has arrived at the following conclusions:

1. The characterisation endorsed by three of these groups – namely, that of the lay public, the philosophy of animal liberation and animal rights, and zoos, is partial at best, and therefore, inadequate and misleading.
2. The characterisation given by the community of zoologists is more comprehensive and goes beyond what human sentiments alone see fit to identify and classify as animals. Furthermore, when suitably teased out, it is seen to endorse a view of animals which does not decontextualise them; through presenting them, not as mere individuals which happen to possess certain attributes, but as members of species which themselves are historical lineages, having evolved and continue to evolve (if not made extinct) within their particular habitats and ecosystems.
3. This, in turn, has certain implications, both philosophical and practical. In particular, it reveals the philosophical drawbacks (i) of the kind of individualism upheld by the exponents of animal rights and animal welfare, (ii) of the captive breeding programmes undertaken or urged upon zoos, which seem to give undue prominence to DNA differences between individual animals whilst de-emphasising the larger, 'holistic' and historical dimensions against which they must be understood. As for the practical implications, it follows that (a) the policy of captive breeding to save (some selected) endangered species may be just as unrealistic as trying to save them in situ, (b) any attempt to save biodiversity must begin with educating the public about the issues raised by the question 'what is an animal?', weaning them from their untutored assumptions of identification and classification, (c) that zoos, by their very nature, are not necessarily the right institutions for this public education, given that their primary goal is entertainment and amusement.

NOTES

¹ I owe this point to Mary Midgley who has also made other suggestions for improvement, for all of which I am most grateful.

² This sense of domestication regarding animals in zoos will be defended later in section VI.

³ The limited number of zoos in the world which participate in the captive breeding programme do engage in scientific research which goes beyond what has just been mentioned. But this work is directly bound up with their recently acquired goal of conserving species threatened with extinction.

⁴ However, to my knowledge one zoo director has agonised about this matter. See David Hancocks' paper 'Lions, Tigers and Bears, Oh No!' in Norton (1995).

⁵ This is not to say, however, that the concept is without difficulties. For instance, it is not applicable to organisms (mainly plants) which reproduce asexually.

⁶ This should not be taken to imply that species are immortal. A mammalian species lasts, on average, a million years.

⁷ The point made here about the educational limitation of zoos is not that zoos cannot provide information by way of videos, lectures, notices and pamphlets about the evolutionary history and habitat of the species which has led to that history, but that this is done, necessarily, in a decontextualised fashion, as zoos, no matter how 'naturalistic' the settings in which most of their animals (especially the larger ones) are exhibited, can only simulate their natural habitats.

⁸ For a fuller account, see Lee, *Social Philosophy and Ecological Scarcity*, pp. 58- 70.

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