fox

martin wallen

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Fox

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Red fox (*Vulpes vulpes*).

1 The Fox in Nature

The modern scientific names of the fox – distinguishing 21 species and 8 genera – depend on classic terms that refer to it as incomplete, false or ambiguous – or simply a bad creature. The Sou American small-eared fox, for example, bears the Greek tag *Atelocynus microtis*, which translat roughly as 'incomplete dog with small ears', and the *culpeo* – whose common name denotes i culpability – was once classified in the genus *Dusicyon*, which means something like 'a dog of ba character', but is now said to belong to the genus *Pseudalopex*, or 'false fox'. These aspersiv classifications are caused, I think, by the fox's tendency to disrupt otherwise neat arrangements by i refusal to participate in a systematic account of nature, but also by an ancient tradition that conside the fox a wicked creature. The fox *seems* to be as open for study as any animal, but it is notorious f turning up where it had not been expected – or where it should not be – and for changing its defini qualities to adapt and take advantage of different situations. As common as the fox is throughout th world, it has mostly eluded scientific certainty, and the efforts of naturalists to rein in this ubiquito yet elusive creature reveal the biases governing their attempts to define nature itself, which is equal elusive. Ultimately, to trace the ways that naturalists have defined the fox over the centuries is glimpse the principles governing different definitions of nature. The first Westerner to attempt systematic account of nature was Aristotle, whose explanations may seem wholly unscientific toda founded as they are on beliefs that he took as truths but that have long been discounted. Nonetheles his influence lies in the systematic approach he brought to classifying animals.

Aristotle follows three principles to classify animals: the different substances that make u analogous body parts; the different environments that animals inhabit – land, sea or air – whic correspond directly to the substances of which their bodies are made; and the differences in the dispositions revealed through their interactions with other animals. Although Aristotle does not devo much space to foxes, he refers to them significantly in the explanations of his systemat classification, making them serve the ironically exemplary role of antipode to humans.

In the Aristotelian hierarchy, humans are closest to divinity, which is the pure life of light and ai and while humans do not quite attain divine purity, they do possess a fluid warmth. In Aristotle scheme, the warm and fluid materials include blood, lard, semen and flesh. At the opposite end of th spectrum are the materials close to the cold, dark and hard earth, such as sinew, hair, bone, gristle ar horn.[1] Man possesses the most complete body because his is the least earthy, including less bone horn and more flesh and sensory organs than the bodies of other animals. Animals like the fox that a close to the earth are less complete, and therefore bony.[2]

In comparing body parts, Aristotle lays special emphasis on the genitals, because, in serving th function of generation, they most contain the nature of the individual's power of life. Thus h alignment of penises: 'The male organ shows much diversity. In some it consists of gristle and fles as in man; and the fleshy part does not become inflated, while the gristly part becomes enlarged. some it is sinewy, as in the camel and the deer; in others, bony, as in the fox, the wolf, the marten. The three types of penises, those of men, ungulates and predators, are ranked according to wh

Aristotle believes they are made of. Since he sees the male human being as the complete form animal life, foxes, in regard to their penises, stand two removes from the human and fro completeness. A human's penis is made of 'gristle and flesh', while an ungulate's is 'sinewy'. Gristl and sinew are both earthy substances, so the significant difference here is that the human penis als contains flesh. Fox penises supposedly have neither flesh nor gristle-sinew, but are simply bone ar therefore earthier, colder and less perfect than the penises of ungulates and humans.

An Arctic fox cub in its den. Aristotle believed foxes to be colder and less 'complete' than other animals because they burrow in the earth.

The cooler and incomplete nature of the fox gains further elucidation when Aristotle describes th different modes of reproduction: 'The fox mounts the vixen for intercourse, and she brings forth as th bear does: the young are even more unarticulated . . . When the young have been born, by licking the with her tongue she warms them thoroughly and brings their concoction to completion.'[4] 'Concoctin in Aristotelean biology means completing the animal into its full form. This process, by no surpris occurs through heat, so that, in licking her babies, the vixen warms them, shaping them towards th complete form, which is to be found in adult malehood. Foxes have a cooler, bonier physiology that closer to the earth than that of humans, and so must be licked into shape.

Red fox cubs. According to ancient authors, the cold, earth-dwelling fox could only become a complete animal when licked into shape.

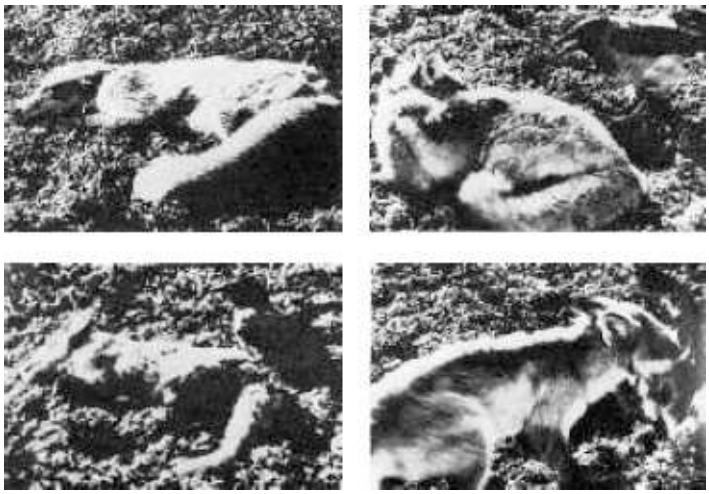
The second basis on which Aristotle categorizes animals – their habitation – clarifies why he think of the fox as bony and cold, for an animal's habitat will determine the substance it is made of. Th animals 'that are constituted out of wet matter are in wet places, while those out of dry matter are

the dry . . . The natures of their matter are of the same kind as the locality where they exist.'[5] What more, he also says that animals' 'food differs chiefly according to the matter out of which they a constituted. For each one's growth comes naturally out of the same matter.'[6] Since foxes burrow the earth, they would be made of earth, and would even eat that which they are made of, for 'what natural is pleasant; and all pursue their natural pleasure'.[7] Aristotle's word for 'natural' here is *physi* that complex term that may refer to origin, constitution and the physical element of which the anim is made. For the fox all these references coalesce, since it comes from the earth, is made of the ear and is cold like the earth.

With regard to the third basis of categorizing animals – their dispositions – Aristotle again ranl the fox towards the bottom – after the 'wild' wolf and the 'affectionate' dog – pointing out that the fo is 'wicked and villainous'. The Greek word that Aristotle uses for 'wicked' is *panourgos*, whi describes those who hide in a particularly sneaky way, as Plato describes Socrates' foe, the sophis doing, hiding 'in most rascally fashion . . . in a place we cannot explore'.[8] For Aristotle, then, th wickedness of the fox lies in its habit of concealing itself where empirical deliberation cann penetrate. Again, because the fox lives in the earth, it is of the earth, hiding itself in darkness and co materiality in a way that makes it inaccessible to empirical observation. For a systematic observer lil Aristotle, an animal that conceals itself from plain view is wicked, since it represents the limit beyor which empirical observation cannot reach. In this way the fox again resembles the earth of which it made and where it lives: the earth is too old to be known, and in the Greek view it is the realm of th most primordial and dangerous forces. The identification of the fox as wicked and belonging to son primordial chthonic order reverberates throughout descriptions and stories of all centuries ar cultures: like the ancient and dark earth itself, the fox eludes the naturalist's best efforts at descriptio because it conceals itself wickedly by hiding or putting on a disguise.

For Aristotle's successor Lucretius, who wrote in Rome in the first century BC, the 'nature' animals retains the Greek understanding of what is revealed in the regularity of their actions, althoug he bypasses Aristotle's hierarchy of completeness by emphasizing behaviour over materi constitution. The nature of a fox, he says, is to act as foxes have always done in order to survi through its ability to perform particular actions better than other animals can. Thus Lucretius depar from Aristotle by focusing on the non-physical characters of animals in order to examine the abilitie enabling them to exploit their habitat. A fox will use its cunning intelligence because that attribute ha saved it in the past, and so the fox can be defined as the animal with cunning. In this sense, then, th fox is neither more nor less than anything else (such as human beings), but is what it needs to b 'Whatever animals you see feeding on the breath of life', Lucretius says, 'either their craft or braver aye or their swiftness has protected and preserved their kind from the beginning of their being . First of all the fierce race of lions, that savage stock, their bravery has protected, foxes their cunnir [*vulpis dolus*], and deer their fleet foot.'[9] Lucretius borrows the word he uses to characterize foxe *dolus*, from the Greek; it may be translated as 'guile' or 'deceit', as well as 'cunning'. Lik *panourgos*, *dolus* is a common description of the sophists – those false teachers who beguile peop into thinking that the weaker argument appears the stronger; but the term is also associated wi Aphrodite, who beguiles men, Sappho says, 'by weaving her wiles'.[10] In describing the fox as *dolu* Lucretius recognizes it as a part of that natural power that aims primarily at deception; cunning gui becomes the governing element in the vulpine character because it has enabled foxes to survive for long as there has been such an animal to feed 'on the breath of life'. But the fox's cunning is also th beguilement of Aphrodite, who charms rational men into allowing her to exploit them. Lucretiu *dolus* points to another quality continually associated with the fox, namely its seemingly endle adaptability to any situation in which it finds itself.

A red fox with its prey.



Four stills from a 1961 Russian film showing a fox feigning death in order to catch a crow. Many believe that the fox's willingness to deceive other animals is more than mere legend.

Writing in the first century AD, Pliny the Elder, who probably had more influence on later naturalis than Lucretius, reverts to Aristotle's view that humans represent the completion of natur organization, and that the animal kingdom constitutes an inchoate human society with the differe species similarly governed by the power relations of politics. Pliny thus introduces the fox in h description of the sympathies and antipathies that connect animals in 'certain kinds of warfare ar friendships'. There are quarrels, he says, between different species, such as foxes and kites, and 'the is a small bird called the aesalon that breaks a raven's eggs, whose chicks are preyed upon by foxe and it retaliates by pecking the fox-cubs and the vixen herself; when the ravens see this they come their aid against the aesalon as against a common foe.'[11] Here the animals do not just prey on or another for food or territory, but because, like humans, they actively and consciously dislike or another. As an officer in the Roman army, Pliny colours his descriptions of animals with the marti tones of a warrior used to weighing up the friendships and conflicts that potential enemies and alli bring with them.

The Fox and the Stork, a water-colour drawing by Philippe Rousseau (1816–87).

Through Pliny the Aristotelian scheme held sway for another 1,500 years, supporting the Judae Christian division between humans and animals. Foxes received particular notice in the Christian e for residing in the earth, possessing an illegitimate intelligence for charm and concealment, and f being thieves; on these charges Christian doctrine identified them with the force of evil, as in th second-century text known as the *Physiologus*, or 'The Naturalist', where the fox is vigorous condemned as the Devil. Because of this religious bias, I shall treat the *Physiologus* more fully in th next chapter, but it is worth knowing in the context of natural history that this moral condemnatio dominated the Western view of foxes until the Enlightenment at least. The Christian aspersion did no arise from the fox's ability to elude knowledge as it did for Aristotle, but from its association with th seductive power of the Devil.

Freed from religious bias, Enlightenment philosophers again took up the part of Aristotle's proje that examined animals in themselves and through their interrelations. Further, with the age o exploration, Europeans began to encounter a broader range of animals, which revived questions o how habitat affects character. The Comte de Buffon, whose *Natural History, General and Particula* appeared in English translation in 1780, combines strategic elements from all three of his classic predecessors, describing animals in terms of their habitats, their relations with other animals and the possession of specific abilities. In this last regard particularly, Buffon aligns the animals in a cla hierarchy, revealing the aristocrat's assumption that higher classes inherently possess more refine faculties than the lower ones.[12]

American Cross Fox, 1845, hand-coloured lithograph by John James Audubon.

Buffon begins his account of the fox, therefore, as though he were differentiating human classes:

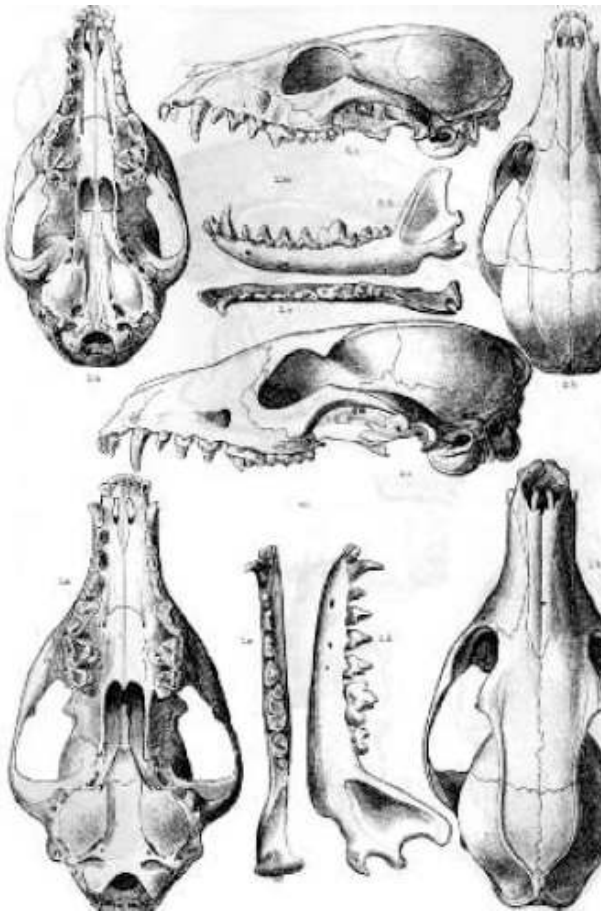
> The fox is famous for craftiness; and he merits, in some measure, the reputation he has acquired. What the wolf executes by force alone, the fox performs by address, and often with more success . . . He exerts more genius than motion, and all his resources are within himself. Acute as well as circumspect, ingenious, and patiently prudent, he diversifies his conduct, and always reserves some art for unforeseen accidents.[13]

For Buffon, the fox's 'craftiness' approaches the deliberation that Aristotle had allowed only fo humans. In fact, in Buffon's account, the fox becomes something of an intellectual – a thief to be sur but one to be admired for his genius. Indeed, in describing the fox as one whose 'resources are with himself ', Buffon promotes Aristotle's incomplete and earthbound beast into a 'circumspec intellectual.

Buffon also introduces the fox's habit of caching its uneaten prey, which not only supports th claim of vulpine intellect but also indicates that foxes do not hunt out of a hunger-driven necessity the wolf does, but that they enjoy a bit of gentlemanly sport. And here Buffon makes a delightful revealing comment: 'The wolf is not more noxious to the peasant, than the fox to the gentleman.' Th Buffon aligns the two canids in an analogy of human class hierarchy: predators like the 'clownish an dastardly' wolf, which kill only to eat, are peasants, while the aristocratic fox hunts from an aesthet appreciation for doing things well.[14]

Aesthetics also govern the decisions made by Buffon's fox about its abode: 'The choice of situatio the art of making and rendering a house commodious, and of concealing the avenues to it, imply superior degree of sentiment.'[15] Buffon explains elsewhere that 'sentiment' is the quality possessing sufficient cultivation to be capable of aesthetic judgement, a quality that makes the fo into the direct analogue of the human aristocrat.[16] And thus Buffon wholly subverts both th Aristotelian and the Christian condemnation of the fox as the wicked opposite of man.

Modern science has continued the Enlightenment attempt to establish universal standards classification, reinforcing a polished version of the three principle bases of categorization establishe by Aristotle – physical structure, habitat and disposition. Foxes are no longer derided for being mad of bone, but are classified according to skeletal measurements. They are no longer said to be made the earth that makes up their habitat, but are classified in terms of the kind of environment in whic they are found – plains, woodlands, desert and so on – and in terms of their distribution throughout th world. Most importantly, instead of being called wicked for eluding empirical study (or said possess an aesthetic sensibility), they are observed for family structure and for the schedules of the activity.



Grey fox skull from an 1850s *Mammals of North America*. Aristotle's belief that the bony appearance of foxes connects them with the earth is echoed in the way modern naturalists use fossilized bones to categorize species.

Contemporary science collects data from around the world on physical characteristics and c behavioural patterns, with the result that foxes are now said to be virtually ubiquitous, with the cave that numerous animals of no relation whatsoever to the red fox are now officially designated 'fox How the different species spread throughout diverse environments provides the focus for much modern scientific investigation, which is based to a large extent on fossils. Because the geologic story of the fox follows that of changing climates and environment, its constant emphasis is c vulpine adaptability and on how the different species developed through access to new regions. Th story thus provides a good introduction to the modern attempt to define the fox through a taxonom distribution.

The geological record suggests that the spread of red foxes coincided with that of ice during th Pleistocene Age, and that the appearance of other foxes began with the retreat of the ice and with th geological events that bridged some land masses and isolated others. According to curre palaeontological knowledge, the ancestors of the North American grey fox were probably the earlie foxes to appear, existing at least 3.5 million years ago; it was slightly larger than the modern grey fo with a narrower brain case. It probably lived in much the same habitat as the modern species brushland, woodland and forest.[17] The modern species of grey fox has left fossil remains throughо the southern portion of the United States, extending no further north than Pennsylvania, and datin back 1.5 million years.

The grey fox of North America, the only species o
fox that can climb trees.

The progenitor of modern red fox species also appears to be the ancestor of the Arctic fox and so
given a name to suggest its relation to both *Vulpes* and *Alopex*: *Vulpes alopecoides*. Fossils
European sites suggest that this species first appeared around 3 million years ago, and was about th
same size as the living Arctic fox, while its dental features resemble those of the living red fox.[18]

The oldest European fossils of living fox species belong to red foxes from about 230,000 years ag
during the period of glaciation from 230,000 to 100,000 years ago, when fossils show that red fox
became very abundant in Europe. Outside Europe fossils have been found from 230,000 to 400,00
years ago. The oldest American fossils of the red fox date from only slightly more than 100,000 yea
ago, indicating that it migrated to the New World sometime before that.

But while the red fox itself is a recent arrival in North America, its ancestors actually migrate
from that continent to the Old World, as indicated by fossils in America that date back beyond 1.
million years ago, exceeding the age of current European species by 1.25 million years. Aft
migrating to Europe, the ancestral *Vulpes* became extinct in North America, then reappeare
sometime between 300,000 and 230,000 years ago. In the far north of Alaska, *Vulpes* fossils have bee
found dating back to 230,000 years ago, but they have been found further south, from California
Colorado to Texas to Virginia, dating to 300,000 years ago. These vulpines are not the direct ancesto
of the red fox, however, but rather of the kit and swift foxes that in their current form live in dese
and plains of the western United States. Evidence suggests that the range of these foxes shran
towards the north as the weather grew warmer at the close of the period of glaciation. Only recent
have they expanded again in response to ecological conditions and through human influences.[19]

The kit fox inhabited North America long before the red fox immigrated to the continent.

In the South American continent canids in general appeared about four or five million years ag
when the Panamanian isthmus provided a land connection with North America. Fossils show th

during the Pleistocene era the *culpeo* – largest of the South American foxes – lived all over th pampas. These and other South American foxes – in both fossilized and living form – hold only a obscure relation to foxes elsewhere in the world.

Remains of the living Arctic fox have not been found dating earlier than 100,000 years ago. Thes foxes only became common from 10,000 to 70,000 years ago, and, according to J. David Henry, a probably the youngest fox species in existence.[20] What is notable, however, is that they seem at on time to have lived as far south as the French Riviera and even in Spain, indicating how far th glaciation spread.

Unlike other foxes, corsacs have round pupils and live in groups called corsac cities.

The *chilla*, like the *culpeo*, shows little fear of people. Charles Darwin famously walked up to one and killed it with his hammer – in the name of science.

The present-day corsac fox of Asia – one of the modern *Vulpes* species – may claim the oldest foss records of any currently existing fox, since it had ancestors that differed only slightly from the livi form dating back more than a million years ago. The exact relation of the fossil species *V. praecorsa* to the modern corsac, or to either the red or the Arctic fox, is not certain, however. Nonetheless, th prevailing view is that the living corsac resembles its fossilized ancestor sufficiently to claim a dire descent. Although there are older fossils than the *praecorsac*, none seems to hold such a clo connection to a living species.

Geological records can provide evidence of an individual species' duration on the planet, and the lend credence to the existing taxonomies charting the relations among species distributed across th

world. But these taxonomies depend entirely on anatomical details – which are all that fossils provi
– such as skull shape and the number and size of the teeth. Henry suggests an alternative evolutio
based on biochemical similarities and behavioural criteria, which not only maintains the relati
between foxes and other canids, but also explains the similarities between foxes and cats. Th
conventional view has canids as one of three branches stemming off from the miacids, the sma
weaselly creatures of the Eocene (see the Evolution Charts). The felids constitute a later sub-branc
from one of these three main branches, the viverrids, which includes hyenas as well as cats. Henr
basing his comments on the research of Alfredo Langguth, suggests that

> foxes of the genus *Vulpes* differentiated early from the rest of Canidae and retained certain of the miacidlike characteristics – for example, a long tail, small foot pads, semi-retractile claws, and long vibrissae. While the rest of the Canidae family evolved differently, the foxes went on to evolve catlike hunting equipment in their morphologies and feline hunting strategies in their behavioral repertoires. This convergent evolution is expressed to varying degrees among fox species and may be most strongly expressed in the red fox.[21]

Henry's speculation provides an alternate narrative to the geological account of fox distributio
making ambiguity itself the defining quality of the animal that is the convergence of two separa
evolutionary paths. From this perspective, recognizing the 'fox' in each of the 21 species requires th
identification not of a singular essence but of a diverse and elusively fluid quality; the red fox remai
the standard by which to measure other fox species only because it is the most ambiguous. Henry
account of fox ambiguity helps to make sense of how 21 widely different animals could come to b
identified as 'fox'. If modern taxonomy recognizes the fox as an animal that can take 21 diverge
forms, can exist in almost any habitat and manifests extremely different dispositions, then it h
entirely overturned the Aristotelian need for distinct, unchanging characteristics. But the fox als
causes problems for modern scientists who do not embrace its ambiguity as easily as Henry does, f
since the nineteenth century naturalists have classified, de-classified and re-classified numerous can
species as foxes, expanding the genera of 'fox' to accommodate the divergences found among all th
foxes of the world.

Starting in the late eighteenth century, as naturalists ventured outside Europe and met unfamili
animals that were canid but clearly neither dogs nor wolves, they tried to fit these animals into th
Linnaean taxonomy by referring to them as foxes. In using Latin and Greek names, Carolus Linnae
created the taxonomy still used as a universal nomenclature by which naturalists might trace anim
relations without being distracted by the plethora of regional names that usually involved some loc
legend. Consequently, the Linnaean system exchanged the folk and regional knowledge for a Europea
perspective that identified the red fox as the standard measure for other foxes that sometimes ho
almost no visible similarity to it. Thus the European red fox is given the Latin name *Vulpes vulpe*
which simply means 'Fox fox', with the redundancy signifying that it is the true fox, and all oth
'foxes' must approximate it in some way or another. The Arctic fox, locally known in Siberia as *isat*
and among the Eskimo as *Katúguliaguk*, was called by Linnaeas *Vulpus lagopus*, 'fox with a hare
foot', since it grows thick fur on the bottom of its feet to protect them from the Arctic ice. It has sinc
been given the Greek name *Alopex lagopus*, to indicate how different it is from the red fox, since th
two cannot breed. Although both *vulpes* and *alopex* literally mean 'fox', the use of names from tw
different classical languages reflects the modern effort to resolve foxy ambiguity by categorizing a
its different manifestations.

A swift fox. Lewis and Clark recount seeing one outrun a deer when they were on their famous expedition to Oregon.

The Latin *vulpes* was given to the red fox and the Greek *alopex* to the Arctic fox because these we the first species encountered by European naturalists, and so they got the names that simply mea 'fox'. But, when naturalists began trying to account for the animals encountered in other continent they had to expand the meaning of 'fox' across species that vary so widely that they had to fall bac eventually on the traditional recognition of the fox's character. No longer do modern naturalis overtly say that the fox is wicked or incomplete, but in their effort to arrange the nineteen speci apart from red and Arctic foxes into a meaningful taxonomy, they have relied on Greek words th were originally epithets expressing the very same moral judgements that science has tried to get awa from, for most of the terms do not literally mean 'fox' but serve as common descriptions of the fox character.

Arctic Fox, 1849–54, hand-coloured lithograph by John James Audubon.

A Darwin fox wearing a radio transmitter so that it movements can be tracked by zoologists.

A survey of fox genera (as they currently exist) on the one hand rehearses the geological narrativ of worldwide distribution, and on the other surreptitiously reinstates the Aristotelian opinion that th fox is incomplete and wicked. The Northern Hemisphere contains four genera: *Urocyon*, or the gre fox of North and Central America; *Fennecus*, or the fennec of North Africa; *Alopex*, or the Arctic fo and *Vulpes*, which contains ten (or possibly thirteen) species. The South American foxes consist three genera: the *Atelocynus microtis*, or small-eared fox; the *Cerdocyon thous*, or *carasissi* (cra eating fox); and the *Pseudalopex*, which includes the *culpeo* and the *chilla*. Southern Africa contains single genus, *Otocyon megalotis*, or bat-eared fox, consisting of a single species divided into tw groups.

A bat-eared fox.

The North American grey fox was identified as a fox by European colonists because it looked lik the animal they were accustomed to, except for its colour (although, in fact, the red fox often do appear in a grey pelage); but it actually does not hold any genetic resemblance to *V. vulpes*. The gre fox, which lives only in North and Central America, earns its own genus, *Urocyon*, a term coined fro the Greek by the nineteenth-century naturalist S. F. Baird to mean 'tailed dog', since the grey fox notable for the stiff bristly hairs along the top of its tail.[22] What Native Americans called the *colis* does not even behave like a red fox in many ways: it climbs trees, lacks the strong foxy smell and, the early twentieth-century naturalist Ernest Thompson Seton put it, 'is less swift, less strong and le cunning than his cousin the Red Fox. The one is a bandit, the other a burglar.'[23] In other words, th *colishé* is not a fox – a *true* fox – except in its character as an unrepentant thief and its ambiguous non-canine trait of vertically slit pupils. The Europeans colonizing America looked for animals the could recognize, and, since red foxes were at that time rare in North America south of New Englan

the colonists saw the *colishé* as the New World equivalent to the vulpine thief they knew.

This same practice of categorizing unfamiliar animals on the basis of some, usually nebulou quality of a familiar animal continued as Europeans encountered the species of South America. But the same time, the names given to South American foxes reflect a real uncertainty as to how thes animals resemble European foxes and even as to what they are as canids. Indeed, studies of Sou American foxes repeatedly stress that little or nothing is known of particular species, apart from t diminution of their numbers by fur traders or sheep ranchers. Three genera populate the southe continent – which has so far remained free of the red fox. The *Atelocynus microtis* is the single speci of its genus, and in both its scientific and common names suggests no relation to European or Arct foxes. Commonly known as the small-eared fox (*microtis* literally means 'small ear'), the scientif name of the genus, *Atelocynus*, translates from the Greek as incomplete or indeterminate dog. So th label tells us that the small-eared fox is not really a dog and its ears are uncharacteristic of a fox. C course, the small-eared fox is 'incomplete' only because naturalists reject the terms of loc descriptions, and measure it against what amounts to an Aristotelian standard of completeness.

Similarly, the genus of *Pseudalopex* is classified by the Greek word meaning 'false fox'. This genu contains four species, including the *culpeo* and *chilla*, that are notoriously unwary of humans: t common name of the *culpeo* refers to its folly in not knowing how to hide sufficiently to prevent from being an easy target for hunters.[24] The *chilla* (*P. griseus*) is the fox that Charles Darwin killed b walking up and hitting it on the head when it was 'intently absorbed in watching' the activity of th *Beagle*'s crew.[25] Such un-vulpine foolishness convinced the Europeans that these foxes must b culpable and false – or, in a more Aristotelian sense, they, along with the *Atelocynus*, are incomple and need further concoction.

The third and last South American genus represents the most extreme ambiguity in fox classification – and perhaps even downright confusion. *Cerdocyon thous* possesses a single specie the crab-eating fox, known locally as *carasissi*. Its scientific name means 'fox-dog jackal', for, a Sheldon explains, the *carasissi* combines the 'characteristics of jackals, dogs and foxes in its soci structure, life history and physical characteristics'.[26] The Greek word *kerdo* is one of the epithets th ancient authors used to describe the fox, but it primarily means 'thief '; so the 'fox-dog jackal' cou also be understood as the 'thieving-dog jackal', and thus is a fox only because of its immorality an its ambiguous blurring of generic boundaries.

The effect of the effort at a universal taxonomy becomes most apparent with these South America 'foxes': among local people the *culpeo*, *chilla* and *carasissi* possess distinctive characte unassociated with the red fox: they are neither culpable nor false, nor are they failed members of oth genera, but rather have developed relations with other animals and with people that rema unrecognized by modern science.

In contrast to the New World foxes, the best-known fox of Africa has retained its local nam fennec, as *Fennecus zerda*, a Latinized version of the Arabic word for 'fox' and the North Africa variant on the Greek epithet *kerdo*. Possibly the reason is that Europeans long admired fennecs exotic pets, because their small size (they are the smallest members of the family Canidae) and larg ears make them decidedly cute. They have often caused a degree of doting silliness in otherwi serious naturalists, such as this from D. R. Rosevear: 'In many ways the little "desert foxes" refle the manners of domestic dogs, as for example in their . . . turning around three or four times befo settling down. They particularly resemble poodles in their ability to stand and walk upright on the hindlegs.'[27] Although they seldom weigh more than 2 kilograms, fennecs have been known to ki rabbits much larger than themselves, which is a point worth noting, since in the last two or thr decades scientists have argued over whether they should be reclassified to reflect the fact th

genetically they resemble wolves more than foxes. But here the reliance on ultra-empirical genotypi
breaks down through the influence of the same Western bias that classified the South American gene
as 'false' and 'incomplete'. The beguiling fennec remains a fox because of its charm and i
ambiguous combination of qualities from both the canids and the felines: although genetically the
may be wolves, and although they dance like poodles, fennecs have the most un-canine habit
purring.

A fennec fox in sand dunes.

Of all creatures, the fox seems to be the one whose most defining feature is its ambiguity. Even th
standard species by which other foxes are measured, the common red fox, *Vulpes vulpes*, elud
definition through its variability. Modern natural histories emphasize that the red fox varies its di
widely and can adapt to almost any environment, precluding its identification with a single habitat. A
we read about other species of fox, we often find that their ranges are limited by contact with
vulpes, which adapts faster and to a wider variety of habitats than its cousins. Unlike many other fo
species, the red fox is not listed as endangered anywhere – in fact, its spread has been a significa
cause in the decline of other animals, both fox and non-fox species. 'The red fox's natural habitat
writes Erik Zimen, 'is the largest of all mammals, with the exception of the wolf. But the fox, not th
wolf, has managed to survive over all his former range, in spite of extermination efforts and habit
destruction.'[28]

A red fox in beach brush.

Scientists, such as Huw Glen Lloyd and E. D. Ables, point out that focused efforts in huma
communities to exterminate the red fox have had little success, and may even have somehow aided th
increase of the fox population. Red foxes are the only mammalian species in Great Britain subjecte
to a 'Government approved and aided bounty'; and in North America several Midwestern and Ne

England states ‘have paid out millions of dollars in fox bounties’ since the Second World War. Zimen reports that of seven countries in central Europe, only two have closed hunting seasons f foxes.[30] But despite the bounties and unchecked hunting, the red foxes have spread throughout th entire northern hemisphere. They were introduced into Australia in 1845 for the sport of thos colonists seeking to emulate English fox-hunters, and by 1893 had assumed such a strong hold on th continent that a bounty was established (further emulating the British). These invaders hav contributed to the extinction of at least 20 native Australian species.[31]

Maintaining its ambiguous character, the red fox has adapted itself to the margins between huma cities and the countryside; in fact, red foxes have become common within cities and suburbs. A human cultivation increasingly intrudes into wildernesses, the shyer species – such as the *colishé*, the Arctic fox – disappear, and the red fox takes over. In our time, the red fox has come to symboliz the destruction of indigenous diversity and the colonial spread of European and America monoculture (and nomenclature). Consequently, even as a wild animal the red fox reminds us of wh we would like to forget – that humans entering nature tend to change it irrevocably – and so the re fox’s status as a member of nature remains among the most ambivalent.

One of the largest canids in South America, the *culpeo* is the fox that was known to the Inca.

Red foxes have proven so adaptable as to be common inhabitants of modern cities.

Although red foxes do not prey on humans, they do steal domestic animals, such as chickens ar

geese, and so natural historians continue to describe them in aspersive terms, as burglars and vermi filthy intruders into a pristine ecology, representing an insidious threat waiting to exploit a defensive weakness. Indeed, much of the interest focusing on red foxes in the past few decades h arisen from the fear that they are contributing to the spread of rabies. This fear was the primary foc of a symposium in 1979 devoted entirely to the red fox, as noted by Zimen, who says that t heightened attention was not to 'the species itself, but its danger to human health through the spre of vulpine rabies over central Europe and North America'.[32] As a carrier of rabies, the red f maintains its low status as an unclean animal, a pathological as well as a moral threat to huma society and nature.

Zimen's comment lays bare another truth about the human attitude towards foxes of all the differe species: even though they exist closely with humans, we still know very little about them. Aristot complains that foxes elude deliberative study, and indeed they remain elusive, but the pathologic aspersion has come to conceal that quality, enabling us to say that we do not care to know about the because they are thieves (*kerdo*) and unclean – in short, because they are vermin. And so the pletho of names – scientific and common – given to foxes around the world still reflects the ambivalence th humans feel towards an animal that is at once beguiling and offensive, charming and dirty.

Recently, two naturalists have worked to dispel the aspersions cast on red foxes. David Macdona in England and J. D. Henry in Canada have each presented long-term field studies that emphasize t vulpine character more than measurements and distribution. Macdonald's work is among the mo fascinating studies of any animal, consisting of a first-person narrative of living with foxes a allowing them to be themselves. Macdonald adopted a young red fox, Niff, which he made no serio effort to tame, letting her destroy his furniture. When Niff matured, he followed her to record h nocturnal jaunts in an up-close account free of moral bias that renews Lucretius' delight in t justness of the fox's existence.[33] Macdonald disarmingly observes that he finds the fox's sce pleasant, and then asserts that, contrary to common belief, the red fox 'is the least typical f species'.[34] In stark contrast to the anthropocentrism dominating natural histories since Aristotl Macdonald puts himself under Niff 's tutelage: he describes how the fox taught him vulpine trackin skills, 'to pause as we rounded a bend or topped a rise, to see before being seen . . . My expertise as tracker blossomed as Niff showed me each trick of her trade. And my trip through the looking gla was all the more exciting as her wonderland was so secret.'[35]

Similarly, even Henry's title – *Red Fox: The Catlike Canine* – embraces the ambiguity that mo naturalists have tried to eliminate. Henry points out that although the red fox displays both t morphology and behaviour of Canidae, it also shares several features with cats, such as the lo whiskers on both the muzzle and the wrist that serve as tactile receptors, the long thin canine teeth, t small toes and the foot pads covered in hair with semi-retractile claws. Like virtually all fox specie with the notable exception of the Asian corsac, red foxes have vertically slit pupils and along with ca they possess the *tapetum lucidem*, which 'causes the eyes of foxes and cats to occasionally glow a du luminous green even though no strong light is shining into them . . . [and] acts like a mirror behind t retina so that light passes over the retina twice instead of once'.[36] In addition, all but a few species foxes possess much smaller stomachs than other canids, leading them to hide whatever prey they not immediately eat among several caches; and foxes have demonstrated a strong memory of the hiding places.

Red foxes display many of the same characteristics as felines, such as pouncing on their prey.

Naturalists' descriptions of the fox uphold a consistency even through the expected differences time and culture. From the beginning, the fox is said to be wicked, to possess an intelligence that socially unacceptable no matter how charming it may appear.[37] Even with the rise of modern scienc the accounts of the fox remain constant, which explains why the definition of 'fox' suddenly explode into so many different species and genera in the nineteenth and twentieth centuries. Foxes possess beguiling charm, but they also stink and steal; they remind us of our loyal dogs, but with the vertically slit eyes and their movements they are also like cats. They are mere animals, yet sho disturbing signs of possessing an intelligence of forethought and aesthetic judgement that shou belong only to humans. Definitions of 'fox' have tried to resolve the ambiguity surrounding th animal and the ambivalence people feel towards it, although the modern expansion of the fox into 2 widely diverse species reflects the fact that scientists still experience an unease towards the fox, sinc it precludes any singular definition that would identify it as a member of the ecosystem that perform a clear function that cannot be fulfilled by any other animal. Foxes have proved to be too adaptabl too variable, too elusive to be understood in the terms in which science wants to know animals. A Macdonald and Henry have proved, to enjoy the fox requires that a person delight in its ambiguity an elusiveness. The chapters that follow will attempt to do just that, and at the same time to show th different ways in which societies have tried to come to grips with an animal that disguises itself, keep its identity hidden, has no sense of integrity and seems to have become almost ubiquitous.

A silver fox.

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