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## Thinking like a dog

- 1 I never cease to be intrigued by the way in which certain animals respond to humans using tools. Let me give an example. When I am brushing away ashes in the fire hearth our border collie will snap at the brush, but only when I am moving it. As soon as the brush is put down, and my hand withdrawn and the brush is completely inert, the snapping and barking ceases. What is interesting about this observation is not simply the phenomenon itself, but a paradox that lies at the heart of our wonderment at the dog's perception and comprehension. It is a relatively uninteresting inference to say that when the tool is moving the dog responds to it as if the tool were animate. What is more interesting is to note that the tool becomes animate because it is attached to me. The dog knows me well enough and does not bark and snap when I am not brushing – only when the activity involves certain kinds of tool that interact with the ground. Thus, it does not happen when I am, say, using a hammer, or working at a bench. So, why does it do so when I am using certain kinds of tool in a particular way?
- 2 One possible explanation is that the dog responds to the brush because it thinks it is an independent organism, and is assisting me with some herding process, or because its close proximity must be threatening me. It responds to the brush as if a recalcitrant sheep. So although it can see that I am the agent moving the brush it responds as though the brush was independent and itself had agency. Both humans and other animals attribute the qualities of living matter and agency to what we call tools and other cultural objects, though a paradox may arise when autonomy is attributed to the object at the same time that it is recognized that its life-like characteristics are motivated by human actions.
- 3 In this paper I show how such an account of the interaction between dogs and tools might be relevant to anthropological debates about the differences between the

cognition of living and non-living things. I elaborate on how movement in its widest sense is critical to the way humans recognize what is alive. I do this by examining certain kinds of tool and artefact that display movement and therefore are 'life-like', and various liminal forms of life that folk classifications find difficult to handle. Nuauulu in eastern Indonesia describe many kinds of object as having the qualities we might otherwise reserve for biological organisms. They also distinguish entities (spirits) that have many of the qualities of life but which ordinarily have no corporeal existence. While all cultural objects are potentially regarded in this way, in practice some objects are more alive and have more agency than others.

- 4 Part of the problem with existing anthropological treatments of the category 'living things' is that they are either logical extrapolations through polythetic extension, or based on formal taxonomic deduction/induction (ethnoscience). Using examples of meat-skewers, outboard motors, sago-processing devices and mechanical graters, together with certain forms of 'peripheral' biological life such as fungi and algae, I demonstrate how Nuauulu ideas of what is animate and agentive are always fuzzy and contingent, and that by combining data from different kinds of context, using different elicitation procedures, a more complex picture emerges. Such an approach challenges certain claims regarding the fundamental differences between the way humans cognize biological and non-biological entities in practice, for example those of Scott Atran.

## Tools, machines, and engines

- 5 Tools have been classified in many ways, but here it helps to distinguish between: (A) tools that once made do not move (e.g. a stake), and (B) tools that move when activated by the human body and are often characterised as an extension of the body. In a Nuauulu context, these include a hammer, sago pounder, or the fire hearth brush. Type (C) tools are those having simple moving parts that relay energy released by initial human motion, such as the Nuauulu sago flour extraction device or treadle-operated coconut grater. These are effectively 'machines', using mechanical power, having several moving parts for performing a particular task. Finally, there are (D) tools that are also machines in the sense outlined but that run on stored energy, and do not require continuous human inputs. In the Nuauulu material universe these might include trucks, chainsaws, or outboard motors.

Figure 1. Series of *Nuaulu asunaete: cuscus (Phalanger)* skewers planted as an offering to ancestral spirits.



Photo: Roy Ellen

- 6 A common type (A) tool would be a pit trap stake. Although Nuaulu might attribute independent agency to a stake, I have no examples of this ever being the case. A more interesting example would be a meat-skewer or *asunaete* (Figure 1). These are used in the preparation and transport of meat, but they are also an instrument facilitating communication between the living and ancestral spirits. Thus, after a wild pig has been killed it will be singed to remove most body hair near to the place where it was caught and before returning to the village. A fire is lit and a wooden stake cut to serve as a skewer to manipulate the carcass. A chip from the skewer—representing its spirit—is placed inside the belly of the pig, removed after singeing and re-united with the *asunaete*. After the pig has been butchered, the skewer will be stuck in the ground and the throat and lungs attached to the top as an offering to ancestral spirits, before being taken back to the village. A similar skewer is used for marsupial cuscus, the most frequent animal hunted by Nuaulu. In this case, however, the skewers do not have the organs of breathing tied to them. Having served their purpose in cooking and for transport they are stuck in the ground and the chip initially removed to make the spike is re-united with the skewer. In this way the *asunaete* has a simultaneous purpose of skewering the meat, roasting it, carrying it, and ensuring that the spirit of the cuscus returns to the cosmos and so sustain the population.

Figure 2. Using a Nuaulu sago pounder.



Photo: Roy Ellen

- 7 Type (B) tools conform to our usual prototype of what a tool should be, and fit the idea of prosthesis: for example, a sago pounder (Figure 2). But while tools become animated by being body extensions, this is insufficient—unlike in dog-brush interaction—to make them ‘animate’ in the sense understood by animism. Most Nuaulu tools, most of the time, are not attributed with animacy. However, some are more likely to be, and we need to identify what the conditions might be to satisfy this. In the first place, these conditions relate to the kind of subsistence activity with which they are connected. Thus, hunting and warfare are high-risk activities in which supernatural support can make a difference.
- 8 Secondly, some technologies are less under the continuous control of an operator. A bamboo pounder never leaves the hand that holds it during the actions entailed in pounding sago pith. However, arrows once they leave the bow are subject to a variety of hazards over which the archer has no direct control: wind, movement of the prey or of objects intervening between the hunter and his prey. In this situation, to attribute an arrow with agency and to make a preliminary offering to its embodied spirit to ensure its effectiveness makes sense.

Figure 3. A Nuaulu sacred shield.

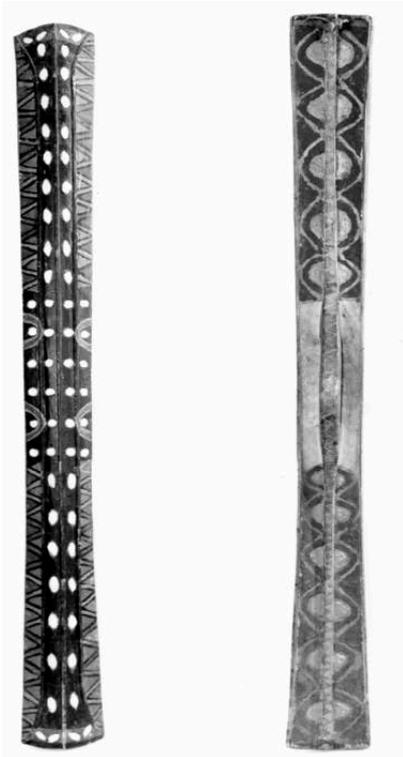


Photo: Roy Ellen

- 9 But there is an additional category where tools are always animate because of their simultaneous status as ritual objects, and regardless of the extent to which they move. In the first place, any tool that has been used in ritual becomes sacred and cannot be disposed of, being stored until it disintegrates in the smoky lofts of clan houses. But there are other ritual objects, such as shields nowadays used only in ceremonial contexts (Figure 3). Most of these are not subject to special ritual attention, but a few are produced and stored with anthropomorphic regard under controlled ritual circumstances. To have all shields, or whatever, accorded special respect would be inconvenient, but to have just some objects in a given category with sacred agency is sufficient (Ellen 1990).

Figure 4. Nuaulu sago-processing apparatus.

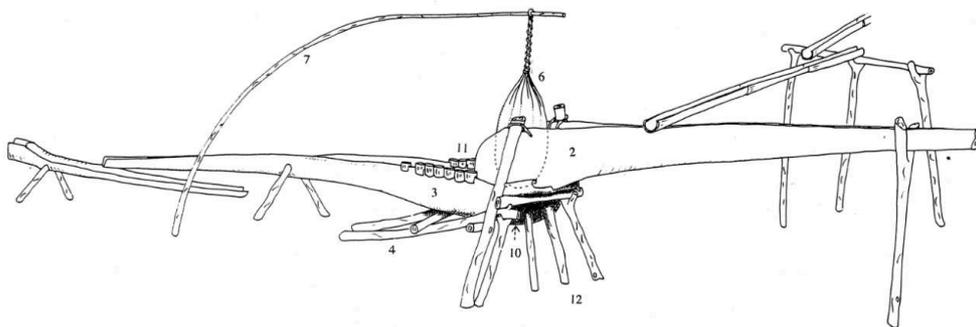


Diagram: Roy Ellen

- 10 The third tool type (C) are those with moving parts. Those that I discuss here are the sago flour extraction apparatus and the treadle-operated coconut grater. Like type B tools they are an extension of the body, but are so in a more complex way. This is the case for many tools that we describe as machines, and we need to examine whether it makes a difference when attributing agency or animacy. The first of these cases, what Nuauulu call the *aha*, is a device of wide distribution in the Moluccas and New Guinea, used for separating starch granules from pith residue (Figure 4). The apparatus comprises two troughs made from sago leafstalk resting on a frame, in which one—the input trough—overlaps with and is slightly higher than the lower output trough. Attached to the overlapping end of the upper trough is a filter, usually of stitched coconut fibre. The upper part of the membrane is attached by string to a flexible sapling that acts as a spring-loaded assembly. As water flows into the upper trough, the resulting mulch is pressed against the filter with one hand and the string pulled down with the other. Because of the flexibility of the sapling the membrane automatically retracts, enabling further compression of the mulch, and is ready for the operator to press once more. Thus, the latent energy produced by the bent sapling assists the process of efficient filtering. There is a process of complex bodily engagement between individual person and apparatus. The *aha* is never described in terms that would lead us to understand that it is anthropomorphised, though the success of the processing activity is routinely ensured by making a small offering to the ancestral spirits who own the sago, tucked into a convenient joint in the apparatus.

Figure 5. Treadle-operated coconut grater used in the Nuauulu village of Rouhua.



Photo: Roy Ellen

- 11 By contrast, the rotary action treadle-operated coconut grater (Figure 5) is of relatively recent introduction, and is perhaps no older than the late nineteenth century. The

operator presses the treadle with one foot, which pulls a string that rotates a cutting head, first in one direction and then in the other, using successive actions on the treadle. The head is made of wood in which metal cutting blades are embedded, and this assembly is attached to a spindle at waist height. As can be seen, the action—like the sago flour processing apparatus—requires engagement with the whole body. There are no associated ritual practices, though in several technical respects the treadle-operated coconut grater is comparable to the much older sago-washing device.

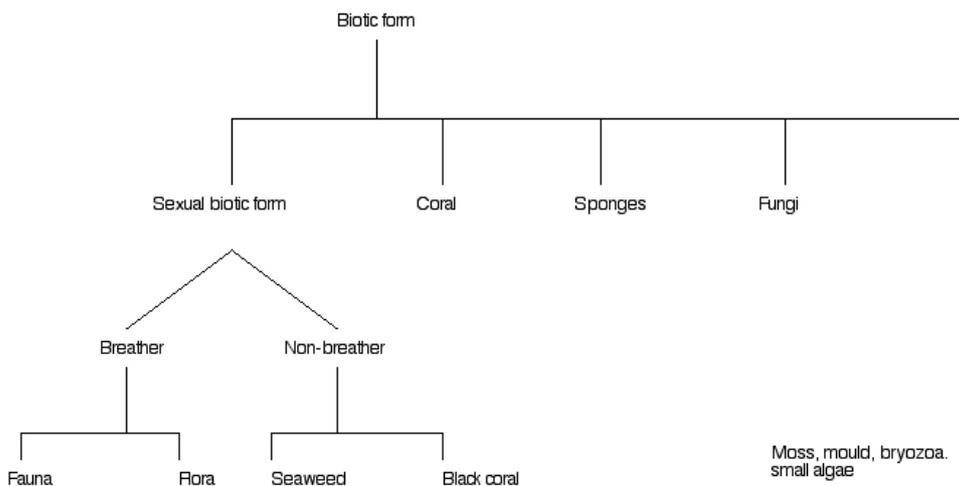
- 12 Finally, there are type (D) tools, engines driven by a non-human source of power, which in the historical experience of the Nuaulu consist of devices reliant on steam power, diesel, or petrol. These have been familiar parts of the Nuaulu world for over a century, with steam and diesel driven boats, and power-driven ban saws used in timber yards. The internal combustion engine found in trucks and generators mainly became familiar along with aircraft during the second world war, and through increased travel. With Indonesian independence the road system deteriorated and most devices with engines were out of reach of most people in rural areas of Seram. As the economy grew under the New Order, so Nuaulu became more familiar with road vehicles, tools such as chainsaws and especially the outboard motor.
- 13 What is relevant here is that Nuaulu treat outboard motors as essentially animate and motivated by a spirit even though some have a good knowledge of the practicalities of how they work. Nevertheless, when they go wrong Nuaulu will make offerings and invocations to get them moving. These offerings are basically no different from those that they might offer before hunting, or tuck into the joints of a sago processing apparatus. I was first introduced to this practice by a chance observation of Nuaulu 'feeding an outboard motor' in 1996. Up until that time no Nuaulu of my acquaintance had owned an outboard motor and I was determined to follow through on the observation. To some extent this fits in with existing ritual practices relating to outrigger canoes and other sailing craft found in central Moluccan waters, which are anthropomorphized and subjected to life-cycle rituals. However, the outboard motor confers a new property on the vessel, namely a source of propulsion independent of human bodily action.
- 14 While this has obvious technical advantages, it has the disadvantage that the operation of the vessel is less under the control of the crew. In a sailing boat, the crew can appeal to the spirits of the wind and may encourage them to blow by supplication in the form of banging gongs or similar metal objects. This is not possible with a *jonson* (an outboard motor) and it is hardly surprising that the crew seek to maximize the forces working in their favour when the risk is increased.
- 15 In making sense of these machines and the practices that accompany them it is also relevant that outboard motors and sago-grating machines, move, whirr, hum and get hot when they are used. Moreover, tools that have a quasi-independent existence in not needing to rely on continuous human power also resemble biological life in their capacity to 'die'. Nuaulu speaking of an outboard motor that has just spluttered to a standstill will say *mataenya* – 'it is dead', just as we might use the same word to describe a malfunctioning vehicle or power tool.
- 16 Maurice Bloch (1998) notes that Zafimaniry use *maty* (an Austronesian cognate of Nuaulu *matae*) for anything that breaks down. So, the attribution of the qualities of life to engines is hardly unique to the Nuaulu, and in Western societies too these same

properties encourage modes of behaviour, emotion and linguistic expression that are wholly compatible.

## Life as a taxonomic category

- 17 Nuauulu ideas about animacy, are—like our own—generally fuzzy and contingent. Nevertheless, there have been repeated attempts to define the boundaries of living matter and what this might imply. These approaches come from philosophy, developmental/cognitive psychology, twentieth century anthropology and particularly ethnobiology or ethnoscience.
- 18 Let us start with the ethnoscience model. Paul Taylor (1990) in his work on Tobelo (Halmahera) ethnobiological classification uses a strict componential form of semantic analysis (Figure 6). Quite reasonably, he begins by indicating that Tobelo distinguish living from non-living, defining the former as entities able to die. But rather than talk of living things he uses the term 'biotic forms', which he then says are divided into 'sexual biotic forms' that contrast with four other groups at the same taxonomic level: coral, sponges, fungi, and 'moss, mould, bryozoans, small algae'. 'Sexual biotic forms' are in turn divided into 'breathers' and 'non-breathers', the latter exemplified by seaweed and black coral, and the former by fauna and flora.

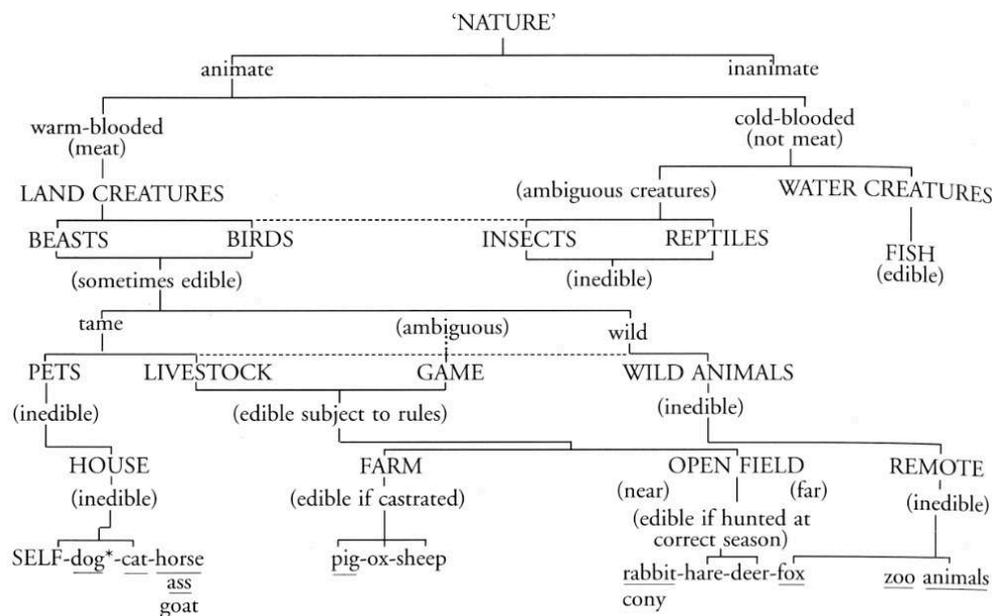
Figure 6. Tobelo taxonomy of 'biotic forms' based on semantic componential analysis (Taylor 1990: 48)



- 19 Edmund Leach (1964) approached the problem in a different way, but with much the same results (Figure 7). He adopts a kind of logical formalism derived from Lévi-Strauss and Mary Douglas. The main problem with Leach, however, is not his underpinning theory, but his methods, particularly as these are reflected in the diagrams he produced. These diagrams are drawn from Leach's imagination, augmented by his knowledge of the role of certain oppositions and notions from English popular culture and sacred texts. Here, nature is not the same as 'life' or 'living organisms', or even less Taylor's 'biotic forms'. Leach divides 'nature' into animate and inanimate, though we are left to speculate whether this means that the category 'inanimate' includes some living organisms, most obviously plants. His category 'animate' applies only to animals, and is sub-divided into warm-blooded and cold-blooded.

- 20 Although Leach's folk-English scheme is a useful teaching example, it has always struck me as problematic. Not only does it provide a suspiciously convenient taxonomy of all living things that fits the logical conventions of a taxonomic approach, but it conflates discourses that we know to be separate, and flies in the face of ethnographic evidence. Unfortunately, 'living things' is a category that is easily yielded using formal elicitation techniques, but it is less obvious once you aggregate data from different ethnographic contexts.

Figure 7. Edmund Leach's (1964) version of the English classification of nature



- 21 Possibly because of the pitfalls of definition, or in order to avoid the problems of using it as a unique beginner in a taxonomic description, many accounts of ethnobiological classification do not consider what is meant by a 'living thing' and get on with the business of describing categories within the separate plant and animal domains. While adopting the over-riding rubric of 'ethnobiological classification' and dwelling on the formal criteria for establishing 'folk-kingdoms' of plant and animal, such an approach is not interested in considering the unique beginner that might define the domain of 'living things'.
- 22 Such approaches, however, logically assume that 'living things' must exist as a phenomenon. Thus, if plants are living things and animals are living things, then there must be a superordinate or more encompassing category that both belong to. But this definition assumes that we are only dealing with what might be conventionally understood as 'biological taxa'.
- 23 For another example of an early ethnosciences analysis of the category 'living thing', we can do no better than look at a paper published by Mary Black in 1969 on the Ojibwa category /*bema.diziwa.d*/. In her analysis Black shows, using a distinctive feature approach, how the semantic content of the category varies depending on context of elicitation, sometimes divided into 'indians', 'white people', 'negroes' and 'asiatics'; in others into 'large animals', 'insects' and 'other'; in still others into 'human', 'large animals', 'small animals', 'birds', 'fish', and 'spirits'. Depending on informants, the category also sometimes includes 'trees', 'stones', 'leaves', 'berries', 'shells', 'sun' and

the 'moon'. So, in Black's understanding of Ojibwa ontology, 'living things' may be biological taxa, human 'racial' groups, spirits or astronomical entities, or almost any combination.

## Comparing biological and non-biological classifications

- 24 Although we might dismiss some of these formal approaches as naïve, they do point at some interesting similarities in the way in which the cultured mind makes sense of domains as diverse as biodiversity, human groups, the spirit realm, and other 'natural kinds', such as minerals.
- 25 Seventeenth century European natural history routinely incorporated minerals as 'natural kinds'. Early attempts to systematically describe the 'mineral kingdom' and related entities 'dug out of the earth' often followed the organization of local floras. This approach was hardly novel even then. Rumphius (1999) in his *Ambonese curiosity cabinet* of 1705 follows Pliny, juxtaposing descriptions of species of crustacea, echinoderms, molluscs, cephalopods, minerals, concretions, etc. Many are described using a version of the Latin binomial system. Thus, a kind of crystal found in Ambon is named *Crystallus ambonica*, while *Amianthus ambonicus* is a variety of asbestos. Also included are curiosities such as cuttlefish stones, and *Dendrites metallica* (pieces of iron found in trees). Then there are fossils said to live under water but to petrify when removed. In such schemes fossils provide both a link with living biota and a problem. The idea that stones might reproduce, as Theophrastus suggested, had still not been entirely repudiated.
- 26 Following Rumphius, Linnaeus too (1758-9), in his *Systema naturae*, attempted a taxonomy of mineral 'species'. Such classifications and attempts to integrate minerals in a more general taxonomic approach to natural history were eventually abandoned, superseded in global science by different arrangements based on chemical composition. However, the same thinking has been extended more recently to the humanly-made world of artefacts. Drawing his inspiration from Berlin's work on the universal features of ethnobiological classifications, Cecil Brown *et al.* (1976) claimed to find the same formal features of taxonomy in the organisation of other domains, including both human artefacts and spirits. See, for example, his rendering of the American English tool taxonomy (Figure 8).

Figure 8. American English 'tool' taxonomy (after Brown *et al.* 1976: 78)

Hierarchic level	Taxonomic category	Term	Nomenclatural status
L0	UB	tool	PL
L1	lf	hammer	PL
L2	gn	hammer	PL
L2	gn	ballpeen hammer	PPL
L2	gn	sledge hammer	PPL
L2	gn	mallet	PL
L1	lf	vise	PL
L2	gn	clamp	PL
...			
L1	gn	saw	PL
L2	sp	sabre saw	SL
L3		crosscut saw	
L2	sp	regular screwdriver	
And so on ...			

Key: UB = unique beginner, lf = life-form, gn = generic, sp = specific;  
 PL = unanalyzable productive lexeme, PP = productive primary  
 lexeme, SL = secondary lexeme, UPL = unproductive primary lexeme.

- 27 In addition to treating certain tools in a 'life-like' way, Nuauulu distinguish entities that have many of the qualities of life, but which in the ordinary way have no corporeal existence. Like many peoples, they think of spirits as a kind of pseudo-organism and represent them as species-like entities that can be ordered in terms of family resemblances, even if, as Pascal Boyer (1994) argues, their conception as such violates the intuitive principles that some psychologists have demonstrated for the domain specificity of living kinds. Because spirits have these qualities for Nuauulu they are sometimes also attributed with corporeal manifestations: they become birds, or lizards, or indeed certain animals may always be regarded as the physical manifestations of spirits, such as certain scarab and long-horned beetles, or the death adder. This is not surprising, since we can only imagine the spirit world through experience of our bodily and social worlds.
- 28 It was difficulties of this kind that pre-occupied Scott Atran in much of his *Cognitive foundations of natural history*. For Atran (1990: 47), there is only a superficial similarity between biological and non-biological domains '... with no other natural-object domain so structured'. In concluding thus he draws on the support of field experiments in child psychology and the work of Frank Keil. Keil (1979) has argued that children possess an ontological category of living things that includes animals and plants, allowing Atran (1990: 73-4) to claim that young children 'categorically distinguish artefacts from living things' and come to presume that only the latter constitute 'natural kinds' with underlying essences, while limiting certain concepts (such as growth) to living things.
- 29 As well as using experimental data, Atran argues his case on logical grounds assuming this to be a universal grammar. Transitive hierarchy, he reasons, works for living kinds but not for artefacts, because the domain of artefacts fails to meet the inductive and deductive requirements of ranked taxonomies. Biota, like artefacts are often placed in

different categories (whether we call these taxa or not), and although he recognizes that people often 'confound' artefacts with living kinds and 'confuse' plants with things made from plants, the underlying field structures are quite different. If we are to argue on the basis of logical formalism, then we might forgive ordinary people from deviating from it in the practices of their ordinary lives. No wonder Atran dismisses that work in developmental psychology (e.g. Susan Carey 1985) that shows that children will spontaneously attribute a common invented property, a kind of underlying nature, to dogs, flowers and inanimate objects. Carey's theories and data tend to support the idea of the integration of domains of knowledge, and of fundamental ambiguity in the concept of 'natural kind'.

## The body, social cognition and the limits of modularity

- 30 While we may still wish to argue that there are special features in ethnobiological classifications that distinguish them from the organisation of other domains, this has less to do with the cognitive apparatus brought to bear on them than the pattern of empirical discontinuities found in a particular ecological context. Similarly, the mind cognizes tools in the same way as living organisms partly because of a shared architecture but also because our models of apprehending and thinking about the world derive from our own bodily experience, and from the social worlds of which we are part.
- 31 It has long been recognized that at the core of human cognition is a necessary duality and tension whereby humans understand the natural world through their experience of society, and the social world through their experience of nature. This is why despite attempts to challenge the culture-nature divide, the divide keeps on re-emerging. It happens because we are bound to model our world on experiences of our own body and we employ representations and evocations of this experience as a source of labels and concepts to interpret the world outside the body. More than this, if we 'thingify' or 'entify' parts of a living system, and then observe that the things move, so to speak, it logically follows that the things may well be spoken of as if they were sentient beings; they will appear as though they were indeed animated.
- 32 The organic models we use vary along a continuum from general organic analogies, plant analogies, animal analogies, general human analogies, and the attribution of particular personalities. It is as if the mind progressively 'enlivens' non-living entities, and humanizes other entities in which it recognizes life. Thus, Nuaulu personify sacred shields that they attribute with soul. The shields are treated with reverence, anthropomorphically, and granted personhood.

## Organomorphism, motion, agency, intention

- 33 Through the working out of the recent evolutionary history of the embodied brain, and through polythetic linkage between different cognitive and semantic domains in any particular cultural population, we will always find a group of things that are regarded as life-like. But in attributing the notion of 'life' and more narrowly 'animacy', what features does the mind latch on to? The evidence so far would suggest that we start

with physical resemblance, since it is visually salient attributes that in most cases are cognitively dominant.

- 34 Some of the boundary problems of the category 'living matter' are raised through engagement with forms of life that do not fit easily into the cognitively—but not lexically—universal prototypical categories of 'plant' or 'animal', that are peripheral to biological life as most ordinary people experience it.
- 35 In Nuauulu ethnobiological classification fungi, algae and sponges are classic liminal forms (Ellen 2008). In their classifying and naming strategies there is a tension for Nuauulu between placing fungi with plants and according them their own separate 'kingdom', while seaweed is aligned with fungi through its nomenclature. The term *unate* refers to all visible fungi, but not lichens; and is also applied to sponges and to all algal seaweed. The broadly inclusive character of *unate* is in itself interesting, given that mushrooms are extremely varied in their characteristics. Since there can be considerable morphological differences, say between bracket fungi and the highly salient coral mushrooms, we must assume that placing them together must reflect some combination of cognitive prototype and common distinctive features. Not subsumed under *unate* are forms such as fruticose lichens, moulds and mildew, and slime moulds, freshwater and terrestrial algae.
- 36 By deliberately selecting liminal forms we can test the extent to which the notion of 'life' applies, and if that test is passed whether such entities conform best to animal or to plant prototypes. But we also need to recognize that both these prototypes are in semantic tension, simultaneously sharing features and contrasting them. All living matter could be said to have both a vegetal and animalistic aspect, a 'vegetal quality' especially found in plants, and an 'animal quality' especially found in animals. This is why where certain peripheral organisms are placed in classificatory space varies between cultures, compared with the greater regularities reported for core vascular plants and chordate animals. But in addition, we are also primed to look out for what is potentially human in other parts of the living world.
- 37 In the attribution of life, and even more so of animacy in the sense of 'animality', morphological resemblance is not enough. As indispensable is motion, in all or any of its manifestations. Everywhere liminal biological forms are attributed with animacy it is because of a characteristic that is semantically rooted in movement or its metaphorical extension, such as 'locomotion', 'growth', 'reproduction', 'fragmentation'.
- 38 Even 'eruption' and 'erosion' are recognizably 'kinds of motion'. When we talk about the 'living' landscape we have in mind the idea that it is dynamic, whether vegetally, animalistically or geomorphologically. Time, change and cause are all described in various contexts as if they were like motion.
- 39 As we move between the different types of Nuauulu tool, the stimuli amenable to the attribution of life seem to increase. In the transition from skewer to sago pounder, and from sago pounder to the sago flour extraction apparatus, from the treadle-operated coconut grater to the outboard motor, there is a gradual shift in the source of the motion—and therefore seemingly of agency, from the using subject to the tool itself.
- 40 The term agency has been much stretched in recent anthropological discussions of animism and technology, but in this context I think we need to shrink it back to its earlier core meaning of an intervention to produce a particular result, or something with the faculty of an agent. So, looking at our selected Nuauulu tools, on material

grounds neither the meat skewer nor the sago pounder can be said to have much objective agency, though more agency may be attributed to them. More complex machines, with many parts form a system with emergent properties not entirely under the control of the operator, and these might well be said to possess agency. Thus, this would be the case for the sago-processing device, the coconut grater and the outboard motor.

- 41 A quality that Nuaulu commonly associate with the essentials of animal and human life is breathe (*nahai*), and breathe too is a kind of motion. Birth, the moment at which a child breathes independently, when the chest begins to move and the lungs ventilate, is the beginning of autonomous human life. Breathe as a concept is recurrent in ritual and attributed to physical entities that are anthropomorphized, such as sacred houses or ritual shields. Ritual shields, like the meat skewer, retain their organs of breathe in the first chip of wood to be cut, and which is thereafter kept in the loft of a sacred house. Most salient of all, however, is the literal extraction of the organs of breath of large game animals and their offering as a sacrifice to the ancestors. In the *asunaete* ritual these same organs are attached to a skewer as a form of repayment for a life taken, and an assurance that life will thereby be replenished. In humans and large animals the physicality of breathe is clear enough, but in other biological organisms and non-biological entities it is not, and here we find that vocalization may serve as a proxy. So, when cicadas sing it is evidence of breathe, or even when the wind blows through certain rocks to produce eerie sounds it may be taken as evidence of life.

## Life is a matter of degree, while animacy is not animism

- 42 I am hardly the first to argue that the attribution of life is necessarily gradual, contextual and, from a biological perspective, inconveniently deviant. Bloch (1998: 53) calls this the 'more-or-less' character of life. Ingold (2011) argues that we can make anything seem alive, but we do not always chose to do so. Moreover, there is much evidence that people do not agree about what life is and no universal distinction as to what is alive and what not.
- 43 What I have tried to do here is to unpack those conditions for the recognition of life and to show how they might constitute a series of progressive cognitive steps that when aggregated are more likely, though possibly not always, to prompt the attribution of life. These are: recognition of morphological resemblance, motion, and independent motion. In a general way these are each reflected in a pattern of conceptual attribution that follows a broadly phylogenetic progression: we apprehend physical entities as being plant-like, animal-like, human-like and – ultimately – like individual human persons.
- 44 Part of the problem in the literature is that discourses on bio-cognition, life and animism begin from different starting points and have different intellectual histories. While analytically we need to separate these and certainly not confuse and conflate concepts and terms, in particular cases it is unlikely that we will ever discover a convenient congruence.
- 45 The preparation for this workshop suggests that we need to separate vital from symbolic forces – that we need both 'vital and symbolic ontologies', just as Marcel

Mauss suggested we separate technical from symbolic classifications, and Berlin general-purpose 'natural' schemes from special-purpose schemes. Unfortunately real-life examples do not give us much hope that this is possible. In some cases we may find evidence of two life forces (spiritual and biological) as Laura Rival (2012) suggests for Makushi cassava, but my guess is that because vital and technical processes are already situated in relational complexes when we experience them, in practical everyday life organisms and things are treated as though they are motivated by a single underlying force, unless prompted by reflexive theology.

- 46 While all cultural objects are potentially regarded in this way, in practice some are more alive, are more likely to evoke the characteristics of agency, animacy or indeed intentionality than others. The same applies to animism, with which the attribution of life is too readily conflated. If, following Descola (2007), animism is 'the granting by humans to non-humans of an interiority identical to theirs' (Rival 2012: 70) I would say that it is virtually impossible to separate ethnotheories of life processes from what is sometimes described as animism, even though not every object in nature is animated, and animism is not totalizing.
- 47 Moreover, regardless of the arguments surrounding how we might best understand 'animism' as a worldview, whether we are considering humans or other species (including dogs), we can observe a tendency for the mind to use an understanding of living bodies to interpret experience of artifacts, including tools. When these exhibit evidence of motion, and especially independent motion, objects prompt responses and interactions that suggest recognition of animacy, agency and intentionality to different degrees. In this respect we can agree with Ingold (2011), that if we are unsure whether something might be alive or not it is prudent to assume that it is. We have evolved a tendency to attribute the characteristics of life to parts of the world and to the world as a whole, since our experience of existence is how we must represent, model, understand and act in the world.
- 48 A final word on motion. Motion is often a necessary condition for the recognition of life, but is seldom sufficient. Motion is often accompanied by multi-sensorial characteristics shared with biological life, for example the expenditure of heat and the emission of sound. But while none of the clanking, whirring and buzzing of the treadle-operated coconut grater, or even the sloshing and slapping of a sago-processing device are sufficient for Nuaulu to conceive them as living entities, the same features in an outboard motor are intrinsic to recognition of its animate status. For while the first two have the technical characteristics of a machine they do not have the autonomy of an engine.
- 49 These technical distinctions are fully understood by Nuaulu who have wondrous ways of fixing malfunctioning engines. But the combined features that give them quasi-autonomy also give them the vitality that is more than the combination of their parts, and which crosses a boundary that places them with other biological and quasi-biological entities. Humanly operated machines may have agency, but engines act 'intentionally'. When Basil Fawlty is thrashing the car he is exacting revenge on an entity that has 'stalled just once too often'. It has willfully disobeyed its owner and driver. We laugh because we recognize that all of us, while fully accepting the technical reasons for mechanical failure, insist on treating the vehicle as if it were a sentient person who is deliberately contrary.

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## ABSTRACTS

Both humans and other animals attribute the qualities of living matter and agency to what we call tools and other cultural objects. In both cases a paradox may arise when autonomy is attributed to the object at the same time that it is recognized that its life-like characteristics are motivated by human actions. Nuaulu people in eastern Indonesia describe many kinds of objects as having the qualities we might otherwise reserve for biological organisms. They also distinguish entities that have many of the qualities of life but which ordinarily have no corporeal existence (spirits). While all cultural objects are potentially regarded in this way, in practice some objects are more alive and have more agency than others. I argue that part of the problem with existing anthropological treatments of the category "living things" is that they are either logical extrapolations through polythetic extension or based on formal taxonomic deduction/induction (ethnoscience). Using examples of meat-skewers, outboard motors, coconut graters, and sago-processing devices, together with certain forms of biological life such as fungi and algae, I demonstrate how Nuaulu ideas of what is animate and agentive are always fuzzy and contingent, and that by combining data from different kinds of ethnographic context, using different elicitation procedures, a more complex picture emerges.

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