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Behaviour Behind Bones

The zooarchaeology of ritual, religion, status and identity

Edited by
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and Anton Ervynck

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15. Observations on the religious content of the animal imagery of the 'Gran Coclé' semiotic tradition of pre-Columbian Panama

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The explicit and flamboyant pre-Columbian art of the 'Gran Coclé' culture area of central Panama is replete with animal images that have invited many interpretations by art historians, anthropologists and archaeologists. Zoomorphic images represent different grades of realism, which permit the application of modern taxonomic principles to the identification of specific taxa, ranging from Class to genus and, in a few cases, even species. The distribution of these taxa on art objects can be compared with that of animal remains in archaeofaunal samples from dietary and ritual contexts in order to reconstruct the way the people of 'Gran Coclé' made use of the regional life assemblage of organisms for food and materials and how they may have related individual taxa to cognitive behaviour and supernatural environments. A wide variety of invertebrates and vertebrates from coastal, littoral and terrestrial habitats are depicted. There are also some striking absences. Although there are many non-natural representations of animals, especially composite creatures that incorporate features of more than one taxon, it is possible to identify their component parts by focussing on anatomical details. Taxa that appear to have a special cognitive significance include marine worms, crabs and other inshore crustaceans, sting-rays, sawfish and sharks, crocodilians, marine and freshwater turtles, certain kinds of birds, bats, dogs, and deer. Interpreting the relationship of animal images to religiosity is fraught with difficulties since pre-Columbian isthmian peoples were pre-literate. In this paper the opinions of several scholars are discussed and the author's personal views expressed vis-à-vis *zoogeography, ethology, taxonomy, aesthetics, dualism, shamanism, and social affinities between humans and animals.*

Introduction

I discuss how certain animal images and geometric symbols used by the pre-Columbian inhabitants of the 'Gran Coclé' culture area of central Panama to decorate artefacts may have been related to a supernatural environment and, in this sense, be imbued with a 'religious' significance (Cooke, *this volume*, Fig. 1). By focussing on taxonomic and behavioural information exhibited by these images, I consider the degree to which modern non-native observers can, or cannot, identify specific categories of animals – ranging from Class to species – in a flamboyant semiotic system that has invited many commentaries from archaeologists and art historians (Lothrop 1937; Lothrop 1942; Linares 1976; Helms 1977; Linares 1977; Helms 1979; Helms 1981; Cooke 1984; Briggs 1989; Benson 1992; Cooke 1992b; Cooke 1993; Helms 1995; Labbé 1995; Helms 1997; Cooke 1998; Helms 1998; Helms 2000). I emphasize four themes: 1) real and imaginary animals in the context of the 'life assemblage' (Klein and Cruz-Uribe 1984, 3) that would hypothetically have existed in pre-Columbian times in 'Gran Coclé' (located between 79°–82° West and 7°–9° North in the Neotropical realm), 2) groups of recognisable animal taxa whose depiction *together* on artefacts can be assumed to have some cognitive 'meaning', 3) anthropomorphic (or, at least, bipedal) forms, which appear to refer to shamanism (or similar ceremonial and ritual activities), and 4) pictorial relationships between geometric symbols, animals and anatomy that help us identify the biological prototypes of these symbols.

'Real' animals and regional faunas

I envision iconographic studies as an integral part of regional archaeozoological research, one that is not necessarily as biologically objective as osteology, but should, nonetheless, be taken seriously. In my opinion, all animal classes depicted on 'Gran Coclé' art, whose affinity with a living taxon can be established sensibly by reference to painted or modelled anatomical details, would have been present within the 'Gran Coclé' culture area during the time period under consideration (~cal BC 200 and cal AD 1550). The term 'sensible' subsumes zoogeographic likelihood as well as observational objectivity: for example, widespread species such as the Virginia opossum (*Didelphis marsupialis*), raccoon (*Procyon*), and coati (*Nasua nasua*) are more likely models for mammals with clearly depicted black masks (Lothrop 1942, figs. 317, 421b; Helms 1995, fig. 75), than the spectacled bear (*Tremarctos ornatus*) (Helms 1992; Helms 1995, 59–71), a species which may be present in mountains near the Colombian border, but has not been recorded elsewhere in Central America in Holocene times (Cooke 1998, 114, note 6).

Once identified, the presence and abundance in art of a specific taxon can be compared with those of taxa whose body parts have been recorded in regional archaeofaunal assemblages in order to acquire as broad a view as possible, not only about how the pre-Columbian peoples of 'Gran Coclé' utilised available animals for food, raw materials, tools, ornaments, pets and trade goods, but also how they perceived their participation of these animals in their cognitive universe, i.e., as symbols, totems and emblems, and as actors with humans in a supernatural environment (Cooke 1992b; Cooke 1998). The fact that many animal taxa have uneven distributions in 'Gran Coclé' art and in dietary, artesanal and ritual archaeofaunal samples suggests that regional pre-Columbian peoples indeed viewed the components of the regional fauna in many different ways (Cooke, *this volume*). The white-tailed deer (*Odocoileus virginianus*) was important pictorially, industrially *and* nutritionally (Cooke 1992b). Sea turtles, crocodiles, bats, dogs and monkeys were seemingly *not* used for food although they were painted and modelled, and their body parts were used for making tools and ornaments (monkeys less often than the other three) (Cooke 1992b; Sánchez and Cooke 1998). Molluscs, catfish (Ariidae, Parauchenipteridae and Pimelodidae), puffer-fish (Tetraodontidae: *Guentheridia formosa, Sphoeroides* spp.), and some rodents (*e.g. Agouti paca*), are regularly found in middens, but were never illustrated (Linares 1977). Some abundant groups of Neotropical organisms, which are visually and behaviourally striking – *e.g.*, butterflies, sloths (Bradypodidae), and tapirs (*Tapirus*) – are absent in identifiable forms both on the art, and (in the case of vertebrates) in sampled archaeological bone samples (Linares 1976; Linares 1977, 67; contra Helms 1995, figs. 20, 22, and Labbé 1995, fig. 23). Notwithstanding sampling biases (extant archaeofaunal samples represent a much more restricted area of 'Gran Coclé' than do artefact samples) such selectivity likely reflects human behavioural traits that comply with the term 'religiosity', such as taboos and social or genealogical affinities between humans and animals (Helms 1979, 70–108). (For invertebrate distributions in kitchen middens, see Cooke *et al.* 1996; Hansell 1979; Carvajal 1999. For vertebrate distributions, see Cooke and Ranere 1989; Cooke 1992a; Cooke and Ranere 1992a; Cooke and Ranere 1999; Jiménez 1999; Jiménez and Cooke 2001; Cooke and Ranere, *in press*).

Lothrop (1942, 28), who first contextualised and described the 'Gran Coclé' art style, contended that 'in no case does the....artist portray the animals of nature (but) instead the beasts from a world of never recorded and long forgotten myths.' His opinion was based, understandably, on the fact that many icons are depicted in an *anatomically* unrealistic manner, i.e., two-legged 'birds' with 'saurian' claws. If we accept this imprecision as an intrinsic element of *style* or *aesthetics,* however, many such zoomorphs clearly depict or incorporate *real*, rather than just fantastic or mythical animals (Linares 1977). What is more, they comprise a surprisingly large number of invertebrate and vertebrate animal classes, all of which are noticeable and/or widespread denizens of the Neotropical realm, being found in estuaries, mangroves and rivers, and, in the case of terrestrial habitats, not necessarily in 'jungles' (Helms 2000, 8), but rather in grasslands, wooded savannas, and gallery and hilltop forests. The landscape had been impacted by agricultural activities for several millennia before the 'Gran Coclé' semiotic system became manifest (Cooke and Ranere, 1992; Piperno and Pearsall 1998, 209–27, 286–97; Cooke and Ranere, *in press*; Cooke, *this volume*).

Sometimes, 'Gran Coclé' animal icons are sufficiently realistic to allow unequivocal identifications to *species*. A well-known example is the king vulture (*Sarcoramphus papa*) (Ladd 1964, plate 4 a and b; Labbé 1995, figs. 64, 145; Cooke 1998, fig. 4.2a). Large white spots on a dark ground (Fig. 1a) identify the spotted eagle ray (*Aeteobatus narinari*) (cf. Lothrop 1942, figs. 211b and 212c; Helms 2000, 102). The white-tailed deer's 'badge' (Fig. 1c) is branching antlers, emphasized even when the icon is devoid of a body (the only other deer genus in Panama [*Mazama*] has erect straight or bifurcate antlers) (Lothrop 1942, figs. 85, 423; Benson 1992; Cooke 1992b; Labbé 1995, figs. 63 and 114; Helms 2000, 43). It appears that the need to obey stylistic and aesthetic principles gave the artisan a licence to manipulate chromatics while honouring biological observation. For example, the bird in Fig. 3b has a *black* body. The only bird species in Panama with a curved red bill and red legs is the ubiquitous white ibis (*Eudocimus albus*). Adult ibises have a white body. Since the background of the ceramic vessel is pale, the artist was obliged to paint a black body (cf. Labbé 1995, figs. 14 and 15).

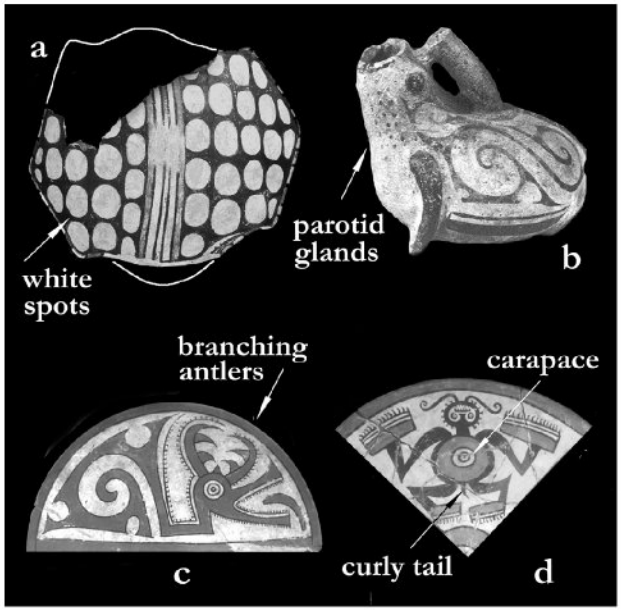

*Fig. 1. a: polychrome effigy plate painted like an eagle ray (*Aeteobatus narinari*), Cerro Juan Díaz, Los Santos, Panama (photo: R. Cooke), b: effigy vessel, probably depicting the marine toad (*Bufo marinus*), Sitio Conte, Panamá (photo: P.S. Briggs), c: half a polychrome plate decorated with the head of a white-tailed deer (*Odocoileus virginianus*), Museo de Antropología, Panamá (photo: R. Cooke), d: icon of a tailed (freshwater) turtle from a polychrome plate, Museo de Antropología, Panamá (photo: C. Hansen).*

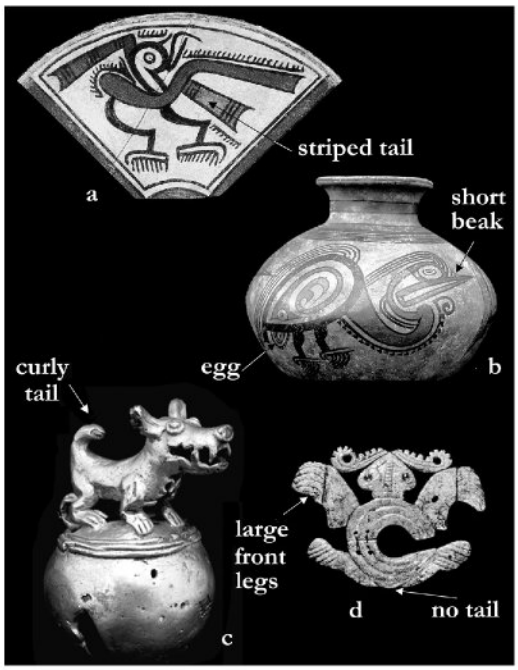

*Fig. 2. a: a backward-looking bird with striped tail, referred by many scholars to the great curassow (*Crax rubra*). One of four icons on a polychrome plate, Museo de Antropología, Panama City (photo: R. Cooke) b: Crested bird, which apparently is laying an egg, from a polychrome jar, Museo de Antropología, Panama City (photo: R. Cooke), c: cast gold-copper bell that depicts a dog, Museo de Antropología, Panamá (photo: J. Maiquez), d:* Spondylus *shell pendant shaped like a sea turtle from Playa Venado, Panama, Dumbarton Oaks Museum, Washington D.C. (photo: L. A. Sánchez).*

Helms (1977 and 1979, 97–108 and 2000, 55–75) insists that subtle anatomical details, i.e., the shape and position of pupils, crests, 'beards', teeth and colouration, signal particular reptile species (*e.g.*, the green iguana [*Iguana iguana*], the baslisk [*Basiliscus basiliscus*] and boa [*Boa constrictor*]), which, she believes, are imbued with great religious significance (as I discuss in later pages). She has also perceptively suggested (Helms 2000, 120, figs. 6.15 and 6.16) that crustacean icons, which exhibit a pointed protuberance in front of their heads and have thin pincers, may be penaeid shrimp whose rostral spikes prick unwary handlers (Lothrop 1942, figs. 374 and 375). The hirsuteness and lack of antlers of a male ungulate zoomorph (Fig. 3c) suggest that it represents a peccary (*Tayassu*). The raised area painted with black dots on an anuran effigy (Fig. 1b) orients one's glance to the swollen parotid glands of a bufonid toad (probably the marine toad, *Bufo marinus*) (Briggs 1989, fig. 21; Cooke 1989). The clearly demarcated round spots of other anurans modelled in clay allude to small dendrobatid ('poison dart') frogs (Fig. 4f). The large front legs and tailless condition of realistic *Spondylus* and cast gold-copper turtles signal a marine species (Chelonia) (Fig. 2d; Lothrop 1937, fig. 118 e,f; Sánchez and Cooke 1998, fig. 7 e,f), and a short, curly tail (Fig. 1d), a terrestrial species. In other modelled and painted images a striped head is the badge of the ubiquitous painted terrapin (*Trachemys scripta*) (Lothrop 1942, figs. 208, 280, 413a; Labbé 1995, fig. 137). A fish effigy from Sitio Conte (Fig. 3a) presents anatomical details that appear to highlight the venomous pre-opercular and opercular spines of a toadfish (*e.g.*, *Batrachoides, Daector*) in addition to capturing impressionistically the large head, wide mouth and prominent eyes that characterise these common inshore genera. Linares (1977, 65–7) proposed that the iconographic pre-eminence of pricking, stinging and biting animals, such as crabs, sawfish, sharks, sting-rays and toadfish, suggests that they are metaphors for qualities of human behaviour that would have been respected in competitive rank societies. The fact that the skeletal parts of these taxa, however, are frequently found in kitchen middens indicates that they were regularly used for food, as well as for making tools and ritual objects (Cooke and Ranere 1999; Jiménez and Cooke 2001).

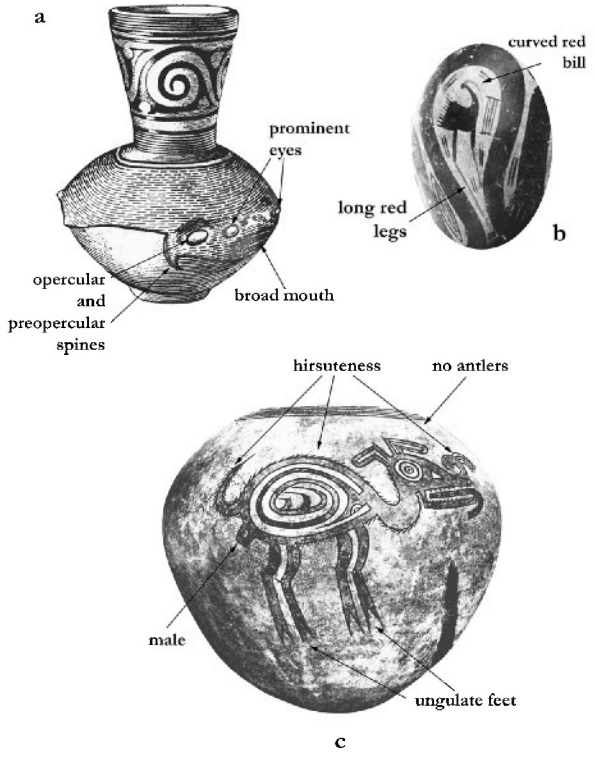

*Fig. 3. a: polyehrome effigy vessel of a fish with features typieal of a toadfish (*Batrachoides *or* Daector*), Sitio Conte, Coelé, Panamá (after Lothrop 1942, fig. 212a), b: detail of a Tonosí style polyehrome vessel whieh may depiet a white ibis (*Eudocimus albus*) with inverted eolouration for stylistie reasons, Museo de Antropología, Panamá (photo: R. Cooke), e: polyehrome jar deeorated with a mammal with eharaeteristies of a peeeary (*Tayassu*), Coelé, Panamá (after Lothrop 1942, fig. 466b).*

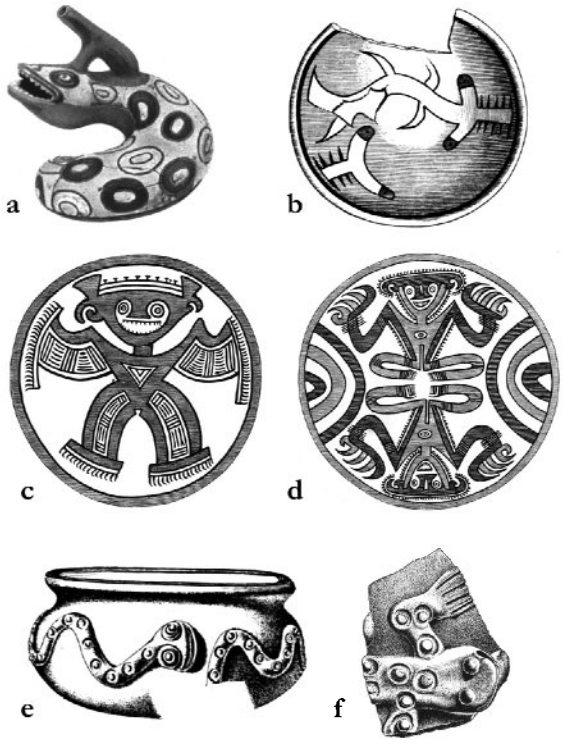

*Fig. 4. a: polyehrome effigy jar shaped like a marine eel (perhaps Muraenidae), Sitio Conte, Panama (after Lothrop 1942, Plate 1d), b: polyehrome plate depieting a fish with eharaeteristies of sawfish (*Pristis*) and hammerhead shark (Sphyrnidae), Pearl Islands, Panama (after Lothrop 1942, fig. 442b), e: human figure with psittaeid ears, and possible vulvar noteh. The arms and legs are deeorated with the double-direetion line motif, probably simulating tattoos or body paint, from a polyehrome plate, Sitio Conte, Coelé, Panama (after Lothrop 1942, fig. 91a), d: paired and seated human figures with pstittaeid ears and vulvar notehes, from a polyehrome plate, Sitio Conte, Panama (after Lothrop 1942, fig. 57b), e: modelled serpentiform ereature on a monoehrome vessel, perhaps a muraenid eel (ef.* Myrichthys tigrinus*), Sitio Conte, Coelé, Panamá (after Lothrop 1942, fig. 347b), f: modelled frog, perhaps Dendrobatidae, Sitio Conte, Coelé Panama (Lothrop 1942, fig. 348).*

It has also been apparent to commentators that 'Gran Coclé' artisans recognised the importance of certain details of physiology and behaviour for signalling specific taxa for their audience. Gill slits and male copulatory organs are emphasized on some shark icons. Rays are depicted with well-marked olfactory pits (Lothrop 1942, figs. 31,150, 212 c,d; Linares 1977, 63; Helms 2000, fig. 16.14). It seems likely that the artist responsible for the crab icon in Fig. 5a wants the observer to know it is a female because of the visual prominence given to the semicircular appendage at the posterior edge of its carapace (Linares 1977). This is a dorsal image. When crabs are viewed thus the abdomen is not generally visible unless the animal is an incubating female (in fact, some female rock crabs press the extended abdomen and egg clutch against the substrate, an action that is, presumably, a form of maternal care [Christy, *pers. eomm.*, 2003]) (Fig. 5b). The only other visual clue to the sex of a crab would be claws of greatly unequal size, which is a characteristic of males of some taxa, including *Cardisoma erassum* – the most abundant crab species in archaeofaunal samples (Cooke *et al.* 1996). However, it is likely that the principles of bilateral symmetry on Coclé art would be inimical to a realistic depiction of differential claw size.

In my opinion, it is the *behavioural* characteristics of domestic dogs that stand out on many curly-tailed, boisterous icons, which I believe represent this taxon (Fig. 2c; Cooke 1992, fig. 4). A polychrome plate has captured exquisitely a group of birds that are surely humming birds

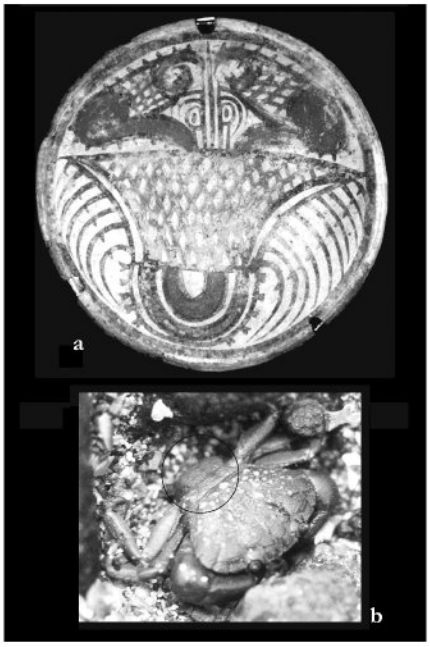

Fig. 5. a: image of a crab with a semicircular motif appended to the posterior end of its carapace. This appears to signal that the abdominal flap is extended. The shape of the carpus suggests a large xanthid crab, such as Ozius *or* Eucides *(photo: R. Cooke), b: An incubating female crab (Xanthidae:*Eurypanopeus*). The crab has extended its abdominal flap and is pressing it against the substrate (photo: J. Christy).*

Fig. 6. Polychrome plate that depicts a group of birds, probably humming birds (Trochilidae), Museo de Antropología, Panamá City (photo: R. Cooke).

(Trochilidae) fussily feeding at flowers (Fig. 6; also Cooke 1984; Labbé 1995, fig. 42). Linares (1977) and Helms (1995, 1997, 2000) suggest that the avian model for a crested bird with a striped tail, which often looks backward (Fig. 2a; cf. Lothrop 1942, 29–30) is the great curassow (*Crax rubra*) whose chestnut-bodied female sports a striped tail. Linares (1977, 61) proposed that the curassow's confident strutting behaviour and crest were metaphors for the comportment of important people, like warriors, who in real life would have worn plumed headdresses. Lothrop (1942, 30) likened these birds' poses on polychrome plates to those of 'dancers'. Helms (1995, 40–1) averred that the backward glance reflected this large species' 'habit of passing the head back over the shoulder and wings.' Some bird images (Fig. 2b; Lothrop 1942, figs. 104 and 225b) are apparently laying an egg. Some reptile images appear to depict embryos inside eggs (Labbé 1995, fig. 139; Lothrop 1942, fig. 192 d). The insect image (perhaps a dragon-fly) on Fig. 7e may be symbolizing metamorphosis from a larval form into an adult.

The identifications that commentators have proposed for some of these ethologically informative icons are debatable. For example, Helms (1995, 44ff) favoured a tinamou (*Tinamus major)* as the model for one of the egg-laying bird icons (Lothrop 1942, fig. 192d) on account of this ground-dwelling species' prodigious egg-laying abilities. As Helms points out, however, tinamous are *not* crested and they have shortish necks; so if the crest and neck are taxonomic 'badges', the bird being signalled is *not* a tinamou. The only bird species present in the region that has a long thin crest is the boat-billed heron (*Cochlearius cochlearius*; Ridgely and Gwynne 1989, plate 2,1), but one would expect this species' enormous beak to be signalled if the artisan wished its identity to be clear. Many 'Gran Coclé' bird icons stress crests, forked tails and hooked beaks; but these traits are shared by so many Neotropical taxa that one can only guess the identity of most of them (Cooke 1984; Cooke 1986; Cooke 1998, fig. 4.3).

It can be inferred from the above examples that pre-Columbian artisans of 'Gran Coclé' *wanted* and *expected* knowledgeable observers to refer certain animal icons correctly to real animals in a familiar environment, and, when necessary, devised methods of highlighting salient anatomical and behavioural features to ensure an unambiguous taxonomic identification notwithstanding repetitive decorative and stylistic formalities. Even when we are unable to assign a particular image to genus or species on the basis of the visual information it contains, this does not necessarily mean that it was taxonomically irrelevant to its pre-Columbian beholders whose own classification of animals is, of course, unfathomable and unrelatable to modern taxonomy. This 'signalling' of diagnostic features of an animal's anatomy applies to biologically coherent taxa and fantastic creatures alike – Lothrop's (1942, 28) 'monsters' or 'dragons'. Composite creatures come in many guises, but they are not necessarily garbled: the badges of their component animals are carefully highlighted. An especially frequent composite animal is bipedal – presumably the signal for a bird – but it has pert mammalian ears and/or the branched antlers of a white-

Fig. 7. a: polychome plate which represents two crocodilian heads connected by a serpentiform shape marked, according to some scholars, like a boa (photo: Bowers Museum of Cultural Art, Los Angeles), b: above: schematic representation of a boa body markings, below: hypothetical derivation from this (the double-direction line motif) (after Helms 2000, fig. 2.5), c: serpentiform image, perhaps a marine worm (Polychaeta) (after Lothrop 1942, fig 94d), d: polychrome effigy jar of a mammal which has the double-direction line pattern along its arms and legs, Museo de Antropología, Panama City (photo: R. Cooke), e: polychrome plate with an image of an insect, perhaps a dragon-fly, Museo de Antropología, Panama City (photo: R. Cooke), f: polychrome plate that depicts a composite creature (bird + deer), Museo de Antropología, Panama City (photo: R. Cooke).

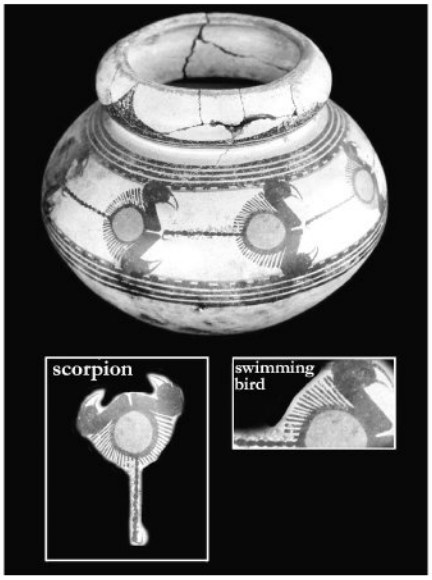

Fig. 8. Polychrome jar of the Tonosí style: a fine example of 'split representation', by which two animals are represented in a single icon, private collection, Panama City (photo: R. Cooke).

tailed deer (Fig. 7f; Lothrop 1942, figs. 51, 61). Several elongate fish-like icons have bilateral projections on the head, which commentators usually identify as hammerhead sharks (*Sphyrna*). There are, in fact, two fish-like icons with laterally expanded heads. One has the eyes placed in the *correct* position for *Sphyrna* – at the extremities of an appropriately expanded 'hammer' (Linares 1977, fig. 36). On a more frequent icon (Lothrop 1942, fig. 485; Labbé 1995, 14; Helms 2000, fig. 6.8b), the eyes are painted at the *corners* of the *thin* projections, while the head sports a *rostral spike,* which is sometimes depicted as a sawfish rostrum (Helms 2000, fig. 6.8). I propose that the icon with the correct eyes and head proportions is indeed signalling a hammerhead shark, while the latter is a rendering of a composite mythical animal (shark + sawfish). This association is explicit on a polychrome plate found on the Pearl islands (Fig. 4b).

It is formally reasonable to attribute a *uniquely* cognitive significance to these combinations of different animals on a single image, i.e. that they describe transmutations of one animal into another, cosmological pairs or mythical beings – ideas which can be expected to have been an important component of 'Gran Coclé' thinking, as I shall discuss later. Nevertheless, the prevalence of 'split representation', in which a single icon represents two or more realistic animals *depending on the way it is observed*, makes more straightforward explanations viable, i.e., that artists enjoyed aesthetic or stylistic ruses – visual tricks, if you like! A typical example (Fig. 8) depicts a quite realistic scorpion viewed from above and a swimming grebe-like bird in profile (see also Linares 1977, fig. 30 a).

'Explaining' combinations of animals and humans

Observers of 'Gran Coclé' art are invariably impressed by its balance, which is expressed geometrically, chromatically and iconologically (Lothrop 1942; Linares 1977; Helms 1993; Helms 1995). Frequently the 'canvas' of an object is divided into sectors separated by lines and scrolls. Colours, zoomorphs and motifs are repeated, alternated, opposed and juxtaposed. Since dualism is a pervasive concept in cognitive systems everywhere one would expect it to have influenced the thoughts behind this kind of

decoration, i.e., lower and upper worlds; life and death; male and female; human and non-human; day and night; real and unreal; 'deer' and 'curassow.' Bicephaly, bifurcation, mirror images and the depiction of animals in pairs - sometimes of the same taxon, sometimes not - also allude to the cognitive importance of twinning. Mary Helms has produced detailed and interesting analyses of such relationships making extensive use of ethnographic analogy. In the following section I offer a few ideas of my own *vis-à-vis* the biological identity of animal icons on 'Gran Coclé' art whose depiction in conjunction, not only with other identifiable animal taxa, but also with humans, suggests a specific religious significance, i.e. in the context of myth, legend, cosmology and 'shamanic' transformations.

Big lizards, crocodiles and boas

In her book *The Curassow's Crest* Helms argued that the sinuous bodies of many images – whatever the identify of the animals depicted as their heads and/or tails – represent *snakes,* specifically the boa (*Boa constrictor*), in her opinion 'the isthmian version of the formidable great snake, widely found in the cosmologies and iconographies of Mesoamerica and lowland South America' whose body represents 'pure, undifferentiated life energy, energy that lies at the heart of all other life-forms as *fons et origo* and that also connotes, in its pure, featureless, un-shaped serpentine form, the life force that existed at the dawn of time before articulated life-forms had been created or organized' (Helms 2000, 12–3). Onto this ubiquitous serpentiform body form Helms grafts details gleaned from the myths and cosmologies of other Neotropical peoples, such as the body parts of humans and animals in the process of being devoured and an iguana-boa crasis with crest and beard, which, she proposes, symbolises a terrestrial/arboreal environment in contraposition to the aquatic environment of the crocodile (Helms 2000, 73–5). Labbé (1995, 37–9) also grants a primary symbolic role to serpents 'as....the concept of vital force, essentially binary in nature, expressing both a 'male' and 'female' aspect'.

Another idea that Helms (1977, 1979, 2000) has championed is that the green iguana (*Iguana iguana*) and the basilisk lizard (*Basiliscus basiliscus*) were more important participants in the 'Gran Coclé' supernatural environment than the two isthmian crocodile species – the cayman *(Caiman fuscus*) and American crocodile (*Cocodrilus acutus*) - to which most other commentators have attributed a widespread *saurian* image, often depicted in a bipedal stance (Fig. 9). In view of the importance of reptiles in the contemporary myths of isthmian peoples like the Bribri, Buglé (Bokotá), Kuna and Emberá (Helms 1977; Helms 1979,102-8), it is reasonable that iguanas, basilisks, boas *and* crocodiles should have been prominent actors in the pre-Columbian myths and religion of 'Gran Coclé'. But since I argue that animals in art comprise but one part of a many-tiered perception and expression of an entire regional 'life assemblage', it is not idle to scrutinise critically the anatomical details, which commentators have accepted as signals of particular species.

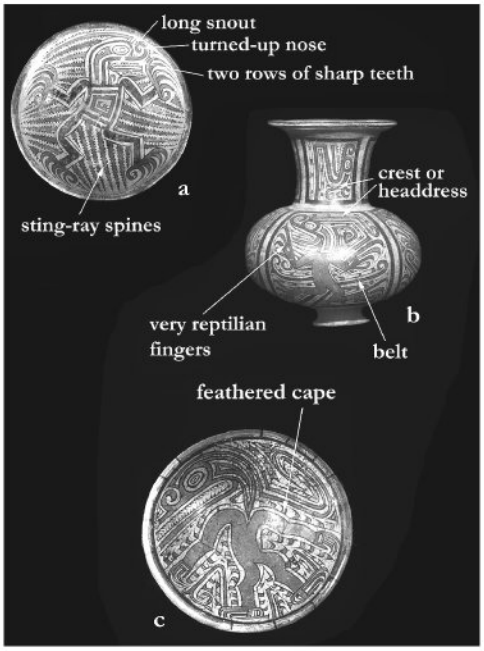

Fig. 9. Images of an image of a bipedal crocodilian. a: Sitio Conte, Coclé, Panama (Photo: R. Cooke), b and c: private collections, unprovenienced (photos: Bowers Museum of Cultural Art) (c: see Labbé 1995, fig. 58).

Minimally, not all sinuous-bodied animals can be accepted *a priori* to represent 'snakes'. A life-like toothed eel with prominent round spots recalls *Echidna nocturna* and *Muraena lentiginosa*, in-shore muraenid eels, which can deliver a nasty bite (Fig. 4a; Allen and Robertson, 1994, 43–8). Since large round spots are not a characteristic of any common snake in 'Gran Coclé' another modelled form (Fig. 4e; Ladd 1964: fig. 52b) may be pointing towards another spotted eel, such as *Myrichthys tigrinus* (Allen and Robertson 1994, 53), whose bones occur in kitchen middens (Jiménez and Cooke 2001).

Another ubiquitous image is that of a sinuous animal delineated by a multi-flecked stripe that parallels the body outline and appears to represent its 'legs.' Alternating horizontal and vertical lines are depicted along the body (Fig. 7c; Lothrop 1942, figs. 70, 94d, 95). Some of these images have a smaller number of thick 'legs' (Lothrop 1942, figs 71, 94c) and others have one or two pairs of typical (conventionalised) clawed legs behind the head (Lothrop 1942, fig. 94 a,b). Since the head often sports a 'tongue' that ends in double scrolls commentators relate this being to a serpent (Labbé 1995; Lothrop 1942). This is not an exclusive relationship, however, because a double scroll motif generally protrudes from the snout of realistic *turtle* images (Figs. 1d, 2d). In my opinion, marine worms (Polychaeta), and sea scorpions (*Squilla*) (Lothrop 1942,

fig. 71) are more likely to be the models for the referred serpentiform images with lateral flecks, than snakes (see also Linares 1977, 65). Admittedly, polychaete worms do not have well-defined heads. But the hairiness or prickliness implied by the image in Fig. 7c seems antithetical to a basic characteristic of snakes – their slipperiness or smoothness.

Helms has constructed an elaborate argument to explain the double-direction line pattern used to fill the bodies of the above-mentioned images as a derivation from boa body markings and, thence, its function as a 'kenning' (replacement symbol) for a mythical iguana-boa (Helms 2000, figs. 2.5 and 4.15). This observation underlines an analytical dilemma that all commentators on 'Gran Coclé' art have confronted: are the several geometric motifs regularly employed on 'Gran Coclé' art – frequently as proxies for tattooing or painting on human and animal arms and legs (Fig. 7d) – 'kennings' of a particular animal taxon and, if so, which analytical procedures demonstrate this relationship? Or are these geometric motifs divorced from life forms and merely decorative? Theoretically, specific geometric motifs can be related back to a particular zoomorph by the standard stylistic procedure of tracing stages along a sequence from real to abstract to geometric, for example, with respect to a bird image with outstretched wings and tail (Sánchez and Cooke 1998, fig. 3) and to a laterally depicted crocodilian head, whose diachronic geometricisation accompanies a general stylistic shift in 'Gran Coclé' painted ceramics from curvilinear to rectilinear designs (Cooke 1985; Labbé 1995; Cooke 1998). It is conceivable that the double-direction line pattern is indeed an extreme simplification of the oval and rectangular markings attributed by Helms to a bicephalous boa (Fig. 7a,b; Helms 2000, fig. 4.2). In this case, boas are 'kenned' with humans and a host of other creatures whose bodies are decorated with the double-direction line pattern (*e.g.*, Figs. 4c and 7e). This relationship, however, would gain validity if there were clear intermediate stages between this ultimate degree of abstraction and *realistic* depictions of boas, which, as far as I can tell, are absent on 'Gran Coclé' art – even in the earliest phases of the development of polychrome pottery when animal images are particularly life-like. *Boa constrictor* is a widespread, frequently encountered animal on today's landscape and its remains are ubiquitous in archaeofaunal bone samples around Parita Bay (Cooke and Ranere 1989; Cooke and Ranere 1992). Therefore, snakes may not have been cognitively primordial at all, but, rather, items worthy of the cooking pot, like pacas (*Agouti paca*), but unworthy of being advertised.

The 'saurian' / 'crocodile god' (Lothrop 1942, 83) / 'dancing crocodile' motif to which I referred earlier is one of the most striking and prevalent in 'Gran Coclé' art. It comes in two guises, one naturalistic (often horizontally depicted), and the other humanised (usually vertical, either frontal or in profile). It incorporates a number of conventions: a) a long snout, with an upper and lower row of strong pointed and isomorphic teeth, b) a crest-like emanation in front of the eyes and/or on top of the head, c) a backward-facing scroll or curlicue at the end of the snout, and d) noticeably reptilian feet sometimes with quite realistically depicted long phalanges and claws (particularly Helms 2000, fig. 5.9). Frequently the bipedal mode is painted against a background of alternating red and bluish serrate spikes, interpreted universally as 'sting-ray spines' (Fig. 9a). When the image is humanised it is often frontally depicted wearing belts with heads at each extremity – these often (but not always) mirrors of the principal icon's head –, necklaces, ligatures, and ear rods, and brandishing offensive weapons like *macanas* or sword-clubs (Lothrop 1942, figs. 149, 193, 223, Plates I a, II a,b; Ladd 1964, Plate 7a; Cooke and Bray 1985, fig. 9; Labbé 1995, fig. 56, 18, table 4; Cooke 1998; Cooke *et al.* 2000, fig. 8.9 b; Cooke *et al.*2003).

Helms has highlighted details, which, she believes, confirm the identity of this image as a 'crested *iguana*', namely, small ticks, curls and lines painted or (on metalwork) embossed between the snout and the eyes and underneath the mandible. She argues that these elements reproduce iguanas' facial filaments and dewlap (Helms 2000, figs. 4.8, 4.10). Apparently she no longer thinks that the humanised variant represents the spectacled bear (Helms 1995, 69, fig. 80). She also notes that many of these icons are depicted with a *horizontal* eye, which, she proposes, mirrors the shape of a closed iguana eye and not an open, vertical crocodile eye (Helms 2000, 57–9; Ladd 1964, plate 7a, fig. 42b). Her argument that the crests that bedeck the icon's head are derived from iguanid lizard crests is neatly woven around careful observation of these reptiles' anatomy and behaviour (Helms 2000, 63–5). There are, however, some incongruencies: for example, the animals depicted on the belts of a Sitio Conte embossed gold plaque (Helms and Sharer 1992, plate 2), which were originally interpreted by Helms (1977; 1979, 105–6 and figs. 17, 79, 199) as basilisk lizards on account of their tricuspid teeth, actually have *mammalian* ears and tongues, so it is non-intuitive to interpret them as *canid* or *felid*, in which case the big tricuspid teeth would be carnassials. This interpretation fits in with the proposal that one guise of the bipedal saurian is that of 'hero-hunter' (Helms 1979, fig. 17; Helms 2000, 90-2). When 'beards' and 'whiskers' are depicted they may be a badge for *humanness*, rather than of *'iguana-ness'*. The Spanish marvelled at the bearded warriors in this region of Panama (Gaspar de Espinosa, in Jopling 1994, 54).

Realistic crocodiles are widespread in many media (Lothrop 1942, fig. 229; Bray 1992, fig. 3.8; Labbé 1995, figs. 52 and 117; Cooke 1998, 97–100 and fig. 4.5b; Sánchez and Cooke 1998, fig. 6). The long-toothed and noticeably upturned and incurved snout is preserved in extremely abstract painted and modelled icons, which belong to the last few centuries of the pre-Columbian era (Ladd 1964, fig. 13; Cooke 1998, fig. 4.5 c, e and f). Realistic iguanas are much rarer. Two are quite explicit

*Fig. 10. Realistic representation of a green iguana (*Iguana iguana*) on a polychrome plate,* n.b., *the long, clearly striped tail and the sub-mandibular skin flap (after Labbé 1995, fig. 43).*

and highlight the striking long striped tail and sub-mandibular skin flap of the green iguana (*Iguana iguana*), which is very prominent in males in breeding condition (Fig. 10). Helms (1995, fig. 76) attributes the realistic iguana image illustrated by Lothrop (1942, fig. 147b [also Cooke 1992b, fig. 5a]) to a coati. Cooke (1992b, fig. 5b) illustrates another iguana in cast gold.

To sum up, I propose that Lothrop's 'crested dragon' motif, epitomised by the illustrations to which I have referred, is based on a *crocodilian* and not a basilisk or iguana. When 'Gran Coclé' artisans depict iguanas they highlight anatomical details that are typical of this species and are different from those that signal crocodilians. The iconographic pre-eminence accorded to crocodilians, especially after cal AD 750, contrasts with the total absence of their bones in 'Gran Coclé' kitchen middens that date to the time period under consideration although crocodiles provided teeth for ornaments, were food items in the same region before cal BC 200 (Cooke and Ranere 1989; Cooke and Ranere 1992b), and were regularly hunted in another area of Panama (Bocas del Toro, Caribbean) (Wing 1980). Bearing in mind the abundance of crocodilians around Parita Bay today, where they are a serious menace to fishers and bathers, I doubt whether pre-Columbian peoples hunting without firearms could have severely impacted local cayman and American crocodile populations. Pascual de Andagoya, a soldier of Pedrarias' hordes, mentions that crocodilians were abundant and a threat to human life in the eastern half of Panama Bay in the decade AD 1510–1520 (in Jopling 1994:34).

Turtles and other animals

Turtles are another widespread animal form on 'Gran Coclé' art. I have already given my reasons for believing that both marine and freshwater taxa are depicted. Although Lothrop (1942) accepted their iconographic pre-eminence in the Sitio Conte ceramic sample, in two- and three-dimensional representations, Helms (2000) does not. She mistakenly attributes the only turtle icon she accepts (a striped-headed and tailed one) to a marine species (1995, 98, fig. 19). In five graves at Sitio Conte, whole turtle carapaces were buried with the dead (Lothrop 1937, figs. 205, 212, 215, 222 and 245). Lothrop (1942, 35) calls them 'large sea turtles' although, to judge from field drawings, they are more likely to be emydid, probably *Trachemys scripta,* and they are not particularly large even for this species (<40 cm carapace length). All these graves were occupied by high rank or high status people (Briggs 1989); Lothrop proposes that the turtles are food offerings for them on their journey to the other world. Linares (1977, 61) suggested that the whole shells may have been ritual paraphernalia, such as sounding boards. Modern Ngobére-speaking Guaymí rub the pitch-covered neck of the carapace to produce a humming noise – an instrument much-used at the *balsería* ceremony (Cooke, *this volume*). Some small vessels depict a modelled human head above an effigy of a striped-headed terrapin (Lothrop 1942, fig. 208 c and e) – an association that alludes to an emblematic or mythological significance (i.e., clan membership or a mythical human-turtle personage). I refer later to another instance of the possible cosmological role of turtles.

Parrot beaks and ears

Seated and standing human figures with ears shaped like psittacid (parrot, parakeet or macaw) beaks are frequently depicted on polychrome plates (Fig. 4 c and d; Lothrop 1942, 37 and figs. 57–9, 91). Lothrop equates them with 'turtles' and a 'turtle god'. Equally baffling is Helms' (1995, figs. 63, 64) proposal that they are spectacled bears! Helms (1995, 83–9, 2000 *passim*) summarises the metaphorical and metonymic significance of detached parts of human and animal bodies among Neotropical Native Americans, including extant isthmian peoples. She argues, for example, that a particular kind of crest, which is related to the icon she interprets as a curassow, is a severed human leg (Helms 2000, 33–53). Helms' interpretation of a pair of seated personages with parrot-ears as 'a section of a boa body...and a boa rectangle' is, however, unrealistically syllogistic (Helms 2000, fig. 5.6). On the other hand, her observation that standing and sitting human figures with parrot ears are likely to be *female* is perspicacious: many are depicted with a vulvar notch and with ligatures on arms and legs – a sartorial item that is a characteristic of modern Kuna *women* (Lothrop 1942, fig. 90; Helms 2000, 34–5) (see also Labbé, 1995, for a discussion of vulva symbolism and Helms 2000, 76–96, for a particularly detailed and interesting discussion of gendering).

Parrot-like birds among some South American peoples are associated, on one plane, with acute hearing and clever speech, and, on another, with seeing into the future and

eavesdropping – activities that are typical of shamans and healers (Cooke 1984). Some cast gold pieces – not necessarily made in 'Gran Coclé', but part of the metallurgical tradition to which this region belonged (Bray 1992) – depict parrot-like birds seemingly whispering in a human's ear. Some anthropomorphic icons sport long tongues, which terminate in a parrot head (Lothrop 1942, plate 1h). Although I have suggested (Cooke 1984) that some kind of shaman-partner or human-avatar relationship is one possible *raison d'être* of the parrot beak metonym, the fact that the seated and standing figures with parrot ears are female, can be considered contradictory. A burial at Sitio Sierra contained the partial skeleton of a macaw buried alongside an unusually small adult male who owned a pelican bone flute and a greenstone necklace (Cooke, *this volume*).

Shamanic transformations

One of the most influential figures of South American anthropology in the last century was Gerardo Reichel-Dolmatoff who gifted the discipline several monographs, which describe the life-ways and cognitive systems of Native American groups who live in tropical forests. His analyses of Tukano, Desana and Kogi myths, cosmology, folk taxonomy, curing and shamanism, including hallucinogen use, upon which he relied in a classic evaluation of the meaning of Colombian gold-work, are bibliographic *sine qua non* (*e.g.,* Reichel-Dolmatoff 1971, 1975, 1976, 1977, 1978a,b, 1987, 1990). It would be most unusual if the principal behavioural correlates of the kind of transformational shamanism that Reichel-Dolmatoff described were not present in the pre-Columbian society of 'Gran Coclé'. Nevertheless it is intemperate to attribute a primary role to psychotropic substances in the light of current ethnographic knowledge for the isthmus (barring a surfeit of tobacco smoke and hot *Capsicum* peppers). As far as I know there is not a shred of evidence that pre- or post-Columbian peoples in central and western Panama (outside areas settled by people of Mesoamerican descent) ever used 'hallucinogenic' mushrooms (Cooke 1989; Cooke 1998; *contra* Helms 1995, 78–81; Helms 2000, 149–57).

Paraphernalia derived from large spotted cats and marine shells, which were associated in graves with fine gold- and stone-work and incense burners, suggest that these are likely to have been the property of people who engaged in ceremonial activities, such as those of shamans, curers and chanters (Cooke, *this volume*). Other animal products found in certain graves in large numbers, such as stingray spines, may have had some kind of ceremonial function although the possibility that they were weapons used in war or for hunting and fishing (as giggs) cannot be ruled out. The transformation of the shaman into other beings, sometimes real animals, sometimes imagined ones, and his voyages to other worlds in their company, are integral episodes of the shamanic experience. Labbé (1995) stressed the role of shamanism in his interpretation

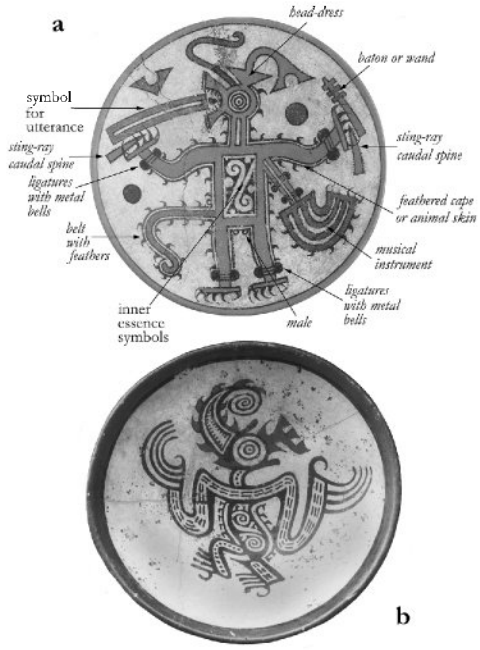

Fig. 11. a: polychrome plate, which exhibits a standing figure clothed like a shaman (after Labbé 1995, fig. 30), b: polychrome plate with a central bipedal figure that suggests a human dancing with an animal mask, Museo de Antropología, Panamá (photo, R. Cooke).

of 'Gran Coclé' art. Dancing with musical instruments, wearing animal masks, plumed crowns and feathered capes, singing in a loud voice, bloodletting, imbibing unusual substances, and sexual posturing are commonplace props for and preludes to knowledge-acquiring flights of fantasy in the ethnographic present. Although it is a hyperbole to assume that every icon of a spread-eagled bird – an ancient and ubiquitous motif on 'Gran Coclé' art (Cooke *et al.* 2003) – represents a shaman transformed into an 'eagle,' 'swallow-tailed kite' or 'king vulture', or that every composite animal has shamanic overtones, several bipedal zoomorphs do give the impression that they represent real humans transformed into animals. This transformation may be symbolised by animal masks: a bipedal figure (Fig. 11b) seems to wear an antlered and snouted 'mask', which recalls that of the *cucuá* dancers of the mountains of Coclé who use bark cloth capes and a snouted and antlered deer mask (see also Cooke and Bray 1985, fig. 10). The standing figure illustrated in Fig. 11a exhibits sting-ray spines; bells on wrists and legs; an object which may be a rattle; a baton or wand; and a suggestion of a feathered or animal skin cape and belt. In this case the human-animal association is not explicit although the details strongly suggest shamanic activities. Some bipedal crocodile figures (Fig. 9c; Labbé 1995, fig. 58) appear to wear feathered capes. Although Labbé refers to these figures as 'shamans-in-combat' (1995, figs. 56, 58, 111 and 142) or 'shamanic transformation themes' (1995, figs.

107 and 109), this explanation vies with Helms' well-researched analyses that give a stronger weight to *myth*, i.e., culture heroes, hunter-heroes, and founder figures. Some icons of the bipedal crocodilian that are embossed on gold and were found in very rich graves at Sitio Conte ape the dress of humans of high rank or status (Cooke, *this volume*; *see,* particularly, Hearne and Sharer 1992, plate 1). This fact, in addition to the very ubiquity of crocodile icons in cemeteries bordering Parita Bay, suggests strongly that social affiliation is implied, *i.e,* that crocodilians were genealogically or politically important for a sector of the 'Gran Coclé' population.

Cosmological twosomes and threesomes

Although I do not share Helms' and Labbé's optimism that it is possible to identify the role of particular celestial bodies in 'Gran Coclé' cognition, such as the sun, some associations of recognisable zoomorphs do point towards a cosmological structure of some kind. A modelled clay vessel (Fig. 12a), found just outside the currently accepted eastern boundary of 'Gran Coclé' (Lake Madden or Alajuela), depicts a turtle suspended by a raptorial bird and resting on the head of a crocodile – a trilogy that alludes to a cosmological scheme typical of some Amazonian groups, of the sky as bird, the earth as turtle and the underworld as crocodile. The size of the front legs suggest that the turtle is a marine taxon and the carbuncled beak that the bird is a king vulture. A modelled trichrome effigy vessel, which depicts a crocodile with a stylised turtle on its back (Fig. 12c), may be thematically related. This vessel, wrought in the 'El Hatillo' style, represents the latest period in the stylistic development of 'Gran Coclé' polychrome pottery and was probably made soon before or just after Spanish contact. Fig. 12b depicts an icon, whose body form is avian (outstretched wings, forked tail); the head is painted like that of curly-tailed turtle images; the wings end in a square-mouthed creature and heads at each end of the tail have bifid tongues. In this case, the possible quadripartite combination (bird + turtle + crocodilian + marine worm?) is suggestive of a tiered cosmological scheme.

Helms (2000, 33–53) has presented an interesting analysis of an animal pair: the great curassow and the white-tailed deer. She proposes that they are related chromatically, thematically and behaviourally as species that 'hold anomalous positions betwixt and between the wild and the human' because they are often penned up and the young are cared for by women. She also remarks (Helms 2000, 47) that both have a habit of looking backwards, the deer when on the alert and the curassow because it constantly rearranges its back feathers (as an owner of a male and female curassow, I can vouch that they almost perpetually engage in this behaviour!). The curassow is a forest bird that requires extensive tracts of mature trees. Curassow bones have not been reported from 'Gran Coclé' archaeofaunal samples (Cooke and Ranere, *in press*). The image in question is a backward-looking crested bird (Fig. 2a; Lothrop 1942: figs. 43–5), which sports a striped tail and, sometimes, what appear to be ligatured legs. These details point to female curassows; males, which have all black tails, would surely be signalled by the yellow knob on their bills and by their striking pure white bellies. This hypothetical female curassow is also paired on clay vessels with a forward-looking bird with crests and a thickened lower mandible – as though the artist were signalling a pelican (*Pelecanus*) (Lothrop 1942, fig. 48b) – and with turtles (Lothrop 1942, fig. 56c).

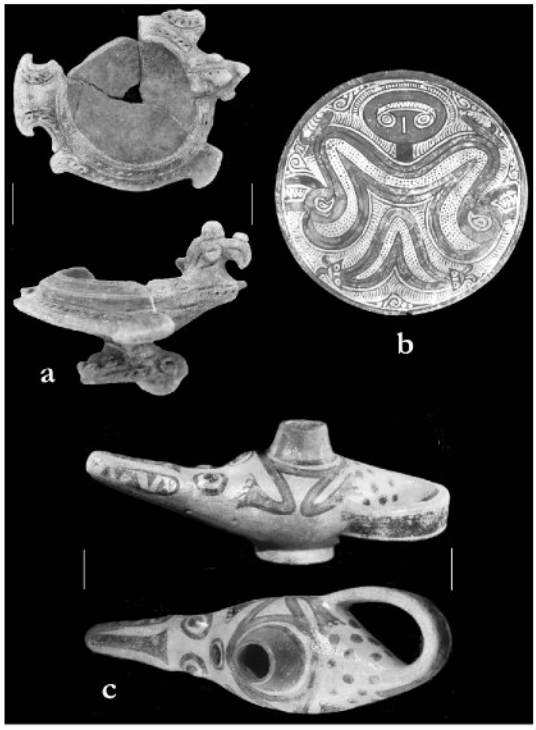

Fig. 12. a: modelled and incised vessel that appears to depict a king vulture (top), a marine turtle (centre) and a crocodilian (bottom), Lake Alajuela, Panama (photo: R. Cooke), b: polychrome plate with a creature consisting of four parts (perhaps a turtle head, bird wings with crocodilian heads, and a marine worm tail, Museo de Antropología, Panama City (photo: R. Cooke), c: effigy vessel of a crocodilian with an animal on its back (perhaps a turtle) (photo: Bowers Museum of Cultural Art, Los Angeles).

The crested caracara (*Polyborus plancus*) is a plausible alternative model for the bird with the backward glance. This visibly abundant raptor in the Pacific plains of 'Gran Coclé' has a confident, strutting gait. It has a prominent crest, striped tail and a big *hooked* beak (as *all* the relevant stripe-tailed icons do; the curassow's beak is short and unhooked). Its bones are present in refuse dumps at Cerro Juan Díaz (Cooke and Ranere, *in press*).

There is documentary evidence that, in spite of the

white-tailed deer's being by far the most abundant mammal species in dietary archaeofaunas around Parita Bay during and before the time period under consideration, its hunting was governed by some sort of social and dietary control: one soldier remarks that unlike ordinary people warriors were not allowed to eat any mammal meat (Cooke and Ranere 1989; Cooke 1992b; Cooke and Ranere 1992; Jopling 1994, 34; Cooke and Ranere, *in press*). Another soldier comments that 'the chief and principal Indians .... are like Dominican and Carthusian monks, because they do not eat any meat of any kind and under any condition whatsoever, except fish and iguanas, although deer and other game are all over the place' (Jopling 1994, 65). (The fact that *all* mammal meat was tabooed by warriors and important people suggest that there was a symbolic and structural relationship between hunting and war; whether it was deer meat or not may, therefore, be unimportant).

Geometric symbols and animals: a brief comment

Ever since Lothrop (1937, 1942) first described the 'Gran Coclé' semiotic system, commentators have been intrigued by, and have attempted to explain, the elaborate and often repetitive bands, blocks and body part terminations constructed with a set of standard geometric motifs, such as Ys, Vs, Cs and Ss. As Helms (2000, 127) succinctly comments, these are 'deceptively simple but very sophisticated design motifs,' which, in some cases, probably do symbolise life-forms, but, as I have argued, are difficult to relate by normal stylistic processes to specific animal classes. That these designs were painted on the human body is apparent from contact-period ethnographic literature, from human effigy vessels with decorated arms and legs, and from finds of clay roller stamps, which would have been used to apply the designs – probably made with the juice of the plant species that are still used by isthmian peoples, i.e., 'jagua' (*Genipa americana*) and annatto ('achiote') (*Bixa orellana*) (Lothrop 1942, fig. 368). Spanish captain Pascual de Andagoya (in Jopling 1994, 34) remarked that in the territory of Escoria (modern Santa Maria river; Cooke *this volume,* Fig. 1) 'there was a generation of Indians older than the others and of better quality: among them were knights who were very proud of being brave: all over their breasts and arms they were decorated with chains and knots' (my translation).

To judge from the ethnographic record for extant Native American peoples in tropical lands, it is not unlikely that geometric designs also reflect cosmology, social organisation, and gendering. Helms has offered some intriguingly complex explanations for the zoological origin of some of these motifs. In addition to stressing, predictably, but in my view undemonstrably, the undulating line–snake connection, she proposes more bizarre interpretations: for example, that the Y- or line-gap motif is connected to 'the haunting call of the often cosmologically significant tinamou (Tinamidae), "possibly the egg-laying bird to which I referred earlier", because the call of the tinamou is described as a single long-drawn-out note sometimes with a dip in the middle' (Helms 2000, 128, fig. 7.3). If I were reducing the call of the commonest tinamou over most of 'Gran Coclé' *Crypturellus soui*) to a geometric form, I may well depict it as lines interrupted by notches although I would not draw the lines straight, but pointing upward!

We are on firmer ground when we assess the *anatomical position* of geometric motifs. On a very large proportion of zoomorphs, YC scrolls are depicted within the body cavity of an organism, as if they were its entrails, or, more poetically, its 'inner essence' or 'life force'. This is very clear, for example, on the icons of the bipedal crocodilians, deer and birds, and on the purported shaman figures I have just described (Fig. 11). In Helms' (1995, 77) words, 'indigenous Panamanian art forms, both verbal and plastic, have utilized expository styles which emphasize the revelation of 'that which is within', indicating that the real value or something (and someone) is found in qualities located inside the being or thing.'

Conclusion

The animal icons depicted on the 'Gran Coclé' semiotic tradition of central Panama are so descriptive, colourful, and repetitive that it is logical that anthropologists, archaeologists and art historians should have dedicated so much time to attempting to identify the taxa represented and relate them to natural and supernatural environments. Although it is presumptuous to ignore merely decorative and aesthetic criteria for the selection and depiction of images by the pre-Columbian artists, the use of animals in this semiotic system as a whole can be construed as relating to religiosity in its broadest sense. The only sensible methodology for its interpretation is social anthropology. The details, of course, will remain more contentious than the intent: specialists will carry on arguing whether a particular zoomorph can be best explained in terms of myth and legend, 'ethnic' and social affiliation, shamansim, cosmology or dualism and will continue to search the literature for analogies with recently disappeared or surviving societies in order to justify their opinions. Come what may, any interpretation of an extinct, pre-literate and largely unfathomable semiotic system benefits from, firstly, doing our level best to be as accurate as possible with taxonomy and biology in a sound zoogeographic and cultural historical context; secondly, comparing the iconographic prevalence of an animal with its presence, absence and abundance in other contexts (such as kitchen refuse, graves and workshops); thirdly, assuming that both the artist and the audience knew how to identify animals, were aware of their diagnostic external characteristics and behavioural quirks, and were sometimes concerned about displaying them realistically and

sometimes not; and, finally, refraining from assuming that all pre-Columbian peoples in the Neotropics lived in unbroken rainforests and were awed only by 'jaguars', 'anacondas' and 'harpy eagles'.

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