ANTHROPOS

114.2019: 169–180

Why Dragons Are Bisexual

A Defense of Naturalism

Robert Blust

Abstract. – Dragons are portrayed in widely separated cultures as simultaneously male and female. While this trait may appear arbitrary, its global distribution implies that it is motivated by observations available to all humans. Many seemingly arbitrary traits of dragons are shared by conceptions of the rainbow, which is widely portrayed as having both male (primary) and female (secondary) arcs. This correlation of features in mythical and natural counterparts shows that the nineteenth-century doctrine of naturalism, which saw various elements of myth and folklore as reflecting features of the natural world, was valid despite excesses that eventually caused its abandonment. *[dragons, androgyny, rainbows, cross-cultural comparison, naturalism]*

Robert Blust, PhD (1974 in Linguistics, University of Hawai'i). – Since 1984 he has been Professor of Linguistics at the University of Hawai'i. – He has conducted linguistic fieldwork on 100 Austronesian languages in Borneo, Papua New Guinea, and Taiwan, and has authored nearly 250 publications. – He was elected a Fellow of the Linguistic Society of America in 2016, and in 2017 he received a Lifetime Achievement in Research award from the University of Hawai'i. – His publications include: "The Austronesian Languages" (Canberra 2009; 2nd rev. ed. Berlin 2013) as well as the ongoing "Austronesian Comparative Dictionary" (<www.trussel2.com/acd>). – See also References Cited. E-mail: blust@hawaii.edu

1 The Abandonment of Scientific Ideas

The abandonment of scientific ideas provides one of the most revealing windows on the sociology of science. Many theoretical orientations that received a ready hearing in nineteenth-century scientific circles were subsequently found to be flawed in some way. In social and cultural anthropology the reaction of the scientific community to the discovery of imperfection in theory generally was an unconditional rejection of the original idea. Only rarely has there been a willingness to reconsider the potential value of core concepts that were initially associated with untenable corollaries. Nineteenth-century evolutionism is a case in point. As originally formulated the central concepts of cultural evolution were inextricably bound up with ethnocentric notions of cultural superiority, and in the early twentieth century the entire enterprise was abandoned and even considered a source of intellectual embarrassment. Shorn of these trimmings, however, and situated within a different matrix of assumptions, the study of cultural evolution made an important comeback in the middle to late twentieth century in the work of such anthropologists as Leslie White, Robert Service, and Robert Carneiro.

In most cases where scientific ideas have been abandoned, however, there has been no return to the *status ante quo* in some other guise. Rather, rejection by the community of scholars has resulted in a sense of ineradicable taint. One of these nineteenth-century ideas, that went from widespread acceptance not just to rejection, but to treatment as a notion that was fundamentally and irrevocably wrong, is Naturalism.

2 Naturalism

The term "naturalism" has several referents. Its most common usage in contemporary scholarship is in philosophy, where it refers to "the view that the spatio-temporal universe of entities studied in the physical sciences is all there is," and is consequently opposed to Theism (Craig and Moreland 2000: xi). However, in nineteenth-century anthropology, and more particularly folklore, the term "naturalism" referred to the position that myths and folkloric motifs have their origin in attempts to represent the natural world in anthropomorphic or theriomorphic shapes. My point of departure is a brief remark by the anthropologist Claude Lévi-Strauss in his 1962 book, "The Savage Mind" (95):

> … even when raised to that human level which alone can make them intelligible, man's relations to his natural environment remain objects of thought: man never perceives them passively; having reduced them to concepts he compounds them in order to arrive at a system which is never determined in advance: the same system can always be systematized in various ways. The mistake of Mannhardt and the Naturalist school was to think that natural phenomena are what myths seek to explain, when they are rather the medium through which myths try to explain facts which are themselves not of a natural but a logical order.

Who was Lévi-Strauss targeting in this critique? He mentions Wilhelm Mannhardt, a nineteenth-century German folklorist who authored a 1,007 page tome entitled "Wald- und Feldkulte" (1875). The most famous representative of this school in the English-speaking world, however, undoubtedly was Friedrich Max Müller, a German national who spent his academic career at All Soul's College, Oxford, and who is perhaps best remembered for establishing the field of comparative religion, and for his theories of solarism, that is, the purported solar origin of many anthropomorphic characters in myths around the world. To members of this school myths often involve only slightly disguised personifications of recurrent events in the heavens, and myth was thus a way of representing these events (which were often important in agricultural societies) in a memorable form. As Müller put in his 1891 book, "Physical Religion," "[i]t was in these very phenomena of nature that ancient man perceived for the first time something that startled him out of his animal torpor, and that made him ask, What is it? What does it all mean? Whence does it all come? – that forced him to look behind the drama of nature for actors and agents … whom in his language he called superhuman, and, in the end, divine."

Müller combined his interest in mythology with an interest in Indo-European comparative linguistics, and insisted that many myths have arisen from "a disease of language," meaning that the original sense of a term has been forgotten, leading to folk etymologies that are not only fanciful, but even myth-producing. He illustrates this with the myth of the barnacle goose "reported by sailors and travelers who had seen birds hatched from shellfish." To explain this belief Müller found a twelfth-century Irish version of the tale, noting that geese were called "Hiberniculae," a name eventually shortened to "Berniculae," which easily becomes "Bernacula," and is confused with "barnacles." As with many schools of thought the solarism and etymologizing of Müller went too far, and despite his fame at the time he became the subject of scholarly ridicule even in his own day. Today the ideas that he represented are generally viewed as scholarly, but quaint. However, in rejecting naturalism as a theory of myth or folklore there is reason to believe that the baby may have been thrown out with the bath.

The thrust of Lévi-Strauss's criticism appears to be that widespread mythological motifs frequently appeal to recurrent processes of nature, but the intent of the myth-maker is not to represent or explain natural processes. Rather, the intent of the myth-maker is to express abstract ideas regarding Man's relationship to Man and to the natural order by exploiting the concrete symbolism readily made available by the phenomena of the natural world. This may be true in some cases, but does it mean that myth and folklore are *never* motivated by an anthropomorphic or theriomorphic portrayal of the forces of Nature? The aim of my argument is to present evidence contrary to Lévi-Strauss that in at least some cases what folkloric beliefs are trying to represent symbolically, and even to explain, is nothing more or less than the world of natural phenomena – particularly phenomena that can be viewed as etiologically challenging to prescientific minds.

3 Myth and Folklore

Myth and folklore are sometimes distinguished for particular purposes, but there is to my knowledge no basis for distinguishing the types of themes or motifs that appear in myths from those that appear in what is commonly called "folklore." Folkore and mythology are frequently treated together in

general discussions (as "Funk and Wagnall's Standard Dictionary of Folklore, Mythology and Legend" [Leach and Fried 1984]), and the tacit view of most folklorists appears to be that similar recurrent themes are found both in the less structured and more anecdotal medium of folk belief, and in the more purely narrative domain of myth. For the purpose at hand, then, the motif inventory of folklore and mythology will be treated as equivalent.

4 Dragons, Familiar and Otherwise

In dealing with any scientific problem, to attain a satisfactory explanation of a phenomenon it is first necessary to have an adequate description of the thing to be explained. Our notions of dragons are often colored by the way they are represented in our own culture. How do we think of these unseen, yet somehow familiar creatures? They breathe fire, they guard treasures, and somewhat oddly they have wings, however vestigial, on bodies they obviously could not lift.

The comparative study of dragons shows both cross-cultural variations and recurrent themes in the characterization of these mysterious creations of the human mind. While European dragons have wings (hence implying flight), for example, they have no stated connection with the weather. Chinese dragons, on the other hand, with their long, sinuous bodies and powers of flight, are intimately associated with rainfall and the control of weather in general. European dragons have come to have pagan associations within the Christian tradition, and so are regarded in many contexts as negative (although the essential moral ambivalence of dragons is apparent in the genuinely affectionate treatment they often receive in children's literature). By contrast, Chinese dragons have overwhelmingly positive associations as bringers of rainfall, and ultimately as symbols of imperial authority. In comparative perspective dragons must be seen as a family of related creatures, or rather creations, which share overlapping characteristics, rather than a single invariant type. The ubiquitous "horned serpent" of aboriginal North America, like both European and Chinese dragons, guards springs or other terrestrial water sources, and has horns, but unlike them it apparently does not fly. On the other hand, the plumed serpent of Mesoamerica flies and guards springs, but has no horns, while the rainbow serpent of aboriginal Australia has traits that vary from region to region, but include horns and an association with menstruation, or more particularly menarche.

Blust (2000: 520) summarizes the geographical distribution of traits associated with dragons in six major regions of the globe: 1. Europe, 2. the Near East, 3. India, 4. the Far East, 5. Mesoamerica, and 6. North America. To facilitate the discussion this information is repeated with minor changes in Table 1:

Table 1: The Geographical Distribution of Draconic Traits (1 = Europe, 2 = the Ancient Near East, 3 = India, 4 = the Far East, 5 = Mesoamerica, 6 = North America; + = Trait Reported)

	(1)	(2)	(3)	(4)	(5)	(6)
a)		+	+	+	+	+
b)	+	+	+	+	+	+
c)	+	+	+	+	+	
d)				+		
e)				+		
f)	+	+	+	+	+	+
g)	+	+	+	+		+
h)	+			+		+
i)		+			+	+
j)	+			+		
k)	+			+	+	
l)	+	+	+	+		+
m)	+			+	+	+
n)						+
o)	+			+		+
p)	+		+	+		
q)	+			+		+
r)				+	+	
s)	+			+		+
t)					+	+
u)	+					
v)	+					
w)	+		+	+		
x)	+		+			
y)				+		
z)	+	+				
aa)				+		+

a =giver/withholder of rain
b =guardian of springs or other bodies of water
c =capable of flight
d =appears when rain and sun are closely interspersed
e =can change shape or size, or suddenly disappear
f =has scales
g =has horns
h =has hair (mane, whiskers, etc.)

i =has feathers
j =is equine or hippophidian
k =is bisexual/androgynous
l =is opposed to thunder/lightning, or the sun
m =is colorful/red
n =is offended by a menstruating woman
o =terrifies young women; can impregnate them with demonic child
p =has fiery breath
q =has fetid or poisonous breath
r =causes tornadoes
s =causes floods
t =causes earthquakes
u =is an omen of catastrophe
v =is an emblem of war
w =guards a treasure
x =is connected with longevity/immortality
y =is connected with fertility
z =encircles the world
aa =lives in waterfalls

Several of these traits are discussed in Blust (2000), but my purpose in this article is to focus on just one, namely "k," the statement that dragons have traditionally been regarded in Europe, the Far East, and Mesoamerica as being simultaneously male and female, as this characteristic is far less commonly mentioned than such traits as the ability to fly, the possession of horns, whiskers, and fiery breath, or the habit of guarding treasures. Given the seeming arbitrariness of this trait, we naturally will want to understand why it exists, but before seeking explanations our first task is to document the reality of the claims.

5 The Sexual Ambivalence of Dragons, Far and Wide

To begin in Europe, few classic descriptions mention the sexuality of the dragon. Indeed, since they are often portrayed in myth and art as menacing young women in ways that are vaguely erotic, most dragons would appear to be unambiguously male. The classic "damsel in distress" who is rescued by a knight in shining armor is commonly shown with a dragon in the background that must be skewered by the lance of Christianity for the tale to end well.

However, there is a second context in which dragons appear in the European tradition, and that is medieval alchemy. The psychologist Carl G. Jung (1967, 1968) has written, in particular, about dragon symbolism in the alchemical process of transforming base metals into (philosophical) gold. Regarding Mercurius, the symbol of the philosophical union of opposites, he says (1967: 217 f.):

> The two substances of Mercurius are thought of as dissimilar, sometimes opposed; as the dragon he is "winged and wingless." A parable says "On the mountain lies an ever-waking dragon, who is called Pantophthalmos, for he is covered with eyes on both sides of his body, before and behind, and he sleeps with some open and some closed." There is the "common and the philosophic" Mercurius; he consists of "the dry and earthy, the moist and viscous." Two of his elements are passive, earth and water, and two active, air and fire. He is both good and evil. ...
> ... Because of his united double nature Mercurius is described as hermaphroditic. Sometimes his body is said to be masculine and his soul feminine, sometimes the reverse.

Hogarth and Clery (1979: 130) illustrate the philosophical concept of the conjunction of opposites in much the same way, with a painting of a semi-anthropomorphic dragon that has sprouted two human heads from its tail, one male, the other female, and is further topped by a Janus-like king-queen figure joined in one body. It is notable that in European dragon traditions this ambivalent sexuality surfaces only in the context of the alchemical quest for gold (precious knowledge), where it can be seen as a special application of the more general observation that dragons embody a fusion of opposed traits (reptilian body with feathers or hair, a creature of the sky and at the same time of earthly springs or waterfalls, massive bulk with sometimes tiny wings, etc.). Given these traits it is not difficult to see how the dragon could serve well as a concrete representation of the philosophical union of opposites. But this still leaves us with an unanswered question: just because dragons have traits that appear to be chimerical, why must they also be conceived as bisexual?

The foregoing question would be puzzling enough if this seemingly fanciful feature was restricted to a single, historically unitary cultural tradition (as we can perhaps assume for Europe). However, it becomes much more pressing (and intriguing) when it is also found in cultural traditions that we can reasonably assume to have been historically independent of European alchemy.

Commenting on the Chinese concept of the dragon, which shows every indication of having developed in isolation from the similar idea in Europe, the same writers note that in Taoist metaphysics the universe is governed by the interaction of opposed but united male (yang), and female (yin) principles, and *a propos* of the dragon they comment (Hogarth and Clery 1979: 52–54):

> Whether dragons derived from the Yang principle or from both was the subject of much learned debate in

which the number of scales on a dragon was of great significance ... Some experts insisted that the scales of a true dragon numbered exactly eighty-one, equalling nine times nine. According to Chinese philosophy, the number nine is Yang ... Other experts, arguing that dragons were not purely Yang but a combination of the qualities of Yang and Yin, put the number of scales at 117, made up of 81 imbued with Yang and 36 (six times six) with Yin.[1]

The details about the sexuality of dragons in European alchemy and Taoist metaphysics are, of course, different, but it would be hard to deny that they share a common element in portraying the dragon as at once male and female, and this convergence of beliefs in two widely separated folkloric traditions is bound to be startling when first encountered. It is well to take a moment to consider why this would be our normal reaction. Dragons are, after all, creatures of the imagination, and in contemplating the imagination we are apt to conceive of this aspect of human thought as unfettered, and its products as consequently not motivated by anything in the real world of sense impressions. So what would compel human beings who had no close contact with one another for millennia to produce supposedly arbitrary folkloric results that turn out to be remarkably convergent?

It is these kinds of widely distributed, but seemingly arbitrary culture traits that have fed into radical diffusionist theories of all kinds, including theories of the dragon, in earlier times (Smith 1919). For those with a different mental disposition the same observations have led to a kind of philosophical fatalism, perhaps best represented in the oft-quoted remark of Jorge Luis Borges (1967: 7) "We are as ignorant of the meaning of the dragon as we are of the meaning of the universe."[2] However, from the standpoint of general scientific method, such convergence should be taken as an indication that the traits in question are not as arbitrary as they might initially seem. Rather, if they have arisen independently in two different regions of the world, the probability is high that they are motivated by some shared features of human perception or psychology (or both).

Or could this agreement in the conception of dragons as bisexual both in Europe and in China simply be a fluke – a random product of chance? Given only two witnesses this possibility cannot be completely ruled out, despite the low probability that it is true. But again, basic scientific method gives us the guideposts we need to answer this question: the surest way to eliminate chance as an explanation for agreements in cross-cultural comparison is to multiply the number of witnesses that support a given inference. What that means in this case is that we search for a third historically independent cultural tradition in which the local version of a dragon is also conceived as +male or +female. There are, in fact, at least two other known cultural traditions in which this requirement is met. The first is the Maya of Yucatan and Guatemala.

In a generalist account of dragon beliefs, Huxley (1979: 9) compares Varuna, the Hindu god of water and the celestial sea, with Itzam Na, the celestial iguana of the Maya, "Itzam meaning iguana and Na, house or woman – whose name also has to do with milk, dew, wax, resin and sap. Itzam Na is bisexual, the male principle being in the sky 'in the midst of the waves' while his consort is the unfaithful Earth, goddess of weaving and painting, whose moon-lover yearly emasculates her spouse." Huxley gives no source for this statement, but he presumably drew, at least in part, on Spinden (1957), and Thompson (1970), who themselves rely heavily on early Spanish sources, and the contemporary ethnography of Mayan-speaking peoples. The latter writer (1970: 212) observes that

1 Hogarth and Clery do not cite a primary source, but Victoria Yen-hsin Chen has drawn my attention to some short passages in the Zhuangzi that discuss the nature of the dragon and point in the same direction. The most relevant of these passages is the following:

孔子 曰：'吾乃 今 於是乎見 龍！
Confucius say I PART today finally see dragon

龍， 合而 成 體，散而 成 章，乘 雲氣而 養乎 陰陽。'
Dragon gather form entity spread form essay ride clouds and form from yin yang

Translation: Now I finally see the dragon. Dragons, they can gather into shape and disappear; they ride on clouds and are formed by the yin and the yang"

2 The full quote in the original edition reads: "Ignoramos el sentido del dragón, como ignoramos el sentido del universo, pero algo hay en su imagen que concuerda con la imaginación de los hombres y así el dragón en distintas latitudes y edades." The English translation of Hurley (Borges 2005: xii) renders this as "We do not know what the dragon *means*, just as we do not know the meaning of the universe, but there is something in the image of the dragon that is congenial to man's imagination, and thus the dragon arises in many latitudes and ages."

Itzam Na means "Iguana House." Itzam is defined in the Vienna dictionary as *lagartos* like iguanas of land and water." *Lagarto* can mean anything from lizard to crocodile. ...
Thirty years ago I ... tentatively identified Itzam Na with the celestial monsters, so common in Maya art, which are part crocodile, lizard, or snake and may even have deer features (antlers or cleft hoofs). At that time the Vienna dictionary was undiscovered. Now that we have its entry defining Itzam *itzam* as "iguana," the case for that identification is immeasurably strengthened.

Elsewhere in the same publication he notes (1970: 21) that

Among the Lacandon, Itzam Noh Ku, "Itzam the Great God," is god of hail, lord of Lake Pelha in which he dwells, and according to a recent source, lord of crocodiles ... Itzam is a Pokom deity ... and, among the Kekchi of the Alta Verapaz and southern British Honduras who claim him as both male and female, he is a world directional mountain deity.

The evidence, then, points to a reptilian creature that lives in the sky, or that perhaps alternates between sky and earth, where he may dwell in terrestrial waters. Interestingly, Thompson further points out that in one of his various aspects (that of Itzam Na T'ul) he "could withhold good rains," a trait attributed to dragons in China and various other parts of the world (Table 1, point a).

One could, of course, quibble with the definition of "dragon" across distinct cultural traditions. While no one has any doubt about the classification of European and Chinese dragons as members of the same mythological category, despite differences of detail in both physical appearance and behavior, purists may wish to exclude dragon-like creatures in other parts of the world from the same category of imaginary beasts. However, as more information is collected, it becomes clear that, despite differences of detail, there is also a substantial body of seemingly arbitrary physical and behavioral traits that links dragon-like beasts as members of a common type, distinct from all others (cf. Table 1). Moreover, writers from Smith (1919) to Huxley (1979) have not hesitated in including at least the Plumed Serpent of Mesoamerica, and the Horned Water Serpent of North America as members of the dragon category. On the face of it, then, we have now established that European, Chinese, and Mesoamerican dragons all are conceived in at least some contexts, as being simultaneously male and female.

Before venturing into deeper waters, there is a fourth candidate for a dragon that is described as bisexual. The rainbow serpent of Australia was first introduced to a wide reading public through the pioneering ethnography of the British social anthropologist A. R. Radcliffe-Brown (1926, 1930). Since then it has become known as one of the defining features of many, if not most Australian aboriginal cultures. In a cameo piece, Mercatante (1988: 546) describes it as

a gigantic snake whose body arches across the sky as the rainbow ... Known as Taipan among the Wikmunkan people, he is associated with the gift of blood to humankind, controlling the circulation of blood, as well as the menstrual cycle of women ... Medicine men and rain makers invoke Taipan by using quartz crystals and sea shells in their rituals. Called Julunggul among the people of eastern Arnhem Land, the Rainbow Snake is believed to swallow young boys and later vomit them up. This is symbolic of their rebirth, or the transition from youth to manhood. Known as Kunmanggur in a myth told by the Murinbata of the Northern Territory to W. Stanner, the Rainbow Snake is either bisexual or a woman. Sometimes he is described as a male but is portrayed with female breasts.

By this point a pattern has clearly emerged: dragon-like creatures that dwell (at least part of the time) in the sky, and are associated with the rains, are conceived in widely separated parts of the world, and in vastly different cultural traditions as simultaneously male and female. It goes without saying that this many independent indications of a seemingly arbitrary trait in a creature that is thought by many to be an invention of pure imagination leaves little choice but to assume that there is a natural basis for the belief that dragons are bisexual. But if dragons do not exist in the real world, what basis could such a belief possibly have?

6 Beyond Dragons – and into the Real World

Before proceeding, it will be helpful to remind the reader how I am using the term "Naturalism," since it has radically different meanings in philosophy, as against folkore or cultural anthropology. My use of the term is closely similar to that of the Sanskritist, classical philologist, and folklorist Friedrich Max Müller over a century ago. Müller was convinced that many myths that feature human or animal figures were actually inspired by direct observation of natural events in the heavens (sun, stars, constellations, winds, etc.), rather than being the brainchild of some highly creative thinker detached from the real world.

As noted already, the type of interpretation that Müller defended, namely, that myths with anthropomorphic or theriomorphic figures were *descriptions* of natural events in the heavens that were important in the cultures of the mythmakers, has been criticized by later writers. In particular, the anthropologist Claude Lévi-Strauss took issue with the claim that the intent of the mythmaker is to portray or explain natural processes, and in general it is fair to say that Müller is thought of today as a scholar who represented a particular school of thought that is no longer supported by a majority of scholars.

What has often happened when the ideas of earlier scholars are rejected as having gone too far in the pursuit of a particular approach to data, is the phenomenon of "throwing out the baby with the bathwater": scholarly excesses are used as an excuse for denying the usefulness of *anything* that was claimed within a given school. However, we know that this kind of Hegelian dialectic in the discourse of science has sometimes led to scholars discarding valid and potentially useful ideas as part of the larger theoretical package that was considered either erroneous or uninteresting. The understanding of *mana* – the impersonal supernatural force associated with chiefs and other high-status individuals in Polynesia and other parts of the Pacific – is a case in point. Scholars since Codrington (1972 [1891]) have described the functioning of the *mana* concept in contemporary societies, but without any interest in how the concept itself might have originated. However, when the full range of meanings of this term is collected, it becomes clear that in a number of widely-separated Austronesian languages *mana* refers not only to the impersonal force associated with individuals of high hereditary rank but also to thunder and violent storm winds (Blust 2007). In considering the possible meaning of this term in the past, and its likely paths of change, it is safe on various grounds to rule out the possibility that it originally referred only to an impersonal supernatural force possessed by people and that was then transferred to dramatic and sometimes frightening natural events. Nor is it likely that the term in its original function referred both to powerful natural forces and to the power of a high-status individual. Rather, the most plausible semantic evolution of the term *mana* is that it began with exclusive reference to intimidating or awe-inspiring forces of Nature that were then attributed to human personalities as a concrete manifestation of their sociocultural power.

With this much in mind, it will be useful to return to the fundamental question that this article is intended to answer, namely, "why are dragons portrayed in widely separated cultural traditions around the world as being simultaneously male and female?" A good place to start is perhaps where we left off near the end of the previous section – with the rainbow serpent of Australia.

Although aboriginal Australia is not included in Table 1, it is clear that the rainbow serpent must be regarded as a type of dragon since, (a) like other members of the dragon category, it is a guardian of springs or other bodies of water (b), is capable of flight (c), appears where sun and rain are closely interspersed (d), is colorful (m), terrifies young women (o), resides in waterfalls (aa), and to our present point, is portrayed as combining male and female features in a single body (k). Most important of all with regard to finding an answer in Nature for why dragons are conceived as bisexual, the rainbow serpent is identical with the rainbow itself.

It is important to digress briefly to justify this claim, since no description of the rainbow serpent has ever, to my knowledge, called it a dragon, and the treatment of the topics "dragon" and "rainbow serpent" in standard encyclopedias of folklore and mythology such as Leach and Fried (1984) do not cross-reference the terms, or show any inclination to regard them as referring to the same mythic entity.

In examining the ethnology of the rainbow it takes little time to discover that the conception of this phenomenon in the Judaeo-Christian tradition is not at all typical of the world's preliterate cultures. In these the rainbow is commonly portrayed as a bridge between heaven and earth, as a weapon or other accoutrement of a divinity, or most typically, as an enormous spirit serpent that drinks water from a river or spring and sprays it out to cause the rain, or that drinks up the rain and causes it to cease. Rather than being an object of beauty or a sign of promise, in most traditional cultures the rainbow is feared (along with sunshowers), leading to a globally-distributed taboo against pointing at it with the index finger, lest the finger be permanently bent into the shape of the rainbow, become infected, severed, etc. (Blust 1999). Above all, despite its natural origin, the rainbow is traditionally seen as a *supernatural* presence to be respected, and in some ways avoided, since it is dangerous to all except powerful shamans.

To understand this conception better a brief thought-experiment might be helpful. Imagine yourself living in the Palaeolithic, with no literacy

or knowledge of scientific principles, but with a quick and inquisitive mind. If you are a man, for much of the time you probably are out hunting, and if you are a woman, you probably are out gathering useful plants. The sky darkens, and with a dramatic prologue of thunder and lightning rain begins to pummel the earth. You take cover to wait it out, and in due course the clouds part, and the sun shines through, across the lessened rainfall that continues to fall. At this moment an enormous colorful arc appears out of nowhere, reaching from horizon to horizon while fire (sun) and water (rain) compete for control of the sky. What is it? Where was it before it suddenly appeared high above the earth, and where will it go when it disappears? These are all natural questions for any intelligent being to ask, and there can be little doubt that Palaeolithic humans asked them of themselves and of one another. As already noted with reference to conceptions of the rainbow in tribal societies, the answer that was usually given is this: the rainbow is an enormous serpent snake (suggested by its elongated, colorful body). When it appears in the sky it is either causing the rain to fall by drinking from a terrestrial water source and spewing it out as rain, or it is causing the rain to cease by drinking it up (rainbows cannot appear in heavy storms or clear skies, but only when sun and rain are in competition for control of the sky). Where does it go when it suddenly disappears, or whenever it is not present in the firmament? That is when it dwells in springs or waterholes, acting as a guardian of this precious resource. It can hardly escape notice that this is exactly what dragons do, and the resemblance between rainbows and dragons does not stop there.

Describing the surprising similarity of the rainbow serpent myth across aboriginal Australia, Radcliffe-Brown (1930: 343) pointed out that "the rainbow-serpent lives in deep permanent lagoons and waterholes. In the New England tableland it is particularly associated with waterfalls, possibly because at such places rainbows may frequently be seen." Each of these well-documented features of the rainbow serpent is matched closely by accounts of more familiar dragons that have no known connection with the rainbow. The rainbow serpent lives in waterholes when it is not in the sky – this provides an answer to the basic question: "Where is it where it is not visible in the heavens?" But dragons also guard springs in widely-separated parts of the world, and every major waterfall for which adequate data has been collected, has its resident dragon.

In a well-known Greek myth, King Cadmus, founder of the city of Thebes, sent his companions to fetch water from the Spring of Ares, but when they arrived they found that the spring was guarded by a fierce dragon which killed most of them before the king himself returned to seek revenge against the monster. According to Huxley (1979: 5), quoting an earlier source, not much over a century ago, rural Macedonians in the Balkans spoke of horned serpents that guarded the "dragon springs" (wells) of their countryside. Very similar accounts of "dragon-rearing wells" are reported in China by de Visser (1913: 63), who states that "[n]obody dared draw water from this well, because if one did so, strange things happened, and the person who had ventured to thus arouse the dragon's anger fell ill." Similarly, the Horned Water Serpent of North America and the Plumed Serpent of Mesoamerica and parts of the American Southwest are well-known guardians of springs. To cite only one of many possible accounts, Spicer (1980: 64) states that among the Yaqui of northwest Mexico respected spiritual powers were connected with certain springs, where "snakes with rainbows on their foreheads lived and swam in the water." It is clear, then, that European and Chinese dragons, and the Horned Water Serpent and Plumed Serpent of the Americas, which are commonly treated as types of dragons, are depicted in various accounts as dangerous guardians of springs.

The association of rainbows with waterfalls is due to basic physics: water crashing against the rocks or river below sends spray high into the air, and sunlight shining through it refracts light in the same way that is seen when sunlight shines through raindrops. We can, therefore, expect any major waterfall (one that sends significant spray high into the air) to be a generator of rainbows on sunny days. Given this observation, it is of no small interest that every major waterfall for which data has been collected has its resident dragon. The Horned Water Serpent of Niagara, as conceived in the belief system of the local Seneca Indians, has been thoroughly documented by several writers, beginning with Lewis Henry Morgan (1851). Frazer (1922/2: 156) observed that "[t]he Oyampi Indians of French Guiana imagine that each waterfall has a guardian in the shape of a monstrous snake, who lies hidden under the eddy of the cascade, but has sometimes been seen to lift up its huge head." Shortly after this passage, with reference to a very similar belief in southern Africa, he adds: "in Basutoland the rivers Ketane and Maletsunyane tumble, with a roar of waters

and a cloud of iridescent spray, into vast chasms hundreds of feet deep. The Basuto fear to approach the foot of these huge falls, for they think that a spirit in the form of a gigantic snake haunts the seething cauldron which receives the falling water." Finally, a concerted effort to discover whether the falls at Iguazú, on the Brazilian-Argentine border, have a resident dragon, turned up a positive result in the legend of Taroba and Naipi. According to Antonio Andres-Lopez, who collected the Spanish text, the local Guarani Indians tell a story of how the Iguazú falls were formed. From the earliest times the Iguazú river was inhabited by an enormous and monstrous serpent which demanded that a beautiful young woman be sacrificed annually to appease him. One year, a young priest named Taroba had the duty of delivering the victim, named Naipi, to the monster, but before doing so he fell in love with her, and so refused to carry out his duty. Mboi, the monster (said to mean "viper" in the local form of Guarani) was driven into a fury, whipping his body about and dividing the course of the river to form the cataracts seen today. It is also clear, then, that wherever waterfalls generate rainbows, dragons appear.[3]

Without entering into further details, then, it should be clear that the rainbow serpent of aboriginal Australia and the more familiar dragons of Europe and the Far East are members of the same category, and that both have arisen from preliterate attempts to understand weather phenomena of the natural world.

7 Why Rainbows Are Bisexual

We began this inquiry with a simple question "Why, in widely-separated cultural traditions, are dragons conceived as bisexual?" Like many basic questions, this one has turned out to be complex, but the first step has now been taken, namely, to establish the cognitive equivalence in tribal societies of dragons with rainbows. The mere fact that dragons and rainbows are radically separate concepts in the Judaeo-Christian tradition should not blind us to the clear connections they have in many tribal societies up to the present time. Rather, the concept of the rainbow serpent, which is still plainly visible in traditional Australian aboriginal belief systems, and only lightly disguised in others, has been transformed in societies with a longer tradition of literacy by a conceptual separation of the rainbow (with its generally positive associations) from the serpent (with its generally negative ones). Within the European tradition, this separation appears to be complete, but in China, there is an interesting split between courtly and folk traditions: in the courtly tradition, where a five-toed dragon became the symbol of the emperor, dragons and rainbows have little clear connection, but in the folk tradition, the rainbow serpent motif remains vividly present. According to a personal communication from Professor Lo Chin-tang, formerly of the Department of East Asian Languages at the University of Hawai'i, the common people of Lanzhou in Gansu province see the rainbow as an immense dragon that drinks water from the sea and sprays it out as rain. Remarkably, then, the folk tradition in at least some parts of China more closely resembles that of culturally simple tribal peoples in other parts of the world than it does the rich and elaborate courtly tradition in its own culture.[4]

But we have not finished our search. If the idea of dragons evolved from preliterate conceptions of the rainbow, how did the notion of sexuality arise with dragons, since rainbows are inanimate, and obviously have no sexual identity? Again, we need to remind ourselves that human perceptions of nature are mediated by culture, and that cultural interpretations involve projections from the human realm onto that of the natural world. However, before looking at cultural interpretations we must return to the basics of the rainbow itself.

Any account of the optics that produce rainbows will explain that rainbows naturally occur double, the primary arc being lower and brighter, and the secondary arc higher, fainter, and with the color pattern of the spectrum reversed. To a physicist the two arcs of the rainbow are primary and secondary, but to tribal peoples accustomed to animating nature with properties that govern their own social organization and lives, it would be surprising if they did not characterize this feature of

3 Given its similarity to the classical Greek story of Theseus and the Minotaur, it is possible that the legend of Taroba and Naipi shows postcontact influence from the dominant Spanish culture. However, this cannot explain why the tale is designed to explain the origin of the Iguazú Falls – very much like the Seneca story of the origin of the Horseshoe Falls at Niagara – and most particularly, why its central character is a gigantic serpent that lives in the spray of the cataract.

4 Victoria Yen-hsin Chen has further drawn my attention to the Mengxi Bitan, a collection of personal anecdotes written by the Song dynasty scholar Shen Gua (1031–1095) between 1086 and 1093, in one of which he notes that "[p]eople used to spread the saying that the rainbow can enter the river and drink from it," confirming the veracity of this claim by stating that he himself has seen the end of a rainbow reaching into a stream.

the rainbow in a more personalized way. This kind of information is not often collected or reported, even in the most detailed ethnographies, but bits and pieces have been noted in enough widely separated societies to make it clear that the two arcs are often called the "male" and "female" arcs in cultures spanning the planet.

Among Austronesian-speaking peoples Malays call the rainbow *pelangi* (although in the closely-related Minangkabau it is *ular minum* = "snake drinking"). However, a double rainbow is called *pelangi sekelamin*, where *se-* is a prefixal form of "one" and *kelamin* is "married couple." To traditional Malays, then, the double rainbow was a married pair, male and female (Skeat 1900: 15, fn. 2). Among Palauan speakers in western Micronesia the clear arc is said to be female, and the indistinct one male (Sandra Chung, p. c.). On the other side of the Pacific Ocean the Totonac of Mexico describe the rainbow as simultaneously male and female (Ichon 1969: 137), the Chibchan-speaking Cuna of Panama call the brighter arc male and the fainter one female (Nordenskiöld 1938: 394), and the Quechua-speaking Inga of Colombia say that a double rainbow is both male and female (S. H. Levinsohn, p. c.). Across the Atlantic Ocean among the Hausa of Nigeria, according to Tremearne 1968: 340) "Gajjimare [rainbow] … is in shape something like a snake but is hermaphrodite, or at least double gendered, the male part being red, the female blue." Elsewhere in Africa de Heusch (1982: 37) notes that among a whole array of Bantu-speaking peoples "[t]he rainbow effectively embodies a contradiction: at once male and female, it unites fire and water, high and low." Among the Venda this contradiction is expressed by the opposition of masculine water to feminine fire.

Finally, although general English-language treatments of the rainbow in China are hard to find, it turns out that writers of the Chinese classics repeatedly over a period of many centuries refer to the two arcs of the rainbow as "male" and "female." I am very much indebted to Victoria Yen-hsin Chen for bringing these sources to my attention, and for helping me understand some of the details. Briefly, they can be summarized as follows:

In what is perhaps the earliest known source, the "Erya" (爾雅), described by Karlgren (1931: 46) as "a collection of direct glosses to concrete passages in ancient texts" and by others as a dictionary, glossary, thesaurus, or encyclopedia, it is stated that the rainbow has both male (*hung* 虹) and female (*ni* 霓) arcs. The dating of this source is problematic, as glosses evidently were added at different times over a period of several centuries, but Karlgren states that most of them are securely dated to the 3rd century B. C.

In the "Book of Han" (漢書), authored by Ban Gu, who lived from A. D. 32–92, there is a description of the rainbow which notes its two arcs, commenting that the one with salient color is the male arc (called *hung* 虹), and the one with light color is the female arc (called *ni* 霓). Next, in what is perhaps the most important work of literary scholarship during the Han dynasty, the "Shuowen Jiezi" (說文解字), compiled by the scholar Xu Shen in A. D. 100 and belatedly presented by his son Xǔ Chōng to the emperor An of Han in A. D. 121, contains the observation that "Ni, is a bent rainbow, with red, green, or white color. It is the yin 陰." Furthermore, toward the end of the Eastern Han dynasty the "Yueling zhangju" (樂令章句), authored by Tsai Yung (A. D. 133–192) comments that the rainbow is a "type of worm," the primary arc being male and the secondary arc female. Considerably later, during the Song dynasty (A. D. 960–1279), the "Guangyun" (廣韻), authored by Pang-nian Chen and others, states that the secondary rainbow is the female rainbow.

Attention to the Chinese classics over a period of more than a millennium, then, confirms that not only was the dragon conceived as either *yin* (陰) or *yang* (陽), or as both, but that the rainbow was also represented in its natural form as displaying two arcs, a primary (brighter) one that was called the "male" (*hung,* 虹) arc, and a secondary (fainter) one that was called the "female" (*ni,* 霓) arc.

The assignment of genders to celestial objects should not come as a surprise, since European languages commonly assign opposite grammatical genders to the sun and moon, and among many tribal peoples the sun and moon are conceived in various ways as being one sex or the other, but never the same one (Lévi-Strauss 1976). However, most cultures stop with the sun and moon, leaving the stars, rainbows, and other celestial phenomena unclassified. A notable exception is the Panare Indians of Venezuelan Guiana, where Dumont (1979: 250) recorded the following attributions of sexuality to celestial bodies (with plus and minus values marked for "male" and "female": sun (+ –), moon (– +), stars (– –), Milky Way (– –), rainbow (+ +). In other words, while the sun and moon are regarded as male and female respectively, the stars and Milky Way are regarded as being neither male

nor female, and the rainbow is considered bisexual.

8 Conclusions

The question of why dragons are conceived in widely separated cultural traditions as being simultaneously male and female is initially a baffling one. However, once a thorough study of the ethnology of the rainbow is undertaken, it becomes clear that the idea of the dragon must have evolved from the once panhuman conception of the rainbow as an enormous snake that drinks water from terrestrial sources and spews it out as rain, or that drinks up the rain and causes it to stop. The rainbow serpent continued its existence with only minor changes over much of aboriginal Australia, and in a somewhat modified form among Bantu-speaking peoples in Central Africa, but traces of its former existence are found over a much broader band of humanity.

Despite whatever shortcomings the "physical religion" or Naturalism of Friedrich Max Müller may have had over a century ago, the problem addressed here and its solution show without any doubt that some globally-distributed features of culture, that at first appear totally arbitrary, are in fact motivated by careful observation of the natural world. So-called "primitive man" may have lacked the scientific tools to understand the physical mechanisms behind the natural phenomena he observed, but his observations were accurate, and his explanations understandable within the animistic world in which he lived. Given this perspective the famous quote by Borges (2005: 7) that "[w]e are as ignorant of the meaning of the dragon as we are of the meaning of the universe" must be seen as unduly pessimistic. While the meaning of the universe may lie forever beyond human comprehension, the meaning of the dragon has yielded to careful scientific inquiry, and in the process has shed light on an important chapter in the history of human thought.

References Cited

Blust, Robert
1999 The Fox's Wedding. *Anthropos* 94: 487–499.
2000 The Origin of Dragons. *Anthropos* 95: 519–536.
2007 Proto-Oceanic *mana Revisited. *Oceanic Linguistics* 46/2: 404–423.
n. d. Pointing, Rainbows, and the Archaeology of Mind. [Ms.; 42pp.]

Borges, Jorge Luis
1967 El libro de los seres imaginarios. (Con la colaboración de Margarita Guerrero.) Buenos Aires: Kier [Orig. 1957]
2005 The Book of Imaginary Beings. (Transl. by Andrew Hurley.) New York: Viking.

Codrington, Robert H.
1972 The Melanesians. Studies in Their Anthropology and Folk-Lore. New York: Dover Publications. [Orig.1891]

Craig, William Lane, and **J. P. Moreland** (eds.)
2000 Naturalism. A Critical Analysis. London: Routledge. (Routledge Studies in Twentieth Century Philosophy, 6)

Dumont, Jean-Paul
1979 Not in Ourselves, But in Our Stars. In: D. L. Browman and R. A. Schwarz (eds.), Spirits, Shamans, and Stars. Perspectives from South America; pp. 241–254. The Hague: Mouton Publishers.

Frazer, James George
1922 The Golden Bough. A Study in Magic and Religion. 2 Vols. London: Macmillan.

Heusch, Luc de
1982 The Drunken King, or, the Origin of the State. (Transl. and Annotated by Roy Willis.) Bloomington: Indiana University Press. [Orig. 1972]

Hogarth, Peter J. (with Val Clery)
1979 Dragons. New York: Viking.

Huxley, Francis
1979 The Dragon. Nature of Spirit, Spirit of Nature. New York: Collier Books.

Ichon, Alain
1969 La religion des Totonaques de la Sierra. Paris: Éds. du CNRS.

Jung, Carl G.
1967 Alchemical Studies. (Transl. by Richard F. C. Hull.) Princeton: Princeton University Press. (Bollingen Series, 20)
1968 Psychology and Alchemy. (Transl. by Richard F. C. Hull.) New York: Pantheon Books. (Bollingen Series, 20) [2nd Ed.; Orig. 1953]

Karlgren, Bernhard
1931 The Early History of the Chou Li and Tso Chuan Texts. *The Bulletin of the Museum of Far Eastern Antiquities* 3: 1–59.

Leach, Maria, and **Jerome Fried (**eds.)
1984 Funk and Wagnall's Standard Dictionary of Folklore, Mythology, and Legend. 2 Vols. San Francisco: Harper & Row.

Lévi-Strauss, Claude
1962 The Savage Mind. Chicago: The University of Chicago Press.
1976 The Sex of the Sun and Moon. In: C. Lévi-Strauss, Structural Anthropology. Vol. 2; pp. 211–221. New York: Basic Books.

Mannhardt, Wilhelm
1875 Wald- und Feldkulte. 2 Teile. Berlin: Gebrüder Borntraeger.

Mercatante, Anthony S.
1988 The Facts on File Encylopedia of World Mythology and Legend. New York: Facts on File.

Morgan, Lewis Henry
1954 League of the Ho-De-No Sau-Nee or Iroquois. New Haven: Human Relation Area Files. [Orig. 1851]

Müller, Friedrich Max
1891 Physical Religion. London: Longmans, Green and Co.

Nordenskiöld, Erland
1938 An Historical and Ethnological Survey of the Cuna Indians. Göteborg: Göteborgs Museum. (Comparative Ethnographical Studies, 10)

Radcliffe-Brown, A. R.
1926 The Rainbow-Serpent Myth of Australia. *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 56: 19–25.
1930 The Rainbow-Serpent Myth in South-East Australia. *Oceania* 1/3: 342–347.

Skeat, Walter William
1900 Malay Magic, Being an Introduction to the Folklore and Popular Religion of the Malay Peninsula. London: Macmillan.

Smith, Grafton Elliot
1919 The Evolution of the Dragon. Manchester: Longmans, Green & Co.

Spicer, Edward H.
1980 The Yaquis. A Cultural History. Tucson: The University of Arizona Press.

Spinden, Herbert J.
1957 Maya Art and Civilization. Indian Hills: Falcon's Wing Press. [Rev. and Enl. with Added Illust.]

Thompson, J. Eric S.
1970 Maya History and Religion. Norman: University of Oklahoma Press. (The Civilization of the American Indian Series, 99)

Tremearne, A. J. N.
1968 The Ban of the Bori. Demons and Demon-Dancing in West and North Africa. London: Frank Cass. [Orig. 1914]

Visser, Marinus Willem de
1913 The Dragon in China and Japan. Amsterdam: J. Müller.