

From an African bestiary to universal science?

Cluster analysis opens up a world-wide historical perspective on animal symbolism in divine attributes, divination sets, and in the naming of clans, constellations, zodiacs, and lunar mansions

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1. Introduction: Universalism and the extension of knowledge systems in space and time

On 23 November, 2001, I was invited by the Netherlands Society for the Philosophy of Science to deliver an address on ‘Knowledge and culture’. My discussion focussed on Sandra Harding’s work over the past decade in the philosophy of science.¹ While critical of the so-called ‘strong’² variant of relativism in the philosophy of science, she exhibits a weaker relativism; this makes her explore the social, political, economic and historical reasons which may have led to modern (i.e. Western, North Atlantic, or cosmopolitan science) to endow itself (rightly or wrongly) with the three crucial characteristics of rationality, universality and objectivity. Yet Harding clearly hopes that these *external* forces will not be all, and that there will turn out to be something in the *internal* nature

¹ Harding, S., 1991, *Whose science? Whose knowledge? : Thinking from women’s lives*, [**check subtitle**] Ithaca, NY: Cornell University Press; Harding, S., 1992, ‘After the neutrality ideal: science, politics and “strong objectivity”’, *Social Research*, 59: 567-587; Harding, S., 1993, ed., *The ‘racial’ economy of science: Toward a democratic future*, Bloomington: Indiana University Press; Harding, S., 1994, ‘Is science multicultural? Challenges, opportunities, uncertainties’, *Configurations*, 2, 2: [**add pages**] , reprinted in: Goldberg, D.T., 1994, ed. , *Multiculturalism: A Reader*, London: Blackwell, pp. [**add pages**] ; Harding, S., 1997, ‘Is modern science an ethnoscience? Rethinking epistemological assumptions’, in: Eze, E.C., ed., *Postcolonial African philosophy: A critical reader*, Oxford: Blackwell, pp. 45-70. My argument below is largely based on the latter article but against the background of Harding’s other publications as cited.

² Philosophers and historians of ideas often differentiate between ‘strong’ and ‘weak’ versions of a particular theoretical position, such as relativism, empiricism, falsificationalism, materialism etc. The stronger version consistently takes the theory to its ultimate consequences, often at variance with conventional wisdom; the weaker position is less extreme and consistent, and humours conventional wisdom to some extent. Cf. Bloor, D., 1993, ‘Strong programme’, in: Dancy, J., & Sosa, E., eds., *A companion to epistemology*, Oxford/ Cambridge (Mass.): Blackwell’s, first published 1992, pp. [**add pages**] , where the strong variant of social constructivism is described as holding the view that also true knowledge is nevertheless socially determined; incidentally, such a position also underlies Harding’s as discussed here: she is looking for (a) social determinants of science’s claims to objectivity, rationality and universality, but does so without (b) excluding the possibility that there could also be internal epistemological grounds for such a claim. Goldman, A.I., 1988, ‘Strong and weak justification’, *Philosophical Perspectives*, 2: 51-71, who describes strong and weak versions of subjectivism; and Harding, S., ‘After the neutrality ideal’, *o.c.*, where varieties of objectivity as a scientific ideal are explored.

and the special epistemology of modern science that would justify its claim to these three characteristics, regardless of the historical political package that has lend extra credibility to such a claim.

One of Harding's arguments is that modern science appears universal, not only because

1. it effectively applies wherever we can ascertain such applicability by means of sensory perception, but also because
2. it is represented everywhere: there are no clear social, ethnic, linguistic or national limits to its actual application, its sphere of effectiveness in fact appears to extend endlessly; in fact, everywhere in the contemporary world there are recognisable centres of exchange for that science (in the form of universities, research institutes, schools,. book shops, museums, Internet sites, television documentaries, experts, etc.), both among professional scientists and between science and the wider society.

Without contesting the validity of Harding's insight on this point, my familiarity, as an ethnographer, historian, and intercultural philosopher, with a number of other systems of knowledge than modern science makes her insight appear in a different light. In fact, many of these non-scientific systems of knowledge have a geographic extension of applicability that is far from local, showing an amazing continuity or convergence at a continental and even intercontinental scale. The point deserves to be developed in detail and with proper empirical backing, because if it can be shown to be true, it would help us take a relative view of the distinction between modern science and other systems of knowledge, and help us appreciate their nature, spread, and persistence over long stretches of time and space.

That a world-wide continuity in systems of knowledge is not only found in contemporary cosmopolitan science but is a long-established fact of cultural history, may be argued, in the first place, on the basis of the extremely wide spread of major mythological patterns like that of 'hero fights monster' (cf. Table 1), which we will summarise in the next section.

2. A near-universal theme in systems of mythological knowledge: ‘hero fights monster’

Bodies of mythological knowledge are among mankind’s oldest attested and (with important exceptions, see below) best studied systems of knowledge. The recognition of the similarity of mythological patterns as found in distinct linguistic and cultural tradition was already a fact in Antiquity, when it inspired the practice of the *interpretatio graeca*:¹ the projection of Greek mythological proper names and concepts onto the mythologies and ritual practices of the Egyptians, Scythian, Celts, etc. at the periphery of the Greek world – a practice well-known from the works of Herodotus and Plato. World-wide, the available mythological material is of an incredible wealth. To make, for the mere purpose of setting the introductory framework, the point of far-reaching continuity and convergence here, I prefer to select only one mytheme (i.e. the smallest meaningful unit of mythological narrative), that of ‘hero fights monster’, and to study it by reference to just one, highly reliable and authoritative, source: the account of Fontenrose’s explorations into the charter myth of the famous Delphic oracle in Ancient Greece. The mytheme involves two archetypal characters, the hero and the adversary, to which often a third is added: the usually passive heroine.

The table demonstrates the truly amazing, nearly universal distribution of this mytheme across world cultures.

¹ Cf. Griffiths, J.G., 1980, ‘Interpretatio graeca’, in: Helck, W., & Otto, E., eds., *Lexikon der Ägyptologie*, Wiesbaden, Harrassowitz, vol. III, cols. 167-172.

	selected protagonists	selected enemies	<i>selected passive heroines</i>
African interior	Perseus	Ketos	<i>Aso, Andromeda</i>
Egypt	Ammon, <i>Athena / Neith</i> , Geb, Horus, <i>Isis</i> , Min, Osiris, Ra, (Set), Thoth, <i>Uto</i>	Apep, Bata, Busiris, the Sea, Set, (Thoth)	<i>Anat, Asherat, (Isis), Nut</i>
Canaan, Israel, Ugarit, Syria	<i>Anat</i> , Aqhat, Baal, <i>Beltis</i> , El (II), (<i>Judith</i>), Kadmos, Melqart, <i>Paghat</i> , Perseus, Phoenician heaven god, Yahweh	Holofernes, Humbaba, <i>Judith</i> , Ketos, Leviathan, Mot, Orontes, Phoenician hawk dragon, Satan, Tannin, Yam, Yatpan	<i>Andromeda, Asherat, Kassiepeia, Omphale, Phoenician earth goddess</i>
Anatolia, Cilicia, Hittites, Cyprus	Baal Tarz, Hittite Weather God, Hupasias, <i>Inaras</i> , Kumarbi, Marsyas, Perseus, Sandon, Teshub, Telipinu	dragon, Illuyankas, <i>Medusa</i> , Okeanos, Syleus, Typhon, Ullikummi, Upelluri	<i>Aphrodite, Semiramis</i>
Mesopotamia	Anu, Ea, (Enkidu), Enlil, Gilgamesh, (<i>Inanna</i>) / (<i>Ishtar</i>), Lugalbanda, Marduk, Nergal, Ninurta, Shamash, Tammuz	Apsu, Asag, Bilulu, (Enkidu), <i>Erishkigal</i> , (Gilgamesh), Girgire, Humbaba, Imdugud, <i>Inanna / Ishtar</i> , Kingu, <i>Labbu</i> , Seven Demons, <i>Tiamat</i> , Zu	
India, South East Asia, Persia	Fredun = Thraetaona, Indra, (<i>Kaikeyi</i>)	Azi Dahaka, <i>Danu</i> , Garuda, <i>Manthara</i> , Nahusha, Namuci, Ravana, Sinhika, Viparupa, Vritra	(<i>Kaikeyi</i>)
China	Chu Yang, Li Ping, No Cha, Shen Yi, Yi, Ying Lung, Yü	Ch'ih Yu, Chu Wang, dragon, Fung Po, Ho Po	<i>Hsi Wang Mu</i>
Japan	Agatamori, Amewakahiko, Izanagi, Raiko, (Susanowo), Takemikazuchi	Susanowo	Amaterasu, Izanami

North Africa and Southern Europe	<i>Athena / Neith</i> , Herakles, Melqart, Perseus	Antaios, Atlas, Cacus, Evander / Faunus, Geryon, Ophion	
Greece	Apollo, <i>Artemis, Athena</i> , Dionysos, Erechtheus, Eros, (<i>Hekate</i>), Herakles, (Hermes), <i>Io</i> , Kadmos, Kronos, Pan, (Poseidon), Uranos, Zeus [Keraunios] ²	Acheloos, <i>Aigis</i> , (Apollo), Ares, <i>Delphyne, Despoina</i> , Diomedes, (Dionysos), Drakon, <i>Echidna</i> , Gigantes, Glaukos, Hades, <i>Hekate, Hera</i> , (Herakles), (Hermes), <i>Hydra, Kampe</i> , Kepheus, Keto, Ker, (Kronos), Kyknos, <i>Lamia</i> , Laogoras, Laomedon, Linos, Neleus, Ocean = Okeanos, Ogygos, <i>Pallas</i> , (Perseus), Phlegyas, Phorbas, Poine, Poseidon, Python, the Sea, <i>Sphinx, Styx, Sybaris</i> , Tartaros, <i>Telphusa</i> , Thanatos, <i>Thetys</i> , Titans, Tityos, (Uranos), Zeus [Chthonios], Zeus's hawk ³	(<i>Artemis</i>), <i>Deianeira</i> , <i>Demeter</i> , <i>Ge, Io, Kelto, Leto, Moirai, Persephone, Rhea, Xenodike</i>
pre-Christian Northern Europe	Bearson, Beowulf, Hagen, Odin, Ogier the Dane, Parzival, Sigurd / Siegfried, Sigmund, Thor	dragon, Fafnir, Firedrake, Grendel, <i>Grendel's Mother, Hel, Holda, Lorelei</i> , Midgard Snake, Regin-Mimir, <i>Valkyrie, Venus, Ymir</i>	<i>Audumla, Brynhild, Krimhild, Lohengrin</i>
Christian Europe	St Evenmar, St George, St Michael	Satan, St George's dragon, <i>the Woman of Rev. 12 & 17</i>	
Americas	Coyote, Gucumatz, Hunahpu, Xbalanque, Tahoe	Nashlah, Xibalba, Vucub-Caquix, Wishpoosh	

Table 1. A near-universal theme of systems of mythological knowledge: 'hero fights monster'

Table compiled on the basis of scattered information contained in: Fontenrose, J., 1980, *Python: A study of Delphic myth and its origins*, Berkeley etc.: University of California Press, reprint of the 1959 edition

Explaining such a near-universal distribution is another matter, and in this connection a number of hypotheses will be developed towards the end of the present paper. As far as our mytheme is concerned, the global distribution does not necessarily confirm a hypothesis (however obvious

² To which could be added, e.g., Agenor, Argos, Eurybatos, Euthymos, Koroibos, Lykos, Pyrrhichos, Silenos.

³ To which could be added, e.g., Admetos, Akrisios, Aktaion, Amykos, Amyntor, Asklepios, Autolykos, Dryopes, Erginos, Eurynomos, Eurypylos, Eurytion, Eurytos, Euphemos, Geras, Heros of Temesa, Koronos, Ladon, Laistrygones, Lakinios, Lityerses, Lykoros, [Peri-]Klymenos, Phineus, Phorkys, Polydektes, Satyros, Theiodamas, Tiphys, Titias.

that would be) in terms of diffusion from a particular well-defined and limited geographical origin. Cross-cultural studies have always cherished the hypothesis of a constant, universal structure of the human mind and the human body, as a rival explanation for cross-cultural convergence of specific cultural and social-organisational traits, which might otherwise have to be explained in terms of diffusion from a specific origin. For the global distribution of our mytheme this means that it is quite possible that its central struggle merely reflects an internal struggle which occurs, time and time again, in the mind of every human being whenever and wherever, so that the expression of that struggle in myth would be a case of ever repeated parallel invention inspired by the universal characteristics and tendencies of the human mind – and not the gradual diffusion, from a specific origin in time and space, of a mytheme that was only invented once for all and, instead of being locally produced from scratch all the time by human minds, was transmitted by means of explicit cultural communication from one culture and period to the next, undergoing major changes in the process, but still retaining its basic mythemetic structure. In his concluding pages, Fontenrose himself tends to an explanation in terms of the struggle that is part of the universal human experience: for him the mytheme sums up every human being's life's story in the face of inevitable death – the hero is simply Everyman. Personally I feel that here he was unduly yielding to the anti-diffusionist and pro-localising tendencies of cultural analysis in the middle of the twentieth century: the Everyman interpretation is disappointingly unspecific and blunt, in view of the many world-wide parallels, not just in the overall mythemetic application but especially in the details of its elaboration and application – reference to some kind of historical process to explain these parallels by reference to the emergence and interactions of specific cultural formations would seem to be needed at least in addition to the all too predictable Everyman hypothesis.

It is however important to keep in mind that Table 1 merely shows a pattern of distribution in time and space, of one mytheme that has been defined in purely typological terms. The typological similarity between the mythemes found in the various cultures listed in Table 1, does not in itself allow us to take a further step and already take the typological similarity as evidence for a generic, historic relationship – as if we can

already take for granted that ‘hero fights monster’ is in fact one and the same story told all over the world in only superficially differing ways. Methodologically, the step from distribution to historical explanation is a very major one, and it does not advance our insight if we would pretend that it is not.

One might even go further and question the assumption that Table 1 in its many cells lists in fact the recurrent occurrence of one and the same phenomenon here summarised by the concept of the mytheme. One could argue that as a result of the richness of narrative free variation in all the many different myth to which Table 1 refers, all the mythical characters listed are truly incomparable. This would make their reduction to the simple formula of ‘hero fight monster’ to an absurdity violating the literary contents and its value.

My response to such a challenge would be that the structuralist analysis of myth⁴ has brought us to postulate that underneath the myths’ narrative surface structures (which certainly also need to be analysed in their own right) relatively simple schemes lurk, which are recurrent in space and time, and whose identification allows us to appreciate the structural unity underlying the surface diversity. This is not an appeal to any universal identity of the human experience or human mind, not to an idiosyncratic, intuitive method of literary hermeneutics, but to a body of theoretical viewpoints and analytical procedures (first formulated by Claude Lévi-Strauss against the background of the linguistic and

⁴ Cf. Lévi-Strauss, C., 1960, ‘Four Winnebago myths: A structural sketch.’ In: Diamond, S., ed., *Culture and history*, New York: Columbia University Press, pp. 351-362; Lévi-Strauss, C., 1968, ‘The story of Asdiwal’, in: Leach, E.R., ed., *The structural study of myth and totemism*, London, 2nd impr., pp. 1-47, first published 1967; Lévi-Strauss, C., 1969-78, *Introduction to a science of mythology*, 4 vols., trans. by J. Weightman & D. Weightman, Harmondsworth: Penguin / Chicago: Chicago University Press [check], original French edition: *Mythologiques I: Le cru et le cuit*, 1964; *II: Du miel aux cendres*, 1966; *III: Origines des manières de table*, 1968; *IV: L’homme nu*, 1971, all at Paris: Plon; Lévi-Strauss, C., 1971, ‘Rapports de symétrie entre rites et mythes de peuples voisins’, in: Beidelman, T.O., ed., *The translation of culture*, London: Tavistock, pp. 161-177; Lévi-Strauss, C., 1973, ‘La structure des mythes’, in: Lévi-Strauss, C., *Anthropologie structurale I*, Paris: Plon, 1973, pp. 227-255; Lévi-Strauss, C., 1979, *Myth and meaning*, London: Routledge & Kegan Paul; Leach, E.R., 1967, ed., *The structural study of myth and totemism*, London: Tavistock; Leach, E., & Aycok, D.A., 1983, *Structuralist interpretations of biblical myth*, Cambridge: Cambridge University Press; van Binsbergen, W.M.J., 1985, ‘The historical interpretation of myth in the context of popular Islam’ in: van Binsbergen, W.M.J., & Schoffeleers, J.M., eds., *Theoretical explorations in African religion*, London/ Boston: Kegan Paul, pp. 189-224; also at http://come.to/african_religion.

psychological structuralism emerging in the first half of the twentieth century) that allow contemporary academic analysts of myths, working within the continually developing intersubjective canons of their sub-discipline, to detect mythical infrastructures, to analyse individual surface myths as transformations of such an infrastructure, and by this procedure define, in considerable detail, the systematic correspondence and differences between surface myths, as found the same and different cultures and historical periods.

Table 1 is only meant as an initial example of the kind of evidence we have for claims concerning the wider distribution in time and space of ancient, non-scientific systems of knowledge. We will not attempt here to subject the material presented there to further analysis. Meanwhile the table illustrates another thing: the paucity of African references in the context of this kind of analysis. Inevitably, ancient Greek material is over-represented in Fontenrose's data base (he is primarily a classicist), and what little African references his book contains derives from ancient Greek sources. For the purpose of illustrating the world-wide distribution of the 'hero fights monster' mytheme this is immaterial. However, the problem is much wider: as compared to the wealth of academic knowledge production on kinship, social and political organisation, ritual, work on African myths is relatively rare, and whenever it exists it is usually in such an obscure and specifically African format and context that it is not available for intercontinental cross-cultural comparative studies by scholars who are not themselves Africanists.⁵

The anthropological study of myth has traditionally been coupled to that of a topic that captivated nineteenth and early twentieth century researchers but that has since sunk into virtual oblivion: *totemism*, by which is meant a system of social and natural classification in terms of which sets of people are named and otherwise associated with classes of phenomena in the natural world, especially with animal and plant species. Lévi-Strauss revived this field in the middle of the twentieth century,⁶

⁵ Within the research group on Agency in Africa of the African Studies Centre, Leiden, established 2002, I am now initiating research intended to cover this relative blind-spot. The present paper could be counted as the first product of that research. The intercontinental continuity of myths including African myths also plays an important role in my forthcoming book *Global Bee Flight*, *o.c.*

⁶ Lévi-Strauss, C., 1962, *Le totémisme aujourd'hui*, Paris: Presses Universitaires de France.

offering the structuralist framework needed to understand that the crux of totemism is not so much (as in the older works on the topic by Frazer, Van Gennep, Freud, etc.)⁷ the individual association between one social group S and one natural class C, but the development of a productive relationship:

$$S_1 : S_2 : \dots S_i = C_1 : C_2 : \dots C_i.$$

In other words, totemism turned out to be an idiom to speak about the social world in terms of the natural world – the animal and vegetal world, and the relationships claimed to exist between the latter, providing the models of thought in terms of which everyday and ritual relations between groups could be articulated and manipulated.

Totemism, in which animal species feature overwhelmingly, thus appears as a particular form of a mode of thought that in the past has been called ‘irrational’, ‘pre-logical’, ‘peripheral’, ‘primitive’, and which Lévi-Strauss’s work (especially in *La pensée sauvage*, 1964)⁸ made us appreciate as obsessed with logic, rational, standard and common in all human societies past and present including everyday life and untutored thought and expression in the contemporary North Atlantic society – even though in the latter the influence of the institutionally and politically dominant forms of scientific thought filters through in the untamed

⁷ Ankermann, B., 1915, ‘Verbreitung und Formen des Totemismus in Afrika’, *Zeitschrift für Ethnologie*, [vol. , ca. 47] : [add pages] ; Armstrong, W.E., 1961, ‘Totemism’, in: Ashmore, H.S., ed., *Encyclopaedia Britannica: A new survey of universal knowledge*, Chicago / London / Toronto: Encyclopaedia Britannica, XXII: 317-320 (in fact an antiquated account reflecting scholarly views in the early twentieth century); Durkheim, É., 1912, *Les formes élémentaires de la vie religieuse: Le système totémique en Australie*, Paris: Felix Alcan.; Frazer, J.C., 1887, *Totemism [and exogamy?]*, Edinburgh: Adams & Charles; Freud, S., 1918, *Totem and taboo*, New York: Random House, English translation of German edition, *Totem und Tabu*, first published 1913, [place] : [publisher] ; Hartland, E.S., 1915, ‘Totemism’, in: Hastings, J., with Selbie, J.A., & Gray, L.H., eds., *Encyclopedia of Religion and Ethics*, Edinburgh: Clark / New York: Scribner, XII: 393-407; Lubbock, J., 1870, *The origin of civilization and the primitive condition of man: Mental and social condition of savages*, London: Longmans, Green; McLennan, J.F., 1865, *Primitive Marriage*, Edinburgh: Adam & Charles Black.; van Gennep, A., 1904, *Tabou et totémisme à Madagascar: Etude descriptive et théorique*, Paris: Leroux. For a recent re-consideration of the issue of totemism, cf. Comaroff, J., & Comaroff, J.L., 1992, ‘Totemism and ethnicity’, in: Comaroff, J., & Comaroff, J.L., eds., *Ethnography and the historical imagination*, Boulder, CO: Westview Press, pp. [add pages] .

⁸ Lévi-Strauss, C., 1962, *La pensée sauvage*, Paris: Plon; Engl. translation *The savage mind*, 1973, Chicago: University of Chicago Press/ London: Weidenfeld & Nicholson, first published 1966.

everyday and ritual expressions, masking their wildness and creating embarrassment. In the light of the ubiquitous and ineradicable presence of ‘untamed thinking’ (for which Lévi-Strauss coined the felicitous term ‘the science of the concrete’), contemporary scientific thought constitutes not the norm of human thought, but the exceptional case: one in which the conditions for the production of, and the assignment of truth to, verbal statements of a propositional form lies not only in their well-formedness and their referring to the natural world, but in the application of very elaborate, strict, intersubjective procedures stipulating the conditions under which such truth is assigned in an epistemologically valid and accountable manner.

We have now set the framework for the appreciation of animal symbolism as a very widespread form of untamed thinking, and indicated both its closeness and its distinction vis-à-vis contemporary scientific thought. Let us now return to Harding’s claim that it is the world-wide mediation of scientific knowledge which persuades us to attribute to such knowledge universality even regardless of whether science would be entitled to claim such universality on the basis of internal epistemological considerations. We have seen that there are mythemes (like the one of ‘hero fights monster’) that could claim practically world-wide mediation and representation. Let us now explore if the same applies to patterns of animal symbolism in non-scientific contexts world-wide.

3. The data set

In order to explore the extension in time and space, and the convergence, of various non-scientific systems of knowledge specifically those revolving on animal symbolism, in Table 2 I have brought together merely eleven series of animal symbolism, derived from widely differing locations (cf. Diagram 1) and periods. The series in this preliminary analysis have mainly been selected on the basis of their availability given the established context of my ongoing research in such fields as African and ancient history, Egyptology, African ethnography, and comparative religion and mythology (as part of a comprehensive historical and comparative analysis of African divination systems; of the applicability of the Black Athena thesis to sub-Saharan African; and of agency in precolonial African history).

The eleven series, while all hinging on the specific use of animal symbolism (often in combination with other conspicuous features of the natural world: celestial bodies, meteorological phenomena, the vegetal and mineral kingdoms, colours, and products of human creation) are highly diverse.

SERIES 1: ANIMAL DEMONS WORLDWIDE

The first series is that of animal demons, whose distribution in space and time largely coincides with that of the ‘hero fight monster’ mytheme as studied in Table 1, was identified as a by-product of Fontenrose’s exhaustive cross-cultural study of this mytheme: across the world’s mythologies, he was struck by the recurrence of a series of animal demons belonging to specific species.¹ Strictly speaking, it would be inappropriate to call this series’ distribution ‘world-wide’, since it is mainly attested for those parts of the world (largely coinciding with

¹ Fontenrose, J., 1980, *Python: A study of Delphic myth and its origins*, Berkeley etc.: University of California Press; paperback edition, reprint of the 1959 first edition.

The footnotes to the filled cells in this column specify page, and motif (numerical code preceded by letter) where this type of animal demon is discussed in Fontenrose’s book *Python, o.c.*

ancient literate civilisations) whose mythologies have been abundantly recorded and studied. Research currently initiated at the African Studies Centre, Leiden, seeks to bring to bear the African mythological material upon such world-wide comparisons.

SERIES 2: EGYPTIAN NOMES

The second series lists the names and symbolic associations of the 42 districts ('nomes', an ancient Greek rendering of the ancient Egyptian term *sp3t*) into which the Nile valley and delta were traditionally divided.² As is demonstrated by archaeological records notably the famous cosmetic palettes, the nomes' nomenclature and symbolism go back to prehistoric times (which in Egypt ended with the establishment of the First Dynasty and the invention of writing, c. 3100 BCE), and its confusing complexity may be partly due to erosion in historic times when the underlying symbolic categories of pre-state local organisation were no longer properly understood.

SERIES 3: EGYPTIAN GODS

The third series lists the attributes, animal and otherwise, of the major ancient Egyptian gods of the historical period.³

SERIES 4: THE CHOKWE BASKET ORACLE

The fourth series lists the figurines as found in the basket oracle of the

² Bernal has persuaded us to recognise in the ancient Greek toponym of Sparta; Bernal, M., in press, 'Review of "Word games: The linguistic evidence in Black Athena", Jay H. Jasanoff & Alan Nussbaum', typescript in my possession, now published [**check**] in: *Black Athena Writes Back*, Durham: Duke University Press.

³ Also based on Vergote, J., 1974, *De Egyptenaren en hun godsdienst*, Bussum: De Haan, second impr., first ed. 1971; Gardiner, A.H., 1994, *Egyptian grammar: Being an introduction to the study of hieroglyphs*, rev. 3rd ed., Oxford: Griffith Institute/ Ashmolean Museum, this edition first published 1957, first edition published 1927; Bonnet, H., 1971, *Reallexikon der ägyptischen Religionsgeschichte*, Berlin: de Gruyter, first published 1952.

contemporary Chokwe people, dwelling in Angola, Zaire, and Zambia.⁴ The oracle consists of a basket that contains dozens of man-made figurines carved out of wood, in addition to parts of animals, plants, and the mineral kingdom. During an oracular consultation, some of these items are caused to drop out of the basket, and the oracular response consists in an interpretation of the symbolic features of these items. The basket oracle, which is far from unique to the Chokwe people, is only one of a large family of African divination systems whose interpretation systems work along similar lines although the symbolic configurations to be interpreted are often generated in very different methods, by different random generators than a basket full of figurines. Important members of this family of African divinatory systems could be demonstrated⁵ to be localising transformations of the Arabian divinatory system of *âilm al-raml*, which was invented in Abbasid Mesopotamia by the end of the first millennium CE, on the basis of influences from Chinese Taoism (specifically I Ching), from astrology as formalised in Hellenistic and Imperial times on the basis of much older Mesopotamian and Egyptian divinatory astronomy, and possibly also independent influences from North and West African divination systems.

⁴ Rodrigues de Areia, M.L., 1985, *Les symboles divinatoires: Analyse socio-culturelle d'une technique de divination des Cokwe de l'Angola (ngombo ya cisuka)*, Coimbra: Universidade de Coimbra.

⁵ Skinner, S., 1986, *The oracle of geomancy: Divination by earth*, Bridport [**check Bridgport, Bridgeport etc.**] (Dorset)/ San Leandro (Cal.): Prism, first published 1977; Trautmann, R., 1939-1940, 'La divination à la Côte des Esclaves et à [check: à la] Madagascar: Le Vôdoû Fa — le Sikidy', *Mémoires de l'Institut Français d'Afrique Noire*, 1, Paris: Larose; Maupoil, B., 1943, *La géomancie à l'ancienne Côte des Esclaves*, Paris: Institut de l'Ethnologie; Maupoil, B., 1943, 'Contribution à l'origine musulmane de la géomancie dans le Bas-Dahomey', *Journal de la Société des Africanistes*, 13. [**add pages**]; van Binsbergen, W.M.J., 1995, 'Four-tablet divination as trans-regional medical technology in Southern Africa', *Journal of Religion in Africa*, 25, 2: 114-14, also at http://come.to/african_religion ; van Binsbergen, W.M.J., 1996, 'Transregional and historical connections of four-tablet divination in Southern Africa', *Journal of Religion in Africa*, 26, 1: 2-29, also at http://come.to/african_religion; van Binsbergen, W.M.J., 1996, 'The astrological origin of Islamic geomancy', paper read at 'The SSIPS [Society for the Study of Islamic Philosophy and Science] / SAGP [Society of Ancient Greek Philosophy] 15th Annual Conference: "Global and Multicultural Dimensions of Ancient and Medieval Philosophy and Social Thought: Africana, Christian, Greek, Islamic, Jewish, Indigenous and Asian Traditions, Binghamton University"', Department of Philosophy/ Center for Medieval and Renaissance studies (CEMERS).

SERIES 5: NKOYA CLANS

The fifth series lists the nomenclature of clans (named human groups associated with a natural species or other natural phenomenon) among the contemporary Nkoya people of western central Zambia.⁶ It was my sudden impression of a surprising parallelism between Nkoya clan nomenclature and Fontenrose's world-wide list of animal demons which triggered the present analysis in the first place.

SERIES 6: TSWANA CLANS:

The sixth series lists the very elaborate clan nomenclature among the Tswana people, a large ethnic and linguistic cluster in Botswana and South Africa.⁷

SERIES 7: THE CHINESE ZODIAC

The seventh series lists the nomenclature of constellations in the Chinese zodiac, which however contrary to most other zodiacs in the Old World represents not an annual cycle calibrating the Sun's apparent progress along the ecliptic, but a twelve-yearly cycle.⁸

SERIES 8: CHINESE LUNAR MANSIONS

Our eighth series lists the rich nomenclature of Chinese lunar mansions.

⁶ van Binsbergen, W.M.J., 1992, *Tears of Rain: Ethnicity and history in central western Zambia*, London/ Boston: Kegan Paul International; and author's fieldnotes. An extensive discussion on Nkoya clans is forthcoming in my *Global Bee Flight*, o.c.

⁷ Schapera, I., 1952, *The ethnic composition of Tswana tribes*, London: London School of Economics and Political Science, Monographs on Social Anthropology no. 11. In addition to those listed, Schapera mentions two totems whose meaning he cannot explain: *mokowe* and *mphareng*; these words, or the roots from which they might be derived, are not listed in the standard Tswana dictionary either: Matumo, Z.I., 1993, *Setswana English Setswana dictionary*, Macmillan/ Boleswa/ Botswana Book Centre, revised version of the 1875 edition of Tom Brown's Setswana dictionary. I suggest *mokowe* relates to the colour white.

⁸ Walters, D., 1989, *Chinese astrology: Het interpreteren van de openbaringen van de boodschappers des hemels*, Katwijk aan Zee: Servire, p. 77; Dutch translation of D. Walters, 1987, *Chinese astrology*, Wellingborough: The Aquarian Press.

Throughout the Old World, ancient astronomies calibrate the Moon's apparent progress along the ecliptic, on a (near-)monthly basis, by reference to a lunar zodiac, more commonly designated a series of lunar mansions or lunar houses, specifying for each day of the lunar month in which region of the sky (marked by a particular star or asterism) the Moon is to be found. The study of lunar mansions has formed a major topic in comparative historic astronomy ever since the early 19th century, when Colebrook, Biot, Weber and Burgess initiated the protracted scholarly discussion on the dependence or independence of the various Asian systems of lunar mansions vis-à-vis each other and vis-à-vis the ancient southwest Asian and Graeco-Roman astronomical and astrological tradition.⁹ In the debate, the contradictions of European scholarship in the period of European colonial expansion came to the fore: on the one hand the scholarly perception of irreducible otherness of the Asian systems, and their fragmentation in terms of unconnected local systems, was in line with the underlying assumptions of European colonial domination, and its legitimation strategies; on the other hand, the contemplation of the sophistication of the Asian systems, and of their unmistakable similarity with the western astronomical and astrological

⁹ Cf. Colebrooke, H.T., 1807, 'On the Indian and Arabian divisions of the zodiac', *AR (Asian Review?)*, 9: 323-376; printed in: Colebrooke, H.T., 1837, *Miscellaneous essays*, vol. 2, [place] : [publisher], pp. 321-373; Biot, J.B., 1840, 'Sur les nacshatras des Hindous: Et les mansions lunaires des Arabes', *Journal des savants*, 1840: 264-279; Weber, A., 1850-1853, 'Ueber den Taittiriya-Veda, astronomische Data aus beiden Yajus und eine Stelle des Taittiriya-Brahmana über die Mondhäuser', *Indische Studien*, 1: 68-100, 2: 390-392; Weber, A., 1865, 'Zur Frage über die Nakshatra', *Indische Studien*, 9: 424-459. Burgess, E., 1866, 'On the origin of the lunar division of the zodiac', *Journal of the American Oriental Society*, 8: 309-334. For the Chinese lunar mansions (*sieou*) listed here, cf. Walters, *o.c.* Other sources on the *sieou* include: Schlegel, G., 1875, *Uranographie chinoise*, 3 vols, Leiden: Brill; Whitney, W.D., 1874, 'On the lunar zodiac of India, Arabia and China', *Oriental and Linguistic Studies*, 2nd series, article 13: 340-421; Boll, C., 1912, 'Der ostasiatische Tierzyklus im Hellenismus: Vortrag gehalten am 9 April 1912 auf dem XVI. Internationalen Orientalisten-Kongress zu Athen', *T'oung Pao*, 13: 699-718; Hentze, C., 1933, *Mythes et symboles lunaires (Chine ancienne, civilisations anciennes de l'Asie, peuple limitrophes du Pacifique)*, Antwerpen: De Sikkel; Petri, W., 1966, 'Uighur and Tibetan lists of the Indian lunar mansions', *Indian Journal of the History of Science*, 1: 83-90; Mostaert, A., 'Introduction', in: Cleaves, F.W., ed., 1969, *Manual of Mongolian astrology: With a critical introduction by The Rev. A. Mostaert CICM, Schilde, Belgium*, Cambridge (Mass.): Harvard University Press, pp.1-65; Oldenburg, H., 1909, 'Naksatra and [und? check ; if 'and', then English therefore sieou without initial capital] Sieou', *Nachrichten von der Königlichen Gesellschaft der Wissenschaften zu Göttingen*, 1909, pp. 544-572, reprinted in: Oldenburg, H., 1967, *Kleine Schriften*, ed. Janert, K.L., Wiesbaden: Glasenapp-Stiftung, vol. 2, pp. 1352-1380.

tradition, conveyed a sense of respect and of Euro-Asian kinship (cf. the discovery of the Indo-European linguistic family a few decades earlier) in principle incompatible with colonial contempt. And the parallels were even stronger than scholar could realise at the time. Each of the 28 Chinese lunar mansions has both an animal association, and an association with a non-animal object. It is remarkable that also Hellenistic astrology (as documented in the Greek Magical Papyri there were to be discovered as from the end of the nineteenth century) designated the lunar mansions largely by animal names, of which there are 28 employed; the last seven of these also have non-animal names which would also eminently fit into our categories in Table 2: ‘Chimaera’, ‘Virgin’, ‘Lamp’, ‘Lightning’, ‘Wreath’, ‘Herald’s Stave’, ‘Boy’ and ‘Key’.¹⁰ The ancient Greek system is in nomenclature rather similar to an Assyrian one from the seventh century BCE, with no more than 17 zoömorphy ‘lunar constellations’, that are in fact incipient mansions.¹¹ Time and again the idea crops up that the lunar mansions were profoundly associated with the invention of the alphabet – the number of letters and of mansions being virtually identical.¹² The idea is certainly attractive: by the time of the invention of the alphabet in the early second millennium BCE, the acrophonic principle of indicating a single phoneme by a symbol denoting a natural object whose name begins with that sound had already

¹⁰ Cf. Gundel, W., 1936, *Dekane und Dekansternebilder: Ein Beitrag zur Geschichte der Sternbilder der Kulturvölker: Mit einer Untersuchung über die Ägyptischen Sternbilder und Gottheiter der Dekane von S. Schott*, Studien der Bibliothek Wartburg, Bd 19, reprint 1969, Darmstadt: Wissenschaftliche Buchgesellschaft [**check for repetition**], p. 223. Inclusion, in Table 2, of these Greek Magical Papyri and early Babylonian series in Table 2 should be considered in the course of further analysis along the lines developed in the present paper.

¹¹ Cf. Parpola, S., 1983, *Letters from Assyrian Scholars to the Kings Esarhaddon and Assurbanipal, Part II, Commentary and appendices*, *Alter Orient und Altes Testament*, Veröffentlichungen zur Kultur und Geschichte des Alten Orient und des Alten Testaments, Band 5/2, Neukirchen-Vluyn: Neukirchener Verlag/ Kevelaer: Butzon & Bercker, appendix B, ‘Lunar constellations’, pp. 385-38 [**check**] .

¹² Cf. Hommel, F., 1891, ‘Über den Ursprung und das Alter der arabischen Sternnamen und insbesondere der Mondstationen’, *Zeitschrift des deutschen morgenländischen Gesellschaft*, 45: 592-619. Stucken, E., 1913, *Der Ursprung des Alphabets und die Mondstationen*, Leipzig: [**publisher**] — which despite the wild suggestion contained in its title is a very thorough and authoritative study; Kelley, D.B., 1992, ‘The twenty-eight lunar mansions of China: Part 2: A Possible Relationship with Semitic Alphabets’, *Reports of Liberal Arts, Hamamatsu University School of Medicine*, No. 6, 1992; Burckhardt, T., 1974, *Clé spirituelle de l’astrologie musulmane d’après Mohyiddin ibn Arabi*, Milano: Archè, Bibliothèque de l’Unicorne.

been available in Egyptian hieroglyphic writing for over a millennium,¹³ and most of the earliest alphabetic signs unmistakably hark back to that source, but what was still needed was a fixed and culturally firmly supported framework of classification in the context of which one was led to rely on just over a score of different signs, instead of the hundreds that are needed for syllable writing, or the thousands for full hieroglyphic, cuneiform and Chinese writing. For many centuries, lunar mansions were in wide, daily use for calendrical purposes, and one may very well imagine how – against the background of the well attested constant influence of Egyptian hieroglyphic writing in Phoenicia / Syro-Palestine¹⁴ – an initial system of merely designating these mansions by conventional signs ended up as an alphabet for the rendering of other words than the names of mansions, and finally for the rendering of all words.

SERIES 9: *ANCIENT BABYLONIA'S OLDEST STAR CATALOGUE*

A famous list of ancient Babylonia's 36 major stars records a very early phase in the standardisation of celestial description through asterisms and constellations, dating from before the fixing of the twelve zodiacal signs.

¹³ Gardiner, A.H., 1942, 'Writing and Literature', in Glanville, S.R.A., ed., *The legacy of Egypt*, Oxford: Clarendon Press, pp. 53-78; Cerny, J., 1971, 'Language and writing', in: Harris, J.R., ed., *The legacy of Egypt*, 2nd ed., Oxford: Clarendon, pp. 197-219.

¹⁴ Dussaud, R., 1946-1948, 'L'origine de l'alphabet et son évolution première d'après les découvertes de Byblos', *Syria*, 25: 36-52; Redford, D.B., 1992, *Egypt, Canaan, and Israel in ancient times*, Princeton: Princeton University Press; and extensive references cited there.

Its symbolism, animal and otherwise, is listed as series (9).¹⁵

SERIES 10: CONTEMPORARY INTERNATIONAL SCIENTIFIC NOMECLATURE OF THE CONSTELLATION

The only series to derive from current cosmopolitan scientific practice is our series (10), which lists the current international nomenclature of the constellations.¹⁶ It is the only one of our series which can claim universal, i.e. world-wide distribution.

SERIES 11: ANCIENT GREEK GODS¹⁷

Finally, series (11) lists the symbolic associations, animal and otherwise, of the major ancient Greek gods.

¹⁵ Walker, C.B.F., & Hunger, H., 1977, 'Zwölfmalldrei', *Mitteilungen der Deutschen Orient-Gesellschaft* (Berlin), 109: 27-34; cf. van der Waerden, B.L., 1949, 'Babylonian astronomy: II. The thirty-six stars', *Journal of Near Eastern Studies*, 8: 6-26. The relatively early texts to which these scholarly articles refer, by no means offer a full account of the complete series of constellations as recognised in ancient Mesopotamia; cf. Weidner, E.F., 1924, 'Ein babylonisches Kompendium der Himmelskunde', *American Journal of Semitic Languages and Literatures*, 40: 186-206; Hunger, H., & Pingree, D., 1989, *MUL.APIN: An astronomical Compendium in Cuneiform*, Horn (Austria): Verlag Ferd. Berger & S. Gesellschaft; Pingree, D., & Walker, C., 1988, 'A Babylonian star catalogue: BM 78161', in: Leichty, E., Ellis, M deJ., & Gerardi, P., eds., *A scientific humanist: Studies in memory of Abraham Sachs*, Philadelphia: Occasional Publications of the Samuel Noah Kramer Fund, 9, pp. 313-322. For the general background to science in the Ancient Near East, cf. Neugebauer, O., 1969, *The exact sciences in Antiquity*, New York: Dover, 2nd edition, first published 1957, Providence (R.I.) [**check**] : Brown University Press. For the magical, especially divinatory use of astronomy in the ancient Babylonian context, cf. Reiner, E., 1995, *Astral magic in Babylonia*, Transactions of the American Philosophical Society, 85, 4 , Philadelphia: American Philosophical Society; van Binsbergen, W.M.J., & Wiggermann, F.A.M., 2000, 'Magic in history: A theoretical perspective, and its application to Ancient Mesopotamia', in: Abusch, T., & van der Toorn, K., eds., *Magic in the Ancient Near East*, Groningen: Styx, pp. 3-34, also at: http://come.to/ancient_thought .

¹⁶ Moore, P., 1984, *The new atlas of the universe*, London: Beazley, p. 203.

¹⁷ The number of sources available for Greek mythology and its animal associations is overwhelming. In order to keep the size of this series within manageable limits, I have greatly limited myself, drawing the data mainly from Robert Graves' extensive and authoritative collection: Graves, R., 1964, *The Greek myths*, 2 vols., Harmondsworth: Penguin, first published 1955. This book is very elaborate on the epithets of major gods, and translates every proper name, although the etymologies given are often admittedly doubtful. Additional data were drawn mainly from: *The New Larousse Encyclopedia of mythology*, introduction R. Graves, London/ New York/ Sidney/ Toronto: Hamlyn, 11th edition, especially the contribution there by Guirand: Guirand, F., 1975, 'Greek mythology', in: *New Larousse Encyclopedia of mythology, o.c.*, pp. 85-198; Long, C.H., 1993, 'Mythology', in: *The New Grolier Multimedia Encyclopedia*, Release 6, 1993; and Criss, P.J., n.d. [2000], 'Animals as represented in mythology and folklore, <http://www.cybercomm.net/~grandpa/animals.html> .

Table 2. Eleven systems of knowledge containing animal symbolism

(0) species, object, concept	(1) animal demons world-wide ¹	(2) symbols of Egyptian nomes ²	(3) major Egyptian gods ³	(4) figurines in the Chokwe divining basket, Angola, Zambia and Zaire	(5) Nkoya clans, western central Zambia	(6) Tswana clans, Botswana and South Africa
abstract concept				lie; imminent misfortune; folly; folded heart (lack of sociability)		<i>nleya</i> (= 'provided with')
ant-eater, aardvark, pangolin				ant-bear, pangolin		ant-bear
antelope, deer		U16 (oryx)	Seth, Anukis, Satis (gazelle)	antelope ('s horn); duiker ('s hoof)		duiker; impala; kudu; reedbuck; eland antelope; hartebeest
bear						
birds, aquatic		L15 (ibis)	Thoth, Chonsu	wild duck ('s foot); white heron ('s claw); kingfisher		
birds, eagle	eagle ⁴			eagle ('s claw)		
birds, falcon		U2, U5, U18?	Horus, Montu, Anti, Antywey / Antaios, Re Horachti, Haroëris, Harmerti, Sokar, Chonsu	(symbolic but not in basket)		

¹ Fontenrose, *Python*, o.c.

² The data as tabulated were largely derived from: Roeder 1952. U = Upper, L = Lower Egyptian nome. No ancient animal association recorded, to my knowledge, for L17.




³ Ancient Egyptian animal symbolism was recently surveyed in: Houlihan 1996. He bases himself especially on the extensive studies in this field which have made up the life's work of Leo Keimer, of which he gives a full bibliography. These publications can inspire further studies on the topic explored in the present paper; however, here again I have had to limit the number of authoritative sources to those specified.

⁴ Fontenrose XXXX: themes A2842, D152.2 (index A, 11).

(0) species, object, concept	(7) Chin- ese zodiac	(8) Chinese lunar mans- ions	(9) the 36 Babylonian stars	(10) modern internation al constella- tions	(11) major Greek gods
ab- stract con- cept		space; empti- ness; danger; stradd- ling	Death; Mistress of life; Lord of death		
ant- eater, aard- vark, pang- olin		tapir			
ante- lope, deer		unicorn, deer	deer	Unicorn; Giraffe	Dionysos, Artemis, Aphrodite, Athene, Apollo
bear				Great Bear; Little Bear	Artemis (she-bear)
birds, aqua- tic				Crane, Swan	Hera (kingfisher); Aphrodite, Zeus (swan)
birds, eagle			eagle	Eagle	Zeus
birds, falcon					5


⁵ Falcon associations do not occur in the context of the major Greek gods. However, the name of Circe, the island sorceress in the *Odyssey*, means ‘falcon’.

(0)	(1)	(2)	(3)	(4)	(5)	(6)
birds, hawk ⁶	hawk ⁷				hawk	
birds, sylvan & general; also bat				laughing-bird('s beak); mason bird (symbolic but not in basket); owl (symbolic but not in basket); touraco bird; unspecified little bird		owl (<i>morubisi</i> , <i>thubisi</i>); red-billed quelea bird; weaver bird; any bird of small or moderate size (<i>nonyane</i>)
birds, terrestrial (fowl)		U3 (double ostrich feathers)	Amon (goose); Maat, Shu (ostrich feather)	cock (paw); guinea fowl (symbolic but not in basket); partridge	guinea fowl	bustard
birds, vulture	vulture ⁸		Nekhbet, Mut		vulture	
body parts, animal (mammal)		L2 (foreleg of oxen) ⁹		buck's rib (or other mammal's); kneecap, tibia, ear, of unspecified mammal		marrow
body parts, human		lungs (L17)	Jusas (hand); Min, Amon (penis); Aton (hand at end of ray); sons of Horus (various organs); Mut, Tefnut (sun's eye)	penis; vagina; heart; folded heart (lack of sociability); woman with distended belly; handicapped person		vulva; heart; penis

⁶ Gardiner XXXX: 467f), brings out that hawk  (Gardiner sign G1, phonetic value *tyw*) and Egyptian vulture  (Gardiner sign G4, phonetic value 3, $\approx a, al, ar$) are often indistinguishable, contrary to the falcon  (Gardiner sign G5, Hr, i.e. Horus) which is so conspicuous in Egyptian religion.

⁷ Fontenrose XXXX: theme D152.1 (index A, II).

⁸ Fontenrose XXXX: theme D152.3 (index A, II).

⁹ Foreleg of oxen, *khpsh* or *dww*, , Gardiner sign F23; also in use to designate the constellation of Ursa Major, *Mskhtyw*, whose apparent shape (which despite all stars' proper motion, being minute, has not noticeably changed since pharaonic times) corresponds with the hieroglyph and with the oxen foreleg it



(0)	(7)	(8)	(9)	(10)	(11)
birds, hawk					Apollo
birds, sylvan & general; also bat		swallow; crow; bat; bird star	raven; swallow;	Crow; Dove; Toucan; Phoenix	Apollo, Athene, Kronos, Athene (crow or raven); Hera, Zeus (cuckoo); Aphrodite, Zeus (dove); Athene (owl); Herakles, Leto (quail); Aphrodite (swallow); Ares, Zeus (woodpecker)
birds, terrestrial (fowl)	cock	pheasant; cock		Peacock	Apollo, Athene, Hermes (cock); Apollo, Ares, Hera, Hermes (goose); Hera (peacock)
birds, vulture					Apollo, Ares, Kronos
body parts, animal (mammal)		horn; tail; beak; wings	bull's jaw		Athene <i>glaukopsis</i> with owl's eyes; Hera <i>boopis</i> with cow's eyes,
body parts, human		neck; heart; stomach	kidneys	Berenice's Hair	Aphrodite Comaetho, Cybele (hair); Artemis Orthia= upright, Dionysos lame, Zeus Velchanos= 'who drags his foot' (body); Athene <i>glaukopsis</i> , Aphrodite peeping, Hera Europa broadly seeing, Hera <i>boopis</i> with cow's eyes, Herakles Bright-eyed, Hades sightless (eyes); Herakles Nose-docker; Herakles of the Wounded Thigh; Herakles the Dactyl (finger); Hermes (phallus)

(0)	(1)	(2)	(3)	(4)	(5)	(6)
bovine	10	U11, U10 (black bull); L6, L3 (two-headed bull); L12 (cow with calf)	Buchis, Mnevis, Apis, Chentechtai, Serapis (bull); Hathor (cow)			ginger ox; cattle; heifer (tshelwana); buffalo
canine	dog; wolf ¹¹	U17, L11	Anubis, Chenti Amentiu, Chent cheti, Wepwewet, Serapis	hunter's dog		wild dog
chameleon				chameleon		
colour		L10 (black); L1 (white)	Uto =Wadjit (White crown); Nechbet, Satis (red crown); Neith (blue crown); Osiris, Wadjit (green); golden (Re and all gods)	white bead		
crocodile, dragon	crocodile ¹²	U6, L14, L5, L4	Sobek, Chentechtai	(symbolic but not in basket)		crocodile (<i>kwena</i> , Maebu)
directions (N, E, S, W)		U13, U14, U20, U21, L19, L18 (Anterior/Posterior); L14 (Eastern); L8, L7 (Eastern/Western); L5, L4 (Northern/Southern); R13 (Western)	Chenti Amentiu (West); Tefnut (South); Seth (East); Neith, Uto (North); Nekhbet (South)			
drink			Hathor, Isis (nursing the king)			
earth, sand, land		Land (U1); Great land (U8);	Re (earth mound in sun temple), Geb			<i>naga</i> (veld / penis)

¹⁰ Fontenrose, *Python, o.c.*: bull (theme D133.2; (index A, 11).

¹¹ Fontenrose, *Python, o.c.*: dog (theme 118, G211.1.8); wolf (theme D113.1, 113.1.1; index A, 11).

¹² Fontenrose, *Python, o.c.*: 183-185, 187, 190, 208.

(0)	(7)	(8)	(9)	(10)	(11)
bovine	oxen	oxen	bull	Bull	Poseidon, Artemis Tauropole= 'bull-killer' (bull); Hera boopis, with cow's eyes; Herakles Bouphagos= 'cow-eater', Athene (oxen, cow)
canine	dog	fox; wolf; dog	wild dog; fox; great dog	Fox; Great Dog; Hunting Dogs; Little Dog; Wolf	Aphrodite, Apollo, Artemis, Ares, Zeus (wolf); Artemis (dog)
chamel-eon				Chameleon	
colour					Aphrodite (dark, black); Apollo, Artemis, Zeus of the White Poplar (white); Athene Chryse (golden); Athene Colocasia = of the red water-lily (red); Zeus (green)
croco-dile, dragon	dragon	scaled dragon; smooth dragon		Dragon	Apollo, Artemis, Athena, Dionysos, Herakles, Hermes, Kronos, Pan, Poseidon, Zeus (fight against) ¹³
direc-tions (N, E, S, W)				Southern Fish; Northern Crown, Southern Cross, Southern Crown	Apollo, Artemis (northern)
drink					Hebe (ambrosia); Poseidon = 'he who gives to drink from the wooded mountain'
earth, sand, land		basis	field; mistress of the enemy-land		Rhea (earth); Poseidon (earthquakes); Zeus (mount of earth on top of Mt. Lukaiois); Pan (pasture)

¹³ None of these were dragons, but all fought dragons.

(0)	(1)	(2)	(3)	(4)	(5)	(6)
elephant					elephant	elephant
equine	horse ¹⁴		Seth (ass)			zebra
feline	lion; cf. Sinhika; panther ¹⁵	¹⁶	Mehit, Tefnut, Pachet, Horus lord of Mesen, Shu Anhuret, Ma-hesa, Sakhmet (lion); Bastet (cat)	lion or leopard's claw or tooth	lion	lion; leopard (<i>nkwe</i>); predator (<i>sebata</i>)
fish (also dolphin, whale)	fish ¹⁷	Lepidotos (L16); unsp. fish (L15); Tilapia ¹⁸ (L4, L5); oxyrynchos (U19)	Neith (Tilapia fish); Hatmehit ('first of the fishes'); Shu (Lepidotos fish); Atum (eel)	electrical fish's vertebra	barbel	any kind of fish
frog			Hekat			
gastropod		belemnite (U9)	Min (belemnite)	cowry; snail's shell; mother-of-pearl shell of long snail		
hare		U15 (hare, fem. hare)	Unut	hare's tail or paw		hare
hippopotamus	hippopotamus ¹⁹		Taweret			hippopotamus

¹⁴ Fontenrose XXXX: theme F471.1 (index A, 11).

¹⁵ Fontenrose XXXX: lion (theme B8712.5, D112.1; index A, 11; 207; cf. Sinhika is the Indian lion-demoness); panther (theme D112.4; index A, II).

¹⁶ It is remarkable that none of the ancient Egyptian nomes has a feline-associated ensign; however, many nomes do have major gods (see Table 2 column (2)) with such associations.

¹⁷ Fontenrose XXXX: theme G308 (index A, 11).

¹⁸ Sacred to the goddess Neith.


¹⁹ Fontenrose XXXX: theme B8712.4 (index A, 11). The hippopotamus does not appear in the astronomical material of our data set outside Egypt. The fabulous animal, often winged, that features prominently in some very late Egyptian zodiacs and whose head and bodily stance are reminiscent of familiar representations of Taweret the pregnant female hippopotamus, on closer examination turns out to be a crocodile; e.g. the Dendera *pronaos* which dates from Nero's time, middle first century CE (Description 1997: 402-403); the zodiac of the great temple of Khnum at Esna, which dates from a few decades later (cf. *ibid.*: 131-132; and the zodiac of the northern temple at Esna, dating from the late third century BCE (*ibid.*: 141-142). Neither does the hippopotamus appear as part of the much older zodiac depicted in the tomb of Seti I (c. 1300 BCE), which does feature falcon/ Horus, lion, bull, Re, crocodile (the smaller second crocodile is an hieroglyphic sign, Gardiner no. I5), and a claw or hoof, and water, as further hieroglyphic signs, notably Aa7 and N35; Picture source: Grolier XXX):



(0)	(7)	(8)	(9)	(10)	(11)
elephant					
equine	horse	horse		Centaur; Foal; Pegasus	Ares, Herakles Horse-binder, Athene, Poseidon (horse)
feline	tiger	tiger; leopard	lion; panther	Little Lion; Lion; Lynx	Artemis, Hekate (cat); Dionysos (leopard); Cybele, Herakles (lion)
fish (also dol- phin, whale)			fish	Dolphin; Fishes; Flying Fish; Sea-goat; Southern Fish; Swordfish; Whale	Aphrodite the Fish; Poseidon, Apollo (dolphin)
frog					Aphrodite
gastro- pod					Aphrodite (Cypraea =cowry)
hare	hare	hare		Hare	
hippo- pota- mus					

(0)	(1)	(2)	(3)	(4)	(5)	(6)
humans and gods		prince (L19, 18); 'ruler of Anzeti' (L13); Anzeti (L9)		nuclear family (father, mother, child); Jinga fertility archetype; spirit of mask dancer; male ancestor; female ancestor; slave; child; human being; couple; wailing-woman; handicapped person; sorcerer; woman with distended belly; polluting spirits of the wild; group of people on their way; spirit associated with menstruation and conception; forest spirit; Suku protective archetype; Cisola fertility archetype; sick child; the double person (who treacherously incites conflict); true witness; hunter's spirit	spear-hunter	
hyena					hyena	hyena
insect, spider, centipede (, arthropods)		L4?, L5? (bee); U18 (centipede)	Chopri (beetle); Sepa (centipede)	insect nest made out of wood; insect's external skeleton; piece of a termite-hill; praying mantis (its egg depository)	bee?	locust
lizard				lizard (riverine)		lizard
luxuries (incl. precious stones)			Hathor, Ihi (menat ²⁰ ; Uto (White crown); Nechbet, Satis (red crown); Neith (blue crown)	white bead	regalia?	tobacco; wealth; iron
monkey, baboon			Thoth	baboon (front-paw)		<i>kgabo</i> (ape); <i>tshwene</i> (baboon); = <i>kgano</i> (meercat)

²⁰ Ornamental collar.

(0)	(7)	(8)	(9)	(10)	(11)
humans and gods		virgin; demons	old man; Anunitu; faithful herdsman of Anu; twins; Shulpa'e; great twins; Shupa; Ninmah; EN.TENABAR.;  king; mouth-opening dem.; Numuſda; Damu; Marduk; hired labourer; king of the sky-gods; Enlil; ...of Sharur; Enlil; Ishtar mistress of the enemy-land; herald; Great.; Ishtar, Anu; [...] of Enlil; [Sin (moon)] and Nergal; Mistress; Anu, Enlil, Ea, all three (?); Lord of Death; Lord (?) Shamash [sun]; Queen of the Igigi-gods; Queen of the Igigi-gods; Enlil (?); Goddess of heaven and earth; King, Lord of the Igigi-gods; Mistress of Haruspicy; Lord of the Sources, Ea; Dwelling of Anu; Hero among the Igigi-gods; the two gods Adad and Marduk; Mistress of Life; The three gods (?), Ea; Lord who kills; King of the Igigi-gods	Andromeda; Archer; Cassiopeia; Cepheus; Charioteer; Hercules; Herdsman; Indian; Orion; Painter; Perseus; Sculptor; Serpent-bearer; Twins; Virgin; Water-bearer	Aphrodite the Stranger; Apollo the Hunter; Persuasive Artemis; Artemis Saviour; Athene Mother; Dionysos Saviour; Herakles= 'glory of Hera'; Athene Guardian; Herakles Saviour; Herakles Victor; Leto= 'lady'; Ares= 'male warrior'; Earth= 'Mother'; Zeus Deliverer; Zeus Morios= 'distributor'; Zeus Preserver; Zeus Reliever; Zeus Saviour
hyena					
insect, spider, centipede (, arthropods)				Bee, Fly	Apollo Parnopios (locust); Artemis, Demeter, Rhea (bee); Herakles Cornopion (locust); Herakles Ipoctonos (grub-killer); Zeus Averter of Flies; Athene (spider)
lizard				Lizard	
luxuries (incl. precious stones)				Northern Crown, Southern Cross, Southern Crown	Dionysos Plutodotes; Athene Chryse, golden
monkey, baboon	monkey	monkey; monkey			

(0)	(1)	(2)	(3)	(4)	(5)	(6)
mountain, wilderness		U12 (snake mountain); L6	Re, Seth, Nephthys			
ovines ²¹	goat ²²		Chnum, Amon, Harsaphes / Herishef (ram)		goat	goat; sheep
pig, wild boar	boar ²³	U11 (Seth animal)	Seth	wild pig's tooth		pig
porcupine				porcupine		porcupine
river, spring, lake, sea			Osiris, Hapi (Nile); Tefnut (moisture); Neith, Wadjet, Seth (sea)			
scorpion, crab	scorpion ²⁴		Selket = Selkis			
shrew, ichneumon, honey badger, mouse, rat			Atum, Haroëris, Harmerti (ichneumon/shrew)	mouse (symbolic value but not in divining basket); honey badger('s nail)		
sky and celestial bodies, including stars			Hathor, Haroëris (sky); Chonsu, Osiris, Thoth (moon); Horus (the moon and sun as his eyes); Nut (moon's mother); sons of Horus (stars); Nut (stars' mother); Amon, Re, Hathor, Atum, Aton, Re-Harakhte, Hamachis (sun); Nut (sun's mother)	moon	rain	
snake	snake; cf. Nagas, Indian snake-demons ²⁵	U10 (snake); U12 (mountain snake)	Uto, Apophis, Meretseger, Naunet, Thermouthis/ Renenutet,	snake spirit; snake's head		snake

²¹ Both in contemporary sub-Saharan Africa, and in ancient Egypt, sheep and goat cannot be clearly distinguished, neither anatomically nor genetically.

²² Fontenrose XXXX: theme B24, D134 (index A 11).

²³ Fontenrose XXXX: theme B871.1.2 (index A, 11).


²⁴ Fontenrose XXXX: theme B8732 (index A', 11).

²⁵ Fontenrose XXXX: theme 203f., 208, 491, 498, Theme 3a (index A 1); A6712.1, A876, B11to B11.12.1 B29.2, D950.0.1, F541.1.4 (index A, 11); cf. Nagas, Indian snake-demons.

(0)	(7)	(8)	(9)	(10)	(11)
moun- tain, wild- erness		hill			Aphrodite Urania = 'queen of the mountains'; Poseidon = 'he who gives to drink from the wooded mountain'; Zeus Acraios = 'of the summit'
ovines	sheep	sheep; he-goat	goat	Ram	Aphrodite Epiragia = - 'turned into a he-goat'; Goatish Athene, Artemis, Dionysos, Pan, Zeus nursed by Amaltheia, Hera Goat-eating (goat); Hermes Ram-bearer, Pan, Zeus Sabazios (ram)
pig, wild boar	pig	pig			Zeus nursed by a sow
porcu- pine		porcupin e			
river, spring, lake, sea		source	Lord of the sources, Ea; Goddess of the sources	River; Water- bearer	Poseidon (sea); Aphrodite (foam- born); Artemis Lady of the Lake; Artemis = '? high source of water'; Orpheus = '? ophruoeis' of the river bank'
scorp- ion, crab			scorpion, crab	Crab; Scorpion	
shrew, ichn- eumon, honey etc.	rat	marten; rat			Apollo Smintheus (mice / rats); Hekate (weasel)
sky and celes- tial bodies, includ- ing stars		Pleiades; Orion; Bird Star	Venus; stars; Mars; great star; brilliant star of stars; [Sin (moon)] and Nergal; Lord (?) Shamash [sun] ; weapon, star of...; Goddess of heaven and earth; the planet Mars		Apollo, Eos (dawn); Solar Apollo, Helios, Solar Zeus (sun); Artemis Alpheia, Selene (moon); Artemis Anacitis = 'of the planet Venus'; Zeus (bright sky); Celestial Herakles; Athena, Zeus (thunderbolt)
snake	snake	snake; worm	snake	Little Snake, Serpent, Water-snake	Herakles Ophioktonos, serpent- killing; [Zeus] Sabazios (snake)

(0)	(1)	(2)	(3)	(4)	(5)	(6)
stone (non-precious), rock			Atum (benben stone)	pebbles		
technology, including smoke		bow (U1); balance post (U2); sceptre (U4, U19); sistrum (U7); relic shrine (U8); flint knife (U22); harpoon (L8, L7); shield (L5, L4); house (L20)	Satet (bow and arrows); Anat (shield, battle-axe); Anzeti (switch, flail); Chnum (potter's wheel); Isis (throne); Meshenet (birth tile); Neith (shield, [bow] and arrows); Reshef (battle-axe, lance, shield); Aker, Sechet (field); Serapis (corn measure); Unut (knives)	boat; drum; mortar; head-rest; night-gun ²⁶ ; hoe; bellows; bracelet; path; wooden arrow point; iron arrow point; knife of power; ²⁷ bier; baby carrying sling; basket; woman's utensils; houses with breached walls to take deceased outside; lock; tally; grave; any object due to European presence in the region; piece of glass or mica; coin; piece of European china (crookery); European bell; bullet	beehive; bell; fish spear?; tinder-box?; bull-roarer?; sparkler?; ²⁸ reed-mat?; peg?; fire-bore?; SMOKE	clay-pit; trench; milling vessel
tortoise				tortoise		

²⁶ A sorcery apparatus in South Central and Southern Africa: a gun made of a human thighbone, to be fired at night at one's enemy's dwelling, in order to cause fatal illness.

²⁷ The ancient Egyptian knife: *ds* , Gardiner sign T30, initially made of flint, has virtually the same shape as the Cokwe figurine. I take this to suggest that a common origin underlies the use of this symbol in both cultures, and that this origin is pre-metallurgy Neolithic or earlier.

²⁸ A little metal thong within a tinder-box, which when scraped against a piece of flint produces the spark that sets linted mushroom kindling afire.

(0)	(7)	(8)	(9)	(10)	(11)
stone (non-precious), rock					Apollo of the White Rock; Hermes = 'cairn or pillar'; Leto = 'stone'
technology, including smoke		winnowing basket; spoon; house; wall; net; bow; coach	plough; arrow; bow; cart; balance; arrow; weapon, star of...; Mistress of Haruspicy; Dwelling of Anu	Air pump; Altar; Arrow; Balance; Clock; Compasses; Cup; Furnace; Keel; Lyre; Mariner's Compass; Microscope; Net; Octant; Poop; Rule; Sails; Sculptor's Tools ; Sextant; Shield; Southern Triangle; Table; Telescope; Triangle	Hephaestus (general); Aphrodite Epitymbria = 'of the tombs'; Federal Aphrodite; Aphrodite Schoenis = 'of the rush-basket'; Apollo of the Embarcations; Athene Girder-on-of-Arms, Warlike Athene, Warlike Zeus (arms); Artemis Cordax = 'of the rope dance'; Artemis Dictynna = 'of the net'; Artemis Eileithyia (midwife); Artemis the hanged one; Artemis the Huntress; Artemis Tridaria = 'threefold assigner of lots'; Artemis Trivia = 'of the three ways'; Athene Alea = 'she who grinds'; Athene Polias, Herakles Melkarth (protector of the city); Athene Skiras (parasol); Cybele, Zeus Labradian (axe); Apollo, Artemis (bow, arrow, quiver); Athena (breastplate); Herakles (club); Zeus (god of the assembly); Zeus, Hestia (hearth); Herakles Ogmios, of the Ogams (a script); Herakles the Healer; Hermes (herald's staff); Apollo, Hermes, Orpheus (lyre); Apollo (omphalos); Pan (shepherd's pipe); Hermes (shepherd's staff); Ares (spear); Three Fates, Athene (spinning, weaving); Poseidon (trident); Apollo (tripod); Hermes (winged hat); Zeus of the Courtyard
tortoise					Aphrodite, Apollo, Hermes, Pan

(0)	(1)	(2)	(3)	(4)	(5)	(6)
trees and plants ²⁹		U13, U14 Âtf, sycamore?); U20, 21 (<i>ntf</i> , granade?); L20	Hathor (sycamore); Uto (papyrus plant); Nefertem (lotus); Osiris, Nepri (corn)	fruits and grains of red maize; Brachystegia tree; raffia palm; gourd (the fruit); a climbing plant; madder; Cannarium tree; Schrebera tree; Elaeis guineensis palm; Parinari tree; Swartzia madagascariensis plant; Abrus precatorius / canescens plant; Vangueriopsis lanciflora; little bundle of sticks ³⁰ ; fragment of mushroom with natural perforations; white mushroom	firewood; wood suitable for carving; kindling (out of mush- room)	pumpkin

²⁹ Here we omit one row which was only defined for Greek mythology: category = ‘unspecified’; listed under this category: ‘Artemis Lady of the Wild Things’.

³⁰ Although isolated in our peculiarly selective data set, the item has remarkably close parallels in other bundles of twigs in cultures North of Africa: the ancient Persian *baresman*, the most sacred item in Zoroastrian ritual, and in the ancient Italic *fasces*; cf. Mills & Gray 1908-1921; Schrot 1979.

(0)	(7)	(8)	(9)	(10)	(11)
trees and plants ³¹		willow			Aphrodite Erycina = ‘of the heather’; Aphrodite Schoenis, of the rush-basket; Apollo, Herakles Melon (apple); Artemis Caryatis = ‘of the walnut’; Artemis Hyacinthopos (hyacinth); Athene Colocasia, of the red water-lily; Athene Itone, Hera Hellotis, Artemis Lygodesma (willow); Demeter = ‘barley-mother’; Helios (heliotrope); Apollo, Artemis (laurel); Aphrodite (myrtle); Zeus (oak); Athene (olive tree); Apollo (palm tree); Persephone, Hera (pomegranate); Zeus of the White Poplar

³¹ Here we omit one row which was only specified for Greek mythology: category = ‘unspecified’; listed under this category: ‘Artemis Lady of the Wild Things’.

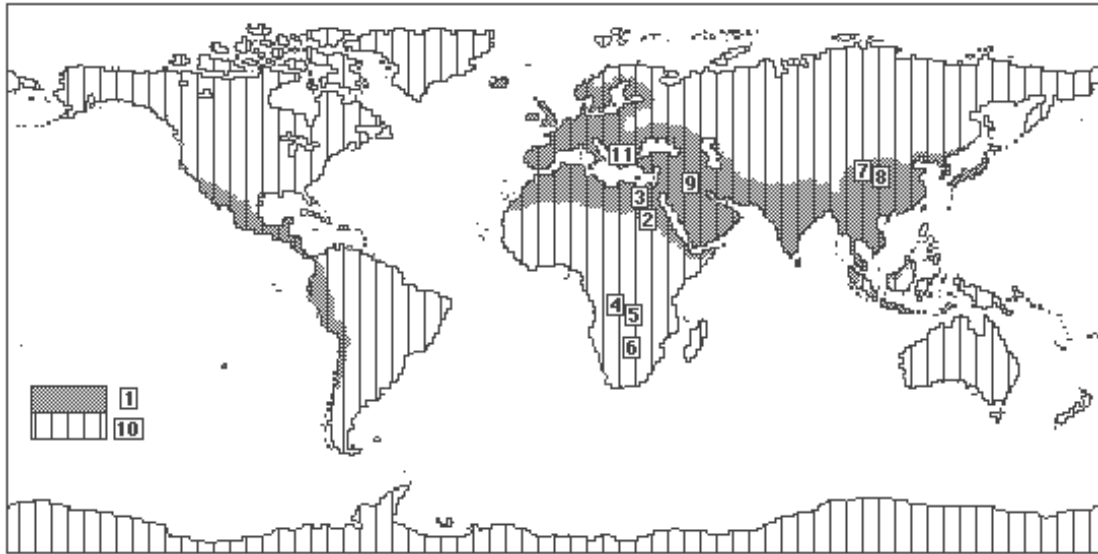


Diagram 1. Locations of animal symbolism included in the present analysis

Legend:

- (1) animal demons world-wide; this is also the extent of the distribution area of the attestations of the central mytheme 'hero fights monster' (cf. Table 1)
- (2) symbols of Egyptian nomes
- (3) major Egyptian gods
- (4) figurines in the Chokwe divining basket, Angola, Zambia and Zaire
- (5) nomenclature of Nkoya clans, western central Zambia
- (6) nomenclature of Tswana clans, Botswana and South Africa
- (7) Chinese zodiac
- (8) Chinese lunar mansions
- (9) the 36 Babylonian stars
- (10) modern international constellations
- (11) major Greek gods.

4. Methodology

Without the slightest doubt, the present data set is extremely limited and one-sided in composition. One would like to see much more material included from Europe, South and Central Asia, Australia, Oceania, and the Americas, reflecting the animal symbolism of gods, asterisms, and such social groups as clans, but also extending to other fields of formalised culture. However, what little could be presented here, is already the fruit of months of strenuous collating and analysis, and could not readily be expanded without a further major research effort, which would clash with my other more pressing commitments.

Meanwhile the most exciting research finding is already immediately clear from Table 2. For it turns out that systems of animal symbolism deriving from widely differing spatial and temporal contexts of cultural history may be conveniently collected in one large matrix, which brings out correspondences and formal continuities (not to speak of generic continuities) to a much greater extent than one would expect to be the case if all these local or regional systems of animal symbolism would have been invented totally independently from one another.

Collecting all these series into one comprehensive matrix requires a number of methodological choices.

In the first place, each series must be well-documented, but finite. One could spend the rest of one's life investigating the ramifications of animal symbolism in Greek mythology, for instance, but for the kind of analysis encountered here, it is better to rely mainly – as I did – on one, comprehensive and authoritative source, and leave further details for a later phase in the analysis.

Another problem concerns aggregation. If one were to define a different category for each animal species and for each other kind of objects found in any of the series involved in our comparative analysis, the number of categories in the overall data set would be astronomical, defeating further analysis. Although the list of categories in Table 2 might look fairly exhaustive as a representation of the natural world,¹ the highly

¹ For a fairly exhaustive enumeration of current African mammal species, cf. Haltenorth, T., & Diller, H., 1988, *A field guide to the mammals of Africa*, London: Collins, this edition first


selective nature of natural species' admittance to each of the local symbolic series can only be appreciated against an enumeration of the many taxonomic series (as distinguished by modern cosmopolitan biology) that objectively exist in each local natural environment.

While the species distinguished by today's cosmopolitan biological science are more or less clear-cut and offer easy solutions for operationalisation (in other words, would make it easy to identify exemplars of the species in reality), we cannot assume that that kind of classification obtains or is meaningful in all the cultures featuring in our analysis. It may be advisable to subsume bats under birds, and marine mammals under fishes, because that is what many of the world's cultures do. Antelopes are not universally distributed, and their northern complement would be the stag or deer, which may therefore be classified in the same category. The aggregate classification we end up with is a mere compromise. It will vary in the degree of specificity it observes with regard to certain types of animals. E.g. in Egyptian and Greek symbolism birds of prey are precisely distinguished and symbolically juxtaposed, so it would not do to lump vulture, eagle, hawk and falcon in one category, but in other cultures the taxonomic distinctions between these birds of prey may be less precise, or less precisely rendered in ethnographic or mythographic descriptions. Another reason for aggregation is that some kinds of animals (notably mammals and birds) are far more subjects of animal symbolism than others (gastropods, insects and other arthropods); thus in some cases a category used in Table 2 would amount to a taxonomic under-species in scientific biology, in other cases to an entire phylum. If we agree that animal classification is some form of inchoate science, it does not do to impose on any specific local systems the specific categorisation of another type of science notably that of cosmopolitan biology, but neither is it possible, in a comparative exercise, to do full justice to all the underlying local classifications. We would also tend to aggregate categories in the case that a specific

published 1980, Engl. translation of *Säugetiere Afrikas und Madagaskars*, München: BLV, 1977, with extensive references. It is remarkable that only a limited selection of the hundreds of species listed there found their way into the systems of animal symbolism as treated in the present argument. The same applies, a fortiori, to the birds and other phyla of the animal kingdom, whose extremely rich ramifications may be gleaned from any standard encyclopaedia.

category would be represented among only one or two series in our sample, unduly isolating it from all the other series. E.g., among the eleven series in our data set, the centipede is only specified in the series of the ancient Egyptian nomes, and in the series of the ancient Egyptian gods; it was found preferable to subsume the centipede under insects, although insects and centipedes constitute distinct sub-phyla within the phylum of Arthropods, to which nearly one million animal species belong, or about 75% of all animal species.²

An initially unforeseen feature of local systems of animal symbolism is the following: symbolism derived from the animal kingdom is often combined with symbolism based on the faunal and mineral kingdom, and on other aspects of the visible world, such as celestial and in general meteorological phenomena, abstract concepts, colours, etc. A major cluster of non-animal symbolism derives from man-made objects, which I have subsumed under one large heading ‘technology’. In some series the technological items are very numerous, even exceeding the faunal references in number. Since our emphasis is on animal symbolism here, I did not differentiate between the various ‘technological’ items.

The ensuing classification underlying (as the list of categories making up the extreme left-hand column) our comprehensive matrix in Table 2  a mere compromise, and any results based on its analysis will have to be considered in a relative light: different classifications would be at least equally justified, and may have yielded different results. In order to allow a re-analysis in terms of slightly or entirely different categories and patterns of aggregation, I have always listed the original local category whenever I have listed a case under an aggregate category; e.g. when ‘goat’ as attribute of a specific god is listed under ‘ovines’ – a category to which also sheep belong – , the name of that god appears in the box ‘ovines’ followed by ‘(goat)’ between parentheses.

Cluster analysis is the standard technique to bring out and underpin mathematically such clustering as one might intuitively perceive in the data listed in the above table. For this purpose, one assigns a numerical value to each cell, and ascertains whether, in the light of any of the usual mathematical linkage methods (average, centroid, complete, median,

² Cloudsley-Thompson, J.L., 1993, ‘arthropod’, in: *Grolier Encyclopedia, o.c.*; Ewing, H.E., 1961, ‘Anthropoda’, in: *Encyclopaedia Britannica, o.c.*, II: 456-459.

single or Ward's),³ certain series have more in common than others.

I assign to each cell the number of actual occurrences as listed in the data set; doubtful cases are counted for 0.5; species which feature symbolically elsewhere in the local society but not in the specific context as analysed (basket oracle, clans, etc.), will be treated as absent (0), since the same symbolic occurrences outside the specified context may also occur in all the other localities as analysed, without perspiring in the documentation. If an item matches more than one species or concept, it is listed twice and counted twice.

Since the data for at least one of our eleven series, that on animal demons per definition cannot include other aspects of the natural or man-made world than animals, one might decide to either

- (a) limit the analysis to those rows that actually concern animals, leaving humans, technologies, trees and plants, etc. out of the cluster analysis; or
- (b) extend the cluster analysis to all species and objects including non-animal ones.

Alternatively, considering the extremely selective way in which the series were constructed out of an enormous available literature, one may well doubt whether the number of recorded occurrences of a particular trait in each of the cells of Table 2 is a reliable and valid representation of the relative weight of this trait in the actual material, if it could be known and taken into account in its entirety. Therefore there is something to be said for a dichotomisation of the data, basing the analysis on the simple fact of whether a cell in the column is empty (= 0) or non-empty (= 1), without taking into account the actual number of occurrences recorded per non-empty cell; such dichotomisation moreover has the advantage that a stronger, parametric distance metric may be used in cluster analysis: the Pearson correlation coefficient.

This yields four analytical approaches:

³ For a discussion of some of these methods and their merits, cf. Anderberg, M.R., 1973, *Cluster analysis for applications*, New York: Academic Press; Everitt, B., 1974, *Cluster analysis*, London etc: Heinemann, pp. 69ff.

- (a) • animals and non-animal items, number of actual occurrences
(Analysis 1_{all categories, actual occurrences})
- (b) • animals and non-animal items, dichotomised (Analysis 1_{all categories, dichotomised})
- (c) • animals only, number of actual occurrences (Analysis 2_{animals only, actual occurrences})
- (d) • animals only, dichotomised (Analysis 2_{animals only, dichotomised})

Since the data in Table 2 are based on a very limited selection of the available literature, we can make no assumptions as to the underlying probability distribution, and therefore prefer a non-parametric distance metric: normalised percent disagreement; as variance method we prefer Ward's, which in comparative assessments has often turned out to be both subtle and reliable.

5. Cluster analysis

Using all series and all categories as in Table 2, and taking the number of actually listed incidences per cell as the cell score to be entered into cluster analysis, the following cluster analysis is produced as Analysis (1):

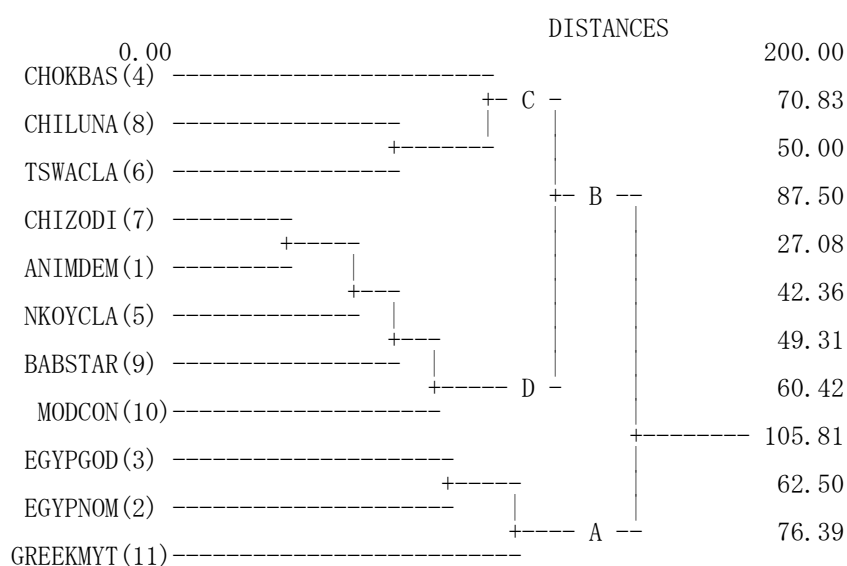


Diagram 2. Cluster Analysis 1_{all categories, actual occurrences.}

Distance metric is normalised percent disagreement; Ward minimum variance method legend:

ANIMDEM	animal demons world-wide
EGYPNOM	symbols of Egyptian nomes
EGYPGOD	major Egyptian gods
CHOKBAS	figurines in the Chokwe divining basket, Angola, Zambia and Zaire
NKOYCLA	nomenclature of Nkoya clans, western central Zambia
TSWACLA	nomenclature of Tswana clans, Botswana and South Africa
CHIZODI	Chinese zodiac
CHILUNA	Chinese lunar mansions
BABSTAR	the 36 Babylonian stars
MODCON	modern international constellations
GREEKMYT	major Greek gods

This cluster structure has a few features which recommend it as convincing and illuminating up to a point. The two Egyptian series

(nomes and major gods), which are relatively close in space and time as compared to the other series in our data set, do cluster together; they also cluster together with the Greek mythological series, which recent research has emphasised to have much in common with the Egyptian material.¹ Series (2), (3) and (11) thus constitute cluster (A), which is opposed to cluster (B) which comprises all the other African and Asian series. Cluster (B) falls apart in two sub-clusters (C) and (D), both of which invite systematic interpretation. Sub-cluster (C) displays a certain spatial and temporal consistency in that it comprises two African societies with elaborate animal symbolism in their clan nomenclature and divination system respectively; however, one is surprised to see the Chinese system of lunar mansions to cluster with Tswana and Chokwe, while Nkoya (the third African society in our data set) and the Chinese zodiac appear as clustering in sub-cluster (D) of the same branch (B). Systems of lunar mansions are found in all Asian major civilisations, to begin with ancient Mesopotamia;² we may therefore postulate that the Chinese version of lunar mansions has a considerable antiquity.³ We have no direct way of ascertaining the antiquity of African clan systems and divination systems, and therefore cannot gauge the time distance between the African and the Chinese material in cluster branch B; but whatever the time dimension,

¹ Bernal, M., 1987, *Black Athena: The Afroasiatic roots of classical civilization, Vol. I, The fabrication of Ancient Greece 1787-1987*, London: Free Association Books/ New Brunswick: Rutgers University Press; Bernal, M., 1991, *Black Athena: The Afro-asiatic roots of classical civilization, II, The archaeological and documentary evidence*, London: Free Association Books; New Brunswick, N.J.: Rutgers University Press; Davison, J.M., 1987, 'Egyptian influence on the Greek Legend of Io', paper given to the Society for Biblical Literature; Bérard, J., 1952, 'Les Hyksos et la légende d'Io: Recherches sur la période pré-mycénienne', *Syria*, 29: 1-43; Lambropoulou, A., 1988, 'Erechtheus, Boutes, Itys and Xouthos: Notes on Egyptian presence in early Athens', *The Ancient World*, 18: 77-86. I earlier objected in print to the idea of close continuities between Egyptian and Greek myths (van Binsbergen, W.M.J., 1997, 'Alternative models of intercontinental interaction towards the earliest Cretan script', in: van Binsbergen, W.M.J., ed., *Black Athena: Ten Years After*, Hoofddorp: Dutch Archaeological and Historical Society, special issue, *Talanta: Proceedings of the Dutch Archaeological and Historical Society*, vols. 28-29, 1996-97, pp. 131-148; also at: http://come.to/black_athena) but have meanwhile accepted this idea wholeheartedly (cf. my forthcoming *Global bee flight, o.c.*; and the greatly expanded and revised reprint of *Black Athena Ten Years After*, under the title: *Black Athena Alive*, Hamburg/ Münster: LIT and New York: Transaction Press, in press.

² Cf. Gundel, *Dekane, o.c.*; Parpola, *Letters from Assyrian scholars, o.c.*

³ However, this assumption may have to be revised in the light of suggestions of Western nineteenth-century CE borrowings into East Asian astrology; Cf. Gundel, *Dekane, o.c.*, p. 216; I come back to this in a footnote below.

undeniably this material encompasses huge distances in space. That yet the African and the Chinese material clusters together, and in close association with the Babylonian material, suggests an unsuspected formal, and perhaps even generic, kinship to exist between these series. That a genuine, historical relationship is involved here is suggested by the fact that cluster (D) encompasses both the 36 Babylonian stars, and the modern constellations.

The considerable convergence in the delineation and even the naming of some major constellations across societies throughout the Old and the New World suggests a Palaeolithic origin, whose details are extremely difficult to reconstruct. Nonetheless, already in the early twentieth century the possibilities of an astronomical interpretation of Upper Palaeolithic signs, cupmarks, rock art was attempted, with more sophistication than recognition, in the work of the French prehistorian Baudouin.⁴ In more recent decades, Marshack's work on the possible interpretation of scratch patterns as found on Upper Palaeolithic mobile artefacts has revived this concern.⁵ Meanwhile the professional astronomer Ovenden has suggested an astronomical method to solve the problem of the origin of the constellations, based on the following question: should we not simply ask at which place in the Ancient Near East and the eastern Mediterranean basin were the earliest attested constellations visible and during which period?⁶ Background of this approach is that precession of the equinoxes causes many stars except the circumpolar ones to be alternately visible and invisible during certain periods of the c. 26.000 years out of which a full precession cycle consists; needless to say, only visible constellations can be named and made into an astronomical system, and this brought Ovenden to situate

⁴ Baudouin, M., 1916, 'La prehistoire des étoiles au Paléolithique: Les Pleiades à l'époque aurignacienne et le culte stello-solaire typique au solutréen', *Bulletin et Memoires de la Societe d'Anthropologie de Paris*, ser. 6, 7: 274-317; Baudouin, M., 1926, *La préhistoire par les étoiles: Un chronomètre préhistorique*, Paris: Maloine.

⁵ Marshack, A., 1972, *The roots of civilization: The cognitive beginnings of man's first art, symbol and notation*, London: Weidenfeld & Nicholson/New York: McGraw-Hill. A reconstruction of the earliest astral science will be attempted in: van Binsbergen, W.M.J., in preparation, *Cupmarks, stellar maps, and mankala board-games: An archaeoastronomical and Africanist excursion into Palaeolithic world-views* (for a preview, see: http://come.to/ancient_thought).

⁶ Cf. Ovenden, M.W., 1966, 'The origins of the constellations', *The Philosophical Journal [Transactions of the Royal Philosophical Society of Glasgow]*, 3: 1-18.

the emergence of the constellations in the Early Bronze Age and the eastern Mediterranean basin – well in line with converging scholarly views about the increase of maritime contacts in that period, which (if they had to include open-sea crossings, e.g. from Crete directly to Egypt; which is far from certain for that period) had to involve sailing by night, and therefore navigation on the stars (contrary to the established Phoenician practice of day-light hopping from factory to factory across distances of 25-30 km).

But Ovenden's approach, though illuminating, does not take into account the virtually world-wide recognition of certain asterisms (the Pleiades, the Great Bear, Orion's Belt), which if it is to be attributed to diffusion rather than to parallel cultural invention, would seem to imply a time scale for the earliest definition of these near-universal asterisms far more extensive than the few millennia which Ovenden's approach would grant us. For certain constellations meanwhile the specific cultural origin (and in those cases far more recent than the Palaeolithic) has been authoritatively reconstructed by astronomically informed specialist in Ancient Near Eastern studies.⁷ This does not mean that all constellations date back to historical times: rather, a picture emerges according to which only a few constellations, heavy with animal symbolism, were discerned in the sky, leaving large stretches of the sky unnamed and unstructured, until the drive at scientific consistency and systematics, in the context of increasingly complex and state-based systems of knowledge, prediction, and control, finally caused the entire sky to be mapped and named, through still largely in terms of animal symbolism.

⁷ Cf. Porada, E., 1987, 'On the origins of "Aquarius"', in: Rochberg-Halton, F., ed., *Language, literature and history: Philological and historical studies presented to Erica Reiner*, New Haven (Conn.): American Oriental Society, pp. 279-291; Hartner, W., 1965, 'The earliest history of the constellations in the Near East and the motif of the lion-bull combat', *Journal of Near Eastern Studies*, 24: 1-16; van der Waerden, B.L., 1952-53, 'History of the zodiac', *Archiv für Orientforschung*, 16: 216-230; Lewy, H., 1965, 'Ištar, the Bow Star', in: Güterbock, H.G., & Jacobsen, T., eds., *Studies in honour of Benno Landsberger on his seventy-fifth birthday, April 21, 1965*, Chicago: University of Chicago Press for Oriental Institute of the University of Chicago, pp. 273-282; Miller, R.A., 1988, 'Pleiades perceived: MUL.MUL to Subaru', *Journal of the American Oriental Society*, 108: 1-25; Borger, R., 1972-1975, 'Himmelsstier', in: Edzard, D.O., ed., *Reallexikon der Assyriologie und Vorderasiatische Archäologie*, Berlin/ New York: de Gruyter, 4. Band, p. 413-414; and (*non vidi*) Gleadow, R., 1968, *The origin of the zodiac*, London: [publisher]. A wealth of information on ancient Mesopotamian astronomy also to be found in: Parpola, S., 1983, *Letters from Assyrian Scholars, o.c.*

The first attestations of constellations in written and archaeological evidence derive from ancient Mesopotamia. There is a well-established intellectual continuity⁸ between Babylonian astronomy (including the first attested constellations), subsequently Greek, Hellenistic, Roman, Indian and Arabic astronomy, and modern scientific astronomy; of the latter the nomenclature of the constellations still forms a modest part. Moreover, there is detailed evidence to suggest that Chinese astronomy owes a considerable debt to Babylonian astronomy.⁹ Also the more or less world-wide (cf. Diagram 1) series of animal demons situates itself in this sub-cluster; Fontenrose's formulation of this series of animal demons was based on a close inspection of the world's recorded mythologies in

⁸ Boll, F.J., 1903, *Sphaera*, Leipzig: Teubner; Bezold, C., & Boll, F.J., 1911, *Reflexe astrologischer Keilinschriften bei griechischen Schriftstellern*, Heidelberg, Akademie der Wissenschaften Philosophisch-historische Klasse, no. 7: 1-54; Barton, T., 1994, *Ancient astrology*, London: Routledge; Tester, S.J., 1989, *A history of western astrology*, New York: Ballantine, reprint of the 1987 first edition; Pingree, D., 1973, 'Astrology', in: Wiener, P.P., ed., *Dictionary of the history of ideas: Studies of selected pivotal ideas*, I, New York: Scribner, pp. 118-126; Baigent, M., 1994, *From the omens of Babylon: Astrology and Ancient Mesopotamia*, Harmondsworth: Arkana/ Penguin Books; Berthelot, R., 1938, *La pensée de l'Asie et l'astrobiologie*, Paris: Payot; Nilsson, M.P., 1943, *The rise of astrology in the Hellenistic age*, Meddelande från Lunds Astronomiska Observatorium, Ser. ii, nr. iii, Historical notes and papers, no. 18. In recent decades, the fundamental continuity underlying astronomy and astrology in major civilisation of Antiquity, the Ancient Near East, South Asia, the Arab world, and pre-modern Europe, has been studied with greatly impressive scholarship by David Pingree: Kennedy, E.S., & D. Pingree, 1971, *The astrological history of M^{sh}@all^h*, Cambridge (Mass.): Harvard University Press; Pingree, D., 1959, 'A Greek linear planetary text in India', *Journal of the American Oriental Society*, 79: 282-284. Pingree, D., 1963-64, 'Indian influence on early Sassanian and Arabic astronomy', *Journal of Oriental Research* (Madras), 33: 1-8; Pingree, D., 1971, 'On the Greek origin of the Indian planetary model employing a double epicycle', *Journal of the History of Astronomy*, 2: 80-85; Pingree, D., 1973, 'Greek influence on Islamic astronomy', *Journal of the American Oriental Society*, 93, 1: 32-43. Pingree, D., 1973, 'The Mesopotamian origin of early Indian mathematical astronomy', *Journal of the American Oriental Society*, 93: 32-43. Pingree, D., 1978, *The Yavanajātaka of Sphujidhvaja*, Harvard Oriental Series 48, 2 vols, Cambridge (Mass.)/ London: Harvard University Press (which contains, among much else of great value, a complete cross-cultural history of astrology); Pingree, D., 1979, 'Ilm al-hay'a', in: Lewis, B., Ménage, V.L., Pellat, C., Schacht, J., eds., *Encyclopaedia of Islam*, new edition, Leiden: Brill, pp. III, 1135-1138; Pingree, D., 1989, 'MUL.APIN and Vedic astronomy', in: Behrens, H., Loding, D., & Roth, M.T., eds., *DUMU-E2-DUB-BA-A: Studies in honor of Åke W. Sjöberg*, Philadelphia: S.N. Kramer Fund, pp. 439-445.

⁹ Bezold, C., 1919, 'Sze Ma Ts'ien und die babylonische Astrologie', *Ostasiatische Zeitschrift*, 8: 42-49; Ungnad, A., 1932-, 'China und Babylonien', in: Ebeling, E., & Meissner, B., eds., 1932-, *Reallexikon der Assyriologie*, Berlin: de Gruyter, II, 91-93. On the other hand, Kugler advanced an astronomical detail (reference to the longest day lasting 14 hours 24 minutes, as in Honan, China, 35° N, but not as in Babylon at 32° 30' N) which might suggest an influence from East Asia upon ancient Babylonia; cf. Kugler, F.X., 1900, *Die Babylonische Mondrechnung*, Fribourg/ Brisgau: [publisher], pp. 79f. [add pages]

the light of the ‘hero fights monster’ mytheme. Therefore sub-cluster (D) includes series between which genuine historical relationships exist, despite their mutual remoteness in both space and time. This suggests that also the appearance of the African material in culture (D) and (C) is not an artefact of blind statistical procedure, but equally reveals some genuine historical relationship, which we shall explore below.

For the methodological considerations given in section (4 [**check**]), we might be persuaded to base our cluster analysis not on the actual occurrences per cell, but on dichotomised data instead. For the entire data set of both animal and non-animal symbolism, this yields the following cluster Analysis 1_{dichotomised}:

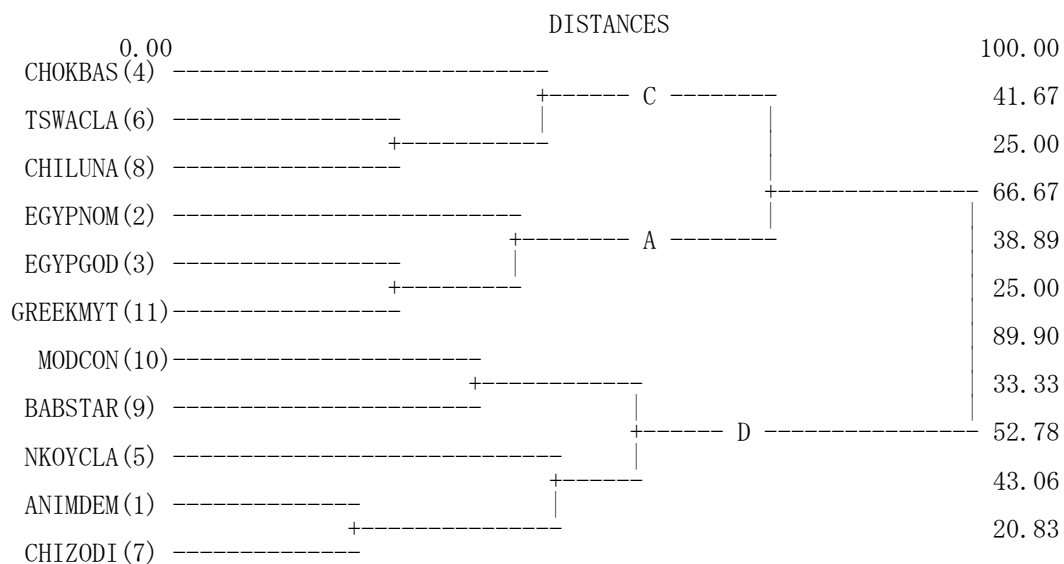


Diagram 3. Cluster Analysis 1_{all categories, dichotomised}

Distance metric is normalised percent disagreement; Ward minimum variance method
 legend: see Diagram 2.

Under dichotomisation, the clusters (A), (C) and (D) as identified in Analysis 1_{all categories, actual occurrences} remain practically unaltered, although their linkage with one another is affected: (A) and (C) now cluster more closely together, instead of (C) and (D) as in the original Analysis (1).

Since we are working with dichotomised data, we are allowed to use the Pearson correlation coefficient as our distance metric. This yields the

following Analysis (1) dichotomised, Pearson:

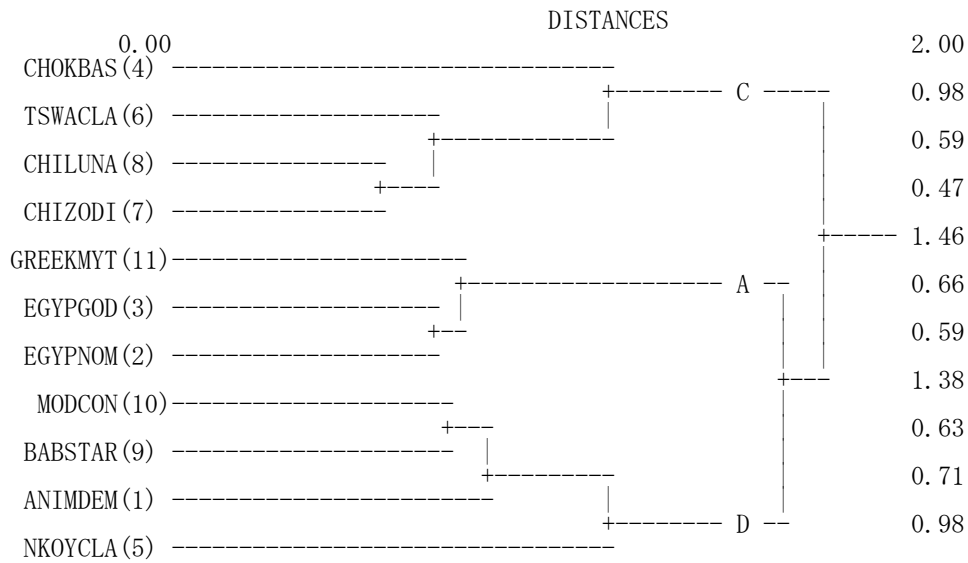


Diagram 4. Cluster Analysis 1_{all categories, dichotomised, Pearson}

Distance metric is 1-Pearson correlation coefficient; Ward minimum variance method
legend: see Diagram 2.

Use of the Pearson correlation coefficient does not substantially affect the cluster analysis: the clusters remain intact but their interlinkage again shifts (now it is (A) and (C) which cluster more closely together than (D)); moreover the two Chinese series now cluster together within cluster C, which is somewhat more convincing by analogy with the two Egyptian series).

If, in the light of the methodological considerations in section 4 [**check**], the analysis is limited to animals only, a clustering pattern emerges as Analysis 2_{animals only, actual occurrences in section (3)}:

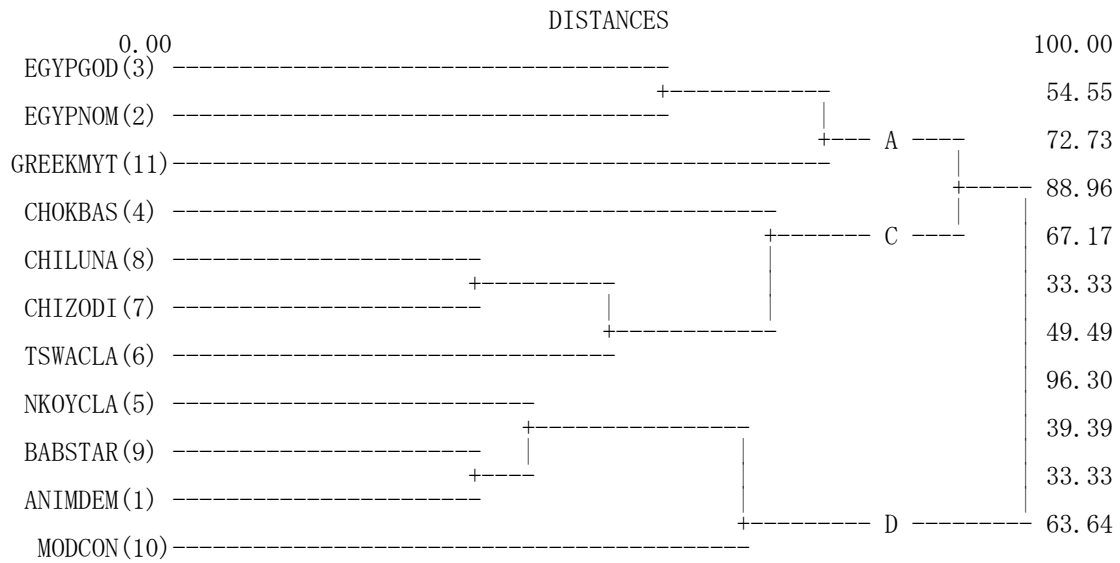


Diagram 5. Cluster Analysis 2_{animals only, actual occurrences}

Distance metric is normalised percent disagreement; Ward minimum variance method
legend: see Diagram 2.

Analysis (2) yields results very similar to those we considered above under Analysis (1). In Analysis (2), the basic clusters (A), (C) and (D) re-appear, with only two modifications: the two Chinese series now cluster together (as was to be expected, by analogy with the two Egyptian series); and whereas in the first analysis (C) and (D) clustered together to form (B), now (C) and (A) cluster together instead of (D).

Also for Analysis (2)_{animals only}, we may proceed to a dichotomised approach.

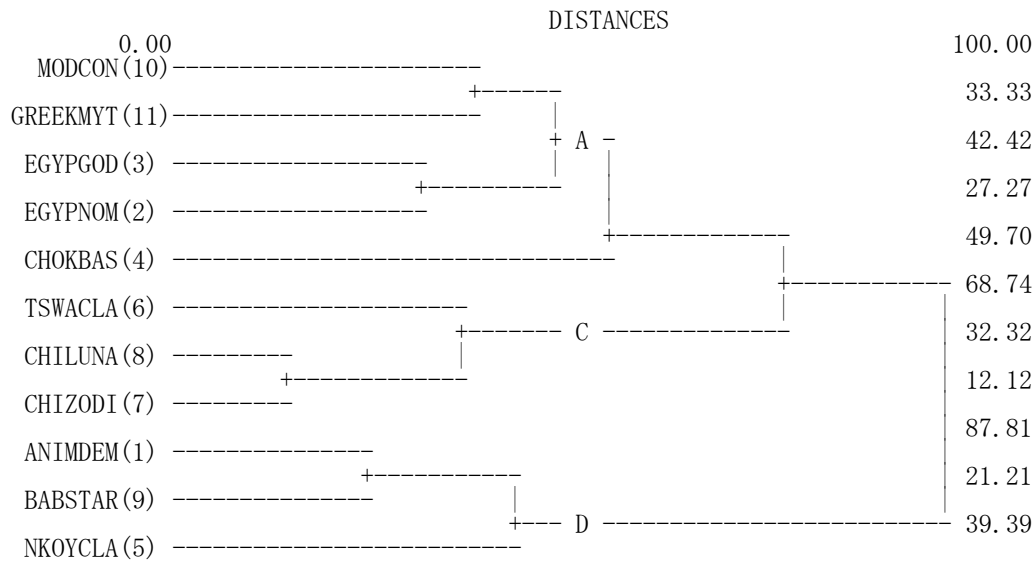


Diagram 6. Cluster Analysis 2_{animals only, dichotomised}

Distance metric is normalised percent disagreement; Ward minimum variance method
 legend: see Diagram 2.

While the basic clustering pattern of the three clusters (A), (C) and (D) is maintained under dichotomisation, remarkable shifts occur: the modern constellations series leaves the proximity of the Babylonian series and instead joins cluster (A) (not without historical basis, for also Egyptian astronomy contributed to the definition of contemporary constellation, while many of their names refer to episodes in Greek mythology); and the Chokwe divination basket series (originally in (C)) comes to straddle the boundary between (A) and (C).

Again, the Pearson correlation is admissible as the distance metric for dichotomised data, yielding the following cluster Analysis (2)_{dichotomised},
 Pearson:

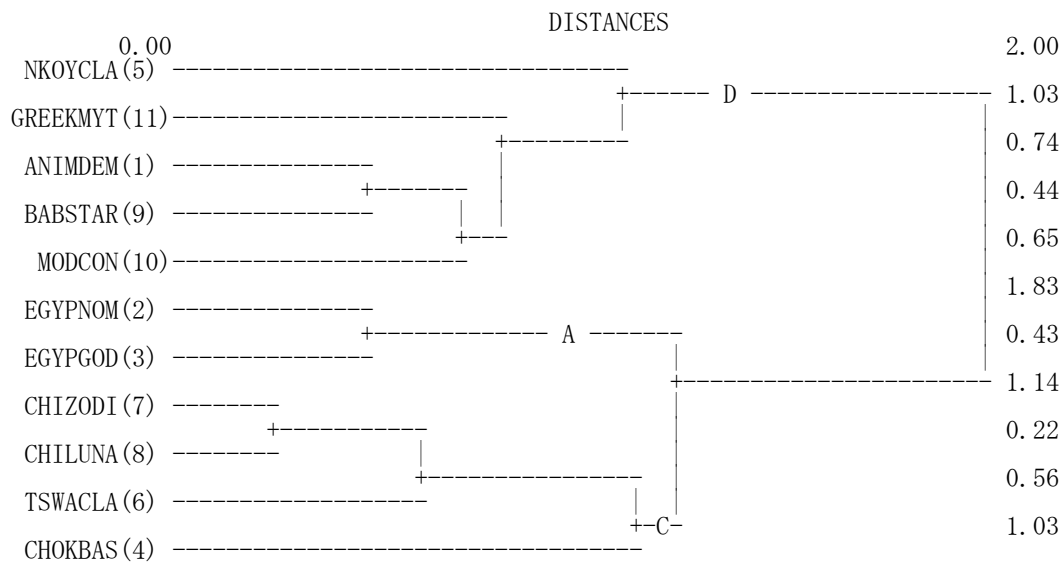


Diagram 7. Cluster Analysis 2_{animals only, dichotomised, Pearson}

Distance metric is 1-Pearson correlation coefficient; Ward minimum variance method
 legend: see Diagram 2.

With use of the Pearson correlation coefficient appears the by now well-known cluster structure (A), (C) and (D) re-appears, albeit somewhat blurred in that the Greek mythology series dissociates itself from (A) and joins (D). Perhaps this is an artefact of the Pearson approach, where the Greek series as by far the most elaborately documented one may behave somewhat oddly. But I prefer to see here a systematic reason: Fontenrose's delineation of the 'animal demons' series was largely based on his analysis of Greek mythological patterns, subsequently enriched with an extensive cross-cultural comparison involving the mythologies of Rome, Egypt, Canaan, Syria, Anatolia, Mesopotamia, India, China, Japan, and the Americas. The Babylonian central mytheme of the famous Enuma Elish cuneiform series¹⁰ ('Marduk fights Tiamat') in part inspired both the 'animal demons' series and the Babylonian series of major stars and asterisms, with their symbolic associations. As stated above, the compilation of Table 2, and the present analysis in general, was instigated, in the first place, by my intuitive observation of the apparently

¹⁰ Pritchard, A.B., ed. 1969, *Ancient Near Eastern texts relating to the Old Testament*, Princeton: Princeton University Press, first published 1950, [add pages] . [check if Enuma Elish is actually in this book, it could also be in Ancient Near East texts on creation etc.]

close parallels between the species after which Nkoya clans are named, and Fontenrose's 'animal demons' series; this observation is borne out by all the above cluster analyses, including Analysis (2) dichotomised, Pearson.

Considering the high degree of aggregation in the non-animal categories (especially in 'humans and gods', 'arthropods', 'sky etc.', 'technology', and 'trees and plants'), as compared to the far greater degree of precision in the delineation of our animal categories, it is Analysis (2) which should guide us when seeking to formulate conclusions about patterns of animal symbolism in our data set. But once again, the difference between Analysis (1) and (2) is slight.

Cluster analysis is a blind statistical procedure. It is often contentious,¹¹ since, depending on the choice of distance metrics very different results may be produced that are highly manipulable and full of mere procedural artefacts, even if we use a method that was found to be relatively reliable, such as Ward's. Our analysis however shows signs of considerable consistency, both formally (the same triple cluster structure (A), (B) and (C) appearing time and again, no matter how we vary the composition of the data set (with or without non-animal elements, and using either actual number of incidence or dichotomised data), and empirically (the Egyptian pair of series, the Chinese pair of series, and two of the three African societies, clustering each consistently together).

¹¹ Cf. the controversy over the cluster analysis of the world-wide variation in mitochondrial DNA. It was on the basis of this cluster analysis that the 'African Eve' hypothesis was first formulated; Cann, R.L., Stoneking, M., & Wilson A.C., 1987. 'Mitochondrial DNA and human evolution', *Nature*, 325: 31-36; Templeton, A.R., 1997, 'Testing the out-of-Africa replacement hypothesis with mitochondrial DNA data', in: Clark, G.A., & Willermet, C., eds., *Conceptual issues in modern human origins research*, Amsterdam: Aldine de Gruyter, pp. 329-360; Shreeve, *The Neandertal enigma?*, o.c.; Lainé, A., 2000, 'Eve africaine ? De l'origine des races au racisme de l'origine', in: Fauvelle-Aymar, F.-X., Chrétien, J.-P., & Perrot, C.-H., *Afrocentrismes: L'histoire des Africains entre Égypte et Amérique*, Paris: Karthala, pp. 103f- [**add pages**] .

Therefore it would be foolish to dismiss the outcomes of our cluster analysis as mere accidental or as a mere artefact of cluster analysis. Instead we have to look for a convincing explanation of what we may take to be a genuine, empirically well established pattern.

6. Interpretation: From an African bestiary to universal science?

How then can we interpret the basic structure of three clusters (A), (B), (C), which is borne out throughout our extensive cluster analysis? Let us look at the dendrogram again:

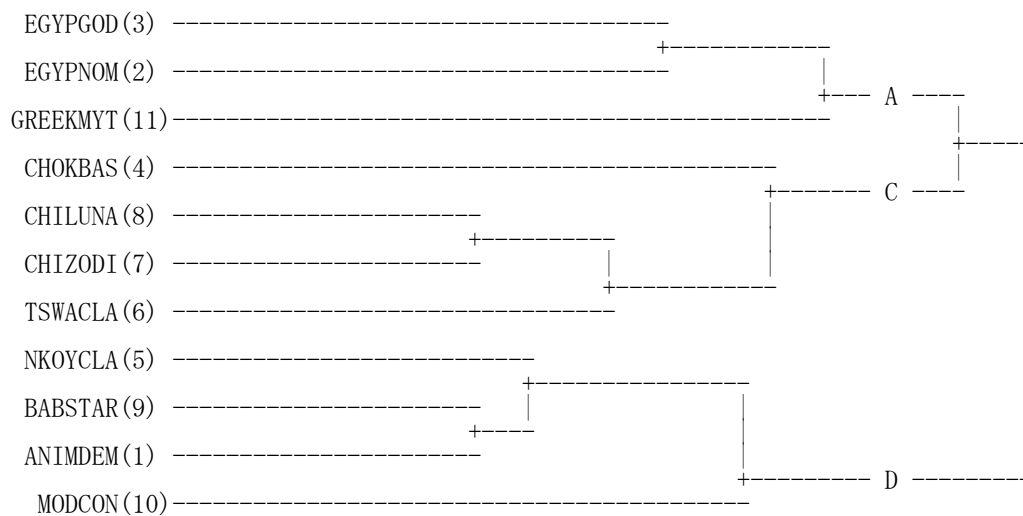


Diagram 8. Cluster Analysis 2_{animals only, actual occurrences} simplified

Broadly, the three clusters may be characterised in the following terms:

- (A) ancient Egypt and Greece
- (B) Central and Southern Bantu-speaking sub-Saharan Africa, and classical China
- (C) Ancient Mesopotamia's astral science, modern astronomy as its contemporary derivative, world-wide animal demon representations, and Central Bantu-speaking Nkoya society.

Cluster (A) brings together a culture area which recent research (especially, but not exclusively, in terms of the *Black Athena* thesis) has increasingly identified as forming one historical whole; we may designate

this the 'Black Athena' culture area.

Cluster (D) would appear to be disconcertingly diverse in both space and time, until we realise that its contents, however selective, nicely match Frobenius' South-Erythraean culture area, which he saw originating in ancient Mesopotamia (with possible extensions towards Dilmun / Bahrayn and the Indus civilisation) and extending south of the Red (= Erythraean) sea to the East African coast and South Central Africa, where the southwestern fringe of the complex would encompass the Nkoya culture of Zambia.¹ There are more extensive reasons for relegating at least certain archaic layers of Nkoya culture to the South-Erythraean culture area, although a discussion would take us too far from the present context.² It is meanwhile attractive to extend the South-Erythraean cluster's core region to the Indus valley, both because this was a recognised centre of cultural innovation with extensive links with Mesopotamia, and because astrological data abounds in the hitherto only very partially deciphered corpus of Indus valley inscriptions³ The Nkoya indebtedness to, or even membership of, this complex⁴ is partly due to the extensive Indonesian influences in East African and South Central African kingship and court culture in general, as attested by the xylophone-centred royal orchestra, and by the presence, among the Nkoya, of mythemes derived from Mesopotamian and South Asian sources as presumably mediated via Indonesia (which was subjected to massive South Asian influence since the beginning of the Common Era) and Madagascar (which was largely populated by people from Indonesia in the first millennium CE).

Cluster (C) brings together two culture areas (imperial China and sub-Saharan Africa) which one would normally not lump together because of their remoteness. Yet the regrettably rare students of both African and Chinese culture⁵ have occasionally been struck by the amazing

¹ Frobenius, L., 1931, *Erythräa: Länder und Zeiten des heiligen Königsmordes*, Berlin/Zürich: Atlantis-Verlag.

² For details, cf. my forthcoming *Global Bee Global bee flight*, o.c.

³ ; cf. Parpola, A., 1994, *Deciphering the Indus script*, Cambridge: Cambridge University Press.

⁴ Cf. my *Global bee flight*, o.c.

⁵ Having myself scratched only the barest surface of Chinese history, culture and language, I cannot possibly include myself among these happy few. However, in the mid-1980s I was invited to participate in a symposium of the Oosters Genootschap ('Oriental Society') at

similarities between sub-Saharan African historical cultural patterns, and such archaic traits of Chinese classic culture which seem to hark back to a cultural substratum predating the unified Chinese imperial state and even the rise of Chinese literacy. Ancient songs and dances, agricultural and ancestral rites, symbols such as enshrined in archaic script signs, and much that went into the making of Taoism as a mythico-realistic approach to nature, all bear witness to this substratum.⁶ Explanations for this continuity have been offered, either in terms of prehistoric diffusion from Africa to China by proto-Mande-speaking intercontinental travellers,⁷ or in terms of maritime diffusion from China to Africa especially during the Ming dynasty (1368-1644).⁸ One might even think

Leiden University dedicated to patterns of social drinking in various non-European societies. As the only Africanist amongst South and East Asianists, I was struck by the very close parallels between the Southern and Central African patterns of social and ritual drinking as evoked in my presentation, and the Chinese data presented at the same occasion. Regrettably, I did not have the opportunity to work my oral presentation of that occasion into a published text.

⁶ Granet M., 1919, *Fêtes et chansons anciennes de la Chine*, Paris: [publisher] ; Granet, M., 1926, *Dances et légendes de la Chine ancienne*, 2 vols., Paris: [publisher] ; Granet, M., 1925, 'Remarques sur le Taoïsme ancien', *Asia Major*, 2: 146-151; Granet, M., 1988, *La pensée chinoise*, Paris: Albin Michel, nouvelle édition précédée d'une préface par V. Eliseeff, earlier edition Paris: La Renaissance du Livre, 1934; Maspero, H., 1900, *Le Taoïsme*, Paris: [publisher] , reprinted in: Demiéville, P., ed., 1950, *H. Maspero: Mélanges posthumes sur les religions et l'histoire de la Chine*, Paris: Civilisations du Sud, Publications du Musée Guimet, Bibliothèque de Diffusion; vol ii; Maspero, H., 1971, *Le Taoïsme et les religions chinoises*, Paris: Gallimard; *Texts of Taoism*, vol. 39-40 of: Müller, M., ed., *Sacred books of the East: Translated by various oriental scholars*, first published Oxford: Clarendon Press, 1875-1910, reprinted 1988, Delhi: Motilal Banarsidass; Karlgren, B., 1940, 'Grammata serica: Script and phonetics in Chinese and Sino-Japanese', *Bulletin of the Museum for Eastern Antiquities* (Stockholm), 12, 1f [add pages] ; Karlgren, B., 1957, 'Grammata Serica Recensa', *The Museum of Far Eastern Antiquities Bulletin*, Stockholm, 29; Needham, J., with Wing Ling, 1956, *Science and civilization in China, vol. 2. History of scientific thought*, Cambridge: Cambridge University Press; Wang Hongyuan, 1994, *The origins of Chinese characters*, Beijing: Sinolingua, first published 1993; Wieger, L., 1965, *Chinese characters: Their origin, etymology, history, classification and signification: A thorough study from Chinese documents*, translation L. Davrout, New York: Paragon Book Reprint/ Dover, reprint of *Chinese Characters*, Hsienhsien: Catholic Mission Press, second edition, 1927; first edition 1915.

⁷ Winters, C.A., 1980, 'A note on the unity of Black civilizations in Africa, Indo-China, and China', in: *PISAS [International Symposium on Asian Studies] 1979*, Hong Kong: Asian Research Service; Winters, C.A., 1983, 'Blacks in Ancient China, Part 1: The Founders of Xia and Shang', *Journal of Black Studies*, 1, 2: [add pages] .

⁸ Duyvendak, J.J.L., 1938, 'The true dates of the Chinese maritime expeditions in the early fifteenth century,' *T'oung Pao*, 34: 341-412; Duyvendak, J.J.L., 1949, *China's discovery of Africa*, London: Probsthain; Hirth, F., 1909, 'Early Chinese Notices of East African Territories,' *Journal of the American Oriental Society*, 30: 46-57; Wheatley, P., 1975, 'Appendix II: Notes on Chinese texts containing references to East Africa', in: Neville, H.,

of Portuguese influence having a converging effect on both Central African societies like the Chokwe, and (via Macao) on China.⁹ I consider these explanations too narrow: the mechanisms they advance in order to explain the massive cultural parallels are too limited to produce the observed effect over vast expanses of the African and East Asian continents; and both the ‘China to Africa’ explanation and the ‘Portuguese influence’ explanation have a far too shallow time depth: patterns of animal symbolism in African clan nomenclature and divination have perspired in the oldest traveler’s accounts of the continent, and Chinese astral science are known from extensive documentary and archaeological evidence far predating the Portuguese expansion to East Asia, even though later Chinese astronomy and presumably also astrology were greatly influenced by European science as a result of the missionary and scientific work of Matteo Ricci (1552-1610) c.s. Gundel claims¹⁰ a remarkable reception of ancient Egyptian decan gods into East Asiatic astrology as late as the nineteenth century CE. Even if this plausible claim cannot be substantiated, we are at least reminded that we should not attribute all latterday parallels between the astral science of China and the Ancient Near East to postulated diffusion in Antiquity.¹¹

Instead I favour the hypothesis of an extensive Old World Late Palaeolithic substratum (spilling over into the New World),¹² and

Chittick, H.N., & Rotberg, R.I., eds., *East Africa and the Orient: Cultural syntheses in pre-colonial times*, New York: Africana Publishing Co., pp. 284-290; Filesi, T., 1972, *China and Africa in the Middle Ages*, translation D.L. Morison, London: [publisher] . For an exaggerated assessment of the Chinese presence in East Africa in the second millennium CE, cf. Schwarz, E.H.L., 1938, ‘The Chinese connection with Africa’, *Journal of the Royal Asiatic Society of Bengal*, 3rd series, 4: 175-193, who speaks of millions of Chinese swarming all over Eastern and Southern Africa by the middle of the second millennium CE; yet the article contains convincing details and has the general marks of serious scholarship.

⁹ I owe this suggestion to Patricia van Binsbergen-Saegerman, who pointed out to me proof of early Portuguese influence on Chokwe art, and on the Kongo kingdom.

¹⁰ Gundel, *Dekane*, o.c., p. 216.

¹¹ Pace Bezold, Ungnad, o.c. For an example of post-Ming Chinese astrology which shows such close parallels with Hellenistic and Indian astrology that it would be difficult to see the Chinese forms as having evolved completely independently on Chinese soil for two millennia or more, cf. Sherrill, W.A., ed., 1976, *The astrology of I Ching: translated from the ‘Ho Map Lo Map Rational Number’ manuscript by W.K. Chu*, London/ Henley: Routledge & Kegan Paul.

¹² Cf. von Negelein, J., 1929, ‘Das Sternbild des “Grossen Bären” in Siberien und Indien’, *Archiv für Religionswissenschaft*, 27: 186-187; Hentze, *Mythes et symboles lunaires*, o.c.; Kelley, D.H., 1960, ‘Calendar animals and deities,’ *South-Western Journal of Anthropology*, 16: 317-335; Kelley, D.B., 1991, ‘The twenty-eight lunar mansions of China’, *Reports of*

detectable in such largely formal cultural systems as astral science, board games, mythologies, basic concepts of cosmology and the human body, of witches and ancestors, etc.¹³

What emerges is a most interesting historical hypothesis.

I submit that the postulated Late Palaeolithic Old World substratum includes an elaborate system of animal symbolism. In those literate civilisations to the North and East of sub-Saharan Africa, represented in our data set mainly by the 'Black Athena' cultural region (Egypt and

Liberal Arts, Hamamatsu University School of Medicine, No. 5; Kelley, D.B., 1992, 'The Twenty-Eight Lunar Mansions of China: Part 2: A possible relationship with Semitic alphabets', *o.c.*; Kelley, D.B., 1995, 'The Twenty-Eight Lunar Mansions of China: Part 3: A Possible Relationship with the Ancient Central-American Calendar', *Reports of Liberal Arts, Hamamatsu University School of Medicine*, No. 9. Incidentally, in a further analysis along the lines presented in the present paper, these studies could be used to extend our data set of animal symbolism (Table 2) into northern Asia, and the New World.

¹³ Stricker, B.H., 1963-1989, *De geboorte van Horus, I-V*, Leiden: Brill for Ex Oriente Lux; Fontenrose, *o.c.*; Ginzburg, C., 1992, *Ecstasies: Deciphering the witches' sabbath*, Harmondsworth: Penguin Books, reprint of the first English edition of 1991, Pantheon Books, translation of *Storia notturna*, Torino: Einaudi, 1989; Campbell, J., 1992, *De vlucht van de wilde gans*, Houten: De Haan/ Unieboek, Dutch translation of *The flight of the wild gander*, New York: HarperPerennial, 1990; de Santillana, G., & von Dechend, H., 1969, *Hamlet's mill: An essay on myth and the frame of time*, Boston: Gambit; for a dismissive view of this study, cf. Palter, R., 1996, 'Black Athena, Afrocentrism, and the history of science', in: Lefkowitz, M.R., & MacLean Rogers, G., eds., *Black Athena revisited*, Chapel Hill & London: University of North Carolina Press, pp. 209-266. For my own work on such continuities, cf. van Binsbergen, W.M.J., 1997, 'Rethinking Africa's contribution to global cultural history: Lessons from a comparative historical analysis of mankala board-games and geomantic divination', in my *Black Athena: Ten Years After*, *o.c.*, pp. 221-254, also at: http://come.to/ancient_thought. For the exploration of Palaeolithic graphic signs, cf. Hentze, *Mythes et symboles lunaires*, *o.c.*, but especially Leroi-Gourhan, A., 1958, 'La fonction des signes dans les sanctuaires paléolithiques', *Bulletin de la Société préhistorique française*, 55, 5-6: 307-321; Leroi-Gourhan, A., 1958, 'Le symbolisme des grands signes dans l'art pariétal paléolithique', *Bulletin de la Société Préhistorique Française*, 55, 7-8: [add pages]; Leroi-Gourhan, A., 1958, 'Repartition et groupement des animaux dans l'art pariétal paléolithique', *Bulletin de la Société Préhistorique Française*, 55: 515-528; Leroi-Gourhan, A., 1964, *Les religions de la préhistoire: Paléolithique*, Paris: Presses Universitaires de France (Mythes et religion 6). Based on the examination, not of subterranean sites of rock art but of portable artefacts, and reaching comparable conclusions: Marshack, *The roots of civilization*, *o.c.*; Marshack, A., 1991, 'The Taï plaque and calendrical notation in the Upper Palaeolithic', *Cambridge Archaeological Journal*, 1, 1: 25-61; for criticism of Marshack, cf. d'Errico, F., 1989, 'Paleolithic lunar calendars: A case of wishful thinking?', *Current Anthropology*, 30: 117; with a reply by Marshack and a rejoinder by d'Errico. For relatively independent views converging with Marshack's, cf. Anati, E., 1998, 'Une écriture avant l'écriture', *Le Courrier de l'Unesco*, april 1998, pp. 10-16; Gimbutas, M.A., 1991, *The civilization of the Goddess: The world of Old Europe*, San Francisco: Harper, ch. 8: 'the sacred script'. A general up-to-date background to processes of symbolisation in the Upper Palaeolithic is offered, e.g., by Gamble, C., 1995, *Timewalkers: The prehistory of global colonisation*, Harmondsworth: Penguin, first published 1993: Allan Sutton Publishing Ltd, Bath.

Greece), these animal symbols came to be *demonised* when the substratum was overlaid by, or supplanted by, anthropomorphic and celestial symbolism such as emerged with the creation of states in the hands of literate priests and kings.

Such demonisation is a familiar and wide-spread process by which once dominant obsolescent symbols are relegated to the subterranean and demonic sphere. The word 'demon' itself in its current usage of evil spirit could be taken as an example of this very process, the ancient Greek word *daimōn* denoting benign spirit (cf. Socrates' moral *daimōn* as described by Plato, Xenophon and Plutarch) until the Septuagint translators of the Old Testament appropriated this word to denote an order of beings inimical to the Jewish God. This usage was adopted into the New Testament and Christianity, and projected onto locally recognised spiritual forces predating to the local arrival of Christianity. In Islam a very similar process obtains, responsible for the distinctively local signature of popular Islam wherever in the vast expanse of Islam from Senegal to Indonesia. A manifestation of this process is the formal and urban Islamic opposition to the popular veneration of trees, rocks and streams, to the latter's association with minor shrines, to beliefs and practices centring on *jinns*, and to the widespread cults of spirit possession, – one can glean examples from most ethnographies of local popular Islam in Africa (including North Africa) and South Asia. In this connection, the devil, Satan, Shaytan, etc. the demon *par excellence*, whose attributes and identity have been projected onto Germanic, Slavonic, African, Native American, Oceanic, etc. spiritual beings and forces in the course of the expansion of the two world religions, Islam and Christianity.¹⁴

In sub-Saharan Africa however this combined process of theocratic and/or secular state formation and literacy did not take place to quite the same extent, the natural environment continued to contain the animal species as part of everyday reality, and therefore in Africa we find the old

¹⁴ Aspects of this process in Africa and South America are treated in: Meyer, B., 1995, 'Translating the devil: An African appropriation of Pietist protestantism: The case of the Peki Ewe in Southeastern Ghana, 1847-1992', Ph.D thesis, Amsterdam University; Taussig, M.T., 1980, *The devil and commodity fetishism in South America*, Chapel Hill: University of North Carolina Press; van Dijk, R., 1995, 'Fundamentalism and its moral geography in Malawi: The representation of the diasporic and the diabolical', *Critique of Anthropology*, 15, 2: 171-191. Glimpses of the process in the Germanic world of first-millennium CE Europe in: Lampen, W., 1939, *Willibrord en Bonifatius*, Amsterdam: Van Kampen.

substratum of animal symbolism still more or less in place, extending over huge expanses of space and time. If indeed we are right in tracing this widespread system of animal symbolism back to the Upper Palaeolithic, then an old and long dismissed suggestion made by the ‘father of prehistory’, Breuil, is thus granted a new lease of life:¹⁵ the idea that there is a historical connection between the bovines depicted in the Upper Paleolithic rock art (specifically that of the Franco-Cantabrian region in southwestern Europe), and the much more recent Babylonian zodiac whose animal imagery is echoed in the Gilgamesh epic and, much later, in Herakles’ heroic twelve works.

There is reason to suggest that the Late Palaeolithic Old World system of animal symbolism may have been first formulated in Africa: it is here that somatically modern mankind emerged some 100,000 years Before Present, prior to expansion to other continents where it replaced the Neanderthaloid population, perhaps with some, but probably with no genetic mixing. The easiest way to explain any Late Palaeolithic Old World cultural continuity is by appealing to the world-wide demographic spread of somatically modern man across and out of Africa.¹⁶ The oldest representations of animals are no longer those of the famous rock art of the Franco-Cantabrian region in southwestern Europe, but from East and Southern Africa.¹⁷

The substratum was well preserved in the sub-Saharan African context, but also in East Asia, where the emergence of the state and literacy incorporated and encapsulated, rather than annihilated, the Late Palaeolithic substratum traits. As a result animal symbolism in Chinese astral science (including the zodiac and the lunar mansions as parts of our data set) closely and consistently clusters together with the Chokwe and Tswana material so as to form cluster (C). That also in the South-Erythraean cultural region (D) the postulated Late Palaeolithic substratum

¹⁵ Breuil, H., 1909, ‘Le bison et le taureau céleste chaldéen’, *Revue archéologique*, 4e série, 13, 1: 250-254.

¹⁶ Shreeve, J., 1996, *The Neandertal enigma?: Solving the mystery of modern human origins*, New York: Morrow/ Viking; Lainé, ‘Eve africaine?’, *o.c.*, and extensive references cited there.

¹⁷ Anati, E., 1986, ‘The rock art of Tanzania and the East African sequence’, *BCSP [Bolletino des Centro Camuno di Studi Preistorici]*, 23: 15-68, fig. 5-51; Anati, E., 1999, *La religion des origines*, Paris: Bayard; French translation of *La religione delle origini*, n.p.: Edizione delle origini, 1995.

of animal symbolism may be detected, is clear from the fact that the ‘animal demons’ series (as a demonising transformation of the original Palaeolithic series) formally situates itself in this cluster (although of course in space and time the animal series transcends all clusters, being virtually world-wide). It is odd that the Nkoya series should situate itself here rather than nearer to the Chokwe material; the Nkoya language is fairly closely related to the Chokwe language,¹⁸ and many forms of material culture and social organisation of both societies are similar. The Nkoya political organisation in kingdoms owes however a demonstrable debt not only to ancient Egypt¹⁹ but also and especially to the East African Coast / Madagascar / Indonesia, and thus might be more effectively influenced by the South-Erythraean cultural complex than the Chokwe. The Chokwe are situated more to the West and would instead display South Atlantic traits (such as worship of the high god Nyambi/ Nzambe/ etc., trading cults, and *nkisi* medicine containers, all of them little developed and probably recent traits among the Nkoya).

Students of early astronomies have often been struck by the extreme success of astrology (divinatory astronomy) as a conceptual frame of reference: apparently invented in ancient Mesopotamia²⁰ as an additional form of divination (next to the dominant haruspicy) to predict events important to the state and the kingship, it had a counterpart on Egyptian astral science already in the middle of the first millennium BCE,²¹

¹⁸ Greenberg, J.H., 1955, *Studies in African linguistic classification*, New Haven (Conn.): Compass.

¹⁹ Cf. my *Global bee flight*, *o.c.*

²⁰ For extensive literature cited, cf. van Binsbergen & Wiggermann, ‘Magic’, *o.c.* On the basis of the early attestation of astrology in ancient Mesopotamia and the subsequent very wide spread of this knowledge system, Winckler launched, a century ago, the idea of pan-Babylonism: ancient Mesopotamia conceived as the cradle of all culture. Winckler, H., 1903, *Himmels- und Weltenbild der Babylonier als Grundlage der Weltanschauung und Mythologie aller Völker*, Leipzig: Hinrichs. This position is since highly discredited, very early on already by: King, L.W., 1915, *A history of Babylon: From the foundation of the monarchy to the Persian conquest*, London: Chatto & Windus, ch X, pp. 289-315. There is a certain, but only superficial, similarity between this, highly discredited, position and my own far more complex suggestion, below, which seeks to explain the unmistakably world-wide success of astrology by interpreting this specialist knowledge system as being greatly supported by, and/ or forming a transformation of, a system of animal symbolism; from Africa the latter spread all over the world with the demographic expansion of somatically modern man, and thus offered everywhere a fertile and kindred ground for the reception of astrology as a more sophisticated form of animal symbolism.

²¹ Gundel, *Dekane*, *o.c.*; Schott, S., 1936, ‘Erster Teil: Die altägyptische Dekane’, in: Gundel, *Dekane* *o.c.*, pp. 1-21; Gundel, W., 1936, *Neue astrologische Texte des Hermes*

subsequently conquered Hellenic science, and in Hellenistic times²² became a central organising theme not only in divination (where it became the systematic reasoning behind palmistry, numerology, etc.), but also in medicine and the pharmacopaea,²³ colour symbolism, mineralogy, art, and permeated the entire world view of Late Antiquity; but also South and East Asia, West and East Africa, and Germanic-speaking northwestern Europe, adopted or developed local astrologies; while the most successful divination method whose localised versions spread all over the world (including the Indian Ocean region, South and West Africa, Byzantium, Renaissance Europe, German peasant culture, and African American shell divination) was the Arabic (*ilm al-raml*, which Ibn ʿaldun already recognised²⁴ to be essentially a perverted form of astrology. I submit that the success of astrology was largely based on the fact that it was an early transformation of a system of animal symbolism that formed a world-wide cultural substratum dating back to the Late Palaeolithic, and to the African continent as the cradle of somatically modern man.

Ever since the late nineteenth century art historians and archaeologists have wondered at another widely distributed representational complex: the ‘animal style’,²⁵ originally identified in Scythian figurines dating from

Trismegistos, *Abhandlungen der Bayerischen Akademie für Wissenschaften Philosophisch-historische Abteilung*, Neue Folge, Heft 12; Robins, G., 1995, ‘Mathematics, astronomy, and calendars in Pharaonic Egypt’, in: Sasson, J.M., with Baines, J., Beckman, G., & Rubinson, K.S., eds., *Civilizations of the Ancient Near East*, New York etc.: Scribner’s, pp. III, 1799-1813.

²² Bouché-Leclercq, A., 1879, *Histoire de la divination dans l’antiquité*, Paris: Leroux, 4 vols, reprint ca. 1960, U.S.A. (the U.S.A. photomechanical reprint I consulted does not contain any details as to publisher and year of publication); Gundel, H.G., 1972, ‘Zodiakos’, in: *Paulys Realencyclopaedie der classischen Altertumswissenschaft: Neue Bearbeitung begonnen von George Wissowa etc.*, Kroll, W., ed., II. Reihe 19. Halbband, cols. 462-709; Boll, F.J., Bezold, C., & Gundel, W., 1966, *Sternglaube und Sterndeutung: Die Geschichte und das Wesen der Astrologie: 5. durchgesehene Auflage mit einem bibliographischen Anhang von H.G. Gundel*, Darmstadt: Wissenschaftliche Buchgesellschaft, first edition Leipzig 1926: Teubner Verlag.

²³ Pfister, F., 1964, ‘Pflanzenaberglaube’, in: *Paulys Realencyclopädie der classischen Altertumswissenschaft: Neue Bearbeitung begonnen von George Wissowa etc.*, Kroll, W., ed., 38. Halbband, cols. 1446-1456.

²⁴ Ibn Khaldūn, 1980, *The Muqaddimah: An introduction to history*, translated from the Arabic by F. Rosenthal, 3 vols, second printing of second edition, Princeton (N.J.): Princeton University Press, 1980, first edition Bollingen Series XLIII, New York: Bollingen Foundation Inc, 1958.

²⁵ Leroi-Gourhan, A., 1943, *Documents pour l’art comparé de l’Eurasie septentrionale*, Paris: Editions d’Art et d’Histoire; Bunker, E.C., Chatwin, C.B., & Farkas, A.R., 1970,

the mid-first millennium BCE onwards, but gradually found to extend over much of Asian and European early history, with ramifications into, e.g., Hittite and ancient Mesopotamian art, and perhaps even Eskimo and other American cultures. The stag or deer occupies a central place in this complex, in its own right or (which seems to be a derived sense) as the animal sacred to a hunting god or goddess. The theme of the ‘flying gallop’ (nowhere to be observed in nature, yet captured in ancient art from China to Scythia, Syria and Crete)²⁶ is also related to this style, and ultimately central shamanistic themes such as the reviving of a dead animal by the proper arrangement of its skin and bones seem to attach to this theme. I submit that the extreme extension of the ‘animal style’ complex is not only to be sought in linguistic or ethnic communality of certain Asian and European human groups, or in extensive migratory or trading contacts, but that these obvious mechanisms of diffusion have been greatly facilitated by the persistence of a relatively intact original system of animal symbolism as contained in the Late Palaeolithic substratum. Presumably a parallel argument may be advanced with regard to animal tales. If we dare insist on an African origin, the stag or deer would then be a transformation of African antelope species – an equivalence I have already applied in Table 2. The extension of the ‘animal style’ over much of Asia, and specifically both in South West Asia (ancient Anatolia and ancient Mesopotamia) and in China, adds plausibility to the appearance of both African and Chinese material in cluster (C).

We are now in a position to suggest an historical explanation for the tripartite cluster structure which our analysis has revealed. Cluster (C), comprising both the African and the Chinese material, corresponds with the Late Palaeolithic cultural substratum including the earliest, presumably Africa-derived, animal symbolism. The other two clusters reveal the two earliest centres of cultural innovation where this substratum was profoundly transformed: ancient Mesopotamia (D) and ancient Egypt (A). It is remarkable that these two centres of civilisation,

‘Animal style’: Art from east to west, New York: [publisher] ; Cammann, Schuyler v. R., 1958, ‘The animal style art of Eurasia’, *Journal of Asian Studies*, 17: 323-39; Rostovzev, M.I., 1929, *The animal style in South Russia and China*, Princeton, Princeton University Press.

²⁶ Reinach, S., 1925, *La représentation du galop dans l’art ancien et moderne*, Paris: Leroux

although relatively close in space (on a world scale) and time, should appear as so radically distinct in our analysis. This is all the more remarkable in view of the fact that the earliest history of Egypt reveals considerable Mesopotamian influence, to such an extent that a considerable number of scholars have seen such influence as decisive in the emergence of Egyptian civilisation (writing, tomb architecture, the unified state, the gods – all a fact by the time of the first dynasty, c. 3100 BCE). Interestingly in the light of our present analysis, it is especially Mesopotamianising themes in the representation of *animals* on cosmetic palettes and seals, that are among the primary indications of Mesopotamian influence on early Egypt.²⁷ Other analyses have played down the Mesopotamian influence, and have instead stressed the internal dynamics of the prehistoric societies of the Nile valley,²⁸ the influence from sub-Saharan Africa,²⁹ or the interaction between sub-Saharan African influences and Eastern Mediterranean influences³⁰ – the latter possibly overlapping with the influence from Mesopotamia. In the latter approach we would envisage a situation, in the fifth and fourth millennium BCE, where our three clusters would still be in statu nascendi, still in the process of dissociating from one another, and with little to distinguish the Egyptian and Mesopotamian cluster from the African one. Given an initially considerable Mesopotamian influence, Egypt soon moved away more and more from the Mesopotamian models and towards a most distinctive socio-cultural orientation of its own. I suspect that this divergence increased because of at least two reasons:

(a) the contingency of cultural change in general (given such

²⁷ Kantor, H. J., 1952, 'Further evidence of early Mesopotamian relations with Egypt', *Journal of Near Eastern Studies*, 11, 2: 239-250; Rice, M., 1990, *Egypt's making: The origins of Ancient Egypt, 5000-2000 B.C.*, London and New York: Routledge.

²⁸ Hoffman, M.A., 1991, *Egypt before the Pharaohs: The prehistoric foundations of Egyptian civilization*, revised edition, Austin: University of Texas Press, first published New York/London 1979.

²⁹ Frankfort, H., 1948, *Kingship and the gods: A study of Ancient Near Eastern religion as the integration of society and nature*, Chicago: University of Chicago Press, French translation *La royauté et les dieux: Intégration de la société à la nature dans la religion de l'ancien Proche Orient*, Paris: Payot; Redford, *Egypt, Canaan, and Israel, o.c.*; Williams, B.B., 1986, *The A-group Royal Cemetery at Qustul Cemetery I: Excavations between Abu Simbel and the Sudan frontier*, Keith C. Seele, Director, Oriental Institute Nubian Expedition volume III, Part I, Chicago: Oriental Institute;

³⁰ My *Global bee flight, o.c.*

contingency, any change both in Egypt and in Mesopotamia – separated after all by considerable stretches of sea and partly inhospitable land – would be more likely to result in further deviation than to further convergence between the two regions); but also

- (b) the Egyptian elite's and general population's endeavour to articulate Egypt's distinctiveness by explicit reference to Mesopotamian models, knowledge about which continued to be available through trade and migration models – as if Egypt and Mesopotamia each sought to occupy distinctive available niches in an extensive and loosely integrated regional cultural ecology; the desire to maintain domestic identity in the face of knowledge about and interaction with surrounding peoples corresponds with the so-called xenophobia for which ancient Egypt has been known throughout its history.

But whatever the earliest history of the civilisations of Egypt and Mesopotamia, the material from these cultures as included in our data set derives not from their earliest times, but from the time of their greatest maturation, in the late second and the first millennium BCE, when literacy, the state, religion, and complex social organisation in general, had propelled both Egypt and Mesopotamia into a specific high level of cultural innovation, resulting in a very marked distinctiveness vis-à-vis one another and vis-à-vis the Late Palaeolithic substratum. In both civilisations animal symbolism remained important, as is testified by the animal associations of Gilgamesh and Enkidu in epic texts and in glyptic iconography; by the *Mischwesen* (composite fabulous animals) appearing in both Mesopotamia, and Egypt, and in Egypt by the very extensive matching, to the point of conflation, between gods and animals. But in both Mesopotamia and Egypt the triumph of literacy, the state, and organised religion consisted in the dethronement of animals as central symbols and vehicles of thought. Their place was largely taken by anthropomorphic gods, often secondarily associated with animals, but also with other natural phenomena and with man-made objects and crafts. It is proper that the demonised animal figures (constituting an anguished memory of symbols that were once – under the Late Palaeolithic

substratum – the dominant repositories of meaning) appear, not as part of the substratum cluster (C) – their original context, where they would still be intact and not yet demonised – but as part of one of the ‘transformed animal symbolism’ clusters, (A) or (D). Given the more emphatically maintained animal nature of the ancient Egyptian gods as compared to ancient Mesopotamia, it is consistent that the ‘animal demons’ cluster, although in principle encompassing much of the entire world, should fall in the Mesopotamian cluster (D).

Nevertheless, we have to acknowledge the fact that animal demons also occur in African symbolism, and not exclusively as recent transformations of African symbolism under conditions of the state and literacy.³¹ As Ruel points out,³² there is also in Africa specific animal symbolism of political domination. This I can only endorse, on the basis of my own studies of royal symbolism in South Central Africa,³³ and of a comparative exploration of leopard-skin symbolism I recently undertook.³⁴ This link between African political domination and animal symbolism in principle leaves open the possibility that also in Africa the demonisation – as a secondary phase – of an earlier form of animal symbolism has been associated with the emergence of precolonial states, though not with literacy. By the same token, we should extend our analysis to the, considerable, sub-Saharan evidence on astral animal symbolism in the form of zodiacs etc.³⁵ It is noteworthy that much of the

³¹ Cf. Ruel, M., 1970, ‘Were animals and the introverted witch’, in: Douglas, M., ed., *Witchcraft confessions and accusations*, Tavistock, pp. [add pages]

³² Ruel, M., 1970, ‘Lions, leopards and rulers’, *New Society*, 380: 54-56.

³³ Cf. my *Tears*, o.c.

³⁴ For a section of my forthcoming book *Intercultural encounters: African lessons for a philosophy of interculturality*.

³⁵ Cf. Griaule, M., 1966, *Dieu d'Eau: Entretiens avec Ogotomèlli*, Paris: Fayart, first published 1948, English translation *Conversations with Ogotemméli: An introduction to Dogon religious ideas*, London: Oxford University Press; Bork, F., 1914, ‘Tierkreisforschungen’, *Anthropos*, 9: 66-80 (where the author examines materials from India, Indonesia and West Africa); Callet, le R.P., 1913, *Tantaran’* [**check Tantara**] ny Andriana, traduit et annoté par M. Colançon, *Bulletin de l'Académie Malgache*, vol. 11-12, vol 12 [**check**] part. [**check**] 1, p. 21-114; Corò, F., 1951, ‘Folklore africano: Astronomia e scienze occulte presso i Tuaregh’, *Rassegna Mediterranea*, December 1951: 19; Crowfoot, J.W., 1920, ‘Beliefs about the mansions of the moon’, *Sudan Notes and Records*, 3: 271-279; ten Raa, E., 1969, ‘The moon as a symbol of life and fertility in Sandawe thought’, *Africa*, 39: 24-53; Sechefo, J., 1909, ‘The twelve lunar months among the Basuto’, *Anthropos*, 4: 931-941; Pâques, V., 1964, *L'Arbre cosmique dans la pensée populaire et dans la vie quotidienne du Nord-Ouest africain*, Travaux et Mémoires de l'Institut d'Ethnologie de l'Université de Paris, no. 70, Paris: Institut d'Ethnologie de l'Université de Paris; Pâques, V., 1956, ‘Le

literature on this point refers to the world of African Islam, as if the astronomical and astrological knowledge systems we are encountering here, though on African soil, do not directly spring from an indigenous African tradition but from the Arabic one which was a direct heir to the scientific and magical tradition of the Ancient Near East and Graeco-Roman antiquity. But in some of these African astronomical and astrological attestations Islam is merely a distant influence, like among the Dogon. In addition, divination bowls both in Southern Africa (Venda) and in West Africa (Yoruba) often have decorated rims that evoke zodiacal symbolism.³⁶ It is not clear whether such zodiacal symbolism belongs to

- (a) an independent indigenous African zodiacal tradition (which I would find extremely unlikely);
- (b) an imported literate zodiacal tradition – most probably from the Arab world – which however is locally carried by specialists more or less competent in that tradition; or
- (c) merely represents the superficial, decorative imitations of foreign examples on imported artefacts, not supported by locally competent meaning.

Kroeber reminds us³⁷ that throughout West Africa we encounter golden rings with twelve zodiacal signs, which however locals cannot explain for lack of astrological knowledge. Of course, magical bowls, sometimes with explicit astrological connotations, have abounded in the world of

Béliet cosmique', *Journal de la Société des Africanistes*, 26, 1-2: 211-253; Hiskett, M., 1967, 'The Arab star-calendar and planetary system in Hausa verse', *Bulletin of the School of Oriental and African Studies*, 30: 158-176; Ferrand, G., 1905, 'Un chapitre d'astrologie arabico-malgache d'après le manuscrit 8 du fond arabico-malgache de la Bibliothèque Nationale de Paris', *Journal Asiatique*, 10th series, 6: 193-273; Knappert, J., 1993, 'al-Nudjum (A.), the stars: In East Africa', in: Bosworth, C.E., van Donzel, E., Heinrichs, W.P., & Lecomte, G., eds., *Encyclopaedia of Islam*, new edition, Leiden: Brill, p. VIII, 105; Bloch, M., 1968, 'Astrology and writing in Madagascar', in: Goody, J., ed., *Literacy in traditional societies*, Cambridge: Cambridge University Press, pp. 278-297; Cerulli, E., 1931-32, 'Nuovi appunti sulle nozioni astronomiche dei Somali', *Rivista degli Studi Etiopici*, 6: 83-92; Cerulli, E., 1929-30, 'Le stazioni lunari nelle nozioni astronomiche dei Somali e dei Dan^akil', *Rivista degli Studi Orientali*, 12: 71-78; Littmann, E., 1908, 'Sternensagen und Astrologisches aus Nord-Abessinien', *Archiv für Religionswissenschaft*, 2 [**check ; 1st year was 1898!**] : 298-319.

³⁶ ; cf. Davis, S., 1955, 'Divining bowls, their uses and origin: Some African examples and parallels from the ancient world', *Man*, 55 (143): 132-135, and references cited there.

³⁷ Cf. Kroeber, A.L., 1923, *Anthropology*, New York: Harcourt, Brace, p. 205.

Judaism, Madaeism, and Islam during the first millennium CE, and given the extensive inroads of southwestern Asian culture into East Africa,³⁸ these could very well be responsible for superficially imitated zodiacal designs on pottery.³⁹

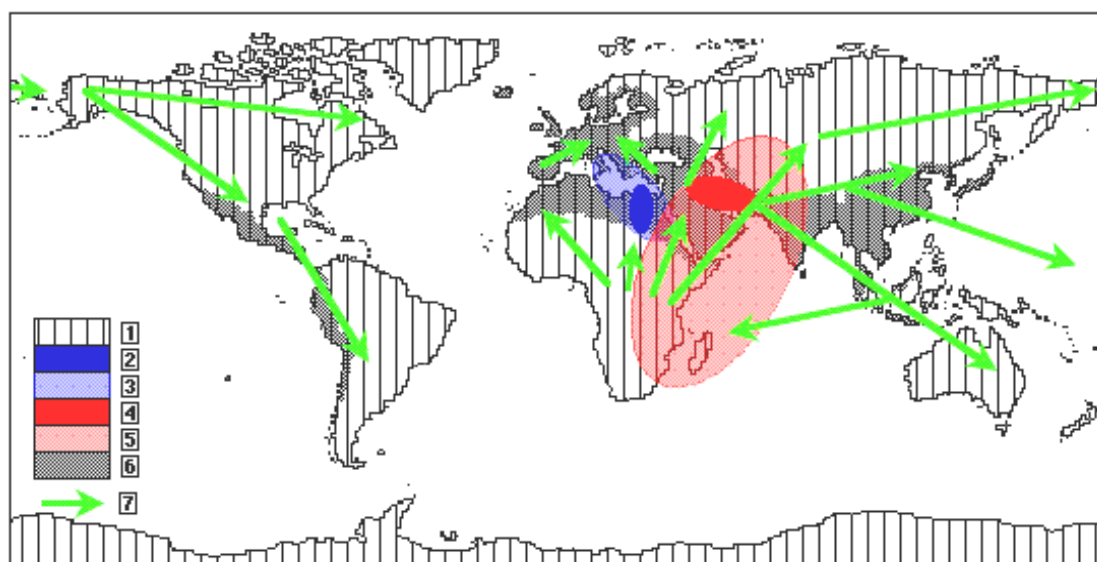


Diagram 9. Interpretation of the results of cluster analysis on world-wide patterns of animal symbolism

Legend:

- (1) Late Palaeolithic cultural substratum i.e. cluster (C)
- (2) ancient Egypt as a centre of cultural innovative transformation
- (3) sphere of influence of (2): the 'Black Athena' region i.e. cluster (A)
- (4) ancient Mesopotamia (with possible extension to Persian Gulf and Indus valley) as a centre of cultural innovative transformation
- (5) sphere of influence of (4): the 'South Erythraean' region i.e. cluster (D)
- (6) approximate distribution area of animal demon beliefs and representations
- (7) postulated diffusion of hypothetically original African animal symbolism over the rest of the world in the context of the demographic expansion of somatically modern man.

Given the abstract, aggregated and highly selective nature of the analysis, few interactive effects which we know to have taken place

³⁸ Cf. Neville c.s., *East Africa and the Orient*, o.c.

³⁹ Naveh, J., & S. Shaked, 1985, *Amulets and magic bowls : Aramaic incantations of late antiquity*, Jerusalem: Magnes Press, The Hebrew University/ Leiden: Brill; Spoer, H.H., 1938, 'Arabic Magic Bowls II: An Astrological Bowl,' *Journal of the American Oriental Society*, 58: 366-383.

between the identified cultural clusters, actually perspire in the present material. For instance, the continuity between ancient Egypt and ancient Greece is highlighted in (A), beautifully in line with Bernal's *Black Athena* thesis, but not so highlighted is the continuity between ancient Mesopotamia and ancient Greece, which is yet a proven fact precisely in astronomy (from which part of our data set was taken) and other sciences,⁴⁰ and which certain scholars⁴¹ have also argued for mythology, e.g. in the parallels between the Gilgamesh epic, the labours of Herakles, and the Prometheus myth. [**check for repetition**] I have already pointed out that it was the thrust of cultural dynamics, accelerated and intensified by societal complexity, literacy, the state and organised religion, which caused the Egyptian and the Mesopotamian cluster to become, at the height of their development, so radically different from one another despite the evidence of Egypt's initial indebtedness to Mesopotamia. This effect of what I have called 'transformative localisation':⁴² the local appropriation and adaptation of globally circulating cultural material, so as to produce a distinctive local form which can no longer be reduced to its original provenance. In this case the effect of transformative localisation is so strong as to obscure, from our analysis, any minor exchanges which are known to have occurred between Egypt and Mesopotamia – which for some time during the New Kingdom shared a border at the Euphrates, maintained a correspondence in cuneiform

⁴⁰ Dalley, S., & Reyes, A.T., 1998, 'Mesopotamian contact and influence in the Greek world (1)', in: Dalley, S., & Reyes, A.T., eds., *The legacy of Mesopotamia*, Oxford, Clarendon Press, pp. 85-106; Bottéro, J., Herrenschildt, C., & Vernant, J.P., 2000, *Ancestor of the West: Writing, reasoning, and religion in Mesopotamia, Elam, and Greece*, Chicago: University of Chicago; van der Waerden, B.L., 1974, *Science Awakening*, I. Egyptian, Babylonian and Greek mathematics, II: The Birth of Astronomy, Leyden: Brill [**check**], English translation of the Dutch *Ontwakende wetenschap: I Egyptische, Babylonische en Griekse wiskunde, II. De geboorte der sterrenkunde*, Groningen: Noordhoff, first published 1950-1954 [**check**] .

⁴¹ Fontenrose, *o.c.*, p. 248; Hrozný, B., 1951, *Ancient history of western Asia, India and Crete*, Prague: Artia, p. 57, 155 (I am aware of the discredited nature of Hrozný's claim to have deciphered the ancient Cretan script, and of the several other flaws of this book, but that is immaterial in this context); Kramer, S.N., 1961, *Sumerian mythology: A study of spiritual and literary achievement in the third millennium B.C.*, Memoirs xxi, Philadelphia: American Philosophical Society, reprint of the 1944 first edition, pp. 13, 33. The idea of a direct relation between Herakles and Gilgamesh was however dismissed by Levy, G.R., 1934, 'The Oriental origin of Herakles', *Journal of Hellenic Studies*, 54: 40-53.

⁴² van Binsbergen, W.M.J., 1997, 'Black Athena Ten Years After: Towards a constructive re-assessment', in my *Black Athena: Ten Years After*, *o.c.*, pp. 11-64, also at: http://come.to/ancient_thought and at http://come.to/black_athena .

Akkadic, exchanged healing statues of gods, adopted each other's gods, boardgames, etc. For the same reason of transformative localisation the Egyptian-Greek cluster (A) should appear so radically different from the substratum one (D) containing most of the African material, despite Egypt's unmistakable cultural and demographic indebtedness to Africa. Both in the case of Mesopotamian / Egyptian exchange, and of African/ Egyptian - Egyptian / African exchanges, the analysis highlights how the dynamics of transformative localisation works on cultural material imported by way of diffusion, and shapes that material into something uniquely distinct from yet historically related to the original source. Our analysis is too crude and too limited to reveal some other historically established interaction processes affecting the societies in our sample, such as the influence of Egyptian material not only on Greece but specifically fed back into Africa;⁴³ or the historical link between China and Mesopotamia precisely in the field of astronomy. In other words, the cluster analysis with its tree-like results tends to play down interaction between clusters and between branches, in this case between cluster (A) and (C) (Egypt/ Africa) and between (D) and (C) (Mesopotamia / China). Ironically, on the basis of extensive field work I recently drafted a book arguing the historical links between the kingship and oral traditions of the Nkoya people of South Central Africa, and ancient Egypt,⁴⁴ whereas in the present analysis the Nkoya with their system of clan nomenclature (which is presumably older than and independent from the kingship) situate themselves in the Mesopotamian cluster (D) (which therefore had to be re-interpreted as South Erythraean) and not with Egypt (A).

Scientific classifications ultimately arose in the context of these transformations in ancient Mesopotamia, Egypt, notably through early astronomy and divination systems, much later to be reworked in Hellenic and Hellenistic times, and in modern times to be partly dismissed as pseudo-sciences. Not only does this analysis support the view that extensive continuities in space and time, as a social basis for the attribution of universality, is a feature of other systems of knowledge besides modern science; it also shows how modern science and its spatial and temporal extension is historically indebted to these other systems of

⁴³ My *Global bee flight*, o.c.

⁴⁴ My *Global bee flight*, o.c.

knowledge.

7. Summary and conclusion

The philosopher of science Sandra Harding attributes modern science's claim to universality not in the first place to its internal epistemology, but to the specific social condition that modern science is available, represented, mediated, anywhere on the globe, at specific centres of exchange such as universities, schools, the media etc. The present paper makes the point that, among systems of knowledge, modern science does not have the monopoly of this social condition. Many other systems of knowledge, far from being merely local, have extensive continuity over vast expanses of both space and time, and hence may be suspected of taking on, in the consciousness of the people sharing such knowledge, a validity comparable to modern science's. The global distribution of the mythological theme of 'hero fights monster' is one initial example. The argument then concentrates on animal symbolism as providing an even more impressive example. From eleven widely differing cultural contexts in Asia, Africa and Europe and from a time span of several millennia, eleven series of animal (combined with non-animal) symbolism are processed: world-wide representations of animal demons; nomes and major gods from ancient Egypt; figurines in the Central African (Chokwe) divining basket; the names of clans among the Central African Nkoya people and the Southern African Tswana people; the classic Chinese zodiac and lunar mansions; Babylonian astronomy; the modern international names of the constellations; and the animal associations of the major Greek gods. It turns out to be possible to subsume these very disparate series in one large matrix. After a methodological discussion, the contents of this matrix are subjected to extensive cluster analysis. Given the notorious variability and manipulability of cluster analysis results, we need to proceed cautiously. However, the patterns that emerge turn out to be remarkably stable and consistent, regardless of whether the analysis is limited to animal symbols or is allowed to include non-animal symbols; and regardless of whether actual occurrences in the data set per series and per symbolic category data are taken into account, or instead the data are dichotomised in terms of mere occurrence, or non-occurrence, per series and per category; dichotomisation allows us to use

a stronger, parametric distance statistic based on the Pearson correlation, but this again yields largely the same results. Three clusters articulate themselves persistently in the data set: an African / Chinese cluster; an ancient Egyptian / classical Greek cluster; and an ancient Mesopotamian cluster, to which modern constellation names are historically indebted, and to which both globally distributed animal demons, and Nkoya clan names, attach themselves. In an attempt to explain this pattern, the hypothesis is formulated of an Upper Palaeolithic cultural substratum encompassing, among other traits including an early nomenclature of (some) constellations, an elaborate system of animal symbolism. In the African (Tswana, Chokwe) and Chinese material in our data set, this Upper Palaeolithic substratum is still more or less intact. Alternatively, under conditions of state formation, the emergence of organised religion, and literacy, the substratum underwent specific transformations in ancient Egypt (from where a decisive influence was exerted on Greek religion and mythology) and, in a radically different direction, in ancient Mesopotamia. While animal symbolism remained a part of both transformative clusters, animals lost their earlier central roles as vehicles of meaning and of thought (as in the Upper Palaeolithic), and gave way to anthropomorphic symbols or to symbols derived from other natural phenomena than animals, especially meteorological and celestial phenomena. Scientific classifications ultimately arose in the context of these transformations in ancient Mesopotamia, Egypt, notably through early astronomy and divination systems, much later to be reworked in Hellenic and Hellenistic times, and in modern times to be partly dismissed as pseudo-sciences. Not only does this analysis support the view that extensive continuities in space and time, as a social basis for the attribution of universality, is a feature of other systems of knowledge besides modern science; it also shows how modern science and its spatial and temporal extension is historically indebted to these other systems of knowledge. In addition to this main line of argument, the paper touches on a number of additional points: the Black Athena thesis on ancient Egyptian / Greek continuity, supported by the cluster analysis; Frobenius'¹ concept of the South Erythraean cultural area, as a likely

¹ I am aware that Frobenius' scholarship and moral stance as an Africanist is discredited among mainstream Africanists today (cf. Zobel, C., 1997, 'Essentialisme culturaliste et

explanation of the Nkoya material's associating with the Mesopotamian cluster, thus highlighting South Asian and Indonesian influences in Central African kingship and mythology; the manifestation of the postulated Upper Palaeolithic system of animal symbolism in the famous rock art of that period; the persisting manifestation of that system in such familiar themes of art history as the 'animal style', the 'flying gallop', animal tales, and certain shamanistic themes having to do with animal death and rebirth; the hypothesis that the postulated widespread Upper Palaeolithic system of animal symbolism may have facilitated the amazingly wide spread of astrology as an astral system of animal symbolism; the demonisation or diabolisation, of that system when under conditions of state formation and literacy a different religious regime emerges; and finally such historically documented interactions between the clusters as evade the tree-like representation of relationships in cluster analysis: Mesopotamian/ Egyptian, Mesopotamian/ Greek, Mesopotamian/ Chinese, African/ Egyptian, and Egyptian/ African.

Of course, more satisfactory cluster analyses, and a more sophisticated and subtle interpretation of their results, could be made if far more series from a wider range of provenances were included – particularly from other African and Asian societies, from the Americas, Australia and Oceania, ancient Europe, and from other spheres of life than religion, mythology, social nomenclature, and astral science. However, the preparation and analysis of our eleven series has already taken months of work. In the near future the data set will of course be greatly expanded in space and in time. Meanwhile, for a first indication of the kind of potential of this material and of this kind of analysis, the present exercise is quite sufficient. It confirms Lévi-Strauss' that animals

humanisme chez Leo Frobenius et Maurice Delafosse', in Amselle, J.-L., & Sibeud, E., eds, *Maurice Delafosse entre orientalisme et ethnographie: L'itinéraire d'un africaniste (1870-1926)*, Paris: Maissonneuve & Larose, pp. 137-143; Streck, B., 1996, 'Frobenius', in: *Deutsche Biographische Enzyklopädie*, 3, München: [publisher] pp. 499f. [add pages] ; Luig, U., 1982, ed., *Leo Frobenius. Vom Schreibtisch zum Äquator: Afrikanische Reisen*, Frankfurt a.M.: [publisher] ; Vajda, L., 1973, 'Leo Frobenius heute', *Zeitschrift für Ethnologie*, 98: 19-29. On the other hand, Frobenius is widely acclaimed as a major intellectual influence on Afrocentricity: Abiola Irele, F., 1997, 'Negritude', in: Middleton, J.M., 1997, ed., *Encyclopaedia of Africa south of the Sahara*, 4 vols., New York: Scribners, vol. 3, pp. 278-286; Césaire A., 1941, 'Leo Frobenius et le probleme des civilisations', *Tropiques* (Fort-de-France), no. 1, pp. 27-36. For a brief anthropological re-appraisal of Frobenius, see my forthcoming book *Global Bee Flight: Sub-Saharan Africa, Ancient Egypt, and the World — Beyond the Black Athena thesis*.

have been *bien à penser*, ‘good for thinking’, in the most literal sense: as props for forms of untamed thought from which, ultimately, along an itinerary whose outline we are beginning to discern, contemporary scientific knowledge was to come forth.

key words: Africa, alphabet, Ancient Near East, ancient Greece, animal, animal association, animal demon, animals, Animal style, animal symbolism, animal tale, anthropomorphism, Asia, astrology, astronomy, attribute (divine), attributes, basket oracle, bien à penser, Black Athena, celestial, China, Chokwe, clan, classification, cluster analysis, constellation, cultural area, demonisation, demons, devil, diabolisation, divination, divining basket, dragon, Egypt, Europe, fable, figurine, flying gallop, Fontenrose, Frobenius, global, god, Greece, Harding, Hellenism, hero, history of astronomy, history of science, India, Indian Ocean, indigenous knowledge systems, Indonesia, kingship, knowledge, Lévi-Strauss, literacy, lunar mansion, Mesopotamia, meteorological, monster, myth, mythology, Nkoya, nome, out-of-Africa hypothesis, Palaeolithic, pensée sauvage, philosophy of science, pseudo-science, religion, rock art, science, shamanism, sky, South Erythraean cultural area, state, strong, symbolism, substratum, totem, totemism, transformative localisation, Tswana, universality, untamed thought, world-wide, zodiac

