

Challenges and Potentials for Sharing between Networks of Excellence (NERE/DSR and E-Culture Net)

Kim H. Veltman

Scientific Director. MMI and Co-Ordinator E-Culture Net

k.veltman@mmi.unimaas.nl

Grote Gracht 82, PO Box 616

Maastricht MD 6200, NETHERLANDS

Abstract

This paper explores nine challenges entailed in the creation of international cultural networks. These challenges centre around contextualisation. It is claimed that we need to explore common origins in belief systems (mythology, religion, science) as a step towards understanding differences in expression in various cultures. The example of mount Meru is used to explore these relations. It is suggested that a combination of belief systems, cultural products (intangible and tangible culture) and attitudes can form the basis for a new model of culture that transcends Euro-centric or Asian-centric limits. The need to work towards a World Distributed Electronic Repository (WONDER) is outlined.

It is concluded that the Asian Network of Excellence for Research and Education on in Digital Silk Roads (NERE/DSR), E-Culture Net and the American Digital Silk Roads project, under the auspices of UNESCO have an obvious rationale to share examples of digital culture. A deeper rationale for their existence lies in sharing ideas and developing methods concerning these more subtle challenges in order that the sharing of digital culture can reveal different expressions stemming from a common humanity.

Keywords

Networks, world-views, cosmology, mythology, religion, intangible culture, cultural models, cultural diversity, distributed repositories, virtual reference rooms, collaborative forums.

1. Introduction

The quest for international networks entails obvious technological challenges such as interoperability of hardware and software, and translation into relevant languages. These challenges are being addressed on a number of fronts and will not concern us here. [1] Nor are we concerned here with cases where there are clear links between two neighbouring cultures.[2]

Most efforts today focus only on sharing things that are the same. This paper suggests that if we study more closely the underlying symbols that we share across cultures, there will be more incentives to face a greater challenge that lies in learning to share differences. In this context, nine more subtle requirements for international cultural networks are explored. How do we translate differences: 1) of meaning into our networks; 2) in the role of collections; 3) in values between settled and nomadic cultures; 4) in the relative role of written versus oral communication; 5) in the interplay of theory of practice; 6) in the definition of originals and the role of copies and versions; 7) in methods of conservation; 8) in methods of writing history, and finally 9) in perceptions? Some practical first steps in addressing these challenges are suggested. Particular emphasis is given to the eighth challenge. The example of Mount Meru is used to illustrate how new links between world-views, tangible and intangible culture can be created. How this might lead to a new model of culture that transcends the limits of Euro-centric and Asian-centric approaches is described briefly. The need to work towards a World Distributed Electronic Repository (WONDER) is outlined.

It is concluded that the Asian Network of Excellence for Research and education in Digital Silk Roads (NERE/DSR), E-Culture Net and the American Digital Silk Roads project (NSF/DSR /CGP) under the auspices of UNESCO have an

obvious rationale to share examples of digital culture. A deeper rationale for their existence lies in sharing ideas to develop methods concerning these more subtle challenges in order that digital culture reveals the complexities and differences of very distinct cultures arising from our common humanity.

2. Translation of Differences

There is a long tradition of making dictionaries to define terms. In the English language, such dictionaries go back to 1604. [3] In the nineteenth century, Roget's Thesaurus (1852) [4] introduced the idea of a dictionary of synonyms, namely subsets of equivalents in meaning. There has been a general assumption that dictionaries are mainly to show equivalent terms. Needed are dictionaries that bring to light differences of words which appear to be the same at first sight.[5] In Europe, for instance, terms such as culture and civilisation, which even sound nearly the same in English, French and German mean profoundly different things. Such multi-lingual, non-synonym dictionaries need to include other major languages along the Silk and Spice Routes including Chinese, Sanskrit, Hindi, Arabic and Japanese.

Each of the participating countries/cultures in the network are already providing their own definitions of key terms relating directly to the silk roads, which can be shared in a common database. A next practical step will be to expand this approach to include fundamental theoretical concepts relating to cosmology and world views. The idea of extending the concepts of the Iconclass classification to go beyond a specifically Northern European, Christian view such that it reflects the expressions of all the world's religions and cultures is an excellent further step.

Virtual Reference	
1. Terms	World Views, Classifications
2. Definitions	Dictionaries
3. Explanations	Encyclopaedias
4. Titles	Catalogues
5. Partial Content	Abstracts, Reviews
Virtual Libraries	Distributed Repositories
6. Full Content	Previous Owner 1
7. Internal Analyses	Previous Owner 2
8. External Analyses	Previous Owner n
9. Restorations	
10. Reconstructions	

Figure 1. Ingredients for networked access: virtual reference rooms, and virtual libraries (cf. fig. 10).

In the past, the limitations of print culture meant that a memory institution was typically limited to a single classification system for their collection. Moreover, work on terminology for world-views, classifications, thesauri, dictionaries, encyclopaedias, catalogues, abstracts proceeded as independent ventures each resulting in separate books, which were then arranged in the reference room of the library or memory institution. In a digital context there can be access via multiple world-views, classification systems and thesauri. There can also be systematic mappings between terms in classifications, definitions, explanations, titles, partial contents and full contents through virtual reference rooms.

In the past, reference rooms served as the portals to libraries and memory institutions. Initially libraries were simply collections of books. Slowly a distinction between primary and secondary literature emerged. It took until the end of the nineteenth century before systematic access to secondary literature emerged through the efforts of Otlet and Lafontaine through their vision of the Mundaneum, [6] which led to the International Federation of Documentation (FID), the Union of International Associations (UIA), [7] and instruments such as the International Bibliography of Periodicals (IBZ or *Internationale Bibliographie der Zeitschriften Literatur*).

The advent of digital repositories should lead to further distinctions within the concept of secondary literature, namely between commentaries which apply methods such as close reading to develop internal analyses of a given primary text; commentaries which provide external analyses by comparative studies that place the text in a larger context; restorations which trace how the text or cultural object has been altered in the course of conservation/preservation and finally reconstructions in the case of objects which are technically ruined and for which we have interpretations about how they might once have been. Needed is the introduction of these distinctions and their integration through virtual libraries in the form of distributed repositories, which link these efforts to virtual reference rooms (figure 1). This will introduce new levels of orientation and sense-making into the world of knowledge and information retrieval.

3. Production versus Collections

In the West, there is a great discrepancy between the places where art and culture was produced and the collections where such art and culture are collected. Thus we find one of the best collections

of 14th century Sieneese art in Altenburg near Leipzig, Germany and even a monumental complex such as the altar once on the hill in Pergamon is now in a Berlin museum. To be sure such conditions are not limited to the West. In the late 13th century the Emperor Tamerlane carried off the Byzantine palace gates of the Ottoman capital of Brusa to Samarkand [8].

Any comprehensive history of art and culture in the West needs ultimately to cover the story of where an artist produced their works, then where they are today and where possible to trace their provenance in the interim [9]. Even for the most famous artists, notwithstanding many attempts to create a *catalogue raisonnée*, even when we have a fairly complete survey of where all their works are today, we seldom have a thorough account of all the collections through which they passed in the course of the centuries.

By contrast, in many Eastern countries, the place where cultural objects were produced is often identical to where they are kept today. The cave frescoes in Ajanta, in Dunhuang or in Bamijan are simple cases in point, as are the collections that were built for the forbidden city in Beijing, for Lhasa, or the royal cities of Nepal, namely, Khatmandu, Patan (Lalitpur), Bhaktapur and Kirtipur, where they still remain today. Even in such cases where the objects have not moved from their original place, often there have been important changes in ownership, which have transformed the objects and their context.

If we wish to compare cultural objects from a) (Western) cultures where there is a great discrepancy between production and collection with those from b) (Eastern) countries where the places of production remain those of collections, special care is needed in order to achieve compatibility between very different data-structures, while at the same time assuring that the complexities of the original situation are maintained. This points to new metadata needs, which include the history of ownership as a basic dimension of our databases (cf. figure 1).

4. Settled versus Nomad

A related and yet quite different set of problems arises when one tries to compare settled and nomadic cultures. Settled cultures typically have museums and other memory institutions wherein they store and display their cumulative, collective memory. Such an emphasis on collective memory and tangible culture in the form of material monuments, buildings and objects is for the most

part necessarily foreign to persons in nomadic cultures, who need to carry everything they have with them. By contrast, the collective memory of nomads is more deeply linked with intangible culture in the form of oral stories, songs, music, dances, and contests.

Organisations such as UNESCO, the International Institute for the Study of Nomadic Civilizations [10] and the Commission on Nomadic People [11] are making us aware of many dimensions of these nomadic civilizations. Even so a major challenge lies in comparing the relative contributions of settled and nomadic cultures (e.g. Kipchaks) [12] When their basic values are so fundamentally different, one obvious possibility lies in exploring common narrative and musical themes in helping to understand how themes and motifs in one culture were conveyed to other nomadic and settled cultures.

Another theme to be studied is how some warrior nomadic cultures such as the Mongolians under Genghis Khan gradually collected remarkable physical objects [13] and how his son, Kublai Khan (1215 - 1294), founded a pleasure dome known in the West as Xanadu (i.e. *Cambuluc* or *Dadu*, lit. big capital, now Beijing), [14] which became the seat of the great Khanate that ruled over one of the largest single empires of all time, namely, the Golden Horde (Russia); Ilkhanate (Middle East); Chagatai (Western Asia) and the Great Khanate (Mongolia and eventually China).

How was it that most nomadic cultures remained literally wanderers while, in this case, the Mongols founded, or more precisely, influenced what became some of the most important cultures of the world? Or how do we explain that Tamerlane, the last of the great nomad rulers, conquered more than any other ruler except Alexander the Great, by combining the efforts of settled and nomad populations? [15]

There is the added challenge that many cultural artefacts which were originally associated with a nomadic culture are now in museums fostered by settled culture, as is the case, for instance, with respect to the cultural expressions of a number of aboriginal tribes throughout the world. In such cases, contextualisation provided by reconstructions (cf. figure 1) must go beyond simply recreating the object in its original condition: it must help viewers to understand how the function of a given object shifted as it moved from its original nomadic to its subsequent settled context. We need eventually to be able to move seamlessly between an object to the museum where it is now,

to the places it was previously and, where possible be able to trace the routes by which it moved [16].

Here a practical first step might be to choose select examples from each of the countries/cultures of the Silk/Spice Roads and illustrate a) their different functions in nomadic and settled cultures and b) the different interpretations that arise from these two contexts concerning the same objects.

5. Oral versus Written

The implications of shifting from an oral to written culture have been studied at considerable length by scholars in the West [17], departing from a general assumption that one leaves behind the oral when one “progresses” to a written culture. According to this model, one can divide the history of a culture into clear epochs, which have either oral, written or print culture. Once things have been printed it is assumed that they will be accessible to all. Unfortunately, this simple, linear model frequently does not apply. From detailed studies in the early history of printing we know that Renaissance herbalists frequently continued mediaeval traditions whereby they referred to knowledge not described in the books themselves [18].

In countries such as Japan, this tradition is much stronger. For instance, one of the standard books on gardening is written and printed. In the midst of this written description, there is a section called “oral transmissions on setting rocks.” In other cases, the phrase “there is an oral transmission,” is merely referred to in esoteric texts and a reader is expected to consult a (Zen) master who conveys orally secret instructions, which have deliberately not been written down. Thus a “kuden acquired apart from the text provides a valuable key to understanding the written transmission” [19]. How should we reflect these traditions on the Internet? Paradoxically, we have websites today with texts such as the following: “You must never show this writing to outsiders. You must keep it secret” [20].

The fact that oral traditions are written down and printed does not mean that they are universally accessible. Leaving aside obvious cases where persons are vision or hearing challenged, even in the case of popular books, writings go out of print. Often complex publications are prohibitively expensive and not infrequently there are formal or informal modes of censorship or filtering. Major libraries, especially their rare book, manuscript, and map rooms, and archives are open only to recognized scholars.

Champions of the World Wide Web frequently assume that all materials, oral and printed alike should be made universally accessible on the web. Aboriginal cultures as in Canada or Australia, and elsewhere around the world have a different approach. Here access to knowledge is not universal. It is typically restricted to a small group of spiritual and other leaders of the tribe. In such cultures oral traditions typically continue to play an important role [21]. Hence, aside from financial questions as to who should pay for the process [22], there are clearly challenges of reflecting honestly differences between oral and written traditions, and different levels of access. For example, should some materials which have traditionally been available only in the oral tradition become available only as audio files?

The Internet already has a notion of different layers of users, distinguishing between the near-omnipotent systems operator (sysop) or administrator, those with special privileges and regular users. Should this approach be developed to include different layers of access to knowledge that respect and reflect cultural traditions? If so, the private knowledge of, say, the Blackfoot Indians or some other tribe would effectively constitute an Intranet, access to which requires their permission just as one needs a company’s permission to access their Intranet.

If we follow this approach will there, in future, be an incentive to experience a medium in its original form or in a simulation of its original context? Who will attain to the level of systems operators in the future? Will the ultimate control of Blackfoot Indian knowledge always lie in the hands of an individual chosen by the Blackfoot Indians themselves? Will there be special conditions when this prerogative could be threatened or overruled? How will this approach function in the case of different religious sects? Will a Suni Imam have access to Shiite texts only via a Shiite Imam? Such examples show that even a simple question about who gets to read what is much more complex than it may at first appear.

While no simple answer to these questions is likely to emerge soon, a practical first step might be to invite all cultures along the Silk Roads which have traditions assuming other than universal access, e.g. the Zen masters in Japan, the Esoteric Buddhist traditions of China and Tibet, the mystical traditions of Islam such as the followers of Rumi, to provide examples of layered access to their traditions. Such provisional models would help in deciding how to create new kinds of hypertext and hyperlink systems that respect the boundaries

introduced through initiation, rites of passage and other traditions which assume that different levels of access are required. This would take discussions of filtering systems into a realm far beyond prosaic questions whether the language and themes of a site are suitable only for children, for adults or both [23].

6. Theory and Practice

Sometimes intimately connected with these differing approaches to oral and written traditions, are different roles of theory and practice. In the Greek tradition theory was given an especially exalted status such that the role of practice was frequently downplayed and sometimes even disdained. By contrast, in the Roman tradition the emphasis was often on practice even to the exclusion of theory [24]. Each culture has had its own relation to theory and practice. A monolithic database of relations between theory and practice would clearly be insufficient. So how can such differences adequately be represented on the web?

Related to this is a deeper problem. Every culture develops world-views as frameworks to explain the universe. Some of these are purely religious and/or philosophical. In Warburg's library they were called: Orientation. In major cultures these world-views typically include some scientific aspects through microcosm-macrocosm analogies. The case of the West is particularly fascinating because its worldviews have gradually evolved into a scientific world-view that claims to be universally applicable (Appendix 1). Sometimes new facts and phenomena lead to a change in a world-view. Often these world-views serve as frameworks, while most of the previous, cumulative facts and phenomena remain unaltered.

The 20th century saw increasing attention to the development of these world-views as explanatory frameworks. In the West, scholars such as Duhem studied the history of cosmological systems from the time of Plato to Newton [25]. Dijksterhuis studied the *Mechanization of the World Picture* (1950) [26]. Interestingly enough, ever since Thomas Kuhn's *Structure of Scientific Revolutions* (1962) there has been such fascination with the so-called paradigm shifts and the study of frameworks as disjunctive events, that scholars have focussed on isolated issues [27] as if there were no cumulative growth of facts, which continued independently of those frameworks. Facts and frameworks are presented as if they were synonymous.

As a result, although today's Internet provides

access to different kinds of dictionaries, encyclopaedias and histories, it treats facts and phenomena as if the only framework for their comprehension were the contemporary one. The Internet does not guide us into different world-views, let alone help us to see how these different worldviews treat the same facts in very diverse ways. Needed is a more comprehensive approach to these facts and phenomena, whereby a search for a concept such as water could take us to water as one of the five elements or more correctly states (i.e. metal, earth, air, fire and water), in the *I Ching*, to Thales's explanation of water as basis of the universe, and to the differing roles of water in other cosmologies. Alternatively, one would be in a given cosmology and be able to see how a concept in that framework was treated differently in other frameworks. Very simply we need more than databases of facts. We need also to go from these facts to the different frameworks in which they are seen.

Here a first practical step might be to include on the website/portal of the project a list of all the cosmologies/worldviews represented by the cultures along the Silk Roads, corresponding to the classification level in figure 1 and then choose a number of common concepts (e.g. the elements) to illustrate how differently these are treated. Such an approach can have a dual effect of simultaneously revealing what we share in common while making us aware of the diversity of expressions found in different cultures. A concrete example is offered below in section nine.

This quest to visualise cosmologies could be very much furthered by the use of augmented reality methods. Innovators such as Steve Feiner (Columbia University) have used special glasses to superimpose on the night sky the constellations of the Greco-Roman tradition. This process could be taken much further such that a viewer can switch to an Indian, Arabic, Chinese or Mayan constellation [28]. Augmented reality would thus literally help us to see the world through different eyes [29].

7. Original, Copies and Versions

In the West, the Platonic tradition introduced the notion of an idea which served as a starting point for artistic creativity. Erwin Panofsky, in his history of *Idea* [30] has masterfully traced how this evolved over the ages. During the Renaissance apprentices worked with a master to create their masterpiece. In 18th and 19th century Romanticism the role of the artist was further transformed to include the notion of unique

creativity. This led to the notion of artist as a genius and in the neo-Kantian tradition to the artist as an intuitive visionary and precursor of scientific breakthroughs. As a result the original acquired a special allure that relegated all versions and copies into the background.

In many other cultures such a notion of the original does not exist. For instance, in China and indeed throughout Asia there is of course a notion of artists creating original works but there is also an assumption that copies and other versions may be equally and in some cases even more important than the original. In Japan, where many cultural artefacts are produced in wood and exposed to the elements, the emphasis is on the original form but not the original object. Hence, as we make ever more cultural objects accessible online, copies and versions will inevitably play a role, but these roles will differ from one culture to another and even from one period to another within a culture.

Further problems arise in international art markets as objects move between cultures. Hence a Chinese vase or scroll painting, which enters a Western private or public collection is valued and treated differently than in its original context. If both are subsequently shown together on a computer screen their similarity in shape is obvious. But what interfaces can we find to communicate such differences in their contexts?

Here a practical first step would be to choose items from each of the cultures in the Silk Roads project and design interfaces which reflect the specific aesthetics and values of that culture. While this will introduce new challenges of interoperability as one moves between these cultural interfaces, it will result in helping us to see a same object in the context of different value systems and world views.

8. Conservation and Preservation

Different aesthetics concerning originals and versions have profound implications for the domains of conservation and preservation. In Japan, the wooden buildings of the Imperial Summer Palace (Kyoto) look as new as ever. They are fully restored every ten years but there is no interest in conserving the original wood. The training required for this is completely different than the training needed to conserve an original cultural object. Indeed if an individual trained in the West were to impose their training on such a wooden temple there would be serious difficulties. How can we prepare conservators to be sensitive to these extremely different methods? Here a

practical step is to offer special training courses that focus on the values of both approaches for conservators who are dealing with materials from both traditions.

9. Complementary Histories

Histories of culture are typically written from the standpoint of a given culture: (e.g. French, Japanese, Russian). Many of the most important sources of culture are cross-cultural in their influence. Here complementary, thematic histories would help us understand links between Greek statues, statues of Buddha in Northern India and Afghanistan, in China and Japan. Sometimes the themes, which are exported to another culture, entail combinations quite different from their original context. For instance, in India:

“Cavittu Natakam is the Christian response to the ancient theatre forms of India. It emerged under the guidance of Catholic priests and the Portuguese presence in Kerala in the mid-sixteenth century. The stories themselves are based on Christian historical and mythological characters, as well as epic romances. ‘The Play of Charlemagne’ is a favorite. Inspired by Ariosto’s ‘Orlando Furioso’, the play has a cast of almost 80 characters and stretches over a fortnight. This play is the ideal Cavittu Natakam, replete with battle and court scenes. The lives of saints, of characters from the Old and New Testaments - all contribute to the themes of heroism and love” [31].

These plays, have their parallels with Mystery Plays in Europe, and yet combine Biblical elements, anachronistic mediaeval events (as when Charlemagne from the 9th century meets Saladin in much later crusades) and Renaissance literature (via Ariosto) in ways very different than in Europe. How do we link such versions of Charlemagne with the historical figure, with the *Song of Roland* and other dimensions of Carolingian culture? This is an example of Western themes going eastwards. Meanwhile there are cases of Eastern themes going westwards as with *Balaam’s Ass*, which began as a Sanskrit story, was carried via the Silk Roads and later became used as one of Chaucer’s *Tales*.

To take another example: Japan is famous for its rock gardens introduced during the reign of the Emperor Kagamiyama who decided that there should be 66 named rocks, a number that was later reduced to 48. This art of setting rocks in a landscape garden began at Lake Manasovar in India where there are 8631 rocks. When this art went to the banks of the Hsun-yang river in China

the number of rocks was reduced to 361 [32]. Such facts are common knowledge to experts in the field and yet we lack histories, which show us just how the tradition was transformed as the art moved from India via China to Japan. Hence, in addition to national and regional histories we need complementary histories, which help us both to see strands that are shared and also transformations that occur as a cultural expression is moved to an entirely different context.

This example of Lake Manasovar is of further interest for our purposes because it is linked to one of the central, unifying themes in Asian architecture. Rising above the Lake is Mount Kailas (or Kailasha), variously known as Jewel of Snow, Tisa, Gang Rinpoche and Mount Meru. The mountain becomes equated with the legendary Mount Mandara from the time of creation, becomes a symbol of the universe and in accordance therewith, temples, monasteries and whole sacred areas are built.

Mount Kailas/Meru is pyramidal in shape and hence it is striking that *vastu* (i.e. the manifest) plays a central role in Indian sacred architecture (*vastu shastra*) [33] where the *vastu* pyramid also plays a significant role. Although Mount Kailasha, Mount Meru, and Mount Mandara (Mount Mondop) [34] are equated, it is striking that each of these inspires specific sets of constructions.

For instance, Mount Kailas becomes the basis for Kailasa temple (Ellora, northeast of Bombay), the largest monolithic structure in the world, carved

Intangible Culture	Mount Meru as
Mythology	Stories
Religion	Belief, Creation Myth
Philosophy	World View
Literature	Epic Stories
Mathematics	Number Symbolism
Tangible Culture	
Nature	Mount Kailas
Architecture	Pagodas, Stupas
Fine Arts	Mandalas
Decorative Arts	Ornaments
Intangible Culture	
Theatre Plays	Masks
	Puppets
	Dance, Music

Figure 2. Mount Meru as a physical object and manifestations in intangible and tangible culture.

top-down from a single rock, with the largest cantilevered rock ceiling in world covering twice the area of the Parthenon in Athens and believed to have taken 7,000 labourers 150 years [35].

The legendary Mount Mandara also known as Mount Mandapa (or Mondop) becomes the basis for sloped pyramidal shaped libraries for sacred Buddhist texts in Southeast Asia. Mount Meru (alternatively called Mount Sumeru) is the inspiration for some of the most famous Indian sacred architecture such as the Konark Temple at Orissa; the Brihadeshwaha Temple, Tanjavur; and the temple at Aurangabad, Maharashtra. In the realm of the decorative arts Meru occurs as a model in the Lama Temple in Beijing [36], as an ornamental Meru Chakra [37] or on top of an ornamental container [38].

There are curious links between Mount Meru and symbolic versions of the Bodhi tree (*Ficus religiosa* or *ficus bengalensis*) under which the Buddha sat when he gained enlightenment. This connection leads to the Enlightenment stupa at Bodghaya, which becomes a paradigm for numerous imitations in Asia. In Kathmandu, for instance, we find this stupa recurring as the Mahabouddha Mandir and we find variants in the Durbar Squares of Kathmandu, Patan and Bhaktapur in Nepal [39]. Some abstract versions of the Bodhi tree under which the Buddha sat resemble a pagoda [40]. Not surprisingly, therefore, one version of Mount Meru comes in the form of a pagoda, which is said to have reached China with the introduction of Buddhism in the first century. The oldest surviving Buddhist structure is said to be the pagoda at Songyue (512 AD). There are over 3000 extant pagodas in China and they take many forms including the square variety as with the Big and Little Goose Pagodas in Xian, or the central of the Three Pagodas of Saintly Worship (Chong sheng San ta, Yunnan) or the Yellow Crane Pagoda. Others are polygonal as in Fengdu, Suzhou or Shanghai. In the case of the Xumi-fushou Temple (Temple of Sumeru Happiness and Longevity) the pagoda is built on a hilltop [41].

In Bali, pagodas are explicitly models of Mount Meru as in the Puru Kehon Temple. On occasion, they are simultaneously linked with Indian gods. At Pura Ulun Danu Bratan, for instance, there is a three-tiered meru for Shiva, a seven-tiered meru for Brahma and an eleven-tiered meru for Vishnu [42]. Hereby, the Bali pagodas convey aspects of the Hindu hierarchy of gods unfamiliar to India itself.

Events: life of Buddha	Stupas
1. Birth	Lotus
2. Enlightenment	Enlightenment
3. Sermon at Deer Park	Wisdom
4. Descent from heaven	Descent: Tushita
5. Great miracle	Miracles
6. Taming: wild elephant	Reconciliation
7. Gift of the monkey	Complete Victory
8. Death, nirvana	Paranirvana [43]

Figure 3. Eight events in the life of Buddha and corresponding types of stupas.

In Nepal, we usually find the three, four and five tiered pagodas that are also found in a variant form in Japan. Much has been written about the history of pagodas. Typically there are studies about Chinese pagodas or Japanese pagodas and yet we effectively have no typology of pagodas that links 2-5 spired pagodas to Nepal and Japan and 5-16 spired pagodas to China; compares square and polygonal pagodas; compares how these forms develop chronologically and geographically and explains their different functions. Such a synthetic approach could be one of the challenges of the Silk Roads Project.

We have already noted a link between Mount Meru and the Enlightenment Stupa at Bodghaya. This is part of a larger phenomenon. Each of the eight major events in the life of Buddha, each connected with a specific geographical location [44], is also associated with a specific kind of stupa [45] all of which, to varying degrees, reflect aspects of Mount Meru symbolism (figure 3). The lotus stupa, for instance, already found at Sanchi (c. 200-100 B.C.), inspires the extraordinary stupas at Badgoan and Bouddhanath, (just outside and in the heart of Kathmandu), and the remarkable stupas of Schwegdagon [46], Pagan (or Bagan) and Hsinbyume in Myanmar.

Examples of the enlightenment stupa as Mount Meru are found at the Samje Monastery, which was the first Buddhist monastery in Tibet. The monastery is designed on the plan of the Odantapuri temple in India (present-day Bihar), and:

“mirrors the structure of the universe according to Buddhist cosmology. The central temple represents Mt. Sumeru, the mythical mountain at the centre of the cosmos. Around it are four temples called 'ling', which represent the four continents (ling) situated in the vast ocean to the north, south, east, and west of Sumeru. To the right and left of each of these are smaller temples, called 'ling-tren', representing

sub-continents. Four great stupas, in four colours (white, red, blue and green) stood facing the (south-east, south-west, north-west, and north-east, respectively) corners of the main temple, and are being reconstructed.” [47].

At Rajgir we find a Stupa of Reconciliation [48]. Examples of complete victory stupas characterized by rounded steps at the drum level are found in the Buddha’s birthplace, Lumbini and in the Tibetan countryside [49]. The paranirvana stupa in the shape of bell is found at the Sule Pagoda in Yangoon and the Myazedi Pagoda in Pagan [50].

Parallel with these monumental examples we also find stupas at the scale of reliquaries for altars and even at the scale of simple hand bells. Indeed, in the context of the decorative arts we find representations of Phra Indra, king of the gods, bearing Mount Meru (also called Sumeru) as a kind of hat ornament [51], a characteristic that recurs in the many forms of masks linked with the Indian epic, the *Ramayana* [52]. Mount Meru also recurs specifically by name in some mandalas [53]. But there are deeper associations whereby all mandalas [54] are seen as the equivalents of two dimensional ground-plans for three-dimensional constructions in the physical world. On occasion, this link between mandala ground-plan and architectural elevation is literally shown [55]. To understand the roots of this tradition we need to go back to the Indian tradition wherein the Vastu Purusha Mandala [56] is seen as the basis for all temple design.

Another version of the two-dimensional mandala as a three-dimensional structure is the Kumbum (which literally means 100,000 Buddhas). Tibet’s most famous example is the Baigun Monastery in Gyantse (or Kumbum Tschörte) [57] also called the Palkhor Monastery [58]. Perhaps the most famous manifestation of this principle is the incredible kumbum at Borobodur in Indonesia, which has interesting parallels with a 7th century pyramidal structure in Nara [59]. There are tantalizing parallels between such structures, the vastu pyramids of the Indian tradition with their pyramidal, central Mount Meru like structures and pyramids elsewhere in the world [60]. Such forms clearly continue to inspire the imagination as witnessed by its recurrence in the city of Arrakis in the miniseries *Children of Dune* [61].

All this becomes the more fascinating when we relate these representations of Mount Meru as mandalas and architectural spaces (pagodas, stupas and kumbums) to the cosmological traditions. The stupa is not just a symbol of the lotus.

East			West
Bhuva	Atmosphere	Vishnu-Swan	Zeus
Suah	Sky	Siva -Fire	Apollo
Bhoor	Earth	Brahma -Pig	Dionysius

Figure 4. Parallels of Hindu and Western gods [62].

It symbolizes the cosmos itself [63]. In Nepal, Mount Meru is part of a complex cosmology, with hot and cold hells beneath and various heavens above [64]. Variants of this cosmological vision are found elsewhere in the East [65] and have interesting parallels with the ancient Turkish cosmos [66]. There are even parallels with the cosmos in Dante's *Divina Commedia* [67]

Earlier we referred to curious parallels between Mount Meru and the Bodhi tree (*ficus bengalensis* or *ficus religiosa*), under which the Buddha achieved enlightenment. If we turn to the ancient Mesopotamian creation myths we discover that their cosmology has a central mountain (cf. Meru) from which sprouts a tree of life (cf. Bodhi or banyan tree) [68]. In itself this is interesting. It becomes remarkable when we realize that this same configuration recurs in the Siberian myths about the primaeval tree of life, Yggdrassil [69], which recurs in the Scandinavian tree of life, which grows from a cosmic mountain [70] and which invites parallels with the tree of knowledge that dominates Paradise in the opening chapters of Genesis in the *Old Testament* [71]. Other versions of this same Yggdrassil tree represent it as the basis of the threefold worlds of the Scandinavian sagas as recorded in the *Eddas* [72], which subdivide into nine worlds (Appendix 4). Some western representations of the tree of knowledge also depict it as growing both above and below ground [73].

If we stand back to look at the nine worlds of the Norse cosmos we see that they entail three basic worlds: the highest, middle and lower levels, which the Christian tradition has translated into Heaven, Earth and Hell. It is striking that Odin in the Norse legends went to the underworld and returned, just as just as Christ did in the Christian tradition. The three basic levels of the Norse legends also have parallels in Indian (cf. figure 4) [74], Georgian [75] and other traditions. A combination of these three levels as circles takes us to alchemical diagrams with seven points of intersection [76] which relate closely to the tree of knowledge figures of the kabala which circumscribe the figure of a man [77]. Other versions link this tree of life with the *chakra* positions of a meditating yogi [78].

East	
Eight	Notes in Octave
	Winds and Directions
	Petals of Lotus
	Wheels (Sanskrit = <i>Chakras</i>)
	Spokes: Wheel of Life
	Fold-Path
	Events of Buddha's Life
	Kinds of Stupas
Multiples (8x8=64)	Trigrams of <i>I-Ching</i>
	Sides: <i>VastuPurushaMandala</i>
	Sides of Chess game
West	
Eight Sides	Dome of Rock
	Cathedral at Aachen
	Baptisteries

Figure 5. Examples of number 8 symbolism.

In 1805, the British scholar, Francis Watford, attempted a fascinating synthesis by linking Mount Meru as the polar paradise in the centre of a lotus flower. In this version Mount Meru was not only the centre of the Indian/Asian cosmos, but the origin of the four great rivers of the world and conflated Mount Meru with Meros, the birthplace of Dionysius [79]. If, in retrospect, this synthesis was overenthusiastic, the parallels and cluster of symbols that metaphorically link creation, the tree of life (tree of knowledge), Mount Meru with the eight-petalled lotus flower deserve further attention [80]. The Australian aboriginal path to knowledge (*noonghaburra*) entails an eight sided star [81]. Eight is the number of the octave [82]. In Indian, sacred architecture, the *vastupurusha-mandala* has sides of eight squares. The chess board also has sides of eight squares.

In Indian mythology, the eight-sided lotus [83] is intimately connected with the act of creation and by association with the tree of life. The Sanskrit word, *chakra* means, wheel [84]. In Kundalini yoga, there are eight *chakra* wheels [85] and the Indian wheel of life also has eight spokes [86]. The Buddha sits under the tree of life to achieve nirvana via the eightfold path [87]. His life has eight defining moments in eight places, which lead to eight kinds of stupas, of which the enlightenment stupa also has eight sides. In the West, this configuration recurs in the Dome of the Rock, [88], in the church of San Vitale in Ravenna that inspired the Cathedral of Charlemagne at Aachen [89], in a great number of Russian churches, in the wells of the Islamic mosques especially in Turkey and almost all baptisteries in Italy where the eightfold shape is typically connected with heaven (fig. 5).

East	
Nine	Planets (7 + Radu and Ketu)
	Waves (Nature)
	Serpents (India)
	Dragons (China)
Multiples (9x9=81)	Ideal Number in <i>I Ching</i>
	Number of Scales in Dragon
	Sides: <i>VastuPurushaMandala</i>
West	
Nine	Worlds: Scandinavian Myth
	Muses
	Orders of Angels
Multiples (9x9=81)	Magic Square of Moon

Figure 6. Examples of number 9 symbolism.

Another version of the vastupurushamandala has nine squares. In Indian astronomy there are nine planets (i.e. the 7 planets [90] and two shadow planets, Rahu (i.e. *serpens caput*) and Ketu (*serpens cauda*), which determine eclipses of the sun and moon). Nine is also an important number of the *I Ching*, where it is associated with the Creative power. In Nature there is a cycle of nine waves. There are also nine great serpents in India. In China, the Buddha is believed to have been protected by nine dragons at birth. One of the most famous walls of the Forbidden City has nine dragons. Indeed the Chinese dragon has nine characteristics:

“Its head is like a camels, its horns like a deer's, its eyes like a hare's, its ears like a bull's, its neck like an iguana's, its belly like a frog's, its scales like those of a carp, its paws like a tiger's, and its claws like an eagle's. It has nine times nine scales, it being the extreme of a lucky number” [91].

Nine is also the number of worlds in the Scandinavian cosmos, the number of the Greek muses, and the number of the Christian orders of angels and there is even a cloud nine (Appendix 4) [92]. Hence, whereas the West focussed on symbolism of the number 7 (Appendix 2), the East focused on symbolism of 8 and 9 (Appendices 3-4). The combinations of these numbers are also significant. For example, the basic vastupurushamandala of 8 squares x 8 squares results in a base of 64 squares. The 8 deva mothers each have 8 assistants, i.e. 64 yoginis. This is also the number of the trigrams in the *I Ching*. The other basic vastupurushamandala of 9 squares x 9 squares results in a base of 81 squares. This is also an ideal number in the *I Ching*. Meanwhile, 9 x 12 (=108) takes us to one of the fundamental numbers of the East: the number of beads in the Buddhist rosary

and the number of times the gong at the entrance of the Forbidden city was sounded each morning.

Such number symbolism could take us very quickly into arcane paths of geomancy [93], the kabala and many other mysteries far beyond the scope of this paper. What interests us is something more basic. The links between the lotus flower, Mount Meru and architecture are much more than a simple metaphor. They entail a series of associations at a number of different levels. One set of these associations entail cosmic eggs, golden eggs and golden apples. Another set of these associations links cosmology, trees, and medicine.

At a purely physical level, there is a curious way in which the banjan tree (*ficus bengalensis*) with its roots above and below the earth is a corporeal form of the tree of life and Yggdrassil. At the level of the flesh, there is a Freudian interpretation which Michelangelo explored in the Sistine Chapel, which takes us (via the lotus-eaters) to the biblical sense of knowledge. At a more complex level, we discover that the Sanskrit word *linga* (cf. *lingam*, linked with the phallus), means symbol. Hence where the East has, in the beginning was the symbol that becomes flesh via the word, OM or *AUM* (which reflects in its three syllables the creation, preservation and destruction of the world); the West has, “in the beginning was the word (*logos*) and the word became flesh” [94].

In Hindu temples, the *linga* has three parts: an invisible four sided section (square, linked with Brahma), an invisible eight-sided section (octagon, linked with Vishnu) and a visible cylindrical section (circle, linked with Siva) [95]. In architecture, the square is typically a symbol of earth; the circle a symbol of heaven and the octagon as a practical intermediary linking the two.

In the mystery religions, the same tree of knowledge becomes a mushroom and leads to knowledge at the level of guided hallucinations. At another level, the same quest becomes spiritual and the banjan tree, as a bodhi tree leads to the eightfold lotus path of nirvana.

At yet another level the tree of life, or world tree (*arbor mundi*), along the axis of the sacred mountain takes us directly into the sphere of astrology [96] and astronomy. In this context, the configuration of Indian temples is much more than an interesting terrestrial construction. It reflects harmonies of astronomy and the celestial domain. We have already noted that in the classic case, a reclining human figure is inscribed within a square which is subdivided into 81 (i.e. 9 x 9) squares [97].

Sometimes this figure appears as a modified Vitruvian man. [98]. A variant square has 64 (8 x 8) smaller squares [99] Multiplying the squares of the smaller and larger sets of the *vastupurusha-mandala*, i.e. 64 x 81 x 5 (*samvatsara* - a cycle of five lunar-solar years) leads to the number 2590, which plays a role in the precession of the equinoxes [100]. Not surprisingly the tree of knowledge has its parallels in the stellar constellations [101]. This awareness takes us quickly to the big picture underlying the construction of some of the major architectural sites [102]

For instance, they clearly played an important role in the Temple of Heaven in Beijing, which was much more than a terrestrial building. It was its own model of the cosmos whereby the mirror on the principal temple reflected its light on the emperor standing in his appointed place at the foot of its steps at high noon on the day of the summer solstice each year. The temple of heaven was, in turn part of a much larger scheme that linked it with at least three further temples (figure 7). [103] Such complexity gives new meaning to microcosm-macrocosm analogies.

At one metaphorical level the banjan tree is Mount Meru is the phallus, is the tree of life, is the world tree, [104] is Yggdrasil, is the tree of knowledge. At another level the tree of life is seen as separate from the serpent [105] of creation in the Indian creation myth, the serpent in the tree of life of the Hebrew Sefiroth; the serpent in the tree of knowledge in *Genesis*; the sacred crocodile on earth and the serpent in the night sky of the Egyptians, [106] Draco in the occidental constellations and the dragon in the heavens that determines the solar eclipses that has its head in Rahu (*serpens caput*) and its tail in Ketu (*serpens cauda*) [107], Sesa the dragon of the universe, or the dragon of Heaven in the *I Ching*.

At the cosmic level there is a constant struggle to keep the dragon from eating the sun (the nearly omnipresent flaming pearl of Chinese decorations): i.e. preventing Draco from removing all the sun's light before the winter solstice in the annual cycle and preventing the great dragon (linked with Rahu-Ketu) from eating the sun in eclipses. At the terrestrial level this becomes the epic battle of the hero conquering a dragon or a serpent that dominates the stories of Ophiuchus (Aesculaepius), Perseus, Herakles (Hercules), Saint Michael, Saint George and his dragon, and Parsifal's quest for the Holy Grail [108]. In this context, it is fascinating to trace the gradual transformation of symbols.

1. Heaven [109]	Tientan
2. Earth	Ditan
3. Sun	Ritan
4. Moon	Yuetan

Figure 7. Ancient Altars in Beijing in the Ming Dynasty.

Hence the seven-headed snake of creation and seven-headed Mucalinda, protector of Buddha becomes nine serpents in India and then nine dragons who protect Buddha and the nine dragons of Chinese mythology (linked with the sea dragon Sese), which make their way via Lithuania as nine positive dragons, which then become negative in the West. Hence, the sea serpent becomes Hydra, sometimes occurring as a nine headed monster to be attacked by Hercules.

Mythology, Astronomy, Cosmology

The above examples point to deeper patterns underlying all of the great cultures. The quest to make sense of the individual is inevitably linked with stories (mythology) and beliefs (religion) that link the individual with nature and at the same time connect the actions of individuals on earth (microcosm) with the harmonies of the heavens (macrocosm). To achieve this, earthly efforts in mythology and religion are invariably projected on the night skies through astronomy [110]. The constellations are thus records, which project the collective imaginations of different cultures using the same underlying set of stars as star maps at differing levels of detail and complexity. These records also change and evolve over time. These records thus provide us with both synchronic projections of different cultures and diachronic projections of their evolution historically. Cosmologies and religions (from *religio* to bind) typically link and integrate these efforts "on earth as it is in heaven" into coherent world-views.

This implies that there is another dimension to intangible culture that needs to be taken into account, namely, that of mythology, astronomy and cosmology. In practical terms this requires working with astronomers to create a virtual (reality) night-sky and the cosmos, which shows both short-term seasons, middle-term phenomena such as eclipses and long-term phenomena such as the precession of the equinoxes. Onto this sky common to all humanity one can then use augmented reality to project the many different interpretations of the celestial motions and harmonies. This will offer a new means of helping persons literally to look at different word-views and at the same time a new means to illustrate the

rich stories of folk tales, mythology, and literature.

For instance, in Japan, there is a tradition of the hare in the moon [111], which is also associated with eggs. If we turn to astronomy we find that the constellation *Lepus*, i.e. the hare, occurs at the time of the vernal equinox (c. 22 March). Thus the Christian feast of Easter, which occurs on the first Sunday after the first full moon after the vernal equinox has a so-called pagan remnant (Easter bunnies and eggs) which is recorded in astronomy. Similarly, the tail of the dragon (*Draco*) and the Phoenix are linked with the winter solstice (22 December) which helps explain the presence of dragon and phoenix together between a flaming pearl of the sun in so much Chinese art.

At first sight there is a danger that all this could be interpreted as an attempt at syncretism. Indeed, if approached naively, this introduces a temptation to distil from the tremendous diversities of cultures, a simplistic set of the common principles, which would lead precisely to a McDonaldisation of cultures against which various scholars have warned.

If, however, our goal is not a naïve reductionism, then this approach offers new ways of understanding the deeper underlying patterns of our humanity, which can then help us to accept more generously the diversity of cultural expressions of the human condition. Such an approach also provides us with an empirical means of exploring Jung's important intuitions concerning a collective unconscious. Themes such as golden eggs and apples (Appendix 5) or serpents and dragons (Appendix 6) are found in almost all cultures. Similarly a study of sacred trees (Appendix 7) reveals clear links between mythical trees of life and real trees. More importantly such study reveals links between sacred trees, in the religious sense and healing trees in the medical sense. Cosmology, astronomy, myth, religion, and medicine are linked in unexpected ways.

As noted earlier it would clearly be misleading to reduce all these complex myths and stories of eggs, serpents and trees to a single scrambled story. At same time, the intuitions that inspired Fraser's *Golden Bough*, deserve to be taken up anew on a worldwide scale in order to understand their underlying roots. Thus a first challenge is to identify these similarities and parallels in order to recognize underlying structural dimensions shared by different cultures. This is almost in the footsteps of anthropologists such as Levy-Strauss in the early 20th century with one significant difference:

it does not stop at the shared structures.

There are also significant differences in the use of these expressions that are essential in comprehending diversity of cultures. Hence both India and Australia have a serpent of creation: but the Indian serpent is seven-headed, whereas the Australian serpent is rainbow-coloured. Both China and Japan have dragons associated with the emperor. In China, the dragon associated with the emperor typically has five claws. In Japan, the dragon associated with the emperor frequently has three claws. The Chinese dragon is frequently a single colour, or simply light or dark whereas the Japanese dragon may have very vivid colours. Just as a tree with common roots can have many branches, so too can culture's underlying symbols have many different and distinct expressions.

Towards New Models of Culture

In the early 20th century when Aby Warburg developed his great library on cultural history, he focussed on such transformations of images mainly in terms of classical antiquity (tracing what he termed as *das Nachleben der Antike*). Jung's collection of universal archetypes (c. 50,000 in all), stored at the Warburg Library, increased the scope of this quest at the level of dreams and the subconscious. Examples such as the cosmic egg, dragons/serpents; and the tree of knowledge (cf. appendixes 5-7) make it clear, however, that the such transformations need to be studied at a global level: not in global terms, but rather in individual terms such that the unique contributions and expressions of different local, regional and national cultures are fostered and continue their role.

A generation ago, the efforts of UNESCO made us aware that in addition to the important role of tangible culture in the form of the built environment (temples, churches, monuments etc.), intangible culture also plays a significant role. UNESCO's definition of intangible culture was primarily in the context of cultural products especially in pre-literate or non-literate cultures: e.g. language, customs, food, music, and dance. The cluster of examples linked with Mount Meru, which we have just considered, point to a wider definition of intangible culture. At one level, there is intangible culture in the form of mythology, religion, philosophy and (epic) literature. This generates a whole range of expressions in terms of both tangible and intangible culture.

Cultural Goal	Means
1. Connecting	1. Mythology 2. Religion 3. Philosophy 4. Literature
2. Ordering	5. Art 6. Mathematics
3. Imitating 4. Matching 5. Mixing 6. Exploring	7. Doing 8. Direct Expressing. 9. Expressing via Written 10. Translating Media 11. Transforming Media
	12. Making 13. Representing
	14. Building
	15. Publishing w. Tolerance 16. Sharing 17. Helping

Figure 8. Six goals and seventeen means as ingredients for a new model of culture

If culture is defined as the cumulative, collective memory of a group of persons, then the range and complexity of these expressions becomes a measure of the richness and greatness of a culture. This richness is partly a function of literacy for the simple reason that oral traditions impose limits on the amount of collective memories which can be remembered by a group no matter how learned and clever their shamans, priests and people. Herein lies a basis for high and low culture independent of all discussions of imperialism and colonialism. Oral cultures have myths and beliefs that are literally memorable (cf. 1-2 in figure 8). Pre-literate cultures have stories. Literate cultures have stories plus cumulative interpretations and commentaries. Literate cultures also have philosophy and literature that generate more complex cosmologies and stories (cf. 3-4 in same). These stories are not only more complex in themselves but also have a cumulative complexity that comes from citing previous literary sources. Hence, Milton and Dante are more complex than many earlier writers because they cite the *Bible* and many classical writings.

Oral cultures typically produce some forms of intangible culture a) in the form of organic or geometrical patterns (cf. 5-6 in same), b) in the form of doing (eating, drinking, customs, cf. 7) and c) in terms of expressing themselves directly (language, speech, cf. 8). Until ways and means are found of recording these expressions, oral cultures remain in a constant danger of extinction. Oral cultures typically also produce some forms of tangible culture in terms of making (pottery, ornament, cf. 11). Again, unless ways and means are found to conserve and preserve these products,

they too remain in constant danger of extinction.

The shift from oral to written culture is thus much more fundamental than a simple translation exercise from one medium to another [112]. Once myths and beliefs are recorded they can be developed into ever more complex cosmologies and stories, which can have their own national, regional and local variants. These cosmologies and stories can also generate an ever greater spectrum of expressions (cf. 9) ranging from the static arts (the so called fine-arts of painting, sculpture often favoured in the West) to the performance arts (e.g. theatre, dance, music, often favoured in the East).

In print culture, it is not only the range of expressions but also the complexity of interplay between expressions in different media (cf. 10), which plays a fundamental role: how, for instance, the Buddha can appear as a manuscript illustration, as a mandala painting, as a tiny hand-held sculpture, a life-sized sculpture, or as an enormous statue as in Yokohama or Hong Kong. In more advanced cases this process of translating from one medium to another is complemented by a process of transformation as one explores new possibilities (cf. 11). There are also new efforts at representing and building (cf. 12-13). Hence, print cultures foster the complexity and range of expressions in both tangible and intangible culture (cf. 9-14).

Cultural ideas (myths, beliefs) and cultural creations are not the only criteria for the sustainability, richness and quality of a culture. Anyone can produce images of their myths and beliefs, but such expressions are not always kind, benevolent or tolerant. In the eighth century, Tibet had a cruel set of beliefs, which caused much suffering. As a result the Tibetan King, Trisong Detsen, decided to invite the Buddhist monks, Santarakshita and Padmasambhava, in order to establish Buddhism as the official religion of the country. One of the reasons why the great religions of the world have had such an influence is because their central tenets have expressed a greater deal of tolerance (cf. 15) than minor sects. Indeed radical, intolerant branches are typically disowned by the mainstream in all the great religions.

The test of a mythology, religion or belief system is not only in its ability to tolerate others, but also in its capacity to share with others. Cultures which have an isolationist policy may have a certain inherent value and coherence in themselves, but if they are not willing to be open to others and share their expressions with others, this limits their value beyond the narrow limits of their original parameters. Hence another test of a serious culture

is the extent that it remains intact when placed in the context of another culture (cf. 16). Cultures which ignore this criterion will ultimately find themselves endangered in a world of global villages.

Ultimately it is not only openness to other cultures but a commitment to help others. Everyone helps their friends. Not everyone helps others. The Christian story of the good Samaritan, although hardly followed by every Christian, is a universally appealing story because it points to helping a stranger, not just a friend. Thus a further criterion for a sustainable culture is the extent to which it reaches out beyond itself to help others (cf. 17).

These different means of expression are linked with a small number of goals of culture and art [113], which change from a pre-literate to a literate context. In pre-literate cultures an initial goal is typically in the form of 1) connecting a physical person or group with a metaphysical, magical world beyond. A second goal in pre-literate cultures, sometimes linked with the first, entails 2) ordering the world (i.e. bringing a sense of order to the world) in the form of regular patterns, often as organic or geometric forms. These goals continue after the advent of literacy. Indeed in the case of cultures with iconoclastic beliefs, the sense of ordering can evolve into an extraordinarily complex set of patterns: e.g. organic and geometrical patterns of Islamic culture.

The shift from oral to written culture typically brings a new goal of 3) imitation (mimesis). Hereby one compares a number of different examples and creates ideal combinations from these examples as in the famous story of Greek sculptors who combined the faces of beautiful ladies to create an ideal face of a goddess. The shift from written to print culture brought further goals of 4) matching in the sense of copying; 5) mixing in the sense of combining realistic and imaginary features and 6) exploring as in more recent modern art, in the sense of transforming images entirely to the point that no necessary link with physical reality remains.

Taken together these six goals and seventeen criteria can be seen as ingredients for a new model of culture. They form neither a simple hierarchy nor any simple form of linear progress. The goals of connecting and ordering have consequences for expressing, making, representing and building, but how they do so varies from one culture to another. High cultures tend to require ingredients 15-17. To be sure, there have been significant cultures which were cruel and unkind. Even so, almost without

exception they were replaced by cultures that were more kind. Being open did more than expand the boundaries of influence of cultures. Typically it made their original expressions richer. Buddhism became much richer by spreading to Tibet, China, Japan, Southeast Asia and around the world. Christianity became richer as it spread beyond the Holy Land to address Europe and eventually the world. Islam became much richer in its expressions when it spread first to Europe and later to Asia and around the world.

This brings us back to the theme of silk roads. The sharing of myths, of religions, of literature, of cultural expressions, tangible and intangible took place along the silk and spice routes, which were often also pilgrimage routes. The example of a single mountain, Mount Meru, should remind us, that even things that seem simple are enormously, almost incredibly rich in their manifold expressions. Paradoxically these themes of most universal interest are precisely those which most elude the comfortable boundaries of any single discipline, any single religion, philosophy and of course any single -ology or -ism.

They stem from the profoundest expressions of the collective human consciousness and what Jung taught us to recognize as our collective unconsciousness, dispersed in our memory institutions. In these expressions lie the sources of our myriad different expressions as countries, as provinces, as towns, as small groups and ultimately as individuals. In these expressions lie also the keys to recognizing the binding themes of cultures, the almost invisible dimensions that define and join our common humanity, which are simultaneously the starting points for its unique expressions that constitute cultural diversity.

The Silk Roads project is thus something fundamental. In discovering the sources of our differences and the common humanity from which they spring we are uncovering something more powerful than the greatest show of physical force. For we are returning to the underlying spirit that makes possible expressions at all levels from the mere physical to the meta-physical. A first practical step may be to choose key examples and trace how these are transformed by the various cultures along the Silk Roads.

10. Interfaces for Perceptions

In today's Internet images from very different cultures appear on our screens in a uniform way. A European painting, a Byzantine or Russian icon and a Buddhist image appear as if they were

completely “the same.” The way these images were intended to be seen, sometimes the entire philosophy behind them may be very different. In the European West, the rise of art and culture since the Renaissance has been linked with the subject-object distinction and with the idea of aesthetic distance. Mythological themes such as Venus or Diana, which inspired serious representations in the 15th century became playful in the 16th century, as paintings often showed noble ladies playing the part of the goddesses, and evolved into social satires in the 18th century.

While Greek mythological themes such as the goddess, Venus or Diana, the Huntress are obvious to anyone schooled in the Western classical tradition, to persons outside this tradition and increasingly to persons in the West, who have not read Ovid’s *Metamorphoses* and are unaware of this tradition such representations might simply appear to be images of scantily clad ladies.

The difficulties of understanding this tradition may be illustrated in two examples. A painting by Francois Boucher is entitled *Mercury, Venus and Cupid* (Berlin, Staatliche Museen) [114], but as we look closely we notice that the wings on Mercury’s feet are simply tied on with ribbons i.e. this is clearly a man playing the part of god rather than a depiction of a deity in any literal sense.

A second example by Sir Peter Lely, is entitled, *Nell Gwynne and the Duke of Saint Albans* (London: Foundling Hospital) [115]. Nell Gwynne (1650-1687) began her career selling oranges outside the King’s Theatre in Drury Lane, became a famous actress and subsequently, as mistress of Charles II, produced an illegitimate son, the Duke of St. Albans. Lely depicts Nell Gwynne as Venus and her son as Cupid officially as a scene based on classical mythology, yet clearly intended as a satire of the king’s indiscretions for contemporaries who would have understood the circumstances.

Such examples assume a subject-object distinction and a considerable amount of aesthetic distance. As such they are almost diametrically opposed to Eastern images which have as their purpose a unity between viewer and image or natural scene which is viewed. They are also very different from the aesthetics of the Byzantine and Russian traditions wherein icons play a complex intermediary role, drawing the viewer towards the sacred icon, often touching and kissing the icon and yet without any pretence of a complete unity with the image.

On a typical computer screen, however, we are presented with Western images that assume

aesthetic distance, icons which are intended to draw one somewhat into their sphere and Eastern images/scenes which are intended to unite viewer and viewed. Unless we have special cues, there is no way of knowing how such images were intended to be perceived. Needed are interfaces that help us to understand which level of commitment is assumed by a painting or work of art.

Intimately connected with questions of how to perceive cultural objects from very different cultures are problems of knowing about the religious and literary sources that inspired them. A non-Christian may be puzzled to see 13 men having dinner. A Christian immediately recognizes them as Christ and the twelve Apostles. In Christianity, 13 is therefore unfortunate. In Buddhism and especially in Tibet, 13 is a lucky number [116]. A non-Buddhist may well be puzzled by the enormous differences between images from different classes of buddhas, namely, Nyorai, Bodhisattva, Myoo and Tenbu. A Buddhist is familiar with these classes, but only rarely will a Buddhist in one culture be fully aware how the compassionate Buddha from India becomes Kuan Yin and Kannon; or how Avalokiteshvara, Chaturbhujia becomes Chen re zi (or Chenrezig) [117] in Tibetan and Chag shi pa in Chinese [118].

Most museum exhibits today have cryptic captions which assume that the viewer knows the context behind the name of a god, goddess, mythological, literary or historical figure or the subjects entailed in a simple title. For viewers from other cultures much more context is needed. Here the augmented reality methods mentioned earlier with respect to visualising constellations in different cosmologies can be used. A viewer of a painting or statue could thus be taken far beyond a mere description of the piece itself into the literary, mythological and religious worlds represented there. As such approaches evolve it will increasingly be necessary to link explanatory systems with time constraints. A visitor to a museum typically expects a brief description of a 1-5 minutes and it would clearly not be efficient for them to stand in front of a Buddhist statue in a museum and listen to a lecture of several hours introducing them to the iconography of Buddhism.

One of the goals of the Silk Roads project might be to work together with other religious and cultural bodies in creating a series of surveys ranging from introductions of only a few minutes, through one hour lectures to full blown courses, both at the general level, such as Buddhism and then at more specific levels, e.g. Tibetan Buddhism, Tantric,

Esoteric etc. If the Silk Roads project served as a portal to these different levels of instruction this would be a great advance on the present day Internet where profound religious, new age, amateur and sometimes even misleading sites appear pell mell.

In future, museums might create profiles for themselves to identify which cultures and traditions are represented in their exhibitions and collections and make these profiles available online. Tourists, students and scholars planning a visit to a museum could then develop a sense of how much effort would be needed in order to prepare themselves properly for their visits. If the trends from a leisure class towards an experience economy [119] continue, then there may in future be new professions and new markets that centre around creating educational materials, classes, and courses for new kinds of visits by tourists as suggested by Mr. Diene.

11. World Distributed Electronic Repository (WONDER)

At the first Silk Roads Conference (Tokyo 2000), there was discussion of co-operation between the newly formed Asian Network of Excellence for Research and Education on Digital Silk Roads (NERE/DSR) and the European E-Culture Net. In the past two years a number of steps have been taken in terms of formal agreements between: UNESCO, NERE/DSR, E-Culture Net and the US National Science Foundation's Digital Silk Roads Cultural Grid Project (NSF/DSR/CGP) to work together (figure 9). It is essential that these projects be based on open-source software and not be tied in to the technological limitations of any company qua either software or hardware.

Meanwhile, E-Culture Net has outlined the need for a multilingual, Distributed European Electronic Resource (DEER) that would have three fundamental ingredients: a collaborative forum for creativity and research; a virtual reference room and a virtual library in the form of distributed repositories (figure 10) [120]. The collaborative forum would effectively serve as a virtual agora for sharing materials and methods.

Needed is something such as the DEER on a global scale, which might be called a World Distributed Electronic Repository (WONDER). While a full scale version may well require decades and perhaps longer to achieve, the UNESCO Silk Roads project offers an ideal starting point for such a venture. Concretely, co-operation between

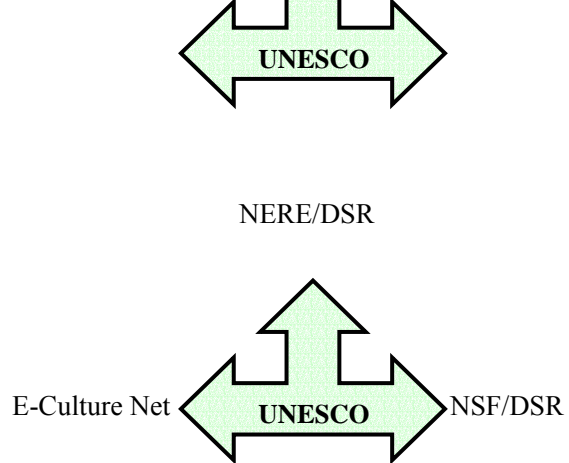


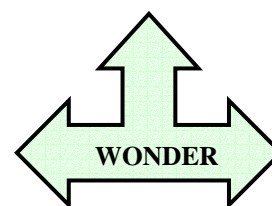
Fig. 9. UNESCO as integrator between NERE/DSR, E-Culture Net and NSF/DSR/CGP.

NERE/DSR, E-Culture Net and the NSF/DSR/CGP can provide a framework within which to share projects arising from the Silk Roads initiatives: a) sharing methods concerning challenges such as those listed in this paper; b) making the resulting contents fully accessible to all members of the twin networks; c) developing methods for multilingual access to these resources.

Prototypes for each of the three elements of WONDER already exist. The NII's Global Multimedia Repository (GMR) forms the basis for Virtual Memory Institutions as Distributed Repositories.

VIRTUAL REFERENCE ROOM -

comprising, interfaces, discovery tools and navigation systems for portraying e-culture, for searching and content retrieval.



FORUM FOR COLLABORATIVE RESEARCH and CREATIVITY –
a virtual space where users can communicate and exchange ideas and content
– a virtual Agora.

VIRTUAL MEMORY INSTITUTIONS as DISTRIBUTED REPOSITORIES-
A network of distributed repositories for preservation and access to content.

Figure 10. Main elements of an initial Distributed European Electronic Resource (DEER) which offers a possible model for a future World Distributed Electronic repository (WONDER). Cf. figure 1.

This deserves to be integrated or at least interfaced with the Archiving Network for Cultural Diversity and should be connected with various digital library initiatives. In Europe, initiatives in the direction of European Virtual Memory through projects such as BRICKS might be linked with this vision

The Advanced Scientific Portal for Distributed Cooperation on the Digital Silk Roads (ASPICO-DSR) is effectively a first step in the direction of a Virtual Reference Room. Meanwhile, another dimension of the ASPICO-DSR is to create a “daily co-operation and services platform.” Hereby, a number of initiatives in the direction of collaborative work and collaboratories can be combined to create a Forum for Collaborative Research and Creativity.

With respect to content the emerging cultural networks of excellence can work together on concrete modules to create ever more comprehensive examples that reflect accurately and honestly the complexities of cultural expression. In revealing underlying roots of our common humanity they will enable us to understand more deeply the value and reasons for our different expressions.

At the connectivity level, this vision requires a co-ordination of the European efforts, qua the Trans-European Research and Education Networking Association (TERENA) [121] and the Asian efforts qua Science Information Network (SINET) [122]. Here the Pan-European Research and Education Network (GEANT) [123] in general and the evolving Trans-Eurasia Information Network (TEIN) [124] in particular can provide the necessary physical networks to connect national networks in respective countries. The Cultural Grid Research fits into this vision.

12. Conclusions.

The idea of sharing on the Internet is akin to motherhood and apple pie: the goal is so obvious and desirable that it can be supported by everyone. This obvious goal also has many challenges. Our main concern in this paper has been to signal nine challenges if we are to share meaningfully our cultural heritage in an international framework. A first is translation of differences. A second challenge arises through contrasts between traditions such as Japan that tend to keep their cultural treasures in situ, and cultures favouring public and private collections which remove objects from their contexts and introduce them to different value systems. A third challenge lies in

comparing achievements of settled versus nomadic cultures; a fourth lies in representing electronically differences between oral, written and print cultures; a fifth lies in representing different approaches to theory and practice. Further challenges include how to represent different attitudes with respect to original, copies and versions; how to integrate resulting differences in conservation and preservation; how to include complementary (synchronic) contexts and (diachronic) histories and how to create interfaces for perceptions, different cosmogonies, and world-views (*Weltanschauungen*). For each of these challenges we suggested practical first steps.

The example of Mount Meru and its various expressions offered a glimpse of what is possible and led us to outline a new model for culture that transcends Euro-Centric and Asian-Centric limits while respecting their cultural diversity. We showed that in contrast to the West, where the number seven has gained symbolic prominence, the East has focussed especially on the numbers eight and nine. We showed that an understanding of this symbolism helps to understand unexpected connections between temples, stupas, pagodas and a range of other cultural expressions. In terms of the Digital Silk Roads projects this theme can help to integrate UNESCO’s local digital content oriented themes such as their religious architecture inventory and palaces and monument locations.

The idea to use theories and world-views as a means of understanding better cultural expressions and creations is not new. In the early 20th century, Aby Warburg began from the same premise when he developed his fourfold scheme of Orientation, Word, Image and Action for what became one of the world’s leading institutes for cultural history. In his honour, we have used the term Orientation which he coined [125]. The only difference is that Warburg’s library was necessarily hampered by the linear limitations of print culture. So his ideas eventually materialised as the four floors of the Warburg Institute library, whereby readers could consult related materials within a single building. Our proposal for a digital context takes these proven ideas a significant step further because it links orientation, image and word directly electronically and potentially also multi-lingually in ways that transcend the linear limitations of print. In this approach Cosmology, Astronomy, Religion and Mythology have unexpected links with Botany, Medicine and Architecture.

Our second major concern was to suggest that these challenges might best be addressed by combining the efforts NERE/DSR, E-Culture Net

and the NSF/DSR/CGP to integrate a number of international networks in the cultural domain and work in the direction of a World Distributed Electronic Repository (WONDER), whereby persons throughout the world can share their common heritage and at the same time foster awareness of uniqueness in every culture, every region and ultimately every individual. Here the Advanced Scientific Portal for Distributed Co-operation on the Digital Silk Roads (ASPICO-DSR) offers an excellent point of departure. UNESCO's strategic plan for Digital Silk Roads projects thus provides a framework to address such challenges.

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Appendix 1. Western WorldViews

Plato and Aristotle developed a metaphysical worldview of a geocentric universe that was perfect and alive. This worldview focussed on geometry and astronomy and was linked with *physis* (φύσις). Ptolemy refined this in the *Almagest* and with his *Geography* set the stage for linking study of the heavens with study of the earth. Plotinus and the Neo-Platonic tradition transformed this into a chain of being with a ladder from imperfect earth to perfect heaven.

Christianity, departing from an assumption that God created the earth, gradually removed the idea that the earth was imperfect and added the idea that one needed to study the visible world. This added optics, botany, biology, statics and mechanics to

the worldview. It also slowly transformed an abstract study of change and motion in nature (*physis*) into a concrete study of motion of physical objects. The Mediaeval Latin West linked this worldview with man through astrology to explain their microcosm-macrocosm analogies as part of natural philosophy. This added astrology and anatomy. Meanwhile, the Mediaeval Arabic tradition added arithmetic to this worldview.

As a result the heavenly bodies were now visible geometrical forms that needed to be measured through geometry, optics and astronomy. Objects on earth could equally be treated as geometrical forms that needed to be measured through practical geometry, surveying, optics and practical optics (*perspectiva*), which evolved into linear perspective. These new combinations inspired a rise in instrumentation and coupled (what we would now call) science with engineering to create the mechanical sciences. The resulting observations led Copernicus to suggest a heliocentric model of the universe. This hypothesis was confirmed through further observations by Brahe and Kepler. It inspired Galileo to use a combination of astronomy and physics to create synthesis whereby astronomy and physics emerged as the integrating sciences for a new heliocentric world-view. Through this combination of mechanical principles, underlying theories of physics on earth were applied in heaven and via Descartes, and Newton mechanistic metaphors spread from individual operations to the universe.

Christian creatural realism led to what became the life sciences (e.g. medicine, anatomy, botany, biology, zoology). As the number and complexity of these findings accumulated, they inspired study of classifications that led eventually to taxonomy and systematics and revealed the interdependence of structure and function linking anatomy and physiology. D'Arcy Wentworth Thompson (1917) used the relation between volume tripling as size doubles to establish that anatomy and physiology were coupled with laws of mechanics. Some saw this as the ultimate triumph of mechanical principles and the mechanistic world-view.

Meanwhile, advances in telescoping and microscopy opened up universes of the very large and small. The discovery of atomic structures and sub-atomic particles eroded hitherto neat distinctions between chemistry and physics, between physical matter and forces; and even between inanimate and animate being. Time, scale, systems and processes became so central to understanding that organic metaphors from the life sciences began to compete with a mechanical world picture.

Appendix 2. Number Seven Symbolism

East	Steps of Buddha as a Child
	Days of the week and Buddha ^[126]
	Headed Snake Mucalinga
	Buddhas of the Past
	Jewels of the Universal Emperor
	Mountain ramps around Sumeru
	Thinking Beings
	Non-Thinking Beings
	Insects
	Heavenly Beings
	Demons
	Mountains
	Gods of Fortune
West	Days (figure 11)
	Planets “ “
	Metals “ “
	Virtues (figure 12)
	Vices “ “
	Pleiades
	Days of Passover, Menorah

Day	Planet	Metal
Sunday	Sun	Gold
Monday	Moon	Silver
Tuesday	Mars	Iron
Wednesday	Mercury	Mercury
Thursday	Jupiter	Tin
Friday	Venus	Copper
Saturday	Saturn	Lead

Figure 11. Seven days, planets and metals. ¹²⁷

Virtues	vs	Vices
Prudence	vs	Foolishness
Fortitude	vs	Inconstancy
Temperance	vs	Ire
Justice	vs	Injustice
Faith	vs	Faithlessness
Hope	vs	Desperation
Charity	vs	Envy

Figure 12. Seven virtues and vices.

Appendix 3. Number Eight Symbolism in East ^[128]

Sounds (Basic)
Chakra wheels
Path of Buddha
Auspicious Symbols
Auspicious Objects
Cremation Grounds
Taras
Great Bodhisattvas
Dikpalas (Gods of Directions)
Astamatrika Goddesses
Ushmisha Deities

Dieties
Yaksa Generals and Kinnaras
Seas Separating the Mountain ranges near Meru
Hot Hells
Gods of Tushita Heaven
Heavens
Traditional Forms (Persia) ^[129]

Letter	Location	Description
1. Ksa	Brahmarandhra	celestial 8 petal lotus
2. La	Forehead	8 petals pure flame
3. Ha	Between Eyes	deliverer from 9 tattvas
4. Sa	Mouth	cause of peace
5. Sha	Throat	8 petals smoky colour
6. Sha	Heart	fiery pericarp: 8 petals
7. Va	Navel	bright as full moon
8. Ha	Genitals	Eight petals: Dharma, Artha, Kama Moksha.

Figure 13. Links between basic sounds, locations and corresponding chakra wheels ^[130].

Appendix 4. Number Nine Symbolism

East	Great Serpents
	Planets (figure 14)
	Dragons
West	Headed Dragon (Hydra)
	Scandinavian Worlds (figure 15)

Planet	Colour	Description
1. Sun	Red	Chariot, Savita
2. Moon	White	Chariot, all pervading
3. Jupiter	Yellow	Chariot
4. Rahu		Lion, Dragon's head,
5. Mercury	Yellow	Lion
6. Venus		Cow
7. Ketu		Vulture, Dragon's tail,
8. Saturn		Vulture, Blue Diamond
9. Mars	Red	Lamb, Trident

Figure 14. Nine “planets”, colours and descriptions: ^[131] i.e. seven planets plus rahu (*serpens caput*) and ketu (*serpens cauda*) which determine eclipses.

It is interesting to note that although the original Indian model has three worlds (cf. figure 4 above). The later Buddhist model also has three worlds ^[132] and has three propelling forces or defilements (f Rooster-Desire; Snake- Hatred; Pig-Ignorance ^[133] surrounded by 6 realms of rebirth or destinies (1. Gods; 2. Titans; 3. Man; 4. Animals; 5. Ghosts; 6. Cold and hot hells) and the 12 conditions of co-arising or chain of causation ^[134].

Highest Level Heavens	
1. Alfheim Lichtelfenheim	Elves of light
2. Asgard	Valhalla, home of Aesir
3. Vanaheim Wanaheim	Vanir, or lesser gods
Middle Level: Earth	
4. Jotunheim Riesenheim	Giants
5. Midgard Mannaheim	Fortress: protect man from giants
6. Muspelheim	World of Fire
7. Svartalheim, Nidavellir	Dwarves, DarkElves ^[135]
Lower Level: Hell	
8. Niflheim	Ice
9. Helheim	Land of the Dead

Figure 15. Nine Worlds of Scandinavians

Appendix 5. Cosmic, Golden Eggs and Apples

In the Indian myth of creation concerning the origins of the world, the god Vishnu is seated on the seven headed snake, Ananta, within a cosmic egg. In other accounts, creation is connected with a Golden Egg (*Hiranyagarbha*). In some representations of the Hindu trinity of Vishnu, Siva and Brahma, Siva is shown in an open, almost egg-like phallus, with Vishnu on top and Brahma at the bottom. Not surprisingly, therefore, there are also Shiva Lingas in egg form. In the West the Orphic theogony as recorded by the Greek philosopher, Thales, also has a cosmic egg by the name of Phanes, the god of love. In the Mediaeval period mystics such as Hildegard of Bingen also depict beautiful cosmic eggs.

In China, cosmic eggs are linked with dragons and are assumed to take 3000 years to hatch. In Russia, such cosmic eggs linked with dragons are linked with fairy tales (cf. the Fairy tale museum in Smolensk: i.e. the *Hen Ryaba* (*Kurochka Ryaba*) and the *The Frog Princess*) and are a recurrent theme in folk art (cf. Teremok House in Talashkino).

In one version of the Hindu trinity, Vishnu is associated with a swan. In the West, Zeus is also associated with a swan in his affair with Leda (cf. Cygnus in astronomy) which produces two sets of eggs: Castor/Pollux and Romulus/Remus which can be seen as symbols of water and earth respectively.

The Indian swan is typically a Hamsa (swan/goose). Accordingly, we find a corresponding Babylonian goose when we travel to the West if India. Mounted on the goose is a cupid like figure, which helps to understand the orphic link between the cosmic egg and the god of love

(Phanes or Eros). Meanwhile, this goose with cosmic significance is reflected in the Western fairy tale of *Jack and the Beanstalk* where there is a goose that lays golden eggs.

In Japan, a tradition of the hare in the moon and the moon, ^[136] is also associated with eggs. In astronomy we find that the constellation *Lepus*, i.e. the hare, occurs at the time of the vernal equinox (c. 22 March). The Christian feast of Easter, which occurs on the first Sunday after the first full moon after the vernal equinox also has associations with Easter bunnies and eggs. Most of us have forgotten that this pagan remnant has its basis in mythology as recorded in astronomy. In light of this, the Russian tradition, whereby Fabergé produced his famous golden eggs acquires new significance.

In the Chinese tradition, the Indian notion of golden eggs continues. In some cases, the golden egg is open and has a Buddha inside. In other cases, the golden egg contains the three wise philosophers. In China this egg also appears as the Pearl of Potentiality, either as a Spiral or as Globe, which can be Red, Gold, or Bluish White; has an appendage in form of a small undulating sprout and symbolizes Thunder, Moon, and Sun.

In China, the egg is an emblem of the dual forces of nature as reflected in the symbols of Yin/Yang and is sometimes associated with the pearl of potentiality. In Confucianism, P'an Ku emerges from Yin/Yang in the form of a chicken's egg ^[137]. It is instructive that one of the most famous Russian fairytales entails a chicken that lays golden eggs (*Kurochka Ryaba*).

At a symbolic level the egg occurs in Kundalini yoga in India at the base of the chakras, where it is typically associated with two snakes (Ida and Pingala). These interconnecting snakes form the caduceus associated first with Hermes/Mercury and subsequently with Aesclepius, whence it becomes a symbol of the medical profession.

If one splits the cosmic egg in two one has half an egg, which becomes the *omphalos* in the West, a symbol of the navel of the earth. In the Indian creation myth cited earlier, Brahma emerges from the navel of Vishnu who is lying on the snake Ananta inside the cosmic egg. Not surprisingly, therefore, the *omphalos* is surrounded by a snake.

Parallel with these stories of golden eggs are stories of golden apples. In the tale of King Atlas, there are gardens where the fruit was of gold, hanging from golden branches, half hid with golden leaves taken by Perseus. The eleventh

labour of Hercules entails the golden apples of the Hesperides. In Greek mythology, there is also the golden apple of discord. In Scandinavia there are the apples of Irun, In Ireland there are the apples of Manannan. Indeed, Avalon, Avallach and Avalloch are Celtic variations of apple [138] and hence the Isle of Avalon (Glastonbury) [139] is sometimes identified with the Isle of Apples (Emain Ablach). Apples also occur in the Land of Promise (Tir Tairnigir, Tir fo Thonn). In other Celtic tales, King Cormac has three Golden Apples and of course the apple of Tree of Paradise. As noted above it would be misleading to reduce these complex myths to a single scrambled story. Even so, the intuitions that inspired Fraser's *Golden Bough* deserve to be taken up at anew on a worldwide scale to understand their underlying roots.

Appendix 6. Dragons, Serpents, Crocodiles

India	Rahu (<i>Serpens caput</i>)
	Ketu (<i>Serpens cauda</i>)
	7 snakes at creation
	Mucalinga: 7 Snakes and Buddha
	9 great serpents [140]
China	Sese
	9 Dragons
	9 dragons at Birth of Buddha
West	<i>Serpens Caput</i>
	<i>Serpens cauda</i>
	Hydra (Sea Snake, 9 headed dragon)
	Nine Headed Dragon (Lithuania)
	Lir (Llyr), God of Sea =
	Father of Manannan, Lodan
	Ninurta of Mesopotamia
	Draco: Killed by Hercules (Labour 11)
	Immortal Dragon Ladon [141]
	Crocodile god Sobek (Sebek, Sebek-ra, sobk, Surhos, Sobki, Sokopmis)

Appendix 7. Holy Trees (Tree of Life, Tree of Knowledge, Well of Knowledge) and Medicine

Sacred trees offer another set of examples to illustrate why a comparative approach at a global scale is desirable. As noted above, the Buddha sits under the Bodhi tree to reach enlightenment. In technical terms this is the banjan or holy fig (*Ficus religiosa*) or Bengal fig (*Ficus Bengalensis*) or the Indian fig tree (*Ficus indica*), also known as the Peepal (*Ashwattha*, *Asvattha*, *Asvattaha*). There are, in fact some 28 species of such fig trees and by coincidence some have found 28 classes of Buddhism. Th Buddha's Enlightenment tree is also associated with the Buddha's Birth Tree or

Sorrowless tree (*Saraca Dives Pierre*) and his Death Tree, the Sal (*Shorea sp*).

In China, legend had it that at his birth the Buddha was washed by nine dragons. Accordingly there is a miniature bonsai, nine- branched Tree of Buddha (*Ficus Benjaminus*). At a regular scale, on the grounds of the Altar of Heaven in Beijing, there is a tree with a trunk of nine interweaving sections.

In the regular Buddhist tradition there are five main trees: 1) Banyan (*ficus religiosa*); 2) Council (*ficus altissime*), 3) Talipot; 4) Betelnut and Palmyra pala (*Borassus spp.*) or coconut. There is also the Bael Tree (*Aegle marmelos*) or Bilva, important medicinally, linked with Siva and his consort,¹⁴² and also linked with four steps in liberation (charya, krija, yoga and jnana).¹⁴³ Interestingly enough, the Bengal Quince is in the shape of an egg. The Bilva is also linked with the Vyula Fruit (Wood Apple, Golden Apple), which is associated with Ganesha or Jaruna Ganapati. This is one of the eight auspicious objects, is a means of food for poorer classes and is representative of the fruits of our own labor [144].

Also in the regular Buddhist tradition are the Tulsi or Holy Basil (*Ocimum sanctum*); the Durva (*Cynoidon Dactyla*) and the Kusha (*Desmotachya Biphinata*) all of which have medicinal qualities. Hence, Buddhist gardens are not just holy places. They are healing places in a literal sense. Hippocrates, associated with Aeculapius (cf. Ophiucus) and linked with the origins of Western medicine is also linked with a remarkable tree on the Isle of Kos: a plane tree claimed to be over 2000 years old.

Fir trees also have a special significance. In India, and Sri Lanka the Ashoka Tree (*Polyalthea longifolia* Benth & Hook. f. var. *pandurata* of a Anonanceae Family), is an evergreen tree, majestically tall like a stupa [145]. In Japan, in Nara, the Noh Theatre has a painted screen with an old fir, flanked by three live younger fir trees, to symbolize the relationship of master and apprentice.

At a more mythical level there is the Wishfulfilling Tree (Kamadhenu Tree) [146] linked with the celestial cow, Kamadhenu, which was created by Sri Krishna from his body). This is also called the Kalpavsksa and tree of plenty. In Georgia, this becomes a real tree in the village to which one ties scraps of clothing.

The banyan tree has its roots both above and below ground. As we have seen this recurs in the

semi-mythical tree of life which goes to Mesopotamia and via Siberia as Yggdrassil to Scandinavia where it becomes the basis for both the three worlds (lower, middle and upper world) and the nine worlds of Scandinavian mythology. In Russia this tree of life is also called the World Tree (*Arbor Mundi* or *Animus Mundi*). In Israel, the tree of Life becomes the Sefiroth also linked with the human body.

In the Near East, there is an Akkadian Tree (of Knowledge) sometimes associated with a Well of Knowledge. In the *Old Testament* the Tree of Paradise becomes the Tree of Knowledge of Good and Evil. In French, the tree of paradise (*arbre du paradis*) is a Persian Lilac or Chinaberry (*Melia Azederach*), which came to the West from India. While it used for medicinal purposes, its raw fruit is poisonous, which adds a new dimension to the forbidden fruit of the *Old Testament*. In Italian this tree is called a Rosary tree (*Albero da Rosari*) because it used for making rosaries.

As we have shown, the tree of life, the tree of knowledge, the world tree (*arbor mundi*), Yggdrassil, the Sefiroth, the axis of the world (*axis mundi*), the Well of Knowledge and the soul of the world (*animus mundi*) are all connected.

Leaving aside the Celtic and Scandinavian traditions with their notions of tree worship, the above examples reveal clear links between mythical trees of life and real trees. More importantly they reveal links between sacred trees, in the religious sense and healing trees in the medical sense.

In the Christian tradition, Easter is linked with the vernal equinox (i.e. the first Sunday after the first full moon thereafter). Similarly, Christmas is linked with the time of the Winter Solstice. In Alsace, the tree of paradise is also linked with period just before Christmas. Astronomy, myth, religion, and medicine are thus linked in unexpected ways.

Appendix 8. Twelve Labours of Hercules and their relation to the Zodiac

Hercules twelve labours are typically discussed as a series of events (figure 16). The first is linked with the Zodiac sign Leo and the second with the Zodiac sign Cancer. If one uses these first two link with the Zodiac as a cue then the twelve labours link up with the twelve signs of the zodiac, ending with Virgo who is associated with woman in old age [147] and traditionally around the autumnal equinox.

Kill	Nemean Lion	Leo
Slay	Hydra	Cancer
Capture	Cerynian Hind	Gemini
Snare	Boar of Erymanthus	Taurus
Clean	Stables of Augeus	Aries
Dispose	Stymphalian Birds	Pisces
Capture	Fire Breathing Bull	Aquarius
Capture	Flesh Eating Horses	Capricorn
Capture	Belt of Hippolya	Sagittarius
Steal	Cattle of Geryon	Scorpio
Steal	Golden Apples Hesperides	Libra
Fetch	Monstrous Dog Cerberus	Virgo

Figure 16. Hercules twelve labours.

This astrological dimension of the Labours of Hercules has been explored at length by Alice Bailey and Djwhal Khul (1974) [148]. Parallels between Christian events and key moments in the annual calendar have also been noted (figure 17).

Winter Solstice	Birth of Christ
	Expulsion from Paradise
Spring Equinox	Death, Resurrection: Christ
Summer Solstice	Birth: John Baptist (June 26)
Winter Solstice	Gate of Heaven (Capricorn)
Summer Solstice	Gate of Man (Cancer) [149]
Christmas-day	Lady-day
	Son of Babylonian
	Queen of Heaven
	Son of Osiris
Easter	Chaldaean Astarte [150]
Nativity of St. John	Festival of Tammuz:
	Birth, Rebirth: Baal [151]
Assumption	Babylon: Bacchus rescues mother from Hell [152]

Figure 17. Parallels between Christian feasts and key moments in the astronomical calendar according to Alexander Hislop and others.¹⁵³

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[18] Michael Giesecke, *Der Buchdruck in der frühen Neuzeit - Eine historische Fallstudie über die Durchsetzung neuer Informations- und Kommunikationstechnologien*, Frankfurt/Main: Suhrkamp, 1991, 2. Aufl. 1994.

[19] David A. Slawson, *Secret Teachings in the Art of Japanese Gardens*, Tokyo: Kodansha International, 1987. p. 52

[20] *Illustrations for Designing Mountain Water and Hillside Landscapes by Zoen*: <http://www.iras.ucalgary.ca/~volk/sylvia/Zoen.htm>

[21] Reg Crowshoe, Sybille Manneschmidt, Akak'stiman. *A Blackfoot Framework for Decision Making and Mediation Process*. Calgary: University of Calgary Press, 2002.
Cf. Julian T. Inglis, ed., *Traditional Ecological Knowledge. Concepts and Cases*, Ottawa: International Program in Traditional Ecological Knowledge and International Development Research Centre, 1993.

[22] There are of course proponents who assume that even if everything were available, it should only be accessible for those who can pay.

[23] Heather Newman, "A look at some popular filtering systems," *Freep/Tech*, 25 July 1999.: <http://www.freep.com/tech/qprog25nf.htm>

[24] In the case of Vitruvius, there is evidence that there was an aim of codifying practice such that it could readily be memorized.

[25] Pierre Duhem has traced the history of cosmologies in his monumental: *Le Système du Monde. Histoire des doctrines cosmologiques de Platon à Copernic*. Paris, 1913-[59]. 8o. 10 volumes. Cf. Pierre Duhem, *SOZEIN TA PHAINOMENA, Saving the appearances*, Original French: 1906. English translation: Chicago: University of Chicago Press, 1969.

[26] E. J. Dijksterhuis, *De mechanisering van het wereldbeeld*. Amsterdam, Meulenhoff, 1950. English: E. J. Dijksterhuis, *The Mechanization of the World Picture*, Oxford University Press (Oxford, 1961).

[27] Cf. Gerald Holton, *Thematic Origins of Scientific Thought*, Harvard: Harvard University Press, 2nd ed., 1988.

[28] This has been discussed in the author's "A European Network of Centres of Excellence for Augmented Digital Culture," *CULTH2: Die Zukunft des Digitalen Kulturellen Erbes, The Future of Digitized Cultural Heritage*, 13 January 2002, Vienna: MUMOK, Museum Moderner Kunst Stiftung Ludwig Wien, 2002, pp. 43-47.

[29] Cf. the author's *Understanding New Media: Augmented Knowledge and Culture* (in press).

[30] Erwin Panofsky, *Idea: Ein Beitrag zur Begriffsgeschichte der älteren Kunsttheorie*, Hamburg: (Studien der Bibliothek Warburg, Nr. 5), 1924 ; 2nd ed, 1960. English translation: *Idea a Concept in Art Theory*, 1974.

[31] Eindiaplus.com under Kerala:
<http://www.eindiaplus.com/musicanddance/Htmlfiles/kerala.html>

[32] David A. Slawson, *Secret Teachings in the Art of Japanese Gardens*, Tokyo: Kodansha International, 1987, footnote 26.

[33] Sri Narasingha Chaitanya Mata
http://www.gosai.com/chaitanya/saranagati/html/site_index.html

The Vedic Age under sacred architecture:
www.gosai.com/.../sacred_architecture/vastu-shastra-2.html

[34] While Mount Kailas, Meru and Mandara are often treated as equivalents, it is noteworthy that there is also a famous Mount Meru in Africa near Mt Kenya and that Mount Kilimanjaro has a Mandara hut.

[35] Mystic Places. Kailasha Temple:
http://www.world-mysteries.com/mpl_11.htm

[36] For an image of the Sumeru model at the Lama Temple in Beijing see:
<http://www.beijing.chinats.com/attr40106.htm> and
lib.indstate.edu/learning/china2/rc2.html

[37] Chakra: : www.life-testinstitut.de/news10.htm

[38] See Vedic astrology from New Dynamic under yantras:

http://www.newdynamic.com/yantra_files/meru_yantra_in_big_brass.jpg. This has various names: e.g. Sphatik Shree Yantra. See:
www.rudraksha-ratna.com/htm/images/linga4.jpg
or Parad Shree Yantra:
http://www.rudraksha-ratna.com/htm/deepawali/diwali_gifts.

[39] As in so many Indian temples, this enlightenment stupa also has phallic connotations.

[40] See: www.weirdload.com under The Mysterious Tau under Bodhi Tree: <http://www.weirdload.com/tau.html>

[41] Copied from the Tashilunpo Monastery in Xigaze where the Sixth Panchen Lama lived, this temple was built in the 45th year of Emperor Qianlong's reign (1780).

[42] See www.chinats.com under Chengde or www.chinats.com/chengde/attr_02_06.htm

[43] Mission Base Bali report:
mission.base.com/pictures/bali/ under pura ulun daru:

[44] Vajra Link. Kuantan, Malaysia. See:
<http://www.geocities.com/vajralink/8buddhastupas.html>.

See Manfred Seeghers, "Stupa - Symbol of the Nature of Mind," *Buddhism Today*, vol. 9, 2001.
<http://www.diamondway.org/bt/bt9manfred.htm>

Events in life of Buddha

1. Birth	Locations
2. Enlightenment	Lumbini
3. First sermon at the Deer Park	Bodhgaya
4. Descent from Trayastrimsha heaven	Sarnath
5. Great miracle	Sankashya
6. Taming of wild elephant, Nalagiri	Shravasti
7. Gift of the monkey	Rajagriha
8. Death, nirvana	Vaishali
	Kushinagara

In other traditions the number of events differs. For instance, in Lumbini where the Buddha was born there are plaques with 12 events in the Buddha's life. Adrian Snodgrass, *Symbolism of the Stupa*, Ithaca: South East Asia Program (SEAP, Cornell University, 1981).

[45] The stupa is also known as chorten (Tibetan) and Daigoba (Chinese).

[46] Burma (Myanmar) in the Victorian Web. The Schwedagon Pagoda, Yangon:
<http://www.scholars.nus.edu.sg/victorian/history/empire/burma/pagoda/1.html>

[47] Samye Monastery:
<http://www.everesttrekking.com/tibet/SamyeMonastery.html>. Another example is found in the Amdo region in north eastern Qinghai. See:

http://www.nyema.org/newsletter/spring2002/images_sp02/wld_stupa_enlightenment.jpg

Cf. Chen Heyi, *The Wonders of Tibet*, Beijing: Picture Book Research Center, China Pictorial Publication, 1994.

[48] Buddhist sites in India:
<http://www.info2india.com/buddhist/rajgiri.jpg>

[49] Tibet a Photo Gallery:
<http://www.tibet-hiking.com/photosT.htm>

[50] Myazedi Pagoda. See:
<http://www.molon.de/galleries/Myanmar/Bagan/EarlyPeriodAnawratha/imagehtm/image14.htm>

[51] Meru Chakra: www.inet.hr/ayurveda/vastu.html

[52] See Ramayana Mask under Ramayana.freeservers.com under Catalogue or: ramayana.freeservers.com/catalogue.htm.

[53] See: Bhutan Fortress of the Gods re: mandala:
<http://www.bhutan.at:81/altdye00/grafik/big/meru.jpg> and Meru Mandala:
<http://www.tibetshop.com/Paintings.html>.

[54] For a distinction between exterior, interior and secret mandala see: Kalou Rinpoche, "Les mandala extérieur, intérieur et secret, in

Dharma,” *Le Mandala de l’expérience*, Editions Prajna, Mai 2003, pp. 29 ff. cf. Manly Palmer Hall, *The Secret teachings of all Ages*, Philosophical Research Society, 1994.

[55] See www.sanathanadharmacom under Symbology of the Temple or: <http://www.sanathanadharcma.com/temple/images1/9.jpg>

[56] V i s t a s p M e h t a, *Rational Vastu. Ancient Science in a Post Modern World, bT Square Peg*: <http://www.btsquarepeg.com/vastu/book/index.html>

[57] Gyantse Stupa: See: <http://buddhism.kalachakranet.org/images/gyantse-stupa-chanez.jpg> or: http://home.zonnet.nl/rene.gieltjes/index_files/KU MBUM.jpeg

[58] See Palkhor Monastery: http://www.travelchinaguide.com/picture/tibet/palkhor_monastery/index.htm. Also written Pelchor Choide (the golden chorten).

[59] A Buddhist Pyramid Monument in Nara, Japan, Yosihitaka Takaki, Tokyo, 1999, Nov. 19: <http://www.asianart.com/forum/takaki/japan/Zutoh.htm>

[60] See [Mygoodvastu.com](http://www.mygoodvastu.com/correction_products.htm) under correction Products or directly at: www.mygoodvastu.com/correction_products.htm

[61] Children of Dune 2003, plate 35. See: <http://www.sf-fan.de/sf-film/dune/index.html>

[62] In an older version this trinity was:
Agni fire
Vayu air
Surya energy life

This invites comparison to the Christian trinity of
God the Father
God the Son
God the Holy Spirit

See The Cosmic trinity: <http://webonautics.com/mythology/cosmictrinity.html> Cf. The Gods and Goddesses of India: <http://www.scns.com/earthen/other/seanachaidh/godindia.html>

[63] Stupa as cosmos: <http://www.abm.ndirect.co.uk/leftside/artystupa/cosmos.gif>

[64] Religion: <http://128.146.41.30/Nepal/introbuddh.html>
Cf. Min Bahadur Shakya, *Sacred Art of Nepal*, Kathmandu: Handicraft Association of Nepal, 2000.

[65] John Fudjack and Patricia Dinkelaker, “Picking Ourselves up by the Bootstraps. Non-linear Nesting Orders in Myth and Ritual,” May 1999. See:

<http://tap3x.net/EMBTI/j5bootstraps.html>

[66] See Turkey Cosmos: <http://www.traveltransforms.com/assets/images/KalacakraCosmosLG.jpg>

Cf.: hakatler.sitemynet.com/kafkas_turkmenbeyi/id7.htm.

[67] Cf. Dante Alighieri, *The Divine Comedy I. Hell*, ed. Dorothy L. Sayers, Harmondsworth: Penguin Books, 1949...p. 138 for levels of Hell. Cf. Larry Adkins Home page. Astronomy 106 under Course Notes under Middle Ages. Cf. www.cerritos.edu/ladkins/a106/middle_ages/middle_ages.htm

[68] Kat Morgenstern, Sacred Earth, EZine, volume 1, number 5, August 2002. The Cosmic World Tree and the Tree of Life.

<http://www.sacredearth.com/Ezine/August2002/Aug2002.htm>

[69] Yggdrasil: <http://norse.narod.ru/dict/yggdrasil.html>

[70] World tree or tree of Life: ourworld.compuserve.com/homepages/dp5/inner4.htm

[71] Interestingly enough another version of the Hindu Indian tree of life has seven arms on each side while the Jewish Menorah reduces this to seven arms in all. See: www.weirdload.com/tau.html.

[72] Dag Rossman, *Nine Worlds Dictionary A Dictionary of Norse Mythology*, Blue Mounds, WI: Little Norway:

<http://www.angelfire.com/ok/DianaMeade/norse.html>. Cf.

http://www.planetewagner.com/la_creation_du_monde.htm#Les%20neuf%20mondes

[73] Art nouveau tree of life: http://www.artmetal.com/enrique/architecture/image/gate_000.jpg

[74] Hindu Mythology: See: <http://www.hindu-mythology.com/html/worship.htm>

[75] Juri Mosidze (Tbilissi), “The Mountain as the Axis of the World in Comparative Mythology,” The Unifying Aspects of Cultures, UNESCO Conference, Vienna, December 2003: http://www.inst.at/kulturen/2003/01methoden/sektion_mosidze_e.htm

[76] The Alchemy web site. Secret Symbols of the Rosicrucians. See: http://www.levity.com/alchemy/secret_s.html

[77] See www.Crystalinks.com under Tarot or: www.crystalinks.com/tarot2.html

[78] An History and Commentary on the Tree of Life: <http://www.revelation2seven.org/> cf. www.revelation2seven.org/WebPages/Chapter1pt2.htm

[79] Francis Wilford, "On the Geographical Systems of the Hindus," *Asiatick Researches*, London, 1805, p. 8.

www.english.upenn.edu/~jlynch/FrankenDemo/Gifs/mtmeru.html

[80] It does not require the insights of Dr. Freud, to recognize the metaphorical associations that link Mount Meru, the tree of life, and the phallus (lingam). The Hindu creation stories also entail the symbol of the golden egg (*Hiranyagarbha*), which has its parallels with the cosmic egg in Western cosmology and religion. The golden egg which also plays a role in Western fairy tales such as Jack and the Beanstalk is in the East a symbol of love leading to nirvana and also occurs as the Hiranyagarbha Lingam, a golden egg which is first swallowed and then caught by the hand and held in the fingers. Freud might have been intrigued by parallels with the myth of swallowing the golden egg in the East and eating the (golden) apple from the tree of knowledge in Genesis in the West. Cf. *Larousse World Mythology*, Grimal, Pierre, ed., London: Hamlyn, 1965. pp. 207-270 re: India; cf. Veronica Ions, *The World's Mythology in Color*, Edison NJ: Chartwell Books, 1987; Principle Of Hiranyagarbha, Sri Sathya Sai Books and Publications Trust, Prashanthi Nilayam. Posted by on SaiNet by V. Srinivasan:

www.worldlightcenter.com/sai-baba/0299%20talk.htm. Cf. Show of Hiranyagarbha Lingodbhavam: <http://www.eaisai.com/baba/docs/shiva99.html>.

[81] Noonghaburra Aboriginal Path to Knowledge:

<http://www.sveiby.com/articles/noonghaburra.htm>

[82] For links between the Indian form of the octave and the sacred sound OM compare the article on OM- The Symbol of Absolute: <http://webonautics.com/mythology/omthesymbol.html>

[83] There are also intriguing plays of squares that lead to the five lotuses as symbols of 5 elements. See: Indira Ghandi Naytional Centre for the Arts, Sarvatobhadra <http://ignca.nic.in/asp/all.asp?projectid=ps03>

[84] Of these 8 chakra wheels seven are in the physical body:

1. Crown
2. Brow
3. Throat
4. Heart
5. Solar
6. Spleen
7. Root

See: <http://www.crystalinks.com/chakras.html>.

[85] These are in turn linked with the

intertwining forms of the caduceus and have a series of further connotations:

Negative	Positive
Yin	Yan
Ida	Pingala
Sasi	Mihira
Lalana	Rasara
Pitrayana	Devayana
Chandra	Surya
Moon	Sun

Cf. Arthur Avalon, (a.k.a. Sir John Woodroffe), *The Serpent Power. The Secrets of Tantric and Shaktic Yoga*, London: Luzac and Co., 1919. Reprint: Dover Publications, 1974; Shyam Sundar Goswami, *Layayoga- An advanced method of Concentration*, London: Routledge and Kegan Paul, 1980, p. 278. Reprint Rochester Vermont: Inner Traditions, 1998.; Ajit Mookerjee, *Kundalini. The Arousal of the Inner Energy*, London: Thames and Hudson, 1982. Reprint: Rochester Vermont: Destiny Books, 1986; Swami Kripananda, *The Sacred Power*, South Falsburg, N.Y.: Siddha Yoga Publication. Syda Foundation, 1984. For the connections between sacred trees and medicine see: Harriet Beinfeld, Efrem Korngold, *Between Heaven and Earth*, New York: Ballantine Books, 1991.

[86] See The Circles of India:

<http://www.kamat.com/picturehouse/chakra/>.

Cf. Chakras of India:

<http://www.kamat.com/picturehouse/chakra/2370.htm>

On some occasions it also has a multiple of eight. For instance, the Matsya Chakra has 16 spokes as a wheel decorated with fish (Badami Chalukyan sculpture, Pattadakallu:

<http://www.kamat.com/picturehouse/chakra/5459.htm>.

[87] In some versions these eight spokes become eight trees of life: www.crystalinks.com under Ancient and Lost Civilizations under Israel under Qabbalah – Kabbalah or www.crystalinks.com/kabala.html

[88] Cf. the octagonal church at Caesarea. http://digcaesarea.org/neh/images/octchurch_illustration.jpg

[89] It was subsequently copied in the Church of Saint John the Evangelist in Liège. Cf. Joseph Deckers, *Le collégiale Saint Jean de Liège*, Liège: Pierre Mardaga Editeur, 1981.

[90] In the Indian creation stories the number 7 is important. There are seven snakes at creation and the 7 headed snake Mucalinga protects Buddha from the storm. It may well be that this number seven symbolism was linked with the seven days of the week and the seven planets of the heavens

and that subsequently, when the role of serpens caput (rahu) and serpens cauda (ketu) was discovered, the importance given to 7 shifted to the number 9.

[91] Discussed in Nine Dragon Baghuazhang. <http://www.ninedragonbaguazhang.com/dragons.htm>

[92] For a more thorough discussion of nine symbolism, cf. Dee Finney, "The Symbolism and Spiritual Significance of the Number Nine." See: <http://www.greatdreams.com/nine/nine.htm> Gary Val Tenuta, "The Secret of Nine. A Synchronistic Puzzle of Metaphoric Proportions." <http://members.aol.com/codeufo/gematria.8.html>.

[93] See <http://www.webcom.com/hermit/page/gematria.htm>

[94] Shiva lingam. A glorious worship: <http://www.shaivam.org/shplinga.htm>

[95] See: Mythology The Hindu Trinity: <http://webonautics.com/mythology/hindutrinity.html> See also Le linga symbole royale bouddhique: http://www.kh.refer.org/cbodg_ct/tur/rel/linga.htm which notes that 6 of 13 mountain temples in Cambodia were devoted to the linga (i.e. Bakong, Bakheng, Koh Ker, Mébon oriental, Pré rup, Baphuon.

In India, the linga is thus simultaneously a symbol of the trinity. As noted in figure 4, the three gods Vishnu, Siva and Brahma are sometimes represented by a swan, fire and a pig respectively. Vishnu's swan is linked with Cygnus (cf. <http://www.winshop.com.au/annev/Cygnus.html>), and with the golden egg or cosmic egg at the beginning of creation. The parallels with Zeus who becomes a swan as opposed to Apollo who becomes the sun are striking. In some versions the swan becomes a goose. The swan with its golden cosmic egg, thus becomes the goose that lays the golden egg. In yet other traditions the swan becomes a sphinx.

In the Indian creation myth the navel of sprouts a lotus from which Brahma is born. In Greek mythology, at Delphi there is an *omphalos*, the Greek word for navel that looks suspiciously like an egg.

[96] Temple India: www.aeongroup.com/caprcrn.htm

[97] Orient Site universatiere d'histoire des religions under Vastu Purusha: <http://stehly.chez.tiscali.fr/vastu.jpg>

Cf. Vastu Shastra and Vedic Sacred Architecture: http://www.gosai.com/chaitanya/saranagati/html/nmj_articles/sacred_architecture/vastu-shastra-2.html

[98] Vini Natham, "Vastu Purusha Mandala:

Beyond Building Codes," *Nexus Network Journal*, vol. 4, no. 3, Summer 2002:

<http://www.nexusjournal.com/N2002-Nathan.html>

[99] R.Champakalakshmi, *The Hindu Temple*, New Delhi, Roli and Janssen BV, 2001, pp. 12-18.

[100] Cf. Patrick McFadzean, *Vastu Vidya*, Institute of Experimental Geomancy (ISBN 0 9534163 0 5). *Vastupurushamandala* See: <http://www.pixie-inc.demon.co.uk/vastu/page05.html>. For a discussion of Indian time cf. Time and the Kalachakra: <http://www.clas.ufl.edu/users/gthursby/tantra/jyot2.htm>.

Cf. <http://www.agt-gems.com/agtport/html/index.php> Desi Sangye Gyatso, *On the White Glaze* (two volumes), China Tibetology Publishing House, Beijing, April 1996-October 1997. 472 pp. and 545 pp. Illus. 26 cm. ISBN 7-80057-136-X. Hardcover. Gems of Snowland Culture Series.

On the precession see: Giorgio De Santillana and Hertha Von Dechend, *Hamlet's Mill - An Essay Investigating the Origins of Human Knowledge and its Transmission Through Myth*, Boston, Massachusetts: David R. Godine, Publisher, Inc., 1977-92.

[101] Tree of resurrected life in Google images. Cf. Birth of Monotheism, Tasting the Forbidden Fruit. See: Zenith at the Pathfinder site: <http://members.aol.com/rex2kids/private/mrs002d.htm#mrs002d> or directly: members.aol.com/rex2kids/private/m3z2321.htm.

[102] We know that astronomical considerations played a role in Karnak, and Persepolis. It is very likely that they played a significant role in Angkor Wat.

[103] The Chinese tourism website for Beijing reminds us that there were further altars for:

1. Land and Grain Shejitan
2. Gods of the Sky Tianshentan
3. Gods of the Earth Diqitan
4. God of Agriculture Xiannongtan
5. Goddess of Silkworms Incanting

<http://www.china.org.cn/english/features/beijing/31017.htm>. Cf. Land and Grain (Shejitan): <http://www.tpbjc.gov.cn/163/2003-1-10/2@1592.htm>. This site does not mention the Altar of mountains and Streams near the Altar of Heaven.

See also, Alfred Schinz, *The Magic Square. Cities in Ancient China*, Stuttgart: Edition Axel Menges, 1996, p. 327. Cf. Yang Chunghua, Feng Faguang, Xu Bang, Yan Zhenguo, Zhang Wanshu et al., ed., *Temple of Heaven. Chinese Landscape Storehouse*, Beijing, 1994; Zheng Zhihai, Qu Zhijing, ed., *The Forbidden City in Beijing*, Beijing: Jiu Zhou Publishing House, 2000.

[104] David Wilcock, *The Science of Oneness*, chapter 15: Sacred Legends of the World Tree. Section 15.1 World Tree/Consciousness Unit Connection:

<http://ascension2000.com/ConvergenceIII/c315.htm>. Cf. E. Valentin Straiton, *Celestial Ship of the North*, London, 1927, Kessinger Rreprint.

[105] For a detailed discussion of serpent imagery: Greg Mogenson, M.A., *The Serpent's Prayer: The Psychology of an Image*, Candidate, Inter-Regional Society of Jungian Analysts (London, Ontario, Canada). For a more detailed study see: Anonymous, *Ophiolatrea. An account of the rites and mysteries connected with the origin, rise and development of serpent worship in various parts of the world, enriched with interesting traditions, and a full description of the celebrated serpent mounds & temples, the whole forming an exposition of one of the phases of phallic, or sex worship*, London, 1889. See:

<http://www.sacred-texts.com/etc/oph/oph00.htm>. Cf. Nortvegr, "Ophiolatrea," *Journal of the Northern Star*:

<http://www.northvegr.org/lore/serpent/00101.php>. Khandro net under symbolism, animals, serpents: http://www.khandro.net_or http://www.khandro.net/animal_serpent_good.htm. See: <http://www.geocities.com/Area51/Chamber/7227/serpent.html>.

[106] Siloam.net: *Restoration of the Eye of Horus*: www.siloam.net/rosta/newgiza/gallery1.html

[107] When the sun, moon and rahu or ketu fall in same zodiacal longitude there is an eclipse. For a discussion of Rahu and Ketu : http://www.sanatansociety.com/indian_art_galleries/harish_johari/hj_md_chakra_wheel01_painting.htm.

[108] Cf. the Kabala Library's *Quest for the Holy Grail*: <http://www.crcsite.org/preface.htm>

[109] Spencer P. M. Harrington, "Vintage altar of heaven. Xian," *Archaeology*. Volume 53, no. 2, March/April 2000: <http://www.archaeology.org/0003/newsbriefs/altar.html>

[110] Cf. E.Valentin Straiton as in note 104 above. Cf. www.astrosurf.com/jwisn/scauda.htm.

[111] Richard Whelan, *The Sun, the Moon and the Stars: Art, Literature, Science and Mythology*, Cobb, CA: First Glance Books, 1998. Chandra Beal, *The Magical Hare In The Moon* (First Published In Llewellyn's 2000 Moon Sign Book): <http://www.beal-net.com/laluna/hare.html>. Cf. The hare in the moon: <http://www.sacred-texts.com/astro/ml/ml08.htm>.

[112] As a series of scholars in the footsteps of Havelock, Innis, and McLuhan, such as Ong and Giesecke have explored these problems.

[113] For a further discussion of these themes see the author's "Goals of Culture and Art," Abridged Version of Lecture to the International Institute of Communications, Kuala Lumpur, September 1999. Also on the site of the International Institute of Communications: <http://www.iicom.org>. Published electronically in TRANS. Internet-Zeitschrift für Kulturwissenschaften, vol. 1, Vienna, <http://www.adis.at/arlt/institut/trans/0Nr/veltman1.htm>.

[114] Salve! J.Michael Shin Sum: <http://www.clt.astate.edu/mshin/france18-1.htm>

[115] Nell Gwynne and the duke of Saint Alban's: www.revilo-oliver.com/Kevin-Strom-personal/Art/gwynne.htm

116 In Buddhist stupas there are typically 13 rings representing thirteen steps of enlightenment, which successively symbolize ten powers of the Buddha and three close contemplations. Re: Tibet cf. "Stories on Snowland. The Mysterious Figures 9 and 13":

According to King Gesar, the world's longest epic, when Gesar was born he held 13 flowers in his hands, walked 13 steps and vowed to become a Buddha at 13. Indeed, when he was 13, he was victorious in a horse race, married and became king of the state of Ling. Also according to King Gesar, Gesar had 13 concubines and 13 Buddhist guardians, and in the state of Ling under his rule there were 13 snowy mountains, 13 mountain ridges, and 13 lakes.

See:

http://www.tibetfor.com.cn/tibetz/tibet50-en/story/doc/story_807.htm

[117] Chenrezig (Avalokiteshvara): <http://www.dharma-haven.org/tibetan/chen-re-zig.htm>

[118] Cf. the Himalayan Art site: Avalokiteshvara – Chaturbhujā (4 hands) <http://www.tibetart.com/image.cfm/80.html>

[119] Cf. B. Joseph Pine II, James H. Gilmore, *Experience Economy*, Boston: Harvard Business School, 1999.

[120] Cf. the study by Francesca Monti and Suzanne Keene on the DEER: <http://www.eculturenet.org/FP5/publicPDF/deliverable11a.pdf>.

[121] TERENA: <http://www.terena.nl/>

[122] SINET:: <http://www.atip.org/public/atip.reports.93/sta-net.93.html>

[123] GEANT:
<http://www.dante.net/server.php?show=conWebDoc.154>

[124] TEIN:
http://archive.dante.net/conference/globalsummit2002/prof_Roh_korea.ppt.pdf

[125] In his famous library Aby Warburg started from the premise of four categories:

1. Orientation	Religion, Science, Philosophy
2. Word	Language and Literature.
	Transmission Classical Literature
3. Image	Pre-Classical to Modern Art
4. Action	Political and Cultural History

Warburg Library:
<http://www.sas.ac.uk/warburg/mnemosyne/SUBJECTS.htm>. It will be noted that our provisional model thus far covers only the first three of these four categories.

[126] Buddha Images in Thailand. The 7 Days. See:
<http://www.seasiancrafts.com/index.htm>. Esp.:
<http://www.seasiancrafts.com/spiritworld/thaibuddha7days.htm>

[127] For a further discussion see the course on number symbolism by Paul Calter at Dartmouth College:
<http://www.dartmouth.edu/~matc/math5.geometry/unit8/unit8.html#>

[128] For further associations with the numbers 8 and 9 see The English Cabala 111:
<http://members.aol.com/Onechild31/111index.html> especially:
<http://members.aol.com/Cabala111/111-1-4.html>

[129] Persian Architecture: Traditional Forms:
<http://bridge.anglia.ac.uk/~trochford/glossary/concepts.html>

[130] Chakras and the 64 yoginis:
<http://www.clas.ufl.edu/users/gthursby/tantra/mat2.htm>

[131] Nine planets under :
<http://www.urday.com/nav.htm>. Cf.
www.sanatansociety.com under paintings for sale or
http://www.sanatansociety.com/indian_art_gallerys/planets_indian_astrology_numerology.htm.

[132] The Three Buddhist worlds are the;

1. Physical	Bhuloka
2. Subtle	Antarloka
3. Causal	Sivaloka.

The idea of three world is also implicit in Egypt where we find:

Horus: God of day; son of Osiris and Isis; hawk-headed.

Isis: Goddess of motherhood and fertility; sister and wife of Osiris

Osiris: God of underworld and judge of dead;

son of Geb and Nut, brother/husband of Isis.

[133] We have already noted (figure 4) the ancient Hindu configuration, which has parallels with both the Buddhist version and a subsequent Tarot configuration. Cf. The Golden Dawn Library Project. Where Ra Tarot Cards.
http://www.hermetic.com/gdlibrary/tarot/whare_ra/tarot3.html:

Ancient Hindu	Buddhist	Tarot
1. Vishnu Swan	Rooster	Desire Sphinx
2. Shiva Fire	Snake	Hatred Wheel
3. Brahma Pig	Pig	Ignorance Monkey

Ad 1. We have already noted links between the swan and goose. In Ancient China the corresponding bird is the phoenix, which seems via the Tarot tradition to have turned into a sphinx.

Ad. 2 Shiva, is linked with the sun, and rides a wheeled chariot. Cf. Apollo who is associated with the python of Delphi.

Ad. 3. In both the Hindu and the Buddhist traditions the pig is a symbol of ignorance.

[134] Lectures 5-6 Theravada Buddhism:
<http://www.rcf.usc.edu/~slingerl/courses/rel131g/topics/theravada>

[135] Schwarzenelbenheim

[136] Richard Whelan, The Sun, the Moon and the Stars: Art, Literature, Science and Mythology, Cobb, CA: First Glance Books, 1998. Chandra Beal, The Magical Hare In The Moon (First Published In Llewellyn's 2000 Moon Sign Book):
<http://www.beal-net.com/laluna/hare.html>. Cf The hare in the moon:
<http://www.sacred-texts.com/astro/ml/ml08.htm>

[137] Yin-Yang:
<http://user.icx.net/~drherb/yinyang.html>

[138] The Golden Apple:
<http://www.lundyisleofavalon.co.uk/mythology/golden%20apple.htm>

[139] King Arthur. A Man for the Ages. Explorations in Arthurian History. Pt 5:
www.geocities.com/.../4186/Arthur/htmlpages/geography5.html

[140] The nine serpents are: Ananta, Vasuki, Sesa, Padmanabha, Kambala, Sankhapala, Dhritarastra, Taksaka, Kality. Serpents are also linked with Naga, Nagarjuna and the Hindu deities

Vishnu	as his couch
Siva	as his ornaments
Durga	as his breast band
Ganapati	as his belly band or belt

<http://www.sanathanadharma.com/symbol/snake.htm>

[141] Ladon: www.theoi.com/Pontos/Ladon.html

[142] Bilva: <http://www.sanathanadharma.com> under symbols.

[143] San Marga Mandala. The Way to Liberation.
<http://www.himalayanacademy.com/books/dws/M08.html>

[144] Artistic and Physical Representation:
http://www.courses.rochester.edu/muller-ortega/rel249/lakshmi/Lakshmi_ArtRep.html

[145] Assumption University. About Us. Ashoka tree: <http://www.au.ac.th/aboutus/general.html>

[146] In India this is linked with the Hrit Chakra which is part of a larger complex.

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|------------|-----------------|
| 1. Sahrara | 8. Vishuddha |
| 2. Garu | 9. Anahata |
| 3. Nirvana | 10. Hrit |
| 4. Indu | 11. Swathirhana |
| 5. Manas | 12. Manipura |
| 6. Ajna | 13. Muladhara. |
| 7. Lalana | |

www.kheper.net/topics/chakras/Hrit.htm

[147] The Legend of Andromeda:
<http://www.ufrsd.net/staffwww/stefanl/myths/andromeda.htm>

[148] Alice Bailey & Djwhal Khul, *The Labors of Hercules*, 1974.
<http://beaskund.helloyou.ws/netnews/bk/hercules/toc.html>

[149] The Labors of Hercules - Labor IV - Part 2:
<http://beaskund.helloyou.ws/netnews/bk/hercules/herc1025.html>

[150] A. Hislop: <http://www.piney.com/His32.html>

[151] A. Hislop: <http://www.piney.com/His33.html>

[152] A. Hislop: <http://www.piney.com/His34.html>

[153] Alexander Hislop, Christmas and Lady-day The Two Babylons: www.piney.com/His31.html.
The same author makes parallels between the Christian Mother and child and other religions (in the The two babylons).

See: <http://www.piney.com/HislopTOC1.html>):

Christianity	Mother	Child
Egypt	Isis	Osiris
India	Isi	Iswara
Asia	Cybele	Deoius
Pagan Rome	Fortuna	Jupiter-puer
Greece	Ceres	Babe at breast
	Irene	Boy Plutus
China, Japan	Madonna	Child
China	Shing Moo	Child in arms