

ROOTS OF SUSTAINABILITY IN ANCIENT INDIA

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ABSTRACT

Archaeology of the "Indus Valley Civilization" (IVC) in the border region between India and Pakistan has revealed a much more extensive pre-existing civilization under the Thar Desert, associated with the once mighty Saraswati river revered in the Rig Veda. Assuming we may now dismiss the primary features of the "Aryan Invasion Theory" for lack of evidence (aside from unresolved linguistic issues), the positive evidence of artifacts from the region, paleoclimatology, hydrology, remote sensing, geophysical studies, and textual interpretation suggest instead that the origins of Vedic philosophy may indeed be indigenous, predating the Classical Vedic period by millennia in a more-or-less continuous proto-Vedic cultural development. The emerging picture is convincing enough to now refer to the "Indus-Saraswati Civilization" (ISC) of Harappan and pre-Harappan times, and to hazard a bold, tentative link between holistic aspects of pre-Vedic philosophy (non-duality) and clearly similar cultural images and designs of the ISC. Exploring the evidence for ancient holism we find its core philosophy to be in remarkable alignment with relational theory (R-theory) and its holon framework, reported previously. The remarkably peaceful, organized, and industrious ISC was apparently sustainable for millennia prior to their decline and diaspora between 1900BC and 600BC, apparently related to climate change. That period also corresponds with the rise of Abrahamic religions and dualistic thinking that spread globally to produce the globally dominant scientific and technological revolution we are in today. Ironically, by delving into dualistic thought we lost the ancient knowledge of whole systems, but gained the technology the ISC perhaps needed to adapt. Unfortunately, that great human experiment is threatening even greater changes today, as we struggle to regain the lost understanding of whole systems. Knowing more about ISC and its culture, speculative as such pre-historic studies must be, may be important in that struggle because it may represent an early and successful test of a sustainable philosophy, if that's what it was, that we may apply to developing a new, more technologically integrated, "Sustainability Science". We recommend an international research agenda for studying "whole systems" in both ancient and modern times. We also suggest a much stronger international effort focused on archaeology of the Indus/Saraswati region, which may be of inestimable importance in the history of Humanity.

Keywords: Vedic, non-dual, holism, Indus, Saraswati, sustainability

INTRODUCTION

Holism has been given a hard time in the modern scientific world, and it is likely that much of the resistance was a result of dualistic thinking that rose to dominance across the world in the second millennium BC, after dispersal of a highly successful holistic thinking society, that seems to have existed sustainably for thousands of years earlier in what can legitimately be called the Indus/Saraswati basin. This paper will attempt to support these conjectures with a combination of fact and necessary speculation, despite strong controversies that persist. In particular, this history has been wrapped up with the highly politicized problem of Vedic origins, which drove many political agendas in European and Indian history.

We thus make a match between the most ancient philosophy on Earth, the origin of which has been controversial, and one of the most ancient civilizations on Earth, the philosophy of which has been equally controversial. still puzzling linguistic issues that may themselves fall to a much more sweeping revision of ancient origins.

The Vedic philosophy of "non-dualism" has been recognized worldwide as one of the most profound philosophies ever produced (Schopenhauer 1966). It has informed modern religion and is credited by the early atomic scientists with having given them the essential insights to develop quantum theory and post-modern physics (Wilber 2001). Vedic or pre-Vedic holism in the Far East was arguably the root of what Aldus Huxley identified with Vedic texts and called "The Perennial Philosophy" (Huxley 1946). Its philosophy and metaphysics appear in every major religion today, and many of its metaphors, images, and stories are reflected in obvious retellings.

The problem of Vedic origin, however, has been to find an historical society that genuinely could have produced such epic ideas, first as oral tradition and later as literature. An opposite problem has existed, to find the beliefs and traditions of the civilization that was indigenous to the Indus/Saraswati basin since at least 3300BC. We have in the same region a philosophy without a people and a people without a philosophy. It appears, despite many unproven claims of cultural ownership outside of India, that there is increasing support for connecting the two. It was a 'lost' civilization for two reasons; first because it became buried beneath the sands of the Thar Desert beginning in 1900BC and only a small fraction of it has since been excavated; and second because it became buried by Western theories of civilization that made it impossible to believe (Danino 2010). The Indus/Saraswati civilization, which included Harapan and pre-Harapan cultures, stands today as an anomaly: a series of cultures without major interruption, that seems to have existed sustainably and peacefully for millennia, as perhaps the most productive and advanced civilization of the world in those times (Mcintosh 2001). Increasingly the link is being made between this civilization and the origins of Vedic beliefs, through symbols found on seals, an Indus Valley Script that some claim lends itself to Vedic interpretation, and other archaeological finds.

Most Western students are taught that natural philosophy began with the Greeks, but actually Western philosophy and science, including that of Egypt and the Middle East, borrowed a great deal from the ancient philosophy in the Far East; not once but many times, each time introducing ideas that were considered 'profound' in the Western context and yet obvious in the Eastern. Understanding how this could be so, and yet how Western science could also be considered superior, is one of the great questions we should ask. Perhaps each of these worldviews should be considered profound with respect to the other; suggesting that an even greater unity of the two may approach closest to truth. The greatest advances in post-modern science were linked to that greater unity known in the East; whereas in the previous 'modern' era it was the idea of mechanism that led the way. Thus while we may chronicle Western science in terms of its nearly exclusive focus on material existence, we might miss the important fact that holistic wisdom has been interjected into that view at critical steps, bringing about major revolutions in science and culture.

The same principle may be true in reverse; at the dawn of Western science and in other more naturalistic societies, where injection of mechanistic thinking may have provided necessary material and technological advances. Perhaps we are wiggling toward a complementarity between two essentially opposite, and possibly equally valuable ways of experiencing the world. Understanding that greater whole is most characteristic of Vedic philosophy and of modern calls for new thinking toward a sustainability science and a more sustainable society.

Here we ask a simple question: "What is the history of Vedic holism, and what can we learn from it to inform the emerging new sustainability science?" Along the way, we will need to explore a number of related issues, and we will discover that the civilized world may once have known and lived according to a holistic world view that brought peace, prosperity, and sustainability for millennia. Humanity appears to have gone through a major and profound transition from that ancient model of holism, but it also appears to have done so for lack of the technological means to survive environmental change.

3000 years later we face a similar crisis brought on by technology itself, but now lacking the holistic means to manage it for overall sustainability. It is a fascinating story, albeit told in sketches, with one important conclusion: *we need to put the two worldviews together*. We suggest that the current challenge is to recombine the ancient and modern understanding of reality, taking the best of both.

DUALISM

Our global culture today is highly dualistic, having adopted the Western model. By this we mean that our models of nature and human society are primarily based on the belief that we are separate from the rest of nature and from our own origins in nature. We thus feel unwelcome having been taught that existence is purely mechanical and subjective experience is beyond understanding. It gives us some measure of confidence to believe that the outer world, at least, is objective when our inner world is not. In a sense, dualism creates the problem and provides a means to solve it by looking outside. But it is an endless cycle as externals don't add up to internals and technological 'solutions' tend to introduce new problems; a highly questionable saviour.

Pre-historic human civilizations were less sophisticated technologically, leaving them more vulnerable to the elements of nature, and we have thought of them as having been guided by pre-scientific superstitions. However, the ancient civilizations of the Indus/Saraswati basin in Northwest India and Eastern Pakistan appear to have developed a scientific holism based on their exploration of inner psychology and its relation to the world we see. We can imagine a period of intensive introspection of a very scientific character as revealed in surviving literature and images, not ruled by myth as has been assumed, but by experience and reasoning. Many Western philosophers and scientists have recognized the ideas of the ancient East as a genuine philosophical, mathematical, and pre-scientific development; but it was not given any such status as compared with the Greeks, where many of the ancient ideas re-emerged or were reconfigured.

Meanwhile, since the apparent shift to dualism, science and society has paid very little attention to the nature of whole systems and instead has developed a world view, which culture has adopted, based on the mathematical idea of mechanism, and hence a 'machine metaphor' for nature itself. Mechanisms operate in generally predictable ways, but complex and living systems re-organize themselves and their behaviour as they operate. They are thus governed by feedback between mechanistic behaviour and organization at the whole system level: which is arguably the essence of holism (Kineman 2011).

Attempts to discuss non-mechanical aspects of nature have been strongly discouraged in Western thought. With that marginalization came a dismissal of many holistic concepts from the ancient Far East, in particular the Vedic tradition, even to the extent of obscuring the origin and antiquity of that philosophy itself in local cultures. Occasionally, when dualism has met with crisis, we have dipped into the treasure trove of ideas from the Vedic philosophy; most recently in the transition from modern to post-modern physics.

Scholars today are painstakingly uncovering Vedic and pre-Vedic history and finding an amazing human heritage that was all but lost to the world, but for its careful preservation in sacred texts and oral traditions that continue today. These ancient teachings were meant for all time and all people. The word "Veda" means knowledge of existence that is available to everyone from within one's own experience. We thus suggest that it was a segment of mixed society (not a single culture or race) that explored the inner knowledge deeply, much as today's scientists explore the outer world. The writing and preservation of Vedic philosophy, apparently from a highly devoted Yogic culture, has served as a guide to holistic systems thinking for many centuries in modern times, particularly in times of crisis.

We face a global crisis today in which we need to dip into the Vedic treasure trove again, this time to understand holism and sustainability of complex and living systems and how to manage them in many dimensions of science, society, and ethics. Here we discuss what may be learned from the ancient Far East about holistic thinking and suggest an international research agenda for continuing the investigation.

THE CRADLE OF HOLISTIC IDEAS

The "Out of India" theory of indigenous Vedic antiquity in the Indus/Saraswati basin, spanning the border of India and Pakistan, has been controversial since it was first proposed by Indian scholars because it runs counter to established European chronologies (Prakash 1969; Kenoyer 1998; Bryant 2001; Devamrita 2002; Frawley & Shastri 2003; Peurhi 2004; Frawley 2005; Feuerstein, Kak & Frawley 2008; Vivekananda Kendra Prakashan Trust 2011, 2012; Cassaro 2011; Tiwari 2012; Prasanna 2012; Bryant & Patton 2013; Shaffer & Lichtenstein 2013). However the European dates and the theory of Asian origin of the Vedas seem to have been based on flawed historical interpretation, racial and political ideologies, and unrealistic Biblical time-scales. A general conviction became established among scholars of the last century that Vedic civilization spread to South Asia from Central Asia via Mesopotamia and Sumeria, around 1500BC, much to recently in the light of climatological and archaeological evidence in the Indus/Saraswati basin.

Instead, the picture is emerging of a relatively continuous culture indigenous to the Indus valley and legendary "Saraswati" river, from very ancient times without significant invasion or conquest from outside (Kenoyer 1998; Devamrita 2002; Frawley & Shastri 2003; Peurhi 2004; Frawley 2005; Feuerstein *et al.* 2008; Danino 2010; Bryant & Patton 2013). There seems to be no basis for myths of an "Aryan" race; that term appearing first in the Vedas and referring to the lofty minded; most likely the sages of a racially mixed society that formed a contemplative order advising rulers but not ruling, in accord with Vedic belief that those functions should be kept apart. We will review evidence that not only was there no Aryan invasion, there was no Aryan 'race' or 'homeland', as such, despite Western obsessions with those ideas.

From admittedly spotty evidence, we may be able to identify roots of a relatively continuous habitation in the pre-historic Indus/Saraswati basin from as early as 7,000-5,000BC until its significant decline and dispersal through India and the rest of the known world between 1900BC and 600BC.¹ This period corresponds with the time of Abraham in Biblical lore, and thus the rise of Western theology and a dualistic worldview. As we learn more of the character and sustainability of this ancient civilization we find perhaps the most profound archaeological and cultural discovery of our time; one demanding an explanation in terms of social and ecological

¹ Production of Classic Vedic literature is estimated to have stopped by 1500BC .

theory. Despite centuries of excavations this research remains surprisingly in its infancy, clearly deserving much higher priority for preservation and continued research.

Of particular interest here, the Indus/Saraswati civilization seems to have been remarkably peaceful up to their decline, without evidence so far of warfare or significant defences, nor even of worship or deference to Kings or Rulers (McIntosh 2001; McIntosh 2008). That is unique among world cultures, and even experts who have not abandoned elements of the invasion theory cite the puzzling inconsistency between a presumed war-like conqueror and strong evidence to the contrary.

"One of the most surprising aspects of the Indus Civilization is that it seems to have been a land without conflict. There are no signs of violence and no depictions of soldiers or warfare in the Indus art. When we look at the other civilizations [of the world] we can see how unusual and unexpected this is." (McIntosh 2001)

It makes little sense to presume that a holistic society was without a holistic philosophy, and that a warlike invader had a philosophy that was astonishingly peaceful and non-violent. There is also doubt that the battles in the Rig Veda attributed to Indra should be considered actual battles, but perhaps natural forces with metaphorical and archetypal relation to lesser human struggles; or perhaps even the inner conflicts of the human soul (Prakash 1969; Aurobindo 1999).

Much of the warrior-like power attributed to Indra may be more easily understood as a metaphor linked to frequent flooding of the region. It is to be expected in ancient times that great forces of nature would be experienced as God, and quite often in the Rig Veda the result of worship, if it bestows grace, does so through the understanding and enlightenment of the sage: *"We have o'erpassed the limit of this darkness while, worshipping the Gods, we sang their praises"*. Griffith, Ralph T.H. (2009-03-11). The Rig-Veda (p. 375). Evinity Publishing Inc. Kindle Edition. Furthermore it is to be expected in those times that natural forces might be perceived as a living force. Anyone who has been in a wildfire or flash flood will certainly have felt as if a wrathful being were at work, and it is only our extensive training that allows us to think of it as a 'thing'. The energy, in fact, is not a thing.

It was noted with some astonishment by archaeologists that the "fortifications" of cities are unsuitable for war but designed more suitably to protect against floods (McIntosh 2001). Indra in the Rig Veda is the God of rain and floods: *"He who...freed the Seven Rivers,...who...leads the waters....He, O men is Indra"*. With this power he was the and with their power *"destroyer of the castles"*. (Griffith, Ralph T.H. (2009-03-11). The Rig-Veda (p. 40). Evinity Publishing Inc. Kindle Edition.) It is now known from paleoclimatology that flooding due to monsoon rains was a major characteristic of the region, as stated in the Rig Veda: *"Through his own strength Indra with bolt of thunder cut piece-meal V.rtra, drier up of waters. He let the floods go free, like cows imprisoned, for glory, with a heart inclined to bounty. 11 The rivers played, through his impetuous splendour, since with his bolt he compassed them on all sides"* (Griffith, Ralph T.H. (2009-03-11). The Rig-Veda (p. 41). Evinity Publishing Inc. Kindle Edition). It is also clear that worship of Indra meant understanding the nature of the floods, not revering a worldly warrior: *"By sacrifice the yearning sages sending forth their songs found furtherance from him who speeds the flood."* Griffith, Ralph T.H. (2009-03-11). The Rig-Veda (p. 146). Evinity Publishing Inc. Kindle Edition.

On the warrior aspect of the Rig Veda, it might be said that its references were to caste struggles in contrast to the great power of nature that both had to bow to or perish from their lack of wisdom: "Both races², Indra, of opposing foemen, O Hero, both the Ârya and the Dâsa, Hast thou struck down like woods with well-shot lightnings: thou rentest them in fight, most manly Chieftain! Griffith, Ralph T.H. (2009-03-11). The Rig-Veda (p. 309). Evinity Publishing Inc. Kindle Edition.

The much discussed issue of horses cited in the Rig Veda, which has been used to justify more recent dating of the Vedas, may also bend to metaphorical meanings, in which rarity in actual culture, like some non-indigenous and mythical animals that were depicted on Indus seals much earlier (scimitar-like Oryx, and Unicorn), may have allowed their use for abstract meanings. Scholars have argued that the Vedas are primarily about metaphysical phenomena, secondarily employing actual geographical and cultural facts which can only be interpreted as such when that meaning is clear (Sethna 1992; Aurobindo 1999). Furthermore as a major regional trading society, they were knowledgeable of many other regions.

The geographical setting and people contemplating these ideas, however, were certainly not themselves mythical. Geographical and geophysical evidence documents that the rediscovered Saraswati River, now under the Thar desert, once flowed very much as described in the Rig Veda at 5000BC. Satellite imagery (**Figure 1**) reveals the extent of the buried river system (Ghose, Kar & Husain 1979; Gupta, Sharma & Sreenivasan 2011), with hundreds of ancient settlements occurring along its now buried course (Valdiya 2002).

The Saraswati was the revered source of civilization and life, referred to in the Rig Veda as the mightiest of rivers, along with a convincing description of the region:

"The Rigveda describes a river called the Saraswati, which rose in the mountain, broke through the mountain barrier with a tremendous roar, and emptied itself into the ocean (Rigveda, 7:0: 5:2; 6:61:29). According to the composers of the Rigveda, it was the best of all rivers (naditame) and the largest of the seven rivers of their country (Rigveda, 2:41:16 and 7:36:6)." (Valdiya 2002)

² This 19th Century translation may have translated the original to 'race' instead of 'tribe'.

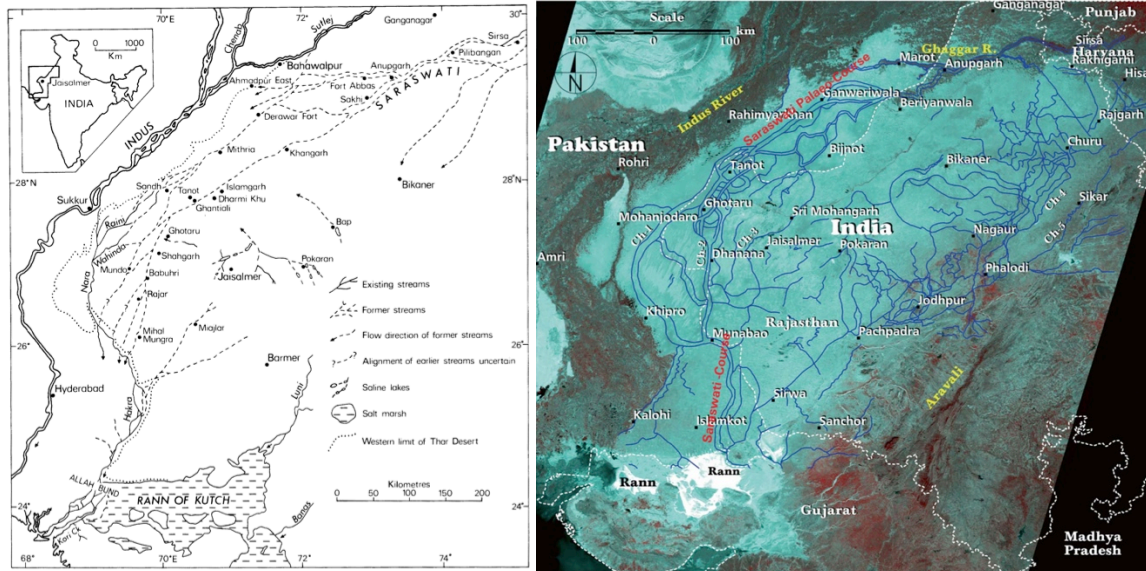


Figure 1: Ancient courses of the Saraswati, reconstructed from remote sensing. Left: (Ghose *et al.* 1979); Right: (Gupta *et al.* 2011)

And, like time itself, it was referenced as a tacit witness to events:

"pra ksodasa dhayasa sasra esa sarasvati dharunamayasi puh prababadhana rathyeva yati visva apo mahina sindhuranya" "Pure in her course from mountains to the ocean, alone of rivers, Sarasvati has listened." Rig Veda (07.095.01.1-2)

But after 2,800BC global climate changed, weakening the summer monsoons in the Indus region (Enzel *et al.* 1999). Recent paleoclimate reconstructions show a unique period of stable high global temperatures between roughly 7,500BC and 3,000BC as shown in **Figure 2** (Marcott, 2013) and hydrological studies confirm that the Saraswati river dried or disappeared below the Thar desert by about 1900BC (Ghose *et al.* 1979; Valdiya 2013), forcing a major resettlement of people to the Indus and Gangetic planes, and elsewhere.

Paleoenvironmental data from boreholes confirm that this period of high global temperature was accompanied by wet fertile conditions (in agreement with descriptions in the Vedas) from 4,300BC to 2,800BC (Enzel *et al.* 1999). A study of the climate-culture connection in the area reported that a severe drought lasting from 2200BC to 1900BC prefaced the demise of Harappan cities and dispersal of the population to a rural society over the course of the next millennium (Staubwasser & Weiss 2006). Climate change, more than tectonic shifts that occurred earlier (Clift *et al.* 2012) may thus have been the main contributor to the decline of this civilization and their dispersal to other regions (Ghose *et al.* 1979; Gupta *et al.* 2011; Valdiya 2013).

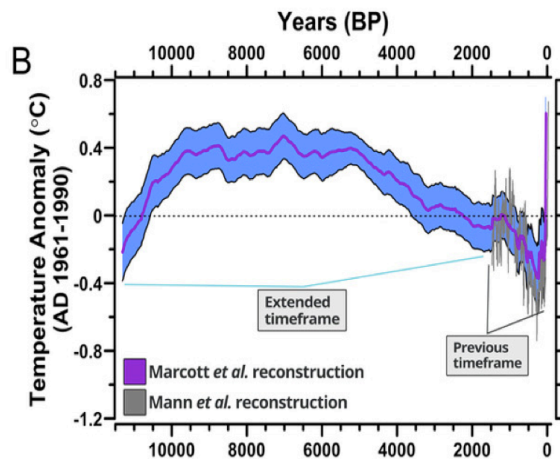


Figure 2: Global Temperature History (Marcott, 2013)

Drying of the Saraswati, which began at least by 1900BC, is also mentioned in the Indian Mahabharata epic, again challenging the standard chronology for orally transmitted Vedanta. Artifacts of Vedic or proto-Vedic culture have been dated to many thousands of years before the "Vedic period" as currently defined. Yogic seals indicative of Vedic culture, found at Mohenjo Dharo on the Indus river, have been dated to 2800BC and Astronomical references in the Rig Veda indicate dates around 4000BC. The co-director of archaeological research at Harappa estimated the Harrapan civilization, from which many apparently proto-Vedic artefacts came, to have begun around 3,300BC (Kenoyer 1998). Strong arguments are being presented for these and even older dates for contiguous pre-Vedic origins (Devamrita 2002; Peurhi 2004; Feuerstein *et al.* 2008). These and other more speculative timelines argue that a relatively continuous history of Vedic origins extends at least back to 3000BC and may be ancient in the extreme. It is also clear that the civilization as a whole entered a significant decline around 1900BC due to climate change, not external invasion, becoming all but extinct by 600BC.

Until these discoveries, some of which are re-discoveries of reports made by early British archaeologists, the Western world viewed the Saraswati river as mythical and divorced the ancient civilizations of this region from Vedic philosophy, leaving both orphaned. The new picture is of a highly advanced holistically centred civilization that existed for millennia in what now appears to have been the largest fertile region of the civilized world at the time (more than 1M km²); larger than the fertile areas of the Nile and Tigris/Euphrates regions put together.

Discovery of the actual course of the Saraswati with geological dating of when it dried and when it must have been the mighty river described in the Vedas, along with interpretation of the symbols found on Indus seals, significantly strengthens the claim that Vedic literature is based on an accounting of both physical and metaphysical aspects of an ancient culture that existed for millennia. That society not only produced perhaps the most profound holistic philosophy on Earth, it seems to have explored and lived that philosophy sustainably; and thus it provides us with a model for holistic thinking that we may learn from today. We may ask what allowed such a unique culture and philosophy to exist; can this reign of peace, prosperity and holistic thinking be attributed solely to fortuitous geography and climate, or was its philosophical basis also responsible?

THE ARYANS

The Aryan Invasion Theory (AIT), that Vedic culture was introduced to India by foreign war-like invaders from the North, held that Vedic history originated with an Aryan culture and race outside of India, somewhere in the steppes of Central Asia (Thapar 1990), Afghanistan (Kochhar 1999), the Caucasus mountains or Ukraine (Kortlandt 1990), the Eastern Himalayas (Cassaro 2011), or even above the Arctic Circle (Tilak 2011). The best consensus may be that there is no exogenous origin (Kenoyer 2008; Bryant & Patton 2013). Nevertheless, the theory held that an Aryan culture that produced the Rig Veda arrived in India through Mesopotamia and/or Sumeria around 1500BC, setting the dates for the Classic Vedic Period of civilization in the Indus Valley. One or several waves of Aryan warriors supposedly conquered the native Dravidians driving them south, and established the Vedic civilization that lasted until its end around 600BC (Bryant 2001; Frawley 2005; Prasanna 2012; Bryant & Patton 2013).

Horses and chariots, known in Central Asia from 3000BC, are cited frequently in the Rig Veda, but found in the Indian sub-continent only after 2000BC. If the references in the Vedas were to actual horses in the local culture of the time, as opposed to mythical horses appropriated from distant legends, the argument thus goes that the Vedas themselves must have been of external

origin. Linguistic arguments have been used as the main support for such externality. We have no unequivocal translation for the Indus Valley Script to thus determine if it has cultural links to the Vedas or pre-Vedic ideas, although some speculative translations indeed claim that it does (Ushanas 1997).

Tremendous inconsistencies notwithstanding, mainstream scholars maintained the theory for over a century, supposing that invaders settled down after violently conquering and driving out the Dravidians and, in complete antithesis to their own war-like and nomadic life style, formed an agrarian and mercantile society that authored Vedic non-dual, transcendental philosophy based on non-violence, dharma, love, peace, and truth. With linguistic evidence now in question and virtually no archaeological or biological evidence to support it, the credibility of that story seems to be stretched beyond belief:

"There is no archaeological or biological evidence for invasions or mass migrations into the Indus Valley between the end of the Harappan Phase, about 1900 BC and the beginning of the Early Historic period around 600 BC." (Kenoyer 1998)

The long prior history of surprisingly peacefully co-existing cultures, on the other hand, appears to have spanned a vast region of the Indus/Saraswati river system. There is also scant evidence of weapons, fortifications (other than against floods), or violent conflict on a large scale until civilization began to decline in the region. There is also apparently no evidence that invaders destroyed this culture, but rather that it crumbled from within, under the stress of environmental disaster (perhaps as we face more globally today) and consequent social decay. We can speculate that it was perhaps their own high priests and sages who encoded their history in the complex and self-preserving oral forms passed down to the present, for future generations and for their own displaced peoples taking refuge in other havens. Writing itself would have occurred only after a long indigenous oral tradition. Written language began to develop around 3000BC by most estimates, but would not have been sophisticated enough for such complex work until much later.

There is little question that the Aryan Invasion Theory (AIT) either consciously or sub-consciously supported colonial interests, ultimately discrediting India's heritage (e.g., see: (Vivekananda Kendra Prakashan Trust 2011, 2012). The myth of an advanced non-Indian "Aryan" race was similarly employed, for example, by the Nazi movement that co-opted Vedic symbols (the Swastika) and ideas to characterize a diametrically opposite ideology that could only be eradicated by two world wars. Even some British authors used the argument of Aryan heritage to support their colonial occupation of India, as the return of India's former leaders from Vedic times (Leopold 1974).

We must be careful, however, in distinguishing AIT's genetic hypothesis from AIT as an origin theory for Vedic ideas and culture. Genetic studies have not supported the idea of an Aryan invasion (Sahoo *et al.* 2006). However, genetic input from Europe and Asia is supported by recent studies indicating pre-historical mixing between Ancestral Northern Indians (ANI) with European and Caucasian roots, and Ancestral Southern Indians (ASI) with more recent African roots, best represented today in the Andaman Islands (Moorjani *et al.* 2013). That recent mixing was reported to have occurred between 2200BC and 100CE, thus overlapping the period of decline and dispersal of the Indus/Saraswati and Vedic civilizations (1900-600BC) and gradual exodus to other areas. That mixing, however, clearly does not correlate with Vedic origins. This recent mixing appears to have begun in the South of India, further contradicting the AIT hypothesis, even if its paradoxical timeline could be resolved.

The first thing we should understand is that neither Vedic philosophy nor its history is tied to questions of race. Ancestral Northern Indians (ANI), more associated with Caucasian roots, and Ancestral Southern Indians (ASI), more associated with African roots, likely entered India many times by different routes (Dolgin 2009; Reich *et al.* 2009). These genetic studies show that the modern population of the Indian region was so mixed between Northern and Southern ancestral types in prehistoric times going back to the Pleistocene, that neither castes nor religions can be clearly distinguished on that basis today; that founder effects occurring after mixing of the two ancestral groups dominate current racial variations. It is thus more likely such genetic mixing was not a direct issue in proto-Vedic cultural origins, but may have been associated with the dispersal of that civilization, as one might expect of a diaspora. The point was made some time ago that: *"There is no Dravidian race and no Aryan race. The two terms are used only in linguistic and cultural contexts"* (Prakash 1969), pg. 19).³ Even Max Muller, accused of beginning the Aryan race myth, made this point: *"There are Aryan and Semitic languages, [but] it goes against all rules of logic to speak, without an express or implied qualification, of an Aryan race, of Aryan blood, or Aryan skulls"* (1880, cited in (Shaffer & Lichtenstein 2013), pg. 78). Europeans thus mistakenly appropriated the word "Aryan" from the Rig Veda to identify with an ancestral "Indo-European" race, whereas in the Vedas it means 'noble', regardless of race, and most likely refers instead to lofty-minded sages involved in deep introspection and associated austerities and thus reporting, as written in the surviving texts, on the inner world of the mind. In other words, it may make as much sense to search for the original homeland and race of 'Aryans' in pre-history as it would for future historians to search for the original homeland and race of today's noble-minded priests and scientists. Nor is it likely that linguistics can be precise enough to identify the origin of Vedic philosophy, which was an oral tradition in an unknown language for millennia before being written in Sanskrit. Perhaps decipherment of the Indus Valley Script will shed some light, but for now the linguistic origins of Vedic philosophy remains a mystery.

We may similarly dismiss racial or cultural ideas of caste, which have also been attributed to mythical Aryan invaders, suggesting that the conquered native population thus became the lower castes. There is no evidence in the Vedas that caste was meant to be racial or to establish a hierarchy of personal worth and endogamy, as it became much later. Quite the opposite, the equality of social levels was emphasized; whereas the division of society into different sectors based on profession is a common factor among all cultures even today, and arguably an important characteristic of a smooth-running society, albeit one that should be natural, not imposed. It is more likely that the degenerate form of caste system that has plagued India in historical times developed with the decline and dispersal of the pre-historical Vedic civilization.

The four castes (Varnas) described in the Vedas were originally described as life-long occupations or professions: (a) sage-priest-scientist, (b) minister-warrior-leader, (c) business-manager-merchant, and (d) tradesman-labourer-commoner. As an emergent social phenomena, these divisions need have nothing to do with race or endogamy as it later developed, except as families tend to specialize because of their education and experience. The Vedic literature and Indus/Saraswati archaeology both suggest that in contrast to later hierarchical orders, Vedic society was characterized by its predominant support for the working class.

In ascending order from workers, each class was successively less represented in area of the city devoted to them, whereas all appear to be equally nourished (McIntosh 2008). In the Vedic system, there was no fifth "untouchable" caste; which perhaps developed as an 'out-caste' as

³ Europeans appropriated the word "aryan" from the Rig Veda to suggest an ancestral Caucasoid race, but in the Vedas it means 'noble', regardless of race.

civilization came under pressure and Vedic culture declined. These same four divisions (and an embarrassing outcast) are found almost universally in civilizations today, however in India it appears that they become rigid categories through endogamy and other social barriers. The Vedas and Upanishads give many examples of both caste and gender equality with regard to wisdom and leadership. Female sages, goddesses and peacemakers figure among the images found on Indus seals. There is no question, of course, that the caste system eventually deviated from these original ideals. Gandhi, who obviously professed Vedic dharma, argued vehemently against what the caste system had become in modern times (Gandhi 1958; Nadkarni 2003).

WERE THERE GOD-KINGS IN THE INDUS/SARASWATI CIVILIZATION?

The way Vedic philosophy separated social classes can help us interpret the meaning of certain artefacts. Apparently the Indus/Saraswati civilization did not have a strong top-down hierarchy nor is there evidence of worshipping Kings and Rulers. Instead, emphasis seems to have been placed primarily on the well-being of the working and merchant classes, consistent with a highly productive and relatively self-organizing society (Mcintosh 2001; McIntosh 2008).

Nevertheless, a famous sculpture found at Mohenjo-Daro (**Figure 3**) has been called a "Priest-King", as one might assume in many other civilizations that archaeologists and historians are more used to. However, such a meaning would be entirely inaccurate in Vedic philosophy. The clothing and ring on the third eye identify this figure as a sage or priest with no signs of being a ruler. Vedic philosophy does not allow joining priest and ruler professions because the combination destroys the purity of both (a cause of corruption evident today, and held in check, for example, in the Constitutional separation of powers in many democratic governments). That separation of roles would allow the sages to provide a social conscience by representing the long term good and needs of common people to decision-makers, whereas ministers and merchants represent the immediate requirements of society to workers. A Priest could no more maintain the meditation needed to find long-term wisdom and humanistic ethics while dealing with day-to-day decision-making, than a ruler could effectively govern while committed to the austerities and detachment necessary for deep meditation. Such principles were meant to maintain order and clarity in Vedic society (Sharma 1991).

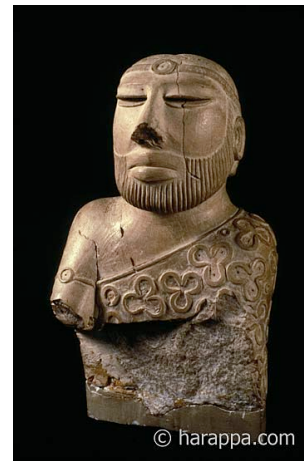


Figure 3: Indus Valley Priest/Yogi

We can well imagine the decline of the Vedic culture and rise of more dualistic thought that would have correlated with the advent of 'God-Kings', as with the Pharaohs of Egypt, arrogating priestly status to rulers. Vice-versa, religions increasingly gained direct political power and sequestered introspective wisdom in various traditions that were kept from the common person forcing them to recognize intermediaries. As the Vedas and Upanishads predicted, conflation of leader and priest classes led to degradation of social order, wars, chaos and many horrors that are now well chronicled over the past 2000 years. The Vedas were clear about the evil that would result from combining these functions in one authority, and to a large degree that is part of the story of the Mahabharata -- how society began to degrade as rulers co-opted ethics as part of their authority and marginalized or ignored the guidance from sages; or as sages also sought political power. Perhaps Ram, in the famous Ramayana epic, can be held up as an exception where a divine personage was also a warrior and King; but the entire story is about the moral dilemmas he faced in that dual role, and the need for him to often consult sages, bow to dharma, and defer to

others on critical matters even renouncing the thrown for 14 years to honour his father's vow. However, while Vedanta preached such ethics, it is clear that society post-Vedic society did not generally practice them.

It is unlikely that favourable climate can be solely credited for such a striking example of social order without strong rule, long-term sustainability, productivity, and peace. That combination is rare, despite favourable climate. On the other hand, climate change does seem to be responsible for the period of decline in Vedic civilization, forcing mass migration and causing cultural, ideological, and even genetic changes. There were repercussions far from the Indus/Saraswati region, which appears to have been a major, if not the major centre of trade for the civilized world prior to 2000BC (Kenoyer 1997). Whereas the previous age was certainly industrious, this dramatic shift at all levels was either absorbed by or helped produce a dualistic world that would race headlong to increase technological abilities primarily for war.

It seems unexplained why the Indus/Saraswati civilization would have remained relatively untouched prior to Greek conquest in the fourth century BC, despite power struggles elsewhere in the world. That apparent paradox will perhaps remain an enigma of history. Ironically, when Greek conquerors arrived long after the region had declined, they were seriously constrained by desert conditions impeding their march into the Gangetic plane where, by the time they arrived, there were huge armies amassed. The Greek rulers remained confined to the Northwest from which they were later expelled.

PROTO-VEDIC HOLISM AND THE INDUS/SARASWATTI CIVILIZATION

The Vedic philosophy is as remarkably holistic in its non-dual view of the universe and mankind as the Indus/Saraswati civilization was, from available evidence, astonishingly peaceful and productive for the duration of its history. We may tentatively put Vedic philosophy and Indus/Saraswati culture together at least with regard to certain holistic concepts of nature that are represented clearly in the literature, archaeological evidence, design of cities, separation of classes, deference to sacred images of unity, and other evidence (Hiltebeitel 1978; Danino 2010; Parpola, Pande & Koskikallio 2010; Richter-Ushanas 2012).

While Indus civilizations seem to have integrated diverse cultures and religious practices (Possehl 2002), there seems to have been a shared core philosophy that was Vedic in character with similar holistic elements early in Indus history. Evidence for this appears on the Indus seals⁴, figurines, and pottery. The Indus stamp-seal motifs suggest references to the philosophy of *Advaita* (non-dualism), a core principle of Vedic holism. In **Figure 4** are shown (left to right):

- (1) Yogi seal depicting deep meditation, either three or four faces (aspects) of Shiva or Brahman, pipal leaves (*ficus religiosa*), a common Vedic symbol of divine mind, separating what may be symbols of creation on the right and the worldly on the left, thus reflecting the quintessentially Vedic idea of unity of material and spiritual existence through higher consciousness. The script that appears on the "Yogi" seal employs universal symbols that appear systematically on other seals allowing a tentative Vedic/Sanskrit interpretation (Ushanas 1997). Reading from right to left, the first vessel-like symbol may represent original creation (uterine shaped), from which springs water

⁴ The Indus seals are small clay 'stamps' many of which were used to label goods, much as business logos are used today, generally appealing to cultural values.

- (river symbol), the giver of life, and then life itself (the fish symbol). On the left of the headdress, which is a pipal branch (*ficus religiosa*) symbolizing higher consciousness, the symbols may refer to the material existence of matter and energy (stick-like shapes) and the built world (the X shape). The separation of these two sides by mind suggests the same duality between the realized (material) and creative (potential) worlds
- (2) Chimerical bull seal showing four aspects of existence as described in the Chandogya Upanishad and elsewhere: two material aspects (represented by the head and body of the bull image) and two ethereal aspects (the mythical heads, one that is commonly represented as a unicorn and the other as a non-indigenous Scimitar-like Oryx).
 - (3) Advaita seal showing non-duality in the form of two unicorns as equal and opposite existences facing each other through higher consciousness indicated by the branch of pipal leaves (as on the first seal). as in the 3rd seal showing opposed unicorns facing the pipal branch.
 - (4) The "Swastika", which is perhaps the earliest symbol ("ka") of divine bliss and wholeness ("Sva Asti"), also indicating the traditional four aspects of existence, each connected in this example by an outer square with pointers into each quadrant, strongly suggesting a transcendent unity (an implicit 5th cause, that is Brahman). This symbol corresponds with the four causal aspects that emerge from existence, i.e., the "four faces [or feet] of Brahman" as described in the Chandogya Upanishad and the bent arms suggest a cyclical aspect (i.e., possibly a cyclical causality as discussed below).



Figure 4 Indus Valley Seals ca 2800BC (Kenoyer 1998)

The Yogi seal depicts an ancient form the yoga posture that is little used today, but known as "Baddha Konasana" (bound angle). It is similar to the now famous 'proto-Shiva' (Hiltebeitel 1978) found at Mohenjo Daro (Marshall 1931), dating to around 2600BC (Kenoyer 1998), except that in this seal multiple faces consistent with Vedic descriptions of the "four faces of Brahman" are more evident. Other seals showing multi-headed animals, may also be consistent with the Vedic four-part holistic existence and causality⁵ (well described in the Chandogya Upanishad, for example). Some possibly related motifs appear on pottery from Mehrgarh, suggesting some continuity to as early as 7,000BC. These seals show up around 2800BC and the as yet undecipherable Indus Valley Script that appears on them originated in the early Harappa period 3,700BC-2,800BC (Kenoyer 1998; Parpola *et al.* 2010).

We also see a branching diagram on the second seal, possibly representing the numerical sequence 1:3:7; which is characteristic of the creation story described in the Vedas and

⁵ Three 'heads' may signify three different ways of relating to or ruling the material world (the bull), as the most basic knowable reality before ultimate Brahman is described in the Vedas as four-fold, symbolized by four-faces (aspects) of Brahman.

Upanishads ("one, three, many"). The number sequence corresponds to emergence of whole systems from unity, which is also a Vedic theme, following the pattern $2^n - 1$ (one less than the binary sequence), where 'n' is the number of individual systems. The mathematical sequence is based on counting the possible combinations of discrete elements; that is, the number of systems that can be formed. For example, as Oneness (the first emergence from Brahman) divides into two systems, the Vedic concept that wholes remain whole and produce only wholes (see quotes later) requires that the first emergence is thus three wholes. Two whole systems cannot exist without a third system that is their unity. Four discrete components thus imply seven whole systems, and so forth. The sequence describes wholeness in diversity.

It is interesting that we do not see the Vedic symbol for Om, as known today, in the Indus script, but also it is not mentioned in the Rig Veda; its first mention is reportedly in the Yajur Veda. Vedanta has certainly developed through the ages, but we are concerned here with its fundamental philosophical core.

Keeping in mind that any interpretation of ancient civilization must be inherently speculative, the Indus/Saraswati civilization nevertheless seems to have been associated with order and prosperity throughout a succession of relatively stable societies between 7000BC and into the period of its decline and dispersal between 1900BC and 600BC, perhaps with indigenous ancestry as far back as the beginning of the Holocene (**Figure 5**). It also appears to have been a very large and advanced civilization with broad trade connections across the civilized world. It appears unlikely to have been maintained by force, but instead by lifestyle and a sustainable philosophy. In turn, that society provided the stable conditions where holistic principles could be nurtured and practiced in intimate relation with the landscape and its people. The importance of 'place' in this regard was probably great, as reflected in their praise of the Saraswati; and loss of that geographical cohesion seems to have destroyed the synergy that was needed to keep this society together.

<i>Stage One: Beginnings of Village Farming Communities and Pastoral Camps</i>	
Kili Ghul Mohammad Phase	7000–5000 B.C.
Burj Basket-marked Phase	5000–4300 B.C.
<i>Stage Two: Developed Village Farming Communities and Pastoral Societies</i>	
Togau Phase	4300–3800 B.C.
Kechi Beg/Hakra Wares Phase	3800–3200 B.C.
<i>Stage Three: Early Harappan</i> <i>Four phases thought to have been generally contemporaneous</i>	
Amri-Nal Phase	3200–2600 B.C.
Kot Diji Phase	3200–2600 B.C.
Sothi-Siswal Phase	3200–2600 B.C.
Damb Sadaat Phase	3200–2600 B.C.
<i>Stage Four: The Early Harappan–Mature Harappan Transition</i>	
Early Harappan–Mature Harappan Transition	2600–2500 B.C.
<i>Stage Five: Mature Harappan</i> <i>Five phases thought to have been generally contemporaneous</i>	
Sindhi Harappan Phase	2500–1900 B.C.
Kulli Harappan Phase	2500–1900 B.C.
Sorath Harappan Phase	2500–1900 B.C.
Punjabi Harappan Phase	2500–1900 B.C.
Eastern Harappan Phase	2500–1900 B.C.
<i>Two related phases in adjacent regions thought to be generally contemporaneous with the Mature Harappan</i>	
Quetta Phase	2500–1900 B.C.
Late Kot Diji Phase	2500–1900 B.C.
<i>Stage Six: Posturban Harappan</i>	
Jhukar Phase	1900–1700 B.C.
Early Pirak Phase	1800–1000 B.C.
Late Sorath Harappan Phase	1900–1600 B.C.
Lustrous Red Ware Phase	1600–1300 B.C.
Cemetery H Phase	1900–1500 B.C.
Swat Valley Period IV	1650–1300 B.C.
Late Harappan Phase in Haryana and Western Uttar Pradesh	1900–1300 B.C.
Late Harappan–Painted Gray Ware	
Overlap Phase	1300–1000 B.C.
Early Gandhara Grave Culture Phase	1700–1000 B.C.
<i>Stage Seven: Early Iron Age of Northern India and Pakistan</i>	
Late Pirak Phase	1000–700 B.C.
Painted Gray Ware Phase	1100–500 B.C.
Late Gandharan Grave Culture Phase	1000–600 B.C.

Figure 5: Indus Chronology (Possehl 2002)

THE MESSAGE OF THE VEDAS

Western scholars at times have declared the Vedas primitive and incomprehensible; but those who approached its reading with a philosophical mind and poetic capacity have found quite the opposite. From physicist to philosopher, many in the west had the highest praise:

"Access to the Vedas is the greatest privilege this century may claim over all previous centuries." (Oppenheimer)

"Vedas are the most rewarding and the most elevating book which can be possible in the world." (Schopenhauer 1966)

What is in the Veda that some find so staggeringly profound, and that others find so utterly incomprehensible? Most profoundly, the Vedas and Upanishads describe a fundamental holism that pervades everything in the universe, existing in each subsystem in the same form that it exists for the universe as a whole. The *Vedic* tradition expresses holistic non-dualism in the concept of "advaita", or "nonduality". This is a very difficult concept for dualistic societies to grasp, even though it has emerged in fields like quantum theory. It is the view that existence is a complementarity of two opposites; that which we can observe or measure from a distance, and that which we can only experience directly from within. Both are equally real and together they are complete.⁶

In dualistic thinking this same relation is the subject-object divide or 'epistemic cut', but in the Vedic worldview subject and object are unified at every level. It is perception that creates the dualistic view of a material world (maya) and one who experiences it (self). In other words, to perceive we must see isolated 'parts' of a system that really exist as aspects of a whole. That whole includes the one perceiving it, so nature must therefore be holographic. It is the sense that what we see is separate from us that therefore has the quality of 'illusion'. This foundational principle is given clearly in the invocation to the Isa Upanishad (which we referred to above when interpreting Indus seals):

*That is whole⁷, this is whole,
From whole, emerges whole,
When whole arises from whole,
What remains is whole.
AUM. Peace. Peace. Peace.*

Would we not live differently if we thoroughly believed that we are eternally whole beings with material and non-material aspects creating each other? This was the knowledge ('veda') that was considered most sacred in the Vedas and apparently in Indus/Saraswati culture. That holistic view introduces an apparent fifth cause, which is *unity* itself; in the Vedic view it is no longer a part of natural causality but a transcendent *organization* of nature, often referred to as 'Beingness'. When cognized, unity thus organizes action and works to make the material reality in some way a reflection of psychological or immanent reality: the equivalence of Brahman and

⁶ We of course must assume that many levels of understanding would have existed in ancient society as today; but Vedic philosophy appears to have been as characteristically and intensively explored in ancient times as the concept of mechanism is today.

⁷ Muller translated this as 'full', some translations say "complete". Here we take it to mean 'whole' in the same sense as described in the Holon.

Atman in Vedic and Buddhist philosophy, or Father and Son in Christian theology, realizable "on Earth as it is in Heaven".

The Vedic philosophy thus describes reality as a causally unified, 'non-dual' whole that includes the material world as a locally discrete projection of non-discrete potentials, which is the world of connections between or prior to events that we associate with 'mind'⁸; these two existences being in co-creative relation with each other. That relation has been described as between "*existence with attributes*" and "*existence without attributes*" (Mehta 2007). While it is a popular idea that Western science tried to expunge concepts of mind from its study of mechanisms, that is not entirely correct; it tried to formalize the mental domain as a computable general system of natural laws, thus eliminating system-dependent realities – eliminating the holographic quality. "*Model-dependent realism*" (Hawking & Mlodinow 2012) may be a cautious hint at the understanding that nature is contextually relative and in an important sense "mental" (Henry 2005).

We do not suppose, of course, that such deep philosophical concepts were held by the majority of people in prehistoric society. Just as we also copy icons from scientific and religious ideas today, merchants and householders of the Indus/Saraswati basin adopted sacred symbols to identify their families, businesses and goods that were shipped all over the known world. With the apparent geographical end of the *Vedic* culture and its necessary dispersal, it seems to have no longer had the means to sustain its beliefs and practices in a reinforcing context against other influences. Ideas must have spread in many directions and taken different forms; although, to the great credit of this culture, its core elements were preserved until today in isolated groups through sacred chants and later written texts. Its general decline as a widely lived philosophy, however, took place about the time when Abrahamic religion was beginning to rise in the Middle East and Egypt, introducing the more dualistic view of reality we are familiar with today.⁹

Nevertheless, 'Western' dualism, which today is global, was not entirely opposite to *Vedic* non-dualism. Both perceived a necessary complementarity in nature as a result of there being an observer and an observed, and by analogy, a source of creation and that which is created. However, where the *Vedic* view perceived a unified whole that was both natural and divine, from which perception creates apparent opposites, Western dualism began to solidify those opposites into separate realities, and even to suppose that the less defined (psychological) existence is created by the defined (material) existence. Such an idea would not have naturally occurred to the Vedic thinker, for how can the undefined come from the defined; the opposite, coming into manifestation from an unknown place, is a more intuitive concept. This very question is debated in the Upanishads. Nevertheless, as Western thinking turned toward reifying the material, we necessarily began to perceive Man as separate from God and Nature, good vs. bad, mind vs. matter, etc. In like manner, a very hierarchical, authoritarian concept arose in religion and politics, with God and Kings at the top and Man at the bottom.¹⁰

⁸ Use of such a general and polymorphous term is, of course, problematic; but better definition will only arise from better theory, which is what we are advocating. Here, a more scientific definition is suggested in terms of "contextual memory" which may have many components and relations but nevertheless has effects in the aggregate.

⁹ We do not mean that dualistic thought is bad, only that it is different and caused society to explore a different view of existence. That it had many negative consequences when pursued exclusively, we consider obvious; in the same way that Eastern 'fatalism' is known to be an ill of the other extreme.

¹⁰ This, of course, is a gross generalization ignoring the many contemplative and introspective components of each of the religions that certainly existed throughout their history; but the characterization stands as a formative and foundational aspect in a certain period of history.

Certainly there were repeated insights into holism throughout Western philosophy. Among Greek philosophers the most notable may have been Socrates (469-399 BC), about whom we know only through Plato and his other students. Plotinus, who traveled to study the philosophy of the Far East, also tried to re-establish greater appreciation of holistic ideas some 600 year later. Aspects of Vedic thought appear frequently in sects of every major religion. Even in Aristotle's (384–322 BC) concept of an 'ordered world' each species has its own distinctive 'unity of end' as a full process in relation to other life processes. But these diminishing insights into nature's unity were covered by the rising tide of dualistic philosophy in both religion and science.

Behind the entire gamut of inter-related physical and life processes, Aristotle inferred in similar manner to Vedic philosophy, a prime mover (God) who is unmoved, the perfect One who gives coherence to diverse phenomena. However, Aristotle had to reconcile the unmoved God with the issue in Plato's (427-347 BC) philosophy of a realm of absolute non-material forms that determined the laws of nature. He thus discussed a hierarchy of causation with God at the top and material nature at the bottom; such that the higher causes establish the lower causes in a top-down manner. That established a dualistic worldview in which the creator may be considered One, but creation became a process of increasing difference and separation from that unified origin. In contrast, the Vedic idea retains unity and holism, the unmoved God, at the centre of causation (Atman), off the 'wheel' of causation as it were and transcendent as Brahman, thus allowing causation itself to be circular and holographic (Atman and Brahman are One). The "modelling relation" discussed below reflects that holism in the mathematical terms of category theory.

But in a hierarchical formulation of causes, God and unity can be pushed outside of science. The foundational concepts of holism in *Vedic* thought, reflected in the statements "*Tat Tvam Asi*" (That Thou art), and that *Atman* (the inner reality) is *Brahman* (the ultimate reality), did not have a place in dualism. Accordingly, Aristotle outlined a four-cause hierarchy from final immanent causation above, to material substance below, but without a link in the other direction. The lower reality then became the more 'real', as in created or realized once and for all, and less of a projection of higher causes still at work. Especially with the interpretation of Sir Francis Bacon (Bacon 1878), it became a domain of absolute substance with a unique set of rules. The higher causes lost their formative role and became mere fantasy, or at most abstraction that does not intervene on the natural world, except as arrogated to the domain of human thought (which had to be explained either as a divinely imparted quality of humans or, in modern science, paradoxically emergent from matter in the opposite direction from Aristotle's hierarchy of causation).

The ecologist, cyberneticist and anthropologist Gregory Bateson put it this way:

"If we continue to operate in terms of a Cartesian dualism of mind versus matter, we shall probably also come to see the world in terms of God versus man; elite versus people; chosen race versus others; nation versus nation and man versus environment. It is doubtful whether a species having both an advanced technology and this strange way of looking at the world can endure...If you put God outside and set him vis-à-vis his creation and if you have the idea that you are created in his image, you will logically and naturally see yourself as outside and against the things around you. And as you arrogate all mind to yourself, you will see the world around you as mindless and therefore not entitled to moral or ethical consideration...If I am right, the whole of our

thinking about what we are and what other people are has got to be restructured.
(Bateson, 1972)

If *Vedic* holism were applied, however, Plato's Forms could have been seen as both immanent and implicit in a genuine unity.¹¹ In such a cosmology, the Divine is not required to save humanity but to enlighten, and every form embodies ultimate wisdom. As the philosopher Alan Watts said of our hierarchical view of causality:

"it is ironic that we should think in the West that democracy is the best form of government while believing that the Universe itself is ultimately a dictatorship".

With God at the top of the hierarchy of causation, there could hardly be an independent world of science. As a result the higher causes involving choice had to be separated from an essentially mechanical nature that runs automatically and predictably. The possibility of science was thus thought to depend on there being one set of formal laws established at the time of creation (or even before). But in contrast, the ancient view was of an "unmoved mover" that establishes and maintains the natural causes as a self-generating cycle (the "cycle of birth and death") – a universal co-creative relation between mind and material that forms an identity – the 'Self'.

The Vedic concept of creation was therefore not in the sense of a maker of an artefact, but as organization of both higher and lower natural causes by which nature can make itself, and in which principles such as dharma, karmic feedback, etc., are built in along with the seemingly rigid laws of material. Divinity thus appears in every manifestation as a reflection of that order and its principles. If it is to be personified, it appears as a Supreme Self (Paramatman), which is a holographic identity that universally is Brahman and personally (within us, for example) is Atman. The Upanishads emphasize repeatedly that all of these are equivalent – one can perceive a personal God or a formless One that is creative principle. This holographic Self ensures a certain order that makes the universe 'honorable' in the sense of having both material and ethical laws. It makes a system whole, gives it identity, and allows it to manifest in the world.

Vedic reality is thus described as a complex reality that exists in all parts of the universe and in the whole of creation. The 5th Chapter of the *Brihad Aranyaka Upanishad*, called the "*Madhu Vidya*," or "*honey doctrine*," (literally a vision or understanding) refers to this principle, which is an identity that is both Brahman (universal reality) and Atman (the true inner Self). "*Madhu*" has been translated literally as "*honey*" or "*nectar*" (later Vedanta refers to milk in a similar way), or more figuratively *divine essence*; certainly meaning a creative and nurturing relation. The principle of Oneness is described as "*tejomayo' mritamayah purusahas*" "*bright, immortal person*" (Muller 1884) or as an "*Immortal Luminous Being*" (Krishnananda, 2006). It is the ultimate witness and 'luminous Beingness' of all. The *Madhu Vidya* states (combining the first 14 verses, which give exhaustive examples (*earth, water, fire, air, sun, space, moon, lightning, thunder, ether, law of action, truth, mankind, and Self*) that will call, for the sake of expedience, 'existence':

"This [and all existence] is the [divine essence] of all beings, and all beings are the [divine essence] of this [and all existence]. Likewise this [Luminous eternal Beingness] in this [and all existence], and that [Luminous eternal Beingness] incorporated in the

¹¹ "Resemblance Nominalism" (Rodriguez-Pereyra 2002) comes close to Vedic philosophy and the theory presented here, in this regard. It is known to offer a possible solution to the debate about Platonic Form.

body (both are [divine essences]); [That] indeed is the same as that Self [Atman] that Immortal, that Brahman [universal source], that All.

{verse 15} "And verily this Self is the lord of all beings, the king of all beings. And as all spokes are contained in the axle and in the felly of a wheel, all beings, and all those selfs [existences, referred to above] are contained in that Self..."

After referencing similar statements from the *Rig Veda*, it states in the 19th verse:

"This is the Brahman, without cause and without effect, without anything inside or outside; this Self is Brahman, omnipresent and omniscient. This is the teaching (of the Upanishads)." (Brihadaranyaka Upanishad - 'Madhu Vidya', (Muller 1884)

We see in these writings as scientific a description as one could provide for psycho-physical reality. It presents a philosophy where the whole is immanent in the part and the part is constituted in the whole, a message that can also be seen in what David Bohm called the "implicate order," based on his study of "non-locality" in physics.¹² Non-local phenomena were confirmed by the famous experiments of Alain Aspect and others testing Bell's Theorem.

Madhu Vidya, considered a central statement of the Upanishads, tells us that everything is intimately related to everything. Hence when we touch anything, we are touching everything – we are touching it not just from the outside as a thing but also from the inside as an essence. If we touch a table, we are touching the sun and a part of ourselves at once. This is considered a mystical view; however the Vedas' meaning is that everything is ontologically related and mutually created. It is the existence that is related, not just the resulting properties, so that when we see anything, that seeing involves everything and in a sense is everything. When we speak to anyone, we are in some way communicating to everybody, and when we interact with others, we are in some way interacting with ourselves.

Modern Hinduism, being the product of millennia, tends to concretize these concepts and anthropomorphize the Vedic idea of a "Luminous Being," giving rise to the many Gods of modern Hindu culture that have quite human characteristics. Most popular religions find this necessary. But the deepest Vedic teachings and some derivatives of this philosophy, such as Zen or Mahayana Buddhism, insist that one must see beyond the more familiar concepts of physical form, which are limited tools, and recognize the vital essence as a subtle principle of the universe and all that exists in nature or mind. Modern teachers of Vedanta in the Hindu culture, such as Sri Aurobindu, Sri Sathya Sai Baba, and many others, emphasize this as the ultimate understanding of the ancient teachings, while nevertheless recognizing the human need for images.

In science we also attempt to formalize our concepts of reality into images and symbols and thus make them more tangible to human perception. The orbital model of the atom cannot be taken literally, quantum properties of 'beauty' or the 'God particle' are colloquial images. The concept of a probability 'wave' is a metaphor derived from material waves, and so forth. Newton stated clearly that his concept of 'force' was a metaphor for distant effects that are certainly connected in ways we do not yet understand (Cohen, Schofield & Hall 1978). Just as scientific imagery must point to something beyond it, spiritual imagery must also point to something beyond it – a shared essence or principle of organization.

¹² Bell's Theorem states that no theory of local variables can explain the strange quantum phenomena known as "entanglement," which is an instantaneous relation regardless of time or distance.

Entering post-modern times, the unity described in Vedic lore became known to the early quantum physicists who studied it and attempted to recapture that wisdom to understand the atomic world. For example, Erwin Schrodinger, famous for the Quantum Wave Equation, wrote:

“The plurality that we perceive is only an appearance; it is not real. Vedantic philosophy... has sought to clarify it by a number of analogies...The recognition ATMAN = BRAHMAN...in Indian thought was considered...to represent the quintessence of deepest insight into the happenings of the world. ... The mystical experience...regularly leads to this view, unless strong prejudices stand [as] in the West.” (Erwin Schrodinger, 1918; in (Wilber 2001))

The depth of the 'non-dual' Vedic worldview has been indisputable to scholars who have given it serious study, although it remains poorly understood or even known in the West. It describes reality as a unified whole that includes the material world as a projection of and relation to an abstract image of that world that has the quality of 'mind'¹³, which is a system-level ("higher") cause. As we have argued, that quality was what Western science tried to expunge from its study of mechanisms, thus destroying any concept of the whole.

The case for recognizing a fundamentally embedded principle of mind-body relation has been repeatedly argued by many modern authors; for example, in complexity science (Rosen 1988; Kampis 1991; Kauffman 1995; Solé & Bascompte 2006), quantum and cosmological science (Wigner 1981; Kafatos & Nadeau 2000; Laszlo 2007; Licata & Chiatti 2008), consciousness studies (Maturana 1980; Searle 1992; Penrose 1994; Chalmers 1996; Hameroff 1999), systems and social science (Maturana 1980; Ackoff 1999; Banathy 2000, 2003; Mingers 2006), management and information (Berners-Lee 1999; Gharajedaghi 1999; Ackoff 1999; Senge 2006), ecology (Allen & Hoekstra 1992; Orr 1992, 2011; Sessions 1995; Ulanowicz 1997; Prime 2002; Bennett *et al.* 2003; Ausubel 2012), and evolutionary philosophy (Baldwin 1896; Bergson 1912, 2007; Korzybski 1933; Teilhard de Chardin 1959; Mullarkey 1999; Loye 2000; Odling-Smee, Laland & Feldman 2003; Bergson & Mitchell 2010) -- the point being that the mind-body problem it is well recognized, but generally ignored because of a lack of consensus on how to deal with it.

LOSS OF HOLISM

The traditional teaching in the West has been that scientific thinking arose de-novo in Greek culture. However, we now know that Greek philosophy learned from but took a significant turn away from the philosophies and sciences of the Far East; away from Vedic non-duality and yogic science toward a radical dualism. This seems to have begun in the Middle East and Egypt at about the time the Vedic Civilization was declining in India and when Abrahamic religion began. It seems likely that a radiation of culture and knowledge occurred from the Saraswati/Indus cultures after 1900BC, but the dispersal of this culture meant it could no longer retain its traditions in common practice, or import them whole to other cultures. It is reasonable to assume that Vedic concepts reached Mesopotamia, the Middle East, and Egyptian societies, from the many common stories in later mythology from these areas, but it did so with significant modifications.

¹³ Use of such a general and polymorphous term is, of course, problematic; but better definition will only arise from better theory, which is what we are advocating.

The picture we can now see is that a unity of material and 'formless' realities was present in Vedic philosophy and culture as practiced for millennia, but this concept of deep holism was lost in transmission to the Middle East, Egypt, and the West. The idea arose of God as separate from Man; God as creator but in the sense of a builder of an artefact, a carpenter or mason. This dualistic idea probably strengthened already existing social structures in which authority is imposed from outside and social organization is therefore hierarchical. The association between rulers and Gods found in Egyptian and Middle Eastern cultures after 2000BC, as noted earlier, was quite different from the traditional relationship between the warrior/leader class and the sage/priest class in the Vedas. The hierarchy that arose in Abrahamic belief separated Man from God, thus engendering great fear. As the unity of nature was lost, rulers usurped the power of gods and political power capitalized on the fear of separation, marginalizing ethicists and actually turning their profession into various dark and secretive arts to be used by the ruling class. Orthodox religion also established middle-persons to communicate with God, and thus to arrogate authority and power.

Middle East, Egyptian and Western societies developed highly secretive orders of Priests and occultists with hidden knowledge and taboos on revealing that knowledge, even on penalty of death. Each of the major religions sequestered deep wisdom among high Priests, mages, seers, and even the practitioners of 'dark arts', giving rise to many secretive traditions that last to this day. Part of this segregation included making the secret wisdom patriarchal. Secret and ill-motivated societies developed throughout the Middle East and later Europe with many tragic consequences that are well known (Keightley 1837; Lachman 2009). Jesus was, arguably, put to death for violating those taboos and trying to bring back holism ("*I and the Father are One*"). Especially challenging, and his official offense, was the idea that Man can forgive sins, thus eliminating the need for mediators and caste divisions. Thus the "perennial philosophy" (Huxley 1946) did not disappear, but became special, non-traditional, and even itself feared. Only in recent times have the major religions lifted bans on personal introspection reopening deeper reality to the masses. Vedic lore says only that the Varnas should be kept distinct in a professional sense and gives a practical admonition (cf. Chandogya Up.) that a father should share the deep knowledge with a son and others who are capable of understanding it, but not with those who cannot understand. The reason is to remain humble and to prevent the Veda from being feared and attacked, as it became.

POST-MODERN RE-DISCOVERY OF HOLISM IN THE WEST

There have been many attempts throughout the history of Western science to describe the missing part of holism. Most were attempts to identify a "5th element" or "5th essence" (as in the term "quintessence", which in Latin means "5th essence"). Most Western attempts until now were to find a new kind of material essence, like "plogiston" or "aether", and most such concepts did not stand up to empirical tests. Describing it as an energy, such as "orgon energy", "elan vital" (perhaps like Prana), and more recently as "subtle energy" has had similar problems. Energy is also a material form, which is convertible into and from matter. Although it may be modern heresy to say so, the answer to holism and sustainability is not likely to be found in material essences, but more likely in the mind-body relation, which is an *information relation*. Many physicists recognize that relation and the quasi-reality of the material world, but it is, by convention, not openly discussed (Henry 2005). Extensive misuse of the concept of energy in popular literature is also a problem leading to its dismissal in mainstream science and thus preventing suitably reviewed exploration. This vicious cycle maintains the marginalization of holism.

Western thought has been generally unwilling to accept the idea of mind as natural (Bateson 1979; Kineman and Kumar 2007), and therefore establishing a holistic epistemology in today's science is a very difficult task. Highly entrenched traditional views marginalize any attempt to discuss whole system aspects, even in a serious mathematical formalism. David Bohm wrote, for example:

"The prevailing tendency in science to think and perceive in terms of a fragmentary self-world view is part of a larger movement that has been developing over the ages and that pervades almost the whole of our society today ... it gives men a picture of the whole world as constituted of nothing but an aggregate of separately existing "atomic building blocks," and provides experimental evidence ... that this view is necessary and inevitable. In this way, people are led to feel that fragmentation is nothing but an expression of "the way everything really is" and that anything else is impossible." (Crowell 1995)

However, at the beginning of the post-modern revolution, many of the most prominent quantum physicists were Vedic scholars who re-discovered the fundamental relation between existence and non-existence (better translated as between 'measurable existence' and 'potential existence') from their sometimes-intensive reading of Vedic sources. Erwin Schrodinger attributed his insight into the quantum wave equation to his reading of the Bagavad Gita. Oppenheimer (head of the Manhattan project that invented the atomic bomb) would spontaneously quote from the Upanishads and was so immersed in Vedic/Upanishadic scholarship that his colleagues thought he would give up physics for it. Bohr, Heisenberg, and others were also versed in these ideas that see to have been central to the discovery of post-modern science and understanding of the "quantum void", "zero-point energy", "quantum vacuum", "dark energy" and other ideas of an existence prior to measurability. However, many scientists in the West still refuse to believe that indeterminism and mind-body relation are related principles, that the material world as we measure it is constructed from both informational and material laws.

Hence these discoveries were confined to the quantum world and cautiously imported into other disciplines such as consciousness studies and second-order cybernetics; but otherwise considered irrelevant to the 'hard' material world of landscapes, industries, economic systems, and the environment, despite the obvious relation to society and management. Western science excelled at the description of machines and established the industrial revolution based on technology, but it had lost its sense of soul and mind in the interest of removing superstition and imagining everything to be predictable. Hundreds of years of tradition are not easy to overcome.

Today we are finding that the post-modern discoveries cannot be confined to the sub-atomic world; that certain principles of system organization apply to everything and in every field. The issue is not scale: it is 'downward causation' from formative aspects of a system – its effect as *context* for another system – thus establishing properties of components. We exclusively studied systems as if the properties of the components were independent of context and could be added up to get all the properties of an assemblage; thinking in that way that 'bottom-up' causation could ultimately explain wholes. But it turns out that the whole of a system can have unique effects of its own under certain circumstances of system organization, such as in causally isolated quantum systems, living systems, and conscious experience. These exceptions to general mechanism aggregate in social and ecological systems to make them equally complex.

The Newtonian world is but a reduction of that fundamental complexity, in which the effect of many interactions allows 'bottom-up' causation to dominate behaviour. But when we go to certain extremes, where for whatever reason observations are more frequent than other interactions, we

find it is the observations that are dominant. Observations are interactions. We can certainly see and experience material objects, and they have interactive properties at a certain scale; but their existence at other scales is a 'constructed' reality that depends on continual interaction and is otherwise temporary. In that case, they are not the absolute natural objects we need to build scientific theory. It should be obvious that those domains where complexity arises, e.g., quantum physics, relativity, life, consciousness, society, ecology, etc., are the ones where observed system causes do not preclude observer-participant causes. As the physicist J.A. Wheeler said, we live in a "participatory universe" (Wheeler 1981): events change the context and context conditions the events. We then see the fundamental mind-body relation spoken of in the ancient Vedic philosophy.

From the quantum discovery of indeterminism to Goedel's proof of incompleteness in number theory it is clear that the present worldview must change. The new ontology can be summarized as in **Figure 6**, in terms of what we consider fundamental and foundational in nature and scientific description. Previously it was thought that material was fundamental, in which case complex systems were mysterious and life required impossible external causes. But by shifting that foundation to complex systems we can see that both the material and living world are easily derived from complex existence. The complex reality includes fundamental material events and fundamental information precepts in relation. Mechanism and what we observe as material involves reduction of complexity while life is a further entailment of it to higher degrees of anticipatory and mindful behaviour.

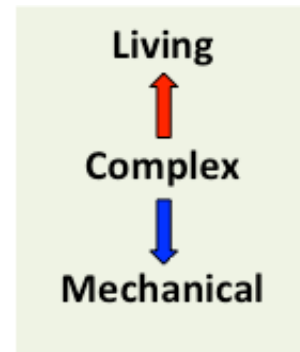


Figure 6: New Ontology

More recent systems theory, following the work of the mathematical biologist Robert Rosen (Rosen 1978, 1991, 1999, 2012), has defined what may be the fundamental holism of nature, described in R-theory as a "relational Holon" (Kineman 2012). The theory is very new and as yet relatively untested, however it aligns remarkably with the Vedic philosophy of Advaita (non-dualism) and the four aspects of reality repeatedly represented both in Vedanta and the Indus/Saraswati images. In this theory the four aspects of Existence and Being that are spoken of in the Upanishads are essentially the same as those identified by Aristotle, except for the mistake of interpreting the causalities as an open hierarchy, as discussed earlier. Rosen, recently described this kind of circular causality as a "modelling relation" (**Figure 7**) It is quite familiar to us as a picture of science itself, but when it is taken more broadly it becomes a holographic template for any naturally whole system or holistic component; where we relate the causes responsible for realizing the system (formal/final explanation) with the causes for how the system operates in space and time (efficient/material explanation). Thus science reflects a natural information relation, which is why it is possible.

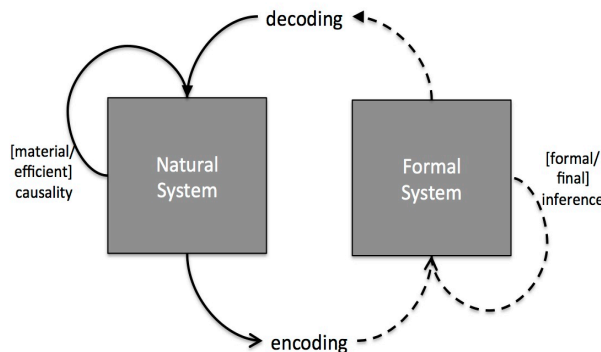


Figure 7: Rosen's Modeling Relation

In science we create a formal model that is isolated from the natural world of space and time by some means (say, in a computer), and thus we can run the model in a different spatial and temporal domain for study purposes. We relate it to nature by encoding and decoding. But, while modern science tried to maintain the "epistemic cut" (subject-object duality), we found that to be

impossible in post-modern science. It should be obvious that one can study a scientist as a natural system, in which case the left side of the modelling relation is really a whole modelling relation in its own right. That implies that the right side must also be a whole relation, and thus the diagram is showing how complementary aspects of two whole systems relate. In this way, nature is described holographically; as infinitely composable relations between whole systems.

Figure 8 shows the modelling relation as a natural Holon (rotated 90-deg. from Figure 7), identifying seven similar descriptions of a four-cause reality. Six are labelled in the diagram and the seventh is the three-headed Indus Bull discussed earlier.

Rosen did not define a four-cause reality as such, but implied it in his description of the modelling relation and reference to Aristotle's causes, discussed earlier. In the modelling relation the four quadrants represent encoding (right side of Figure 7) and decoding (left side). Encoding occurs from the material world into a formal context: it is structural. Decoding occurs from a formal model into the laws of action that cause material results: it is functional. In the language of Category Theory, the two sides represent inverse categories of entailment, related by "functors" labelled here as structure (existing/becoming) and function (forming/doing). The symbols in the circular diagram correspond with an application of Category Theory presented in an earlier synthesis of relational complexity (Kineman 2011).

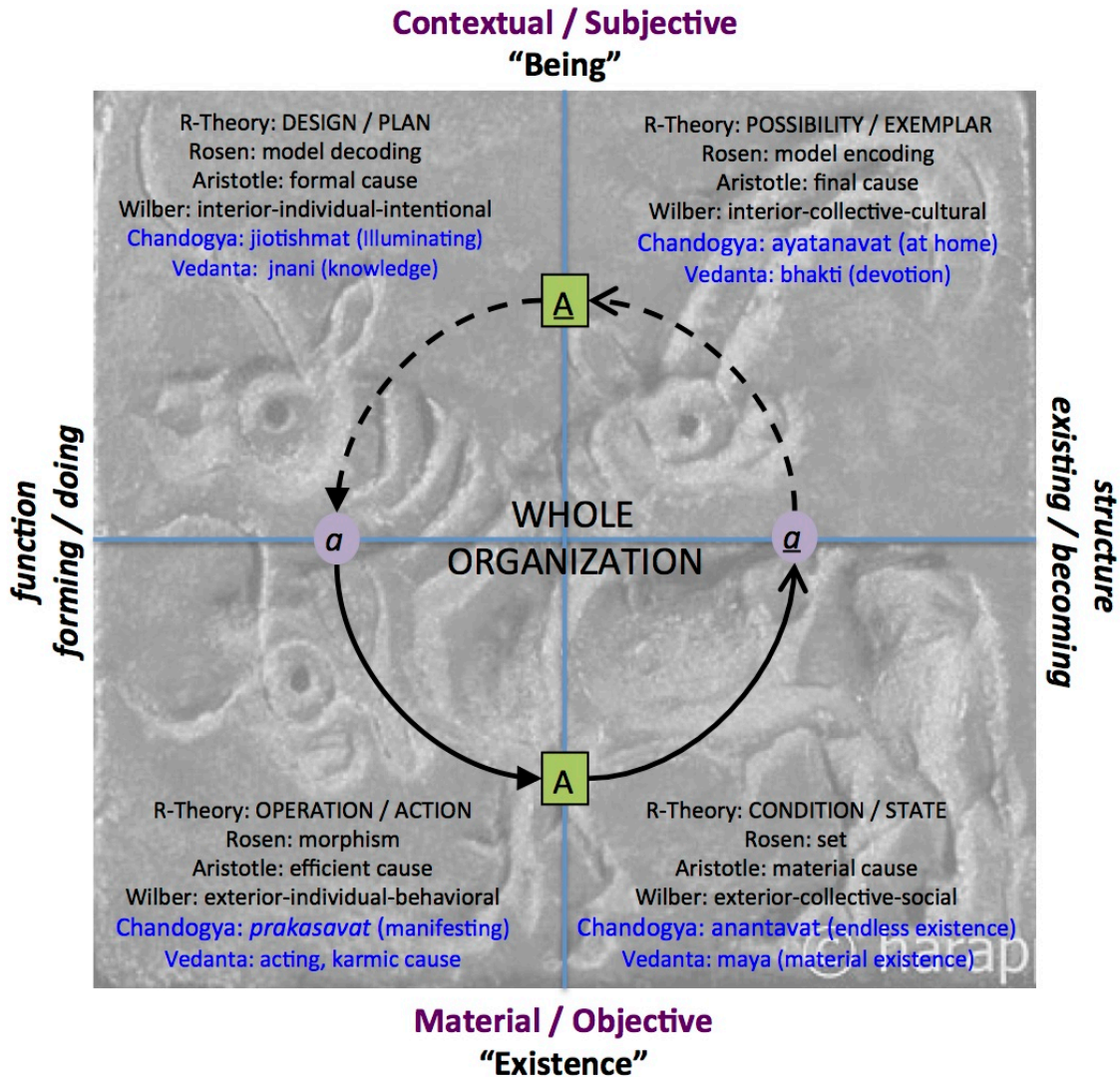


Figure 7: Four Quadrant 'Holon'

Wilber derived a similar four-quadrant cultural cosmology from his study of native reality beliefs (Wilber 2007). They correspond with this diagram except for their causal order, which Wilber did not consider.

We saw the four-quadrant structure earlier in the Sva-asti-ka seal in **Figure 3**, in which a fifth level is indicated with pointers into each of the four quadrants. The Holon also has this fifth-level organizational implication – it is the entailment of causes itself, with its rules for how each of the four quadrants are related in a circular hierarchy. Those rules can be expressed in Category Theory, but we will not go into them here.

It is hard to interpret the three-headed Bull Seal in any other way than as a three kinds of causation governing the material body, which is fully in keeping with this description of four-cause reality and with Vedic literature. It is explicitly described in the Chandogya Upanishad¹⁴

¹⁴ Chandogya Upanishad, 4th Prapathaka, 5th to 8th Khandas.

and in the concept of the "four faces [or "feet"]of Brahman" (Muller 1876). Note that the heads of the Indus Bull corresponding to the higher causes (top half of the diagram) are each mythical creatures (Unicorn and Scimitar-like Oryx native to Africa and Arabia) whereas the material causality (lower half) is represented by a realistic creature from India, suggesting a worldly mind and body. Also, the final cause 'head' (top-right) is retrospective, as the karmic reading and effect of past conditions (not to be confused with the usual meaning of Karmic as the actual cause of this feedback, represented by action in the lower-left quadrant). Karma thus reads the past and writes the future. The holographic nature of this causal cycle is also clearly described in the Chandogya Upanishad, which gives the labels for each quadrant as shown, then labels the sub-quadrants of each of those four main level quadrants, and then gives an example of further holographic decomposition, thus strongly implying an infinite holarchy.

We could as well relate this schema to the ancient and modern concepts of social class (without the unfortunate development of caste endogamy discussed earlier), from the top-right quadrant counter, clockwise: Priest, Leader, Manager, and Worker. While all such labelling implies variations in meaning and application, they hint at a fundamental common reality. R-theory now adds mathematical rigor to these perennially implied ontologies.

Virtually any phenomena can be described in terms of compositions and decompositions of this four quadrant causal loop by replacing the appropriate quadrants with similar Holons describing aspects of the system of interest. It is a highly parsimonious and general method for analysing whole systems in terms of whole relations. The final, 4th level closure with prior conditions is the key to establishing a circular, holographic relation. It is the effect of exemplars in environments, observers, or formal contexts, which is characteristically important for all living and cognitive systems and fundamental to post-modern physics. Mechanistic behaviours are those behaviours that can be defined within a single causal context (i.e., assuming that the higher causes are fixed), but the idea that nature is generally governed by a single law-like context has now been replaced with the view that such a general reality emerges from frequent interaction (as in quantum decoherence). The Holon allows for both, depending on what system is being considered.

Holons can therefore be combined infinitely through mutual relations occurring in any (or all) of the four quadrants, thus establishing a holistic analysis. It does not sacrifice the predictive power of mechanisms, which are always possible reductions of the complex (as indicated in Figure 6). Thus Holons are literally *part and whole* in that they are always components of larger systems and also contain components that are sub-systems. Regarding informatics, the Holon is also a template for coupling potential and dynamical models, which may be a parsimonious way of modelling complex systems (Kineman 2007).

Figure 9 shows the Holon expanded to show four sub-quadrant Holons. Each sub-holon thus replaces the causal arrow in that quadrant. Here it is superimposed over an Indus seal that is suggestive of the same holarchical decomposition. There are more images from the Indus/Saraswati archaeology that seem to have a relation to the Holon model of causality and are suggestive of its category relations. For example, **Figure 10 (left)** is an equivalent reconfiguration of

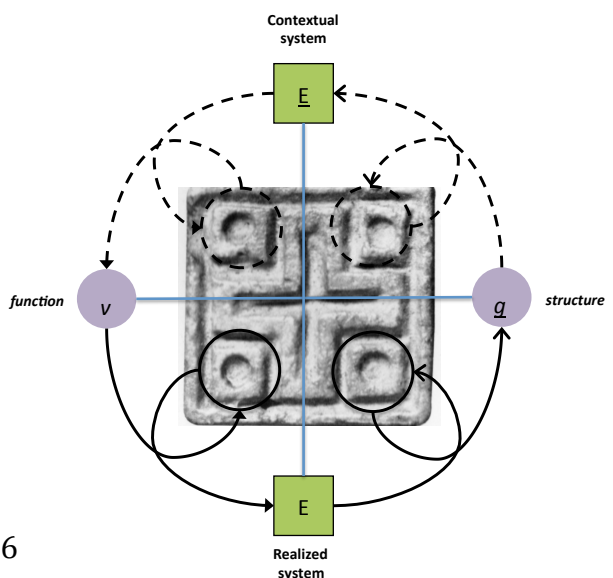


Figure 9: Holographic Composition

Figure 9 that emphasizes the non-duality between existence (solid line) and non-existence (dashed line); or material world and Beingness. It also shows how the epistemology of each existence is embedded in the other existence: We know about the material world through the mind, and we know about the mind through the material world. A very similar drawing was found at Mohenjo-Daro dating to 2900BC, known as the "infinite knot" (**Figure 10, right**).

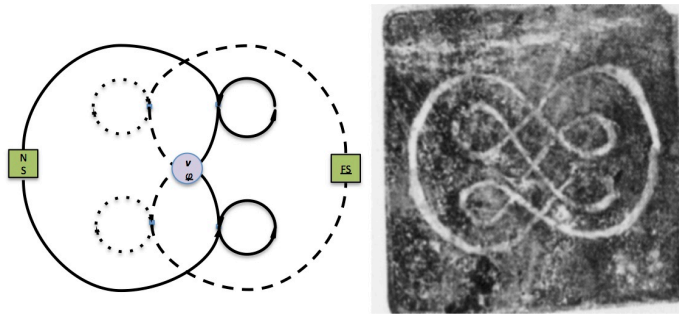


Figure 10: Relational Holon / Indus "Infinite Knot"

The two hemispheres of the drawing show duality between the material world and the non-local world of Being. A similar diagram can be drawn emphasizing the interactive properties of the whole, as phenotype and genotype. Both views describe an "aperiodic solid" that was referred to by Schroedinger as the key to understanding the new physics (Schrödinger 1943; Rosen 1999, Ch. 1). The diagrams in

Figures 9 and 10 also correspond with Rosen's analysis of the minimum causal requirements of a living system.

These rough comparisons are certainly not conclusive, but taken all together they suggest a deep correspondence between the mathematics of whole systems that is emerging in Western science today, and non-dual philosophy 5000 years ago; surely an astounding discovery if it holds up to further investigation.

AN INITIAL SOCIO-ECOLOGICAL FRAMEWORK

The views of holism discussed above are idealizations of whole systems that also apply to idealized whole components of systems. In the complex world we commonly interact with we are aware mostly of fractional systems, and it is hard to see the deeper relations that would make them whole. We approach the problem through traditional institutions and cultural habits that don't necessarily have complete views. In the framework presented here, fractional systems are combinations of Holons in which we join various quadrants of the Holon and omit the detail of other quadrants. In fact, that is how mechanism is structured, by summarizing variations in the higher causes as error, uncertainty, chaos, etc. The value of understanding whole relations is not to say that fractional analysis is wrong, but to provide a means to go farther when needed; to identify whole systems that presumably can impart desired qualities of balance and sustainability. In other words, it is to help us find the missing components or to better connect the ones we are aware of.

As an initial, very broad, socio-ecological framework, we can identify three main sectors of societal leadership in modern society. These are listed here as Ethics, Science, and Policy; which are each and together about society and the environment. The idealized relation between these three leadership domains is the Holon relation as shown in Figure 8. Roughly speaking we can associate Ethics with Possibilities and Exemplars in the upper-right quadrant of the Holon, Science with Designs and Plans, and Policy with Operation and Action. Each has ultimate results in the material socio-ecological Conditions and States we occupy and are concerned about. The three paths also correspond, roughly, to the primary paths of learning or enlightenment in Vedic philosophy: bhakti, jnana, and karma (together, Raja, the 'royal' yoga).

However, in **Figure 11** we show implicit direct relations (which are fractional) between the sectors to discuss their apparent relations. As specific social practices they could involve many possible holon relations not shown in the diagram. For example, ethics may affect policy through theology and church policy instead of science and governmental policy. But here we take a very general societal view.¹⁵ We are concerned with how the three domains inform each other, and particularly how they can ascend toward greater holism (cf. Ulanowicz 1997).

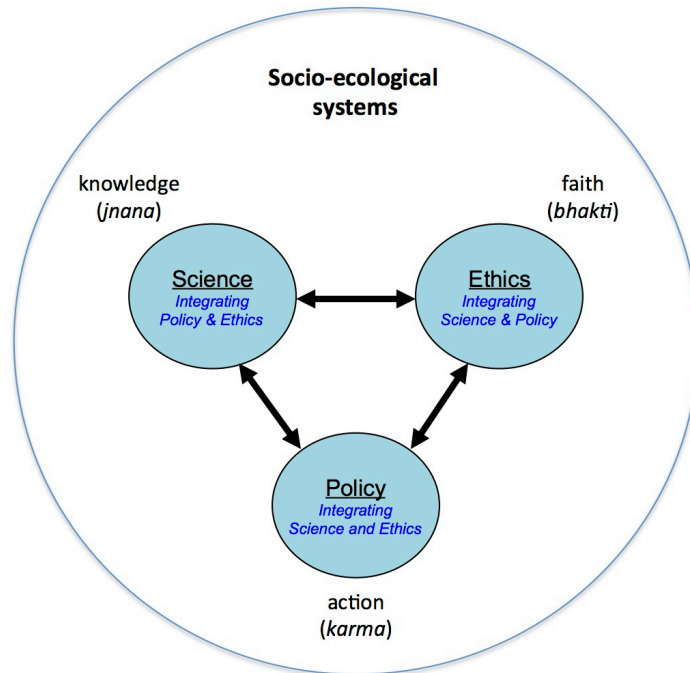


Figure 20: Socio-Ecological Leadership

The diagram suggests that a holistic balance should be achieved between the three domains, in the same way that the basic paths of yoga aim for balance and harmony. The diagram also suggests a method of conflict resolution: That each point in the triad could be taken as a means for resolving conflict between the other two as a means of leading toward balance and wholeness. For example, the competing forces of science/technology on the one hand, and moral value systems on the other, challenge policy. Similarly, science and policy are often at odds over priorities, which find their basis in ethical values. 'Informed policy' and 'policy-relevant science' are largely decided within a cultural value system. And likewise, differences between policy and ethics, as with stem cell research, genetic engineering, etc., can remain at an impasse without better scientific knowledge. In each case, to combine the true aims of two sectors requires the third. We suggest, then, that a good ethical system will have a model that harmonizes science and policy; a good scientific enterprise will have a model that harmonizes policy and ethics, and a good policy system will have a model that harmonizes ethics and science.

Political and ethical conflicts exist over the issue of climate change and are expressed as scientific

¹⁵ A deeper holon analysis could, for example, reveal methodological aspects and relations we need to be aware of to realize certain goals, such as sustainability, and it could also help analyze system pathologies.

uncertainties. However, current science is failing to resolve those conflicts because it has not expanded into the kind of holistic science needed to include social and ethical dimensions.

ECOLOGICAL LEADERSHIP – A HOLISTIC MANAGEMENT IMPERATIVE

Our discussion of Vedic and modern holism would not be complete without touching on the socio-ethical dimension. Holistic socio-ecological science is one thing that primarily occupies our intellect, but practical application has to do with an organization's or an individual's personal character. It is then impossible to translate the perspective on wholeness discussed in technical terms above, into human feelings and actions without engaging moral dimensions and commenting more directly on human behaviour. The two descriptions are not different in content, but in focus. As with the three-fold leadership diagram, we similarly engage three aspects of our own humanity – Spirit, Intellect, and Heartfelt action – to produce appropriate results in our communities and the world. We now address these human dimensions of moral holism more directly.

In Vedic tradition, nature is regarded as a living whole. Vedic/Upanishadic scriptures stress the interrelatedness of life and the place of humanity in the order of things through several fundamental tenets of the Vedic ethos. The foremost tenet is that there is a Cosmic Power, discussed earlier as Paramatman, pervading and enveloping all things in the universe. Oneness with this Cosmic Power can be experienced and realized by man through *Sadhana*, an intensive endeavour through any of the three major yoga paths. There are specific methods for achieving the highest ideal of each path, namely: Action done according to one's duty (Dharma), Belief established through devotion (Bhakti), and knowledge purified by meditation (*Jiana*). As one's own inner self is an aspect of the Divine, man should thus conduct himself in a way that harmonizes with the Divine, on all three levels.

According to Devkota (2003), *“The Vedas are the primary sources of not only moral enhancement for the economic man but also paths for misguided ecology to achieve a true sustainability. The Vedas view human perfection and happiness from integrated perspectives, which embraces both material and spiritual values in individual and harmonious unity. The Vedas provide guidance to enlighten the inner human soul in order to preserve moral values, true purpose of life and care for Nature.”*

To quote Caldwell (quoted in Miller, 1985), “The environmental crisis is an outward manifestation of a crisis of mind and spirit. The crisis is concerned with the kind of creatures we are and what we must become in order to survive”. We might note that survival in misery is hardly desirable either. The goal of understanding these concerns and following sustainable development practices is, therefore, "Human Wellbeing"; and it even our pre-occupation with fears about immediate survival has justified all kinds of degradation. Somehow, we need a broader view of what supports us.

It will be apt to recall the moral & spiritual facets of Adam Smith with respect to the concept of the invisible hand in a free market. He was as much a moral philosopher as a political economist. He believed strongly in moral faculties as the ultimate foundation for our thoughts, words, decisions, and actions – which include the individual economic activities that culminate in societal wealth. To him, morality was the key to individual and societal fulfilment, and the spiritual source of those moral faculties was abundantly clear in his writings:

By acting according to the dictates of our moral faculties, we necessarily pursue the most effectual means for promoting the happiness of mankind, and may therefore be said, in some sense, to co-operate with the Deity, and to advance as far as in our power the plan of Providence. By acting other ways, we seem to obstruct the scheme which the Author of nature has established for the happiness and perfection of the world.

They [moral faculties] were set up within us to be the supreme arbiters of all our actions, to superintend [control] all our senses, passions, and appetites, and to judge how far each of them was either to be indulged or restrained. [These] were plainly intended to be the governing principles of human nature; the rules which they prescribe are to be regarded as the commands and laws of the Deity.

Most ancient cultures have grown in the lap of Nature with reverence for nature in which all of its elements, mountains, rivers, forests, animals, etc., may be considered sacred. The Hindu scriptures like the *Upanishads*, *Srimad Bhagavatam*, *Puranas*, *Vedas*, and *Bhagavad Geeta* have also expressed the sacredness of various aspects of the environment and its conservation. Ancient texts like *Kautilya's Arthashastra* have an immense amount of information on environment, natural resource management and prevention of pollution. The realization of this fundamental and ultimate Truth is that there is unity of all life and existence and the goal of human life is to merge one's little self in the Divine to experience this unity.¹⁶

The all inclusive approach of *Mangalya*, from the *Mangal Sutra* as explained by Adi Shankara (Śaṅkarācārya & Sūryanārāyaṇa 1999), expresses a concept of universal well being in the union of masculine and feminine aspects of creation, not unlike the Chinese philosophy of Yin/Yang and concepts of 'Chi' paralleling the Vedic concept of 'prana' as applied in Ayurveda medicine; each expressing the concept of natural balance between complementary opposites. The Buddhist prayer wheel is a symbolic reminder to humanity that it should adhere to the laws of nature – *Dharma Chakra Pravartana*. The Jewish myth draws no distinction between human, animal, vegetable and mineral kingdom, similar to Aristotle's theory of unity of end of all species which suggests that the natural order is not divorced from social order. A prayer in *Shukla Yjurveda* prods us to invoke business dynamism with a vision of unity and perfection inherent in each one of us.

In the Invocation to the Isa Upanishad (quoted earlier) the concept of completeness can be interpreted as perfectness in action. The desire to manifest this perfectness that is already inherent in every aspect of nature should be promoted, for example, by business and government managers through vision, goals and associated incentives and disincentives. Such enlightened management would contribute significantly to the primary inclusiveness of all beings, as pointed out in the *Vedas* - "*Loka Samastha Sukhino Bhavanthu*" (My all the beings of the world be happy). This principle of unity of life has the potential to transform the vision of a society or organization to a broader and more generous one, taking the organization to a higher trajectory through infusion of greater unity and harmony among all its stakeholders. In today's environment of cut-throat competition, this can provide the corporate world with a new kind of industry leadership.

¹⁶ Note, in this regard, the earlier comment about the concept of 'maya'; which should not be taken as any dismissal of the importance or sacredness of the material world, but more technically as a reference to the difference between manifestation and its source, in the sense that the material world is a projection of the mind. There is nothing inherent in the idea of maya to say that projection should not see the sacred; in fact, the *Vedas* and *Upanishads* may be construed as saying one should only see them as sacred.

Sri Sathya Sai Baba (1973), for example, summed up two essential qualities for leadership in this era: service to others, and “walking your talk.” He lamented that the world has come to a sad state from a lack of good and competent leadership, resulting in every human endeavour being polluted with the craze for money. His cure was to cultivate the desire for selfless service to others as the most essential quality of a good leader, benefiting him with a more balanced and happy personality, and extending a feeling of love and affection for those being served. He said that service is the first step along the spiritual path. If a leader understands the oneness in Spirit of the one serving and the one being served, he would not only derive great peace and satisfaction through service, but also retain and enjoy his leadership. He added that to be able to thus live and work with a service orientation, one must first possess a strong ‘character’ and have an inner structure that is composed of certain universal qualities like selfless, expansive love and willingness to sacrifice for a higher cause. These will come to a person who possesses unity of selfless and clear thoughts, straightforward and convincing words and personally exemplifying deeds, also referred to as *trikarna shuddhi* by Sri Sathya Sai Baba. These traits merge together and define the ‘character’ of a good leader. Such a leader is thus able to envisage a complete picture of the 'niche' of the organisation in the natural environment; in every sense the same as an ecological niche from both resource and functional aspects, subject to meaningful adaptation and evolution as a mutual co-creation with the greater whole. In this sense, a sustainable business orientation is even converted into a key business advantage, on the additional strength of mutual relations. Such a vision of unity prepares a leader to sacrifice self-centered and short-term orientations to become an example for others to emulate and imbibe, creating a culture of sustainability in the whole organisation.

From such leadership follows an ethos of 'practice before percept': “*Leadership requires that you should lead others in the right direction. What you want others to do, you must be the first one to practice*” (Sri Sathya Sai Baba -- discourses). A similar expression has been popularized as "be the change you want to see". To the list of such leaders we could add eco-visionary Indian leaders like Mr. Tulsi R Tanti, Chairman and Managing Director, Suzlon Energy Limited, Mr. Harsh Jha, Managing Director, Tata Metaliks Limited (TML) and Mr. Azim Premji, Chairman of Wipro Limited, but any such list would remain grossly incomplete.

But in trying to "walk the talk", the right manner of implementation gains exceptional importance. A leader should always be wary of trying to impose an idealistic notion on the organisation. Instead he should first study and understand the internal and external environment in which the organisation is operating and expected to operate in the future in completeness, in the sense that a living organisms must find its proper habitat and functional relation with the environment and other creatures on the landscape. Only then can aspects of sustainability be enhanced one step at a time. In the process the leaders can take all stakeholders to a higher level of integrity, commitment and innovation, each well informed about the purpose, process and possibilities that more holistic initiatives could unleash. The leader should focus on customer satisfaction through use of innovative technology, superior quality, and service, in full harmony with the social and physical environment. In the process he should give due value to developing the diverse talents of employees through roles of initiative and leadership. Let us again reiterate that the acceptance of a leader’s vision depends on the extent he himself practices what he

preaches. It is only when he lives the ideals he professes or advocates that he becomes a role model worthy of emulation for the organisation.¹⁷

Lastly, a leader who is a catalyst for sustainable change will strive to remain flexible and open to change and to encourage a healthy flow of instructions and feedback through two-way communication at all levels. These principles, which humanity has known for ages and can be read from nature's own way of functioning, are emerging in popular business literature today in the form of "Learning Organization", Peter Senge's "Fifth Discipline" (Senge 2006). There is little question that a re-discovery of holistic principles is underway and will likely govern the next several decades of change. These trends are certainly driven by an awareness of environmental, ecological, and social crisis. It is common to turn toward greater unity of purpose and being during times of crisis. Business and government leaders know from experience that cooperative programs are difficult to organize without crisis and urgency. Very large amounts of funding can quickly assemble teams of supposed collaborators, but more often than not the motivation for financial gain proves to be a false incentive for true cooperation and the enterprise will likely be short-lived.

Here we have described a third motivator: enthusiasm, which literally means being filled with the feeling of divinity. Today there are many student organizations realizing their power to organize and drive some of the educational and career agendas that will be present in their future. Their enthusiasm can be contagious in the best of ways, exemplifying Senge's model for balance between 'top-down' and 'bottom-up' organizational (and individual) learning. In such re-discovered holistic methods we are finding that well-being itself is natural, and that perhaps it is the lack of well-being that we create through false models. For example, the US auto industry believed that it had discovered the ideal management system in strong top-down leadership models, while in fact their success after WW-II was a result of an exploding economy and unlimited resources. Certain visionaries advised the auto companies to adopt more holistic and iterative design thinking for the future, but they ignored the advice, which then was taken to Japan (Gharajedaghi 1999). The US auto industry suffered a great deal and has only recently started to recover with massive subsidies. An enlightened leader must listen and be quick in making course corrections to remain adaptive, anticipatory, and evolutionary; and thus to take the organisation to a higher level of productivity, efficiency, innovation and profitability.

PROGRAMS

The above discussion of ecological and management holism leads us to the important question of next steps. It is one thing to express an ideal but another to implement a way of reaching it. In brief outline above we saw how past concepts of ecological balance were subverted by the language and ethos of economic accounting, which initially seemed like a good idea with regard to facilitating communication with business and government leaders. It has indeed introduced the concept of a natural bank account and natural capital, with corresponding analogies for maintaining a healthy and diversified investment portfolio. But ultimately these business models are restricted by their singular value in terms of currency. In nature, and we argue in natural societies and healthy business, there are many values being optimized, only a few of which can be expressed in terms of money. The relational model of holism presented in brief here, describes how multiple values and contexts can be integrated in a holistic design. More is needed on how to

¹⁷ We might take an example from the life of Mahatma Gandhi: When a mother requested him to advise her son not to partake too much sugar, he stopped eating sugar himself for a week before rendering the advice, which was hence effective.

apply this analysis -- research currently underway -- and other models exist with similar aims. On the one hand it is important to know that the problem can be handled scientifically and rigorously in an expanded concept of reality that includes the information domain. One way to move the agenda of holism forward is through models that can be proven to work. However, at this primitive stage in the renaissance of holism, it is also important to consider all approaches in the spirit of 'learning organization' discussed above.

We therefore propose a new international educational agenda for jointly discovering our "Ecological Literacy" (Klemow 1991; Orr 1991, 2011; Berkowitz, Archie & Simmons 1997; Stone & Barlow 2005; Kahn 2010). We will refer to this as a cooperative education initiative in "Ecological Literacy Leadership" (ELL). The idea is to open the box to investigate cross-culturally and multi-disciplinarily the lessons of holism from direct experience, theoretical research, and dialogue. If it is true, as presented here, that Humanity has lost its once-known concept of the whole, and now needs to re-discover it; it is also true that centuries of incorrect training in the perspectives of a 'machine metaphor' will be very hard to undo. No one theory or slogan or moral leader will likely accomplish the task for us; we will simply need to do the work. First and foremost, to understand holism one must experience it. That requires participation with an open mind in real-world problem solving and the methods recommended by those who have 'been there'. No amount of academic learning can substitute for experience, and yet experience must be guided by wisdom and a sense of true value.

The initiative we propose is to establish an international higher education program leading to a Graduate Certificate in "Ecological Literacy Leadership". This Certificate will be available to post graduate students pursuing a standard degree in any discipline, who wish to understand natural holistic ecological principles that can be applied in their future life and work. The ELL program will be centred on a core course that will be taught in parallel courses among partner institutions in different countries. An initial instance of this idea is being proposed as a cooperative initiative between the USA and India. The requirements for the Certificate would be:

1. Core course, taken either at an institution offering it, or by distance learning;
2. Approved electives from ones' home institution (which may already be part of a student's degree options)
3. Distributed electronic "co-laboratory" with options for analysis or communication
4. Practical internship and project coordinated with one of the partner institutions.

The emphasis in this course would be hands-on, student-driven, faculty enhanced, culturally diverse, highly interactive, problem-oriented, experiential and dialectic learning. In today's learning environment, the curriculum can be enhanced by Internet technologies bringing valuable cross-cultural experience. In particular we can note that the extensive history of holism in the East as described above is not just an historical curiosity, but has significant effects and remnants today in the cultures, beliefs, stories, and ethos that survived from those times. In contrast, the cultural history in the West, while having its own deep roots, has nevertheless lived in recent centuries experiencing conquest of natural expansive landscapes and resources, with quite different cultural metaphors. Each has learned lessons from nature, lessons that need to be combined to find the whole.

There will also be an evaluative component of the overall initiative that will attempt to assess its progress but also to capture what is being learned generally. An overarching goal of the program, aside from the immediate benefits to students and dissemination of holistic ecological thinking into many sectors of society, will be to look for emergent paradigms and even development of new scientific models as presented here. Through several research programs and Chairs, research in various directions can be encouraged while at the same time learning from the innovation that

such a wide variety of cross-cultural students will bring. The program is built on the single premise that holism is natural, waiting for us to discover it.

CONCLUSION

The Vedas and Upanishads arguably represent the oldest and most complete holistic philosophy known. Their central doctrine was 'non-duality'; a 'liberated' condition transcending the subject-object division; profoundly challenging to realize and yet the underlying principle of unity in nature and existence. Our hypothesis is that this philosophical wholeness was lost as ideas spread westward through the Middle East and Egypt, yielding to occult, mystical, and 'dark' magical arts that obscured transcendent elements and their relations. Emerging Abrahamic religions (Judaism, Islam, and Christianity) and emerging European civilizations thus acquired a profound sense of separation (duality) from nature and divinity. The goal of religion became reconciliation with God after Man's irreconcilable fall, as opposed to transcending illusion in the Vedic teaching. Greek philosophers developed the foundations of modern science from a similarly dualistic point of view, separating material existence from transcendent causes. Holism became obscure and impossible to codify in the emerging Western worldview. Holism was both feared and demonized as political institutions usurped religious authority and religious institutions gained political power. Not surprisingly, numerous attempts in Western science to suggest a '5th element' to recapture holism, which continue today, have each failed as a material concept.

With that nearly exclusive focus on material and mechanism, and marginalization of holism, came a dismissal of many profound concepts from the ancient Far East, and even its cultural origin and antiquity; concepts we need today to guide management. Scholars uncovering that history are discovering an amazing human heritage that belongs to us all, if we exercise the courage to share it.

A new scientific holism is possible by a basic correction to a mistake Aristotle made over 2000 years ago, allowing us not to codify whole relations in rigorous and practical terms. The approach appears to be consistent with post-modern science, the Vedas, and what little we know from archaeology of the Indus/Sawaswati civilization.

The result is a 'unified dualism' that translates the Vedic concept of non-duality into a method of analysing wholes, yielding definitions of relation, life, consciousness, sustainability, wholeness, information, time, and other previously intractable concepts. A profound re-coding of science is thus available, that does not eliminate its achievements but opens it for tremendous expansion into new areas of research that are increasingly important to human understanding.

Our material view of nature is based on a dualistic separation between subjects and objects that allows us to see nature separate from us and to analyse it in terms of independent mechanisms. The ancient view was more a view from the inside of nature, where we are integral components. Both views must be fundamentally correct and yet fundamentally incomplete. If we can understand the principles by which they relate to each other, we may then understand holism and sustainability. Presently, we are only building technological bridges across the epistemic cut, whereas we need a much more general concept of system organization.

Sustainability Science, an emerging new discipline, along with other related emergent fields such as anticipation and relational complexity, may benefit directly from the study of this ancient philosophy and its relation to modern thinking. This opinion is underscored by two tentative observations; first that the Indus cultures thrived within a holistic worldview but seem to have

failed due to a lack of technical ability to cope with environmental changes; and second that modern culture seems on the brink of failure from technology-driven environmental changes without understanding the holistic feedbacks. Our suggestion is that both societies may have, or have had, knowledge that when put together may provide us with better answers than either alone.

Our mutual recovery requires that we establish a new ethos for "ecological literacy" in which we can address the current environmental crisis with vision, science, and heart. That science must be rigorous, but we also need to broaden the epistemological boundaries of what we presently call science. It cannot remain limited to machine metaphors alone. With that great leap in science we also need a leap in personal and institutional character. While people will continue to pass through all stages of human experience, it is possible to cultivate the general character of ethical Man and there are many spiritual leaders working tirelessly toward that end. We need to include them and listen to them, and attempt to do the work.

As a collective means to move forward, we propose a new international education program in Ecological Literacy Leadership that will explore these holistic concepts in much greater depth, perhaps taking some of the suggestions presented here. This program of education should be strongly based on direct experience with problem solving in a multi-cultural environment. It should involve not only experience with nature but also experience with society, management and leadership at the political and business level. It may as well include experience with religious institutions involved in preserving the sacredness of nature. It needs, therefore, to engage all three sectors of ecological leadership: Science, Policy, and Ethics.

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