4-1-1992

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CIVILIZATION: A DEFINITION
Part II. The nature of formal knowledge systems.*

JOHN K. HORD

Abstract.

Part I of this paper hypothesized the existence of formal knowledge systems, systematized integrations of ideology and data which were proposed to be the core and defining elements of individual civilizations. The Catholic Church, modern science, and Marxism-Leninism were mentioned as examples. Thus it was further proposed that a movement between civilizations in space or time can be usefully described as a movement between such formal knowledge systems, such that for example, a journey from medieval Europe to medieval China could be called a movement from Catholic to Buddhist civilization. But this cannot be all the story; Buddhism for example still existed in medieval India and is not usually considered part of the same civilization as medieval China and Japan; both Europe and Byzantium recognized Christianity, but are also generally considered separate civilizations. This second part of the paper will first assail certain Western preconceptions of the nature of civilization and will then propose a generalized classification and structure which is suggested to apply to all formal knowledge systems.

The concept “formal knowledge system” seems straightforward enough: Catholicism, science, Marxism-Leninism were all cited as examples and are all well-established schools of thought and knowledge. Collecting these labels under a single higher order of classification seems unexceptionable. But application of a single label implies knowledge of the meaning of the label, and when one examines the many different formal knowledge systems that have existed in history, a certain amount of prejudgment according to the values of one’s own knowledge system is bound to creep in. Most historians for example place great value on complexity; the more complex a system the better, so that such things as cities and writing and hierarchy tend to give a prospective civilization higher marks than it would otherwise receive. But there is

*“Civilization: A Definition Part I” was published in Comparative Civilizations Review 25 (Fall 1991): 28-51.
nothing in the concept “formal knowledge systems” that intrinsically makes complexity a virtue. Consider for example medieval Ireland.

One of the challenges a civilization may face to its identity is the onset of severe pressure from a more developed civilization. Can a “civilization,” without cities and other traits often cited as necessary to the type, retain its integrity in the face of such external pressure? It is quite certain that in ancient times the Roman Empire, with its cities, writing, industries, administrations, etc., was vastly more developed technically than was the island of Ireland at the time. But Rome fell, and its civilization was replaced by a new one based on Christian models (Hord 1987). Ireland was at this time a land of petty kings, whose literacy was at best questionable, and no cities, towns, or even villages. But it had a highly developed culture (whether or not one admits the label “civilization”), exemplified by the intricate permutations of the Brehon Law. During the early Middle Ages Christianity, a formal knowledge system utterly alien and repugnant to the rulers of Classical Greece and Rome, became the center of European and Byzantine civilization. Ireland was also converted. But the reception that Christianity received in Ireland was vastly different from the one it got in Europe and Byzantium.

If Christianity had ‘triumphed’ more or less peacefully [in Ireland], it had been at a considerable price. It was regarded as an additional enrichment to life; for many it had the attraction of dramatic entertainment, for some individuals it was their sole purpose in life; but for the population at large, it was by no means an all-embracing way of life. . . . The law tracts of the eighth century . . . only take passing notice of the Christianisation of the country. . . . In addition, monogamy was not the rule in medieval Ireland, Christianity having changed nothing in this regard. Contrary to Christian concepts, marriages were dissolved in agreement with Irish law. . . . It is at least certain that Christian kings in England attempted to consolidate their position through Christianity. Once again, there is nothing comparable in Ireland. The petulant word of an Irish bishop in 1711 that there had been no martyrs in Ireland before the arrival of the English is appropriate here. . . . This raises a question as to what extent the office of king in Ireland was subject to Christian influences. In view of the fact that the community was nominally Christian, this influence was surprisingly small. Adomnan tells of how Colum Cille ordained Aedan, king of the Ui Neill, by the laying on of hands at the command of an angel who appeared to him three times: *imponens manem super caput eius ordinans benedixit* (VC108a). Whether this ‘ordination’ was to have any influence on the office of the ruler is not evident. Adomman’s account makes it possible to postulate the
anointing of kings in Ireland at this time although it is possible, if not certain, that some Irish kings were anointed towards the end of the eighth century. Aed mac Neill of Tara (797) was given the epithet Oirdnid (from Latin ordinatus) and, by that time, the anointing of rulers had already reached England from the kingdom of the Franks. If Aed was anointed, which is by no means certain, it would have been due to outside influences. In Ireland, the anointing of rulers was at best passing fashion. [Richter 1988:33, 60, 66-67, 87]

Thus it would seem that Ireland’s reception of Christianity was highly selective, and so also that one case is proven in which a civilization’s low level of technology and organization did not necessarily hinder at all its ability to retain its integrity in the face of foreign blandishments. The, so to speak, “civilizational effectiveness” of the west Celtic synthesis of the first millennium AD is also indicated in that in Britain, after 350 years of Roman occupation, the successor states of the Empire and the other political and social survivals of the imperial period were quite generally Celtic, not Roman.

This relative question of complexity also raises the absolute question of size. How many people are necessary before a “civilization” can be said to exist? Here again our own urbanism tends to distort our judgment. Ireland, as just noted, had no cities, towns, nor even villages during the Middle Ages, but resisted amalgamation into Western Christian civilization anyway. If one wants to find the minimum population for a civilization, the obvious tactic is to trace the civilization back to its beginning and simply estimate its population at the lowest point. In practice, since there have been successive civilizations in most places, this means tracing civilization itself back to its origin from a pre-civilized condition.

Part I of this paper quoted Gordon Willey’s nomination of Olmec Mesoamerica and Chavin Peru ca. 1200 BC as such initial integrations; Hord (1981) also nominated Catal Huyuk in Anatolia of the seventh millennium BC and Mississippian North America ca. AD 1200 as others of the type. The central site of Chavin Peru remains in dispute, but population estimates are available for the other three. Catal Huyuk is estimated to have had a population of 3,000 [Fairservis 1975:158] to at least 5,000 [Mellaart 1975:99]. San Lorenzo, the principal site of the early Olmecs, and its two satellite villages are estimated to have had a total population of 2,250 [Marcus 1976:79-89]. In Mississippian
North America, Moundville and Etowah are estimated at “many more than two thousand” [O’Brien 1972:196], the smaller sites of Angel and Kincaid, “1000 or slightly more” [Griffin 1978:268]. When the de Soto expedition passed through the periphery of the Mississippian culture area in 1539-40, its members “repeatedly remarked in their accounts that all the Southeastern Indians were alike ... living in large communities and depending on agriculture for much of their food” [Hudson 1976:10]; their towns ranged in size from 1700 to 4500 people” (Gibson 1974:131).

As the above figure suggests, a civilization can be initiated by a rather small number of persons. It can also be sustained by a very small number. It is well known that Polynesian culture was hierarchically and culturally developed, albeit preliterate and pre-urban, and was cohesive enough to remain essentially the same even when scattered all around the Pacific Ocean. It is also well known to have maintained this culture on islands with populations in the low thousands, and “so small an atoll as Ifaluk supports a complex order of genealogical ranks among a population of only 500 persons who live mainly by fishing [and it] is not exceptional in this respect” [Goldman 1970:xx].

There is also the issue of stability regarding non-complex formal knowledge systems. Such systems may evolve with ease but can they sustain themselves? In the absence of increasing complexity, will they return to a pre-civilized status? Here the best case in evidence would seem to be subsaharan Africa, traditionally a continent reserved for anthropological inquiry rather than historical, which presents a remarkable example of isolation of member units with no great divergence or disintegration reported in consequence.

Stretching right across Africa from the Red Sea to the mouth of the Senegal, and right down the central highland spine of Bantu Africa from the Nile sources to Southern Rhodesia [now Zimbabwe], we find the axis of what we shall call the Sudanic civilization. The central feature of this civilization was the incorporation of the various African peoples concerned into states whose institutions were so similar that they must have derived from a common source. At the head of such states there were kings, to whom divine honors were paid, and to whom divine powers were attributed. The king led a life sedulously excluded from the common people; he gave public audience from behind a curtain; not even the most intimate of his courtiers might see him eat or
drink. Each year the king hoed the first plot of farming land and sowed the first seeds. . . .

The divine king's subjects might number anywhere from a few thousand to a million, or even more. Such kingdoms tended in fact to form in clusters, with one or more large kingdoms at the center of the cluster, and a host of smaller ones scattered around the peripheries. But on however small and ineffective a scale, such kingdoms would nearly always show at least vestigial traces of a strongly centralized political structure, contrasting sharply with the loose family or lineage institutions of those societies which had never been organized in this way. The typical "Sudanic" state was not feudal. It was not based on the hereditary position and power of great families within the state. It was in principle something nearer to a bureaucracy—a bureaucracy without paper, ink, desks, or telephones—in which power was wielded by officials, who held their offices during the king's pleasure, and who could be transferred from post to post, promoted, demoted, or even destituted by a nod of the divine head or a syllable from the divine mouth. Around the royal person circled a galaxy of titled office bearers, as numerous as the economic organization of each state was able to support. The pre-eminent offices were nearly always those of the Queen Mother, the Queen Sister, and a limited number of titled "great wives" of the ruler. At the head of the administration were a few high officials, often four in number. From these depended a descending hierarchy of provincial and district chiefs, often recruited from the pages, sons or nephews of the great, who had been educated at court. [Oliver and Page 1962:44, 45]

This system was at least six centuries old when the West arrived, (Davidson 1966:97) and may well be as much as eight thousand years old. Thus, the insistence on a complexity level comparable to a Near Eastern model would be inappropriate for subsaharan Africa.

Hypothetically, it could be argued that pre-literate people remain pre-civilized regardless of the stability of their system. However the present work will refute those sources that arbitrarily establish such things as writing, cities, and large-scale sociopolitical organization as decisive factors reflecting a civilized state. Classical Greece is a perfect example that civilization can exist under "non-literate" circumstances. It is universally known that the civilization of Classical Greece developed from a nonliterate period, called the Hellenic Dark Age. This Dark Age was an intermediate stage between "civilized" Classical Greece and an earlier Mycenaean culture that was highly developed and literate. The Greeks themselves date their civilization from Mycenaean times and trace its development through the dark age
to the classical era. Thus, according to the Greeks, key elements of classical civilization were carried across an age so dark that the writing system itself was lost, and had to be re-invented in an entirely new script.

Advocates of literacy as a necessary condition for civilization may try to diminish the Greek emphasis on their Mycenaean roots or they might argue that people can move in and out of a state of "civilization" based on the presence or absence of writing, but the ancient Greeks themselves would not have agreed with such judgments. Based upon the Greek assessment of their own past it would appear that literacy is not essential to civilization, and those who try to make it a precondition exercise an arbitrary judgment. While literacy is useful in the process of civilizational development, it is not essential. While formal knowledge systems are difficult to define archaeologically, there is no evidence that when one system dies and is replaced by another, the people involved revert to a pre-civilized condition. Historically, there is no evidence that this has ever occurred.

There is one final thing that formal knowledge systems are not; they are not bound by territorial limits. The modern Western mind loves visions of maps and territoriality, and so tends to see "civilizations" in terms of maps of the territory they occupy. Thus, to the modern mind the hypothesis "civilization = formal knowledge system + people" will appear to be virtually a violation of natural law because the term "formal knowledge system" is unrelated to the notion of territory. The problem created by this distinction is most acute for anthropologists who tend to see the state/civilization/territory as a fused whole. For those scholars, any discussion of the state and civilization without regard to territory becomes nonsensical. Discussion of the relationship between formal knowledge systems and states has been made elsewhere (Hord 1989), so for the moment, suffice to say that in terms of formal knowledge systems, no intrinsic connection between the state/civilization and territory appears at any level of analysis. It is quite possible for one formal knowledge system to exist totally contained within the geographic territory of another, and such instances have in fact occurred. The position of the Jews in medieval and modern Europe is an obvious example, and the Gypsies have been even less bound to a particular territory.
After all those caveats about what a formal knowledge system is not, it remains finally to suggest what it is. Just how does one apply that label “formal knowledge system?”

For purposes of this initial exposition, the term will be defined as pragmatically as possible, with no attempt at an absolute and final definition. While it is quite possible that one particular formal knowledge system may be correct in its definition of itself, it is certain that more can be learned by studying the thoughts of different civilizations on the subject. It is equally certain that no definition could possibly include everything that might be known about the nature of knowledge. There is just too much universe out there for mankind even to pretend at finality. Therefore this paper will attempt only to define the words “formal knowledge system” as they might be used in practice across many civilizations. Thus the word “knowledge” will refer simply to “data held to be sufficiently factual as to constitute a valid basis for action.” The word “factual” will be left to each civilization to define in its own terms. “System” means any arrangement of data such that the arrangement itself becomes one of the data. The word “formal” conveys a sense of permanent establishment which the words “knowledge system” do not provide by themselves and so is used when the full technical label seems desirable.

One may hypothesize a “formal knowledge system” which does nothing but control the positions of 60 marbles in a game of Chinese checkers, but this would hardly seem a sufficient base on which to build a civilization. Civilizations have greater concerns than that: everything from the techniques of farming, fishing, and the rearing of the next generation to the causes behind the stars in the sky, from frosts and droughts to marriage, motherhood, and society itself. Thus, some major degree of universality is proper to a formal knowledge system: indeed, a pretension to complete universality is an intrinsic characteristic forced by the very nature of such systems as keys to an entire civilization. This is only partly correct. Consider for example three words which are often used in connection with classifications of knowledge: philosophy, science, and religion. “Science” and “religion” have already been mentioned as formal knowledge systems in these pages and philosophers would be likely to enter their own claim.

How would one differentiate among these three distinct kinds of knowledge? “Philosophy” in particular has had very widespread
applications in the past and for purposes of this paper several of its older meanings will be deleted from consideration, primarily those involving ontology, epistemology, and what used to be called "natural philosophy." The first two are deleted as being intracivilizational points of theory, while the last, "natural philosophy," has become "science." "Philosophy" will here be limited to the modern popular usage of the word, that being the wisdom concerning man, such as Epicureanism and Stoicism. With this restriction, one may propose a useful differentiation among philosophy, science, and religion on the basis of the supposed separation between man and nature:

**Philosophy:** any systematized presentation of the relationship between man and the universe.

**Science:** any systematized presentation of the relationship between nature and the universe.

**Religion:** any systematized presentation of the entire universe, including both man and nature and also gods and the supernatural (if any).

Thus, philosophies are herein proposed, as based on modern popular usage, to be intrinsically man-centered while sciences are intrinsically nature-centered. It is impossible for a science to differentiate man intrinsically from any other thing in nature, except on the same basis as applies to all other things in nature, or by assuming a priori that man is different and outside the normal scientific rules. Religion on the other hand can include both philosophies and sciences and can have any rules it likes. A religion can, for example, both admit that man is an intrinsically special entity and then abhor and deplore the very existence of such a separation, labelling it a fall from grace which the religion claims to put right again. But even here there are limits. Because under this definition religions claim applicability to the entire universe, any intrinsic differentiation of man must be handled very carefully lest it challenge the very unity of the universe that is a foundation of any knowledge system's claim to exist.

Can a civilization be built solely around a philosophy, so defined? One may conceive of the possibility of a totalistic rule of society by philosopher-kings, excluding all other knowledge systems, but to the best of my knowledge it has never happened. Man-centered descriptions are useful for many things, but there are just too many other things in life for which they are not useful (e.g. the very basic item of farming, which has supported most
people through most of history). Philosophies may be useful guides to the activities of man as ruler and as citizen and may serve as auxiliary knowledge systems for that special purpose, either within a religious knowledge system or by themselves. But to create a basis for all the activities that comprise a civilization, something is needed beyond philosophy.

Can a civilization be built solely around a science, so described? This may theoretically be possible, so long as the civilization either includes a priori assumptions granting special status to man and perhaps other things, or is prepared to accept that physical nature is all there is. But this is a very difficult admission to make. Thus, while Experimental Science is one of the most prevalent formal knowledge systems in the world today, it is always as an auxiliary system, never as the principal system on which the civilization is based. One may doubt that even the positivists were willing to follow the philosophical consequences of an absolute rule of science to their final conclusion.

Can a civilization then be built solely around a religion, so described? The preceding discussion of Europe, Byzantium, India, and China suggests this to be an obvious possibility. Does this mean that all formal knowledge systems are religions? It does not. Here the usefulness of having multiple formal knowledge systems enters the picture. These have been seen in Part I in India and China and also in medieval Europe with the invention of modern Experimental Science. But the United States was also noted to be consistently employing three separate knowledge systems:

Christianity: a religion, covering all man and nature, as an unofficial but hardly uninfluential system.

Experimental Science: a science, covering the relationship of nature to the universe and including man in such crucial fields as medicine.

Nationalism: a description of the relationship of man to (a limited and described portion of) the universe, and so in the terms of this paper a philosophy.

Each of these claims some portion of universality, but only religion claims it all. Most of the formal knowledge systems that have stood at the centers of the various civilizations have been religions, claiming, at least potentially, a complete understanding of the universe. But many such systems have existed that are, like nationalism and experimental science, qualified only with the
oxymoron "limited universality," complete application only within their described fields. Indeed, considering the events noted in Part I in Europe, India, and China when their religious knowledge systems began to lose their monopolies, one may suggest that the creation of such specialized and limited auxiliary formal knowledge systems is a signature of well-developed civilizations.

With the relationships between formal knowledge systems and civilizations having been described, let us now turn to an examination of the internal structure of formal knowledge systems themselves. What follows is the perspective of an historian, rather than that of an epistemologist or ontologist, and it is intended to be purely pragmatic.

Again, one must first eliminate from consideration that basic question which is generally thought to be the very core of any knowledge system, i.e., what is knowledge? No consideration will be given to matters such as the connection between perception and reality, between symbols and forms. These are theoretical issues to which various civilizations have formulated very different theories, and by tautology, any characteristic that varies from one civilization for another cannot be a defining element of all of them. Whatever may finally prove to be the nature of reality, it is a problem that stands prior to any questions of the nature of civilization. So here again, ontology and epistemology must for immediate purposes remain beside the point.

Thus, regarding the question of the nature of formal knowledge systems the present work will address only the mechanics rather than the content of knowing, and then only at the most basic level. How does a formal knowledge system "know" something? In the present analysis, the interior of a formal knowledge system may be considered in five layers, rather like an onion (rather more like the vertical distribution of thermonuclear reactions in aged large stars). At the core are the most central and unchallengeable elements of the system, herein called covenant; the three intermediate layers are law, procedure, and myth. (See Figure 1) In modern computer terminology these are the data of the system; so in the outermost layer, one finds the processing equipment, the hardware and the software. In a formal knowledge system the software, changeable and even evanescent, is the people, ideas, and events which make up the everyday workings of
the civilization; being changeable and evanescent they do not have the permanence associated with the other elements of the system and so will not be addressed here. The "hardware" comprises such things as the language(s) in which knowledge is expressed; one of the major differences between European and Byzantine civilization for example was in this hardware, because one recognized Latin, the other Greek, as the language of culture, and so had access only to data readable on that hardware. The theoretical position of this hardware in a formal knowledge system is debatable. In principle it could be changed at any time; in practice, such things as the properly recognized use of Latin and Greek, and even more of Arabic and Mandarin Chinese in their civilizations, is given a level of value that ranks close to being a basic assumption of the proper working of the universe. Such differences in hardware can cause major differences in the workings of different civilizations, as one may appreciate by mentally comparing the workings of cuneiform on clay in ancient Sumer with the possibilities of the modern computer terminal. The influences of each civilization's particular hardware should be kept in mind when studying that civilization, but they are not classifiable in the same way as the four proposed central elements of
formal knowledge systems and so will not be further addressed here.

Of these four central elements the most important of all is covenant. It is proposed herein that the core, the most central and inviolable element, of a formal knowledge system is a set of assumptions which are unquestionable and irrefutable—"we hold these truths to be self-evident"—and are, to use an old saw, imparted to each new generation with the mother's milk. With one exception, it is not necessary that any particular assumptions be involved; any given formal knowledge system may or may not include the concept of divinity, may or may not include the concept of centrality, may or may not include the concept of assumption itself. The defining qualities of these core beliefs are solely that they are accepted without question and that their acceptance is shared by essentially all members of the civilization. When the beliefs cease to be thus shared, the formal knowledge system is failing; when the constitutional beliefs of a civilization cease to be shared by its people, the society is failing, breaking down, and becoming ready for the imposition of new formal knowledge systems that may be radically different from the old. (An analysis of the end of medieval Europe is presented as an example of this process in Hord 1989).

The word covenant, from the Hebrew covenant with God, is hereby suggested as a label for this core of shared beliefs. One may object that this word already has other uses; for example, this same word was used by the Massachusetts Puritans to describe their compact with God. But this Puritan idea of compact and religious association is actually a very good illustration of the word "covenant" as used here. The Puritans did indeed feel themselves subscribers to a covenant with God, but they also, in their own theory, had no power either to change this covenant or to refuse it:

As the heavens are higher then [sic] the earth, so are the wayes of God higher then our wayes . . . and in speciall the wayes of his grace, and of the Covenant thereof, with men indeed mutuall agreement and consent is necessary to a Covenant, but with God, Gods appointment maketh a Covenant, whether the Creature consent to an agreement or no. [Miller 1961:488; source not cited]

It was approximately the same situation as among the ancient Hebrews, and indeed exactly from that example; one democratic
reform was refused precisely because "we should have no warrant in scripture for it; there was no such government in Israel" (Morison 1930:92, quoting John Winthrop). Their subscription to the covenant with God was voluntary and individual, but the covenant was there and applied to each one of them whether they subscribed to it or not; any personal, or even community, objections would have no more effect than a proposal by Congress to amend the law of gravity. The same applies in this proposed label: Covenant is an accepted community belief about the nature of the universe, recognized to be a belief, but an irrefutable belief and no less a fact for being a belief. One may call it a contract, but it is a contract that is valid and binding regardless of the presence or absence of consent by the people bound to it. For example, that formal knowledge system herein called Experimental Science has two basic assumptions in its covenant: 1) that the universe is governed by laws which operate everywhere the same, independent of any and all observers; 2) that all such laws are ultimately and fundamentally reducible to mathematics.

Between covenant and the individual components of society (institutions, extended families; persons, etc . . .) stand three other elements. The one that touches people most directly is myth, as described in William McNeill's recent book Mythistory. Myth is both temporal and personal, dealing with events in time happening to or caused by individuals. The time and the persons involved in myths may be real or may be imaginary; they may even be anthropomorphized and, so to speak, "event"-ized qualities of nature. But although these myths always happen in time, in application they are timeless. Myth in this sense may be perceived as the translation of the permanent beliefs of a civilization into actual working guidelines for the personal edification of society. Myth generates role-models for individuals. "George Washington and the cherry tree" is myth in this sense. Those stories that are usually considered to be myths, e.g. the legends of the Greek gods and heroes, are fossils of what once was myth in this sense. One of the signs of a vital and successful civilization/formal knowledge system is its ability to create and sustain new myths as new situations arise; contrariwise, the failure of a society may be measured in the death of its myths. The present situation in American urban ghettos will illustrate. This must be emphasized: the function and defining quality of myth as presented herein is the connection of civilization with the individual, the acculturation of an
individual to his civilization. If this can be disproven, then this proposed concept of myth is invalid.

In closest proximity to covenant stands "law," physical, religious, or otherwise. This is the one and only concept that is common to every formal knowledge system. In every system there exists a set of inherent rules that are eternal and unchangeable that govern the universe. The modern world, with its emphasis on science, associates this quality only with the physical law, but it applies just as thoroughly to the social and religious laws propounded by any other formal knowledge system. The recent situation inside revolutionary Islamic Iran may provide the non-historian some flavor of this emphasis on unchangeable ruling law. Otherwise, the concepts applying in medieval Europe to the relation of law and society describe the situation as well as any:

To the early medieval mind, king and people together, welded into a unity which theoretical analysis can scarcely divide, formed the State. Neither the rule of a monarch whose powers were limited by law, nor the active legislative co-operation of the community expressed in the consensus fidelium, was regarded as 'sovereign' in the modern sense. Sovereignty, if it existed at all, resided in the law which ruled over both king and community.... The blunt 'either-or' of later times—either the king is unlimited or the people is sovereign—is an impossible dilemma from the standpoint of the early Middle Ages.

Not the State, but 'God is the source of all law'. Law is part of the world-order; it is unchangeable. It can be twisted or falsified, but then it restores itself, and at last confounds the evil-doer who meddled with it....

Germanic and ecclesiastical opinion were firmly agreed on the principle, which met no opposition until the age of Machiavelli, that the State exists for the realization of the Law; the power of the State is the means, the Law is the end-in-itself; the monarch is dependent on the Law, which is superior to him, and on which his own existence is based. [Kern 1970:70-71, 141, 150-151]

Law is the opposite of myth, being both impersonal and eternal, the unbreakable commands of reality. It is different from covenant in that covenant is reality itself, beyond analysis and correction, while law is only a function of reality. Such law is, both as a body and individually, unchangeable insofar as human action is concerned, although if a covenant includes a God whose rule stands prior to the law, then actual change by Him is theoretically possible. In practice there is a way even for man to "change" law,
in that it may be understood or reinterpreted in the light of new data, even though in theory all such law is eternal. “According to mediaeval ideas, therefore, the enactment of new law is not possible at all; and all legislation and legal reform is conceived of as the restoration of the good old law which has been violated [Kern 1970:151].” The recent conservation of the law of parity in physics is an almost identical example. Physical law was not changed; our understanding of it was merely proven incorrect. Experimental Science took this realization about its laws so seriously that the physicists responsible for making the correction were immediately given the Nobel Prize. Such laws may be quite preposterous from the point of view of a civilization that does not believe them, but that is completely irrelevant to civilizations that do believe them. Law in this sense is the link between covenant and the universe outside the individual; its function is to form the link between the individual and his universe outside himself, to make the universe comprehensible and predictable. As such it too will often be expressed in myth, in stories illustrating the creation or working of the law.

Note that in these definitions, both temporal myth and timeless law are open to question, on grounds of new situations (myth) or lack of proper understanding (law). Thus in spite of their presumed status as unchanging and eternal, in practice they can change. Covenant, however, is prior assumption, and is not supposed to be open to question; questioners are treated either as madmen (when the covenant is strong) or heretics (when it is coming under challenge). But although covenant is not supposed to be open to question, it may in fact change or even collapse under the impact of changing thought or changing reality. When this happens it is a very dangerous time for any civilization. Reformulation of such assumptions can be survived when the reformulation is accepted as widely as the covenant itself, but dispute on this basic a matter can reduce an entire civilization to anarchy. Covenant is reality, and when reality collapses, the civilization itself can hardly remain. The collapse of medieval Europe, (discussed in Hord 1989), is proposed to be an example of such a catastrophe.

A more limited conflict may arise when a civilization subscribes to more than one formal knowledge system. In such a situation the laws of the different knowledge systems may be in conflict, or
partisans of one system may try to change the laws of the other(s). This is illustrated for example by the occasional efforts of American state legislatures to simplify scientific law, for example officially redefining \( \pi \) to be an even 3—but even in the present weakened situation of Christianity, they would not dare try to pass an Eleventh Commandment. As a rule such conflicts are simply left unrecognized and unresolved, and a civilization keeps the peace by refusing to admit that any conflict exists.

Between law and myth lies a more abstract component of the formal knowledge system, which shall be called "procedure." While covenant and law are both theoretically eternal, and both in practice must change with the times, such change cannot be made at random. "Procedure" is the rules by which changes are made (or rather, to note the proper theory, by which misunderstandings are corrected and lacunae are filled). In the Christian religion these are the rules of revelation, exegesis, and interpretation; in Experimental Science they are the rules of theory-formulation and experiment. These rules are not themselves divine revelation and they are not laws of the natural universe; they are not assumptions nor are they personal experience. They are simply the accepted ways by which new knowledge may be found, and since knowledge is the principle subject of knowledge systems, these procedures also become very carefully indoctrinated and mythologized verities. But unlike the case with law and covenant, there is no pretense that procedure is eternal; it is simply what is proven, understood, and accepted to work. If tomorrow someone invented a new procedure for determining necessary changes and convinced the scholars concerned that it actually worked, there would be no bar against accepting it as proper procedure.

Procedure, so defined, sounds minimally important, even negligible. It is not. One may even assess it to be in practice the most important component of the four. "Knowledge," the personal knowledge and personal divine relationships of the Paleolithic-type shaman, may have existed longer than the human species itself, but "knowledge system" implies a packaging that transcends individuals. Indeed the key event that marked the passage into a state of civilization, so long ago at Catal Huyuk and among the Olmecs, the Chavin, and the Mississipians, may have been precisely the invention of a set of rules to make new knowledge valid or invalid regardless of the shaman proposing it. In that discovery
lies the ability to place any new datum into comprehensible rela-
tionships with what is already known, and to turn these data even-
tually into calendars and cathedrals and the road to the stars.

By way of test, this formulation predicts that certain combina-
tions of knowledge should not occur. Law is suggested to be eternal
and impersonal; myth is temporal and personal. Can the other combinations of these two factors exist? If law is impersonal
and eternal, can there also be a non-eternal law? The idea of a
temporary law of nature seems laughable but perhaps some have
been proposed. Myth is considered to be personal and temporal;
are there any myths which do not include a time-sense? The idea
of the anthropomorphized godhead might be proposed to be
such, but the idea by itself involves no action, and actions take
place in time. Likewise, can there be a law of nature which applies
only personally (i.e. to specific individuals), or a myth which does
not involve people or some other anthropomorphized entities?
Under the hypothesis of formal knowledge systems such combi-
nations are forbidden and at least on first impression they all
seem insupportable.

This paper has suggested two propositions regarding formal
knowledge systems: one, there can be three types of knowledge
systems (philosophies, sciences, and religions); and two, each
type has four key elements (covenant, law, procedure, and myth).
Hardware, individual persons and events are also part of each civi-
lization.

The ruling system in Western civilization today is Experimen-
tal Science, a study of nature where truth is determined by inde-
dependently repeatable experiments. Experimental Science has so
monopolized Western nature studies in the twentieth century that
no one envisions other forms of nature-study as being legitimate.
While it is agreed that "religion" can take many forms and "phi-
losophy" can take many forms, the same is not true of science.
The current paper rejects the notion of a single science for just as
there are other philosophies and other religions there can also be
other sciences. An example of such an alien science that will also
serve to give the reader a more concrete appreciation of just what
is meant by "covenant," "law," "procedure," and "myth" comes
from medieval China.

During the Northern Sung dynasty (AD 960-1126) there
emerged in China several schools of thought known collectively
as the *tao-hsueh* (learning of the *tao*, called in English Neo-Confucianism; not to be confused with the various schools of Taoist philosophy (*tao-chia*) and religion (*tao-chiao*). The roots of the *tao-hsueh* included, besides Confucianism, the *Yi-hsueh*, one of the many esoteric traditions that appeared and flourished during the Han. The *Yi-hsueh*, based principally on the *Yi-ching*, the Book of Changes, had by Northern Sung times developed into two principle schools of thought; one the famous line of moral philosophies (*Yi-Li hsueh*), the other a lesser known tradition which "focused on cosmology and the functioning of the universe"—thus a study of nature, a science. This was the *hsiang-shu hsueh*, the "image and number learning," so-called because "images" and numbers constituted two of its most important basic elements. This proposed formal knowledge system included first a set of basic assumptions which in this paper would be listed as a "covenant":

[The] fundamental assumptions and concepts were associated with different social groupings. A rough breakdown from the most general to the most narrow concepts consists of three levels: Chinese culture in general, the elite literati culture, and the *Yi* learning, a particular philosophical tradition. Some concepts, the most general ones, belonged to the epistemological imperatives of the culture. Acceptance of the epistemological imperatives of the culture is not restricted to any social group. Although different groups at different times may understand them differently, the assumption of their existence is so basic that they themselves are never questioned. Many of these concepts may have originated with a particular school of thought, but at some point they became accepted by the culture as a whole. Moreover, as society develops, new epistemological imperatives appear. *Yin* and *Yang*, *wu-hsing* (the five phases), *t'ien-ti* (heaven and earth), *wan-wu* (the myriad things), *chi*, *tao*, *shen* (spirit), and *hsin* (heart/mind) are examples of epistemological imperatives of Chinese culture in this time. Their existence was assumed without question and they were the foundation of other concepts. The twentieth century has witnessed the appearance of others, derived in particular from Marxist thought.

*Yt'ien-ti*, "heaven/earth," for example, "asserted the division of the universe into two basic realms, the sky and the earth. These realms existed on the sensorial level of reality, the level of appearances and human experience." The concept *wan-wu*, "the myriad things," asserted that all the things and events in the world of human experience are specific, finite, and particular. [Birdwhistell 1989:2-5, 51-52]
To find “law” in Chinese science is another matter, and indeed provides an informative example of the dangers involved in the transfer of words and concepts from one civilization to another. “Law” in the sense of a positive command or requirement, even of nature itself, was unacceptable in traditional China. Needham goes into detail as to why this should be so, but for present purposes the following abridgement of his statement will suffice to illustrate the attitude of Chinese science toward rules of nature.

In essence, then, Li is indeed the ‘principle of organization’ as we called it when discussing the Neo-Confucians. There is law implicit in it, but it is a law to which parts of wholes have to conform by virtue of their very existence as parts of wholes. And this is true whether they are human parts or non-human parts. This ‘law’ arose not by decree of a universal Controller but directly out of the nature of the universe. Li is no fortuitous concourse of atoms obeying statistical laws of their own either; it is in no way connected with the patterns of chance. The cosmic order is whole and unchanging; it is a Great Pattern in which lesser patterns are included, and the laws which are involved are intrinsic to these patterns, an integral part of them, not extrinsic to them or dominating them as the laws of human society dominate men.... We must conclude, then, that ‘law’ was understood in an ‘organic’ sense by the Neo-Confucian school: law in the sense used in describing the mathematical universe of Newton was either completely absent from their definition of Li or, at the most, played a very minor part. The main component was ‘pattern,’ including pattern living and dynamic to the fullest extent; in other words, ‘organism.’ In this philosophy of organism all things were included: thus Heaven, Earth and Man have the same Li. [Ronan 1978:300]

The concept of “law” as specified above for formal knowledge systems says nothing about lawgivers and indeed, even modern Experimental Science would give little thought to that issue. A law that is intrinsic to its jurisdiction remains a law.

“Procedure” as defined above is one way in which Chinese science was most appreciably different from the modern Western variety. Experiment and mathematics were not by any stretch of the imagination the governing rules for determining the validity of suggested knowledge.

One further aspect of [this] explanatory theory concerning change must be briefly considered: the logic of the system, or the implicit logical principles on which [its] thought is based. As noted earlier, this refers to the system of concepts that specify not only the relations that can hold between the elements of the discourse but also the way in which questions can be asked. The logic of [this] philosophical
system of thought was ... characteristic of thought in general in eleventh-century China.

In terms of the discussion here, the most fundamental assumption was the validity of correlative, or associational, thinking. In this type of logic, all things in the universe are associated with other things on the basis of established categories or classes. The categories form a "natural" classification scheme into which all things fit. Joseph Needham has quite aptly called it an immense "filing system"...

In a system based on correlative logic, the significance or explanation of any event is based on the correlations. Meaning is thought of as something that indicates the category of correspondence. Understanding and explaining, therefore, involve knowing the classes and knowing to what other entities the thing or event in question is correlated. Relationships between things are a matter of the categories...

Furthermore, the kinds of questions that can be asked are determined by the logical system or proof structure. For example, with correlative thinking, one does not explain an animal's behavior by asking whether the behavior is learned or inherited. That kind of question simply does not belong to the system. One asks, instead, whether the animal belongs to a yin or a yang category, or to which of the four images the animal corresponds...

The answers were explanations because they helped classify the functioning of movement and response. [Birdwhistell 1989: 63-64]

In terms of modern Western Experimental Science such a system is of course errant nonsense. But then, what was China's first assessment of modern Western Experimental Science?

"Myth" in any assessment of traditional China is obvious; the entire corpus of traditional Chinese biography was one long study in role models, and should not require further comment.

This completes the initial presentation of the hypothesis of formal knowledge systems as the core and defining element of each civilization. The analysis implies various applications, but only one will be provided for illustration. Modern international politics has made much of international morality, without ever establishing how morality is to be determined. If the proposed description of formal knowledge systems is correct, then it implies a particular character for the nature of morality when that term is applied to a civilization's moral evolution.

No formal knowledge system is ever completely integrated, because every civilization includes some actual events or characteristics that are deeply offensive to its basic values (e.g., slavery in the United States, poverty and degradation of most of the people in most Christian societies). By and large these seem to be handled by compartmentalization; they are walled in with state-
ments such as "the natural order of things" and people simply ignore them. Moral progress then occurs when the walls are breached and the conflict resolved. Note that this does not create any absolute morality; conflicts can occur with moral values only when the values are present in the first place. No matter what the situation, if there is no value in conflict with it, there is no opportunity for moral crisis, nor even for recognition of the possibility. Note that this interpretation also does not require any particular solution; it is required only that the conflict be resolved, not that it be resolved in favor of some particular value. Probably most people would assess that the greatest moral progress occurs when the resolution supports the original value, but this seems to reflect only the preconditioning that most people have in favor of the righteousness of their ingrained moral values. It is quite possible for the moral value itself to be the problem. Present-day Iran for example has resolved the conflict between Westernization and its traditional moral assessment of the proper place of women by the wholesale reassertion of tradition. But is such repression a higher moral value?

Note further that these positions may vary from one milieu to another within a single civilization/knowledge system; not all assumptions are covenant, and not all folkways are law. One group may consider some value a basic assumption while another considers it a derivation from presumed law, while another finds the whole notion outdated and exceptionally quaint. This variation applies not only across time and between regions but particularly as one passes between so-called "high" and "low" culture. A formal knowledge system must have room for low culture, even if disdainful of it, and for high culture however evanescent its fashions. Evanescence, time, change can also be difficult problems in themselves. Formal knowledge systems are hypothesized in this paper to pretend to universality and permanence, so change and time are things that should be handled very delicately. The preferred method seems to be to go for the first derivative and look for regularity—the cycles of the phases of the moon, of the year, of the lifetime. Irregularity and especially chaos are event-types that should be hard to organize into the permanent universality preferred by formal knowledge systems, so if organized religions are indeed such, then irregularity and chaos should tend to be walled out as beyond the pale, demonic, accursed. The same ap-
plies to Science, in which for example the new field of chaos theory intends not to study chaos but to illuminate the order behind it.

It remains finally to apply this hypothesis to the question which has bedevilled the ISCSC for all its existence. What is "civilization" (in the generic term)? The present hypothesis suggests civilization as a generic term to be the combination of an autonomous formal knowledge system—one not subject to governance by another—with a group of people who act by it. Within a sort of hierarchy, each civilization could also contain sub-civilizations each of which is built around its own formal knowledge system subordinate to or contained within the overarching one. What is a particular civilization? What bounds a particular civilizations and makes them identifiable? It is at this point that the components of a formal knowledge system, and particularly procedure, become important. It was noted earlier that Catholic and Orthodox Christianity are usually considered separate as of AD 867, because of the Photian schism. This schism was based on, and became lasting because, one group did not recognize the changes made to the faith by the other group (specifically, because one group did not recognize the decisions of the other's Church councils as valid and binding). Therefore, this single original formal knowledge system (Christianity) may be held to have split when one set of partisans did not recognize the other's changes, thereby allowing development to proceed separately henceforth; this difference in "procedure" is the point of separation recognized by the churches themselves. Conversely, the acceptance by Spain and Britain of European procedure (and not just as regards Church councils) may be said to mark the amalgamation of these two formerly autonomous regions into Western civilization.

Beyond this is the question of hardware, since Europe and Byzantium also used different languages as the means of expression of each culture. The influence of hardware is also seen in east Asia, where one might assign China, Vietnam, Korea and Japan all to a single civilization on the basis of their common usage of Mandarin Chinese as the vehicle of culture, while Tibet would be reserved to some kind of greater India because its high culture was derived principally from Sanskrit. For the moment such a differentiation is particularly useful during the early development of each civilization, but picks up considerable uncertainty once each
begins using its vernaculars heavily. Would a distinction according to the language of high culture cause separate civilizations once the vernaculars become "cultural"? In our own times, would India be a single civilization? For the moment such questions can be answered only in a somewhat arbitrary fashion. Therefore, as of this writing, questions of procedure will be admitted to distinctions of civilizational level, and questions of hardware, while probably also civilizational in importance, will be reserved to future determination on this point. Thus two definitions are hereby proposed:

**Civilization** (generic definition): The presence of a formal knowledge system, together with the people subscribing to it.

**Civilization** (individual specimen): A formal knowledge system or interacting group thereof, with the people subscribing to it/them, which as a group recognize the same procedures (rules and institutions for change) as valid and binding.

These definitions may now proceed to testing.

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NOTES

1. The Mississippian culture-system also included one site, Cahokia, which was an order of magnitude larger than any of the others; population estimates vary from a low of 5,000 [Griffin 1978:268] to 40,000 [Fowler 1975:100]. About AD 1200 this area also supported four "large towns," five "small towns" and 45 "villages," totalling perhaps 20,000 [Pfeiffer 1977:425] to 50,000 [O'Brien 1990:2] additional population outside Cahokia itself [see also Fowler 1978: 478-469]. But Cahokia does not seem to have been the home area of the Southern Cult, and when historic times began, the abandoned site lay outside the area of the "civilized tribes," being populated only by the Osage and some branches of the Sioux, "semi-sedentary" and "closely related to the Oneota Aspect" of the northern fringe of Mississippian development, not to Cahokia and the Mississippian core [Chapman 1952: 145-149]. There is some possibility of what is referred to later in the main text of this paper as a "hardware" difference, in that while the civilized tribes and most of the area of the Southern Cult spoke Muskogean languages, Cahokia may have been occupied by Siouan peoples. But this remains debated.

2. However, one should not be too smug about this. Complexity can
be built on so simple a difference as that between "0" (zero) and "1"; out entire system of computer language is based on such a purely binary system. Likewise one may build complexity merely on the difference between the solid and broken lines of the Yi-ching, as witness the Yi-hsueh noted later in the main text of this paper.

3. Even this has come under some question lately, as one of the hypothetically possible consequences of the currently popular inflationary model of the origin of the universe. However, one must suspect that, if it ever does come to pass that physical law is proven to be local to one (part of a) universe, then Grand Laws will promptly be sought that determine the local laws of each area. The situation otherwise would in scientific terms literally be unthinkable!

REFERENCES


