

Reconstructing Prehistoric Civilizations In a New Theory of Civilizations

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I. Introduction

The idea of a civilization is difficult to pin down.¹ Aristotle once said, “I know what it is but when I turn to write it down it eludes me.” (Aristotle’s “it”, of course, did not refer to civilizations.) While it is difficult to come to a commonly accepted definition of what constitutes a civilization, there is broad agreement on the major civilizations in history. As Melko¹ points out, “There is impressive agreement among civilizationalists on the identity of the major civilizations.” Taking an operational point of view we have defined a civilization as any larger, long-lived social entity that conforms to the general nature of the civilizations and resides in the commonly accepted set of civilizations. While this definition leaves many details and some major features “up in the air” it enables us to proceed to study some common aspects of this set that we feel typifies civilizations in general.

Based on this concept we have developed a mathematical theory of civilizations and applied it to known civilizations with apparently good results.² The theory begins with Toynbee’s well-known three and a half beat pattern for civilizations – a period of growth, followed by a breakdown (an “event” marking the end of growth), followed by cycles of rout-rally-rout-rally-rout-rally-rout. He observed that civilizations last for approximately a thousand years in general (barring catastrophes) with a four hundred year “Time of Troubles” and a four hundred year universal state. The “Time of Troubles” period typically has a “rally” and the universal state period typically has a “rout”.

These observations formed the starting point of the mathematical theory of civilizations. The first question that we addressed is “What is ‘rallying and routing’?” If we were discussing the stock market where this terminology

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originated it would be a representative stock market index such as the Dow or NASDAQ. But in the case of civilizations there was no existing index. Consequently we defined an index that we called the “societal level.” This index is a measure of the health of a civilization in the same way that a stock index measures the health of the market. The immediate question that arises is how to measure the societal level of a civilization and how to compare the predictions of the theory with the available historical data. These interrelated questions do not have a simple answer. The best that we can do is to plot the routs and rallies predicted by the theory as the history of a civilization evolves and then to compare the plot with the actual historical events that happened together with the “sentiment” of the civilization to see if they match. If they match for the vast majority of civilizations then we have a successful theory. In reference [2] many plots with historical data are presented that show the match is extremely good for Asian, Mid-Eastern, European, African and American civilizations.

Some additional detail that may be of interest to the reader is²

S = Societal Level = the strength of a civilization in terms of political and social institutions, social cohesion, ability to innovate to solve social problems, capacity for technological innovation, flexibility in finding solutions, enterprise in meeting challenges. The societal level is a measure of the inner development and inner strength (the psyche) of the people of a civilization. Historical events, social conditions and material conditions reflect the societal level in the sense that they are the symptoms that measure its state just as a doctor measures the health of a patient by the patient’s symptoms. Historical events are the symptoms of the “health” (societal level) of a civilization.

Thus naïve ideas that size, wealth, power, size of armies, and so determine the health of a civilization are not correct. And in our view the study of the causes of events in the case of civilizations is misleading. Some individual events can be singular (such as the temporary Gothic conquest of Rome in the first century AD). But the long term pattern of events is determined by the societal level. The thesis of our approach is that the course of a civilization is more determined by the inner strength of the people than by external factors except in the case of overwhelming events such as natural disasters or an invasion by forces with an overwhelming technical advantage. The inner strength and cohesion of the people determines the health of a civilization over the long term. Examples abound: Rome, the Greeks vs. the Persians and so on.

It would be possible in principle to develop a “societal level survey” along the lines of consumer sentiment surveys that would measure the societal level based on the “average” responses of a statistically significant sample of the people of a civilization. However, the determination of the questions on the survey and their mapping into

a societal level number are difficult issues. And the success of the survey approach can only be verified by applying it to multiple civilizations over a period of 500 to 1000 years or more. Thus substantial difficulties attend the survey approach.

If we plot societal levels, good events should appear during rising parts, and peaks, of the societal curve. A good event(s) also usually marks the low point in the curve and begins the upward trend. A bad event(s) marks a maximum (peaks are the beginnings of downward moves). Bad events typically appear during the downward move of the curve as well as near the minimums of the curve. Thus the overall pattern of events is the test of the theory's match with historical data. Individual anomalous good or bad events can of course happen at any time. In addition, we anticipate deviations of up to roughly a generation (± 34 years approximately) in the occurrence of events. The reason for these potential deviations is our belief (described later in detail) that the three and a half beat pattern is based on four generation trends in human societies. Thus the length of a generation is roughly our "error bar."

II. Nature of the Theory

The theory that we developed based on Toynbee's (and other historians') observations uses a physics formalism. Oscillating phenomena such as rout-rally cycles are common in physics. Since we wanted the theory to describe a civilization that builds to a peak, suffers a breakdown and then oscillates down to a static level, the simplest approach was to use a damped harmonic oscillator theory. We are all familiar with this theory in practice – imagine a large bell that is given an initial push, and clangs repeatedly, but moves with a diminishing oscillation until it comes to a standstill. That motion is damped harmonic oscillator motion. Simple enough to visualize.

Figure 1. The basic 3.5 beat Toynbee pattern as represented by the plot of the societal level in our theory.

After developing this picture we then realized that the time period before the breakdown was also part of the process. The initial push was a period of rapid growth of about 134 years that led to a peak – the point of breakdown. In contrast Toynbee was somewhat vague about the period of growth before the breakdown. When comparing this idea of a roughly 134 year period of growth with actual civilizations we saw some dramatic confirmation – most notably in the history of Egypt (the one hundred year period of the building of the great pyramids), and, in a less dramatic way, in the other civilizations. It also seems evident in the growth of some nations – consider the growth in the United States from 1800 to the 1930 – a period of enormous growth in percentage terms – the conquest of a continent.

Other extensions of our simple beginning point became apparent as the theory was developed and led to the complete theory described in reference [2]. For example, while a tolling bell eventually comes to rest in the same position as it was before the initial push, the people of a civilization are not the same after a civilization ends. Consider Hellenic civilization before 500BC compared to the civilization in the western branch after the fall of Rome in the fourth century. The invading Goths kept the structure of Roman society – including the civil courts – for the most part, reserving only the military and senior governorship for themselves. Thus our theory sums the rallies and routs of the history of a civilization so that the societal level of the end is above the societal level of the beginning. Spengler enunciated a similar idea that the history of a civilization accumulates. While many more points concerning our theory could be made that show it goes significantly beyond Toynbee it would be impossible to do so within the space limitations of a journal setting. The interested reader is referred to reference [2].

III. Application to Pre-historic Civilizations

After scientists develop a theory they often apply the theory to experimental data that previously was without any recognizable form and then they find that the “formless” data fits the pattern of the new theory. Similarly, an artist will often see meaning, form and beauty in a scene that an ordinary person would view as formless or without interest. The artist’s inner vision – the artist’s “theory of beauty” – leads the artist to recognize beauty and form where others might not. Modern Art in particular is often strongly based on the artist’s inner vision.

The mathematical theory of civilizations that we have developed also has the capability of providing a framework with which to examine historical data. Therefore we will see that we can use the theory to give form to little-known periods of prehistory. These periods of prehistory have no written language and thus what we know of these periods is based on oral records recounted by later generations of historians, or based on archaeological evidence. Many of the oral records can be viewed as “legendary.” Nevertheless we will seek the mustard seed of truth in these oral accounts and legends using our theory as the winnowing agent.

We have also applied² this technique to periods such as Carolingian times and Biblical times, and found recognizable patterns of civilizations in periods Toynbee viewed as *interregnums*. We found the placement of a civilization between Hellenic civilization and Orthodox Christian (main body) made sense when we examined events in the Eastern Roman (Byzantine) Empire. We called this “new” civilization Byzantine civilization.

Similarly the placement of a civilization between Syraic civilization and Iranian Islamic civilization also seemed to make sense and be in accord with historical data. This “new” civilization which we call Iranic civilization started in 312 BC and was based on a fusion of Hellenic and Iranian culture. Its historical events matched the routs and rallies in the societal level of the theory.

In addition we found historical support for a “new” civilization in Palestine starting in 107 AD that we call JudaeoPalestine civilization, and an Early Hindu civilization starting in 80 AD. All of these civilizations show a pattern of historical events that follows the routs and rallies of our theoretical societal levels.

IV. Some Prehistoric Civilizations

By providing a view of prehistoric civilizations through the use of our theory we provide an intellectual framework with which to understand these civilizations, and provide guidance to archeologists and historians at work in the field on uncovering the civilizations.

The first generation civilizations, that Toynbee was aware of, have had the good fortune to have a written language in which their history has been at least partially recorded. We think particularly of the Sumeric, Egyptaic and Sinic civilizations in this regard.

Both the Egyptaic and the Sinic civilizations have writings referring to an earlier stage in their civilizations, or a predecessor civilization, that existed prior to the known civilizations with which we are familiar. These periods were more or less prior to the development of writing.

Some Egyptian and Greek historical records describe a period of civilization with a united Egypt under the Pharaoh Menes in 3000 BC. While we often think of Egyptaic civilization as suddenly flowering from nothing, and then the immediately building of the pyramids, there is a long prior period during which the Nile Valley was brought into cultivation, and societies and governments developed. This prior period encompassed the 0th and 1st Dynasties. It included the legendary kings:

Ka, Narmer, Aha, Djer, Djet, Den, Anedjub, Semerkhet, Qa’a

King Narmer appears to be the King who united Upper and Lower Egypt based primarily on a shield-shaped sculpture called the Narmer Palette that has been dated to 3150 – 3125 BC. The front side of the Narmer Palette shows Narmer wearing the White Crown of Upper Egypt in the act of striking an enemy from the marshlands. The rear side shows Narmer wearing the Red Crown of Lower Egypt (the Nile delta) as he inspects the bodies of headless enemies.

In the period from 3500 BC to 2600 BC, Egypt evolved from two separate regions, Upper Egypt with strong African influences and Lower Egypt (the Nile delta region) with strong Libyan and Middle Eastern influences, into one united kingdom. The building of the great pyramids that followed reflected the wealth and power of a united Egypt. This later Egypt was the Egypt of Egyptaic civilization.

But the prior one thousand years contained an Egypt of various states created during and after the taming of the Nile Valley. It also developed a universal state that existed for about four hundred years before the beginning of Egyptaic civilization (which we have set for good reason at 2557 BC.)

The only other important “known facts” of the thousand years of prehistory are:

- A major (unspecified) calamity took place in the reign of King Semerkhet around 2800 BC,
- An upheaval appears to have happened during the reign of King Qa’a,
- A major rivalry existed between the cults of Set and Horus around 2725 BC.

Although the data on Egyptian prehistory is somewhat sketchy we can use our theory of civilizations to develop a picture of that civilization based on any one of the following dates:

1. The beginning of the time of troubles
2. The end of the time of troubles
3. The beginning of a universal state
4. The end of a universal state

Any one of these data items fixes the S curve (the societal level curve) for the civilization. Any other information that we have on the civilization can then be used to check the routs and rallies of the S curve to confirm its validity.

Similarly we can examine the information in early Chinese writings referring to prehistoric dynasties and empires from the period before the recognized beginning of Sinic civilization. Again only one date is necessary to fix the S curve for a possible pre-Sinic civilization.

We do not expect that many more unknown civilizations will be uncovered in view of the beginning of climatic conditions favorable for civilizations only 10,000 years ago and the need for some time after that point for the growth of agriculture and the growth of population levels necessary for civilization. However, if evidence of additional civilizations is found, then our theory offers a way to set up a time framework for the evolution of a civilization with minimal data input: namely one of the above mentioned four dates.

V. A Prehistoric, Unrecognized Egyptian Civilization?

The Narmer palette showing Narmer wearing the White Crown of Upper Egypt and the Red Crown of Lower Egypt is believed to indicate that Narmer united Upper and Lower Egypt into a universal state. Other historical data indicates his central importance. Since the Narmer Palette has been dated to 3150 – 3125 BC we have chosen 3157 BC as the beginning of the universal state of a prehistoric civilization that we will call *Nile River civilization*.

Figure 2. Societal Level curve of Nile River civilization.

Allotting 400 years for a time of troubles and 134 years for a Startup growth phase we arrive at a beginning date of Nile River civilization of 3691 BC. We use the standard theory of a civilization to obtain the societal curve shown in Figure 2.

The Semerkhet Calamity and the Qa'a Upheaval appear at a low point of the theoretical societal level. Also, the rivalry between the Set and Horus cults appears on the slope of a downturn in the societal level. Thus there is a correlation between known historical events, and the routs and rallies of the societal curve. As further archaeological data surfaces, more detailed tests of the S curve of the Nile River civilization will be possible.

VI. A Prehistoric Unrecognized Chinese Civilization?

Chinese writing matured during the waning years of the Shang Dynasty around 1400 BC to 1200 BC. Prior to that time we have pictographs and early Chinese characters—many of which are not known, or imprecisely known, in terms of modern equivalents.

Chinese prehistory is not well documented. Some Chinese classics describe legendary figures and historical events of the period before 1000 BC. Some of these works appear to contain passages that are forgeries from later times. Generally Western historians have viewed historical accounts of these early times with suspicion.

Hints of an Early Chinese Civilization

However, recent archaeological finds have been changing the view of western historians. The Shang Dynasty period from 1766 BC to 1123 BC was viewed as mythical until recent archaeological discoveries confirmed the existence of this dynasty and its place in the history of China. The earlier Hsia Dynasty (usually thought to last from 2205 BC to 1766 BC with some proposing the alternate period of 1994 BC to 1523 BC) has been radiocarbon-dated to 2100 BC to 1800 BC in relatively recent archaeological studies of its capitol city.

An examination of the culture and events of China between 3000 BC and 1000 BC suggests that a civilization existed in the Yellow River region which we will call the *Yellow River civilization*. The sophistication of the *Shih Ching* (the “Book of Songs”) which dates to before 1000 BC confirms the existence of a lengthy, previous cultural tradition. We will now summarize the known events and features of the period before 1000 BC that suggest an unrecognized civilization existed in that period.

Chinese History from 3000 BC to 2205BC

Chinese history in this period has a mythological flavor but probably is based, at least in part, on historical fact. There are two phases in this period: the period of the three cultural heroes and the period of the three sage kings. The center of cultural development was the Yellow River valley. The climate of the valley at this time was warmer and more moist than the present climate of this region. Swamps and lakes were more common.

The three cultural heroes were three great kings who were prominent in a period of significant cultural development. They were accorded credit for the cultural and technological progress of the period. These great kings who lived between 2800BC and 2600 BC are:

- Fu Hsi – He taught men how to hunt, fish, and cook.
- Shen Nung – He developed the cultivation of the five grains, invented the plow, and established markets (a mercantile economy).
- Huang Ti – He invented boats, oars, and the fire drill. He cleared the plains with fire so crops and cattle could be raised. He encouraged his court to cultivate music.

The three sage kings of this period were Yao, Shun, and Yu. These kings were celebrated for their wisdom and virtue. The approximate date of their activity is:

- Yao – 2350 BC
- Shun – 2250 BC
- Yu – 2205 BC

Emperor Yu, who drained the land so that it could be cultivated, is reputed to have created the mountains and founded the Hsia Dynasty in 2205. Most western historians view the period up to the founding of the Hsia Dynasty as

mythological. Yet the fact remains it was a period of major cultural growth as well as major advances in agriculture.

Chinese History from 2205 BC to 768 BC

This period can be viewed as composed of three parts: the Hsia Dynasty (2205 BC – 1766 BC, or alternately 1994 BC – 1523 BC), the Shang Dynasty (1766 BC – 1123 BC, or alternately 1523 BC – 1027 BC), and an interregnum (1123 BC – 768 BC, or alternately 1027 BC – 768 BC) started by a successful invasion of King Wu of Chou (the leading march (frontier) state).

The Hsia Dynasty was founded by the sage Emperor Yu in 2205 BC in an inland portion of the Yellow River valley. Historians had viewed this dynasty as mythological until excavations in 1959 in the city of Yanshi uncovered what appears to be the capitol of the Hsia Dynasty. Radiocarbon dating of artifacts at the site showed they dated from 2100 BC to 1800 BC.

The Hsia Dynasty existed until the reign of Emperor Chieh, reputedly a decadent emperor, who was overthrown by the wise and virtuous Emperor T'ang who founded the Shang Dynasty in 1766 BC.

The Shang Dynasty is noted for the invention of Chinese writing. Some of the noteworthy events and features of the Shang Dynasty are:

- The Dynasty had a number of capitols until Emperor Pan moved the capitol permanently to Yin (near modern Anyang) in 1401.
- The Dynasty developed a highly organized bureaucracy.
- Bronze casting reached a peak of perfection during the later years of the Dynasty.
- The religion of this period combined ancestor worship with the worship of a supreme god Shang Ti (“Lord on High”) who presided over the lesser gods.
- Between roughly 1500 BC and 1100 BC Chinese writing underwent a transition from pictographic writing (pictures representing words) to Chinese characters similar to modern Chinese characters. Many of the Chinese characters of those times are not known today.
- The boundaries of the Shang Empire at its peak were the Pacific Ocean on the East, Shensi on the West, southern Hopeh on the North and the Yangtze on the South.

The Shang Dynasty ended in 1123 BC. There was a great drought in the reign of the last Shang emperor, Ti-hsin, that probably weakened the dynasty significantly. King Wu of the leading march state, a vassal on the frontiers of the empire, staged a successful revolt and invasion in 1123 BC conquering the empire. Wu started the Chou Dynasty that also appears at the beginning of the Sinic civilization.

The period between the fall of the Shang Dynasty (1123 BC) and the beginning of the Sinic civilization (768 BC) was an interregnum. This period contained about 1773 feudal fiefs engaged in constant warfare. It is similar in character to the feudal period of European history.

A Yellow River Civilization

The Hsia Dynasty lasted for approximately 400 years. The Shang Dynasty lasted for approximately 600 years. The length of these periods and the advanced state of their culture strongly suggest that a significant civilization existed.

We will apply our standard theory of civilizations to the Yellow River civilization and set the end of the civilization's universal state to the end of the Shang Dynasty in 1123 BC. With this choice the beginning of the civilization (the startup) is 2057 BC – a date that is consistent with the radiocarbon dating of the Hsia Dynasty to 2100 BC.

Remarkably the beginning of the universal state is 1553 BC and the time of troubles period lasts from 1924 BC to 1523 BC – these dates are remarkably similar to the dates that some modern scholars specify for the Hsia Dynasty (1994 BC to 1523 BC) and the Shang Dynasty (1523 BC to 1027 BC). With a Startup date of 2057 the dates are consistent with radiocarbon dating of the Hsia capitol artifacts at Yanshi.

Figure 3. Societal Level curve of Yellow River civilization.

VII. A New View of Chinese & Egyptian Civilizations?

The analysis we have performed on prehistoric Egypt and China strongly suggests that unrecognized prehistoric civilizations existed in those countries. In our view the list of Egyptian and Chinese civilizations is:

Chinese civilizations:

2057 BC – 1123 BC	Yellow River
768 BC – 172 AD	Sinic
172 AD – 878 AD	New Sinic
878 AD – 1853 AD	Far Eastern (main body)
1950 AD – 2884 AD	SinoTechnic

Egyptian civilizations:

3691 BC – 2757 BC

2557 BC – 500 AD

Nile River

Egyptaic

The application of our theory to other potential lost civilizations, that may be uncovered as archaeology progresses, can help to expand our understanding of these forgotten civilizations.

VII. Reconstructing Mayan Civilization

Recently new Mayan hieroglyphics were accidentally found in Dos Pilas, Guatemala that describe a series of events and wars between the Mayan “superpowers” Tikal and Calakmul.³ These historical findings appear to support our new mathematical theory of civilizations. Previously Mayan history was viewed as a collection of random wars between city-states that ended around 900 AD in a mass exodus from the cities. It now appears that Mayan civilization was undergoing a pattern of development that is similar to the pattern of development of Eurasian civilizations.

If we apply the standard societal level curve to Mayan civilization we need to set only one parameter – the point where the civilization began its rise. We set the beginning of Mayan civilization to 223 BC. Prior to that year we view Mayan society as largely static. Figure 4 shows the plot of societal level with known events of Mayan history (including the new hieroglyphic data) identified. There appears to be good agreement with the historical data.

A series of major wars between Tikal and Calakmul, Mayan superpowers, in the fifth through seventh centuries appears to have brought Mayan civilization to its knees. Recently unearthed hieroglyphics describe phases of this war such as the founding of an important military outpost (stronghold) Dos Pilas by Tikal in 629, its conquest by Calakmul around 650, its emergence as a powerful state that conquered its founder Tikal around 660, and its eventual abandonment in 760. Thus a sequence of what originally appeared to be local conflicts between 600 and 700 were, in reality, a continuation of a “world war” between Tikal and Calakmul that culminated in the conquest of Calakmul in 695 by Tikal.

The roughly 250 years of warfare between Tikal and Calakmul lasting from the fifth through seventh centuries corresponds to the 267 year cycle found in Western civilization, and Middle Eastern and Asian civilizations, and embodied in our theory.

Mayan civilization began with a roughly 134 year period of major growth starting around 223 BC. Great cities were built such as El Mirador. Teotihuacan was also founded in the first century BC. Mayan civilization then

went through three and a half cycles of ups and downs just like Eurasian civilizations. The last cycle was dominated by constant wars between Tikal and Calakmul that culminated in the decline of Mayan civilization. Tikal's conquest of Calakmul around 700 AD started the last stage of decline that ended in the complete abandonment of the Mayan cities around 900 AD. The last stages of the decline of the Mayans can be compared to the last stages of the decline of Rome: constant warfare with Barbarian invaders culminating in the conquest of Rome and the reduction of Rome to a small agricultural village among splendid ruins.

Thus the spectacle afforded by Mayan history compares with that of European and Asian civilizations, and confirms the evolution of civilizations is based on our common human nature.

As Figure 4 shows, overwhelming fratricidal warfare between states weakened the strength of the civilization in the period from 445 – 575 AD. The period between 580 and 700 shows an upturn in the civilization that is probably due to a lower level of conflict that allowed the civilization to begin growing again. The settlement at Dos Pilas in 629 and its growth into a major power support the notion that the Seventh Century was a period of growth.

The emergence of a “winner” – Tikal – in 695 with the conquest and destruction of Calakmul roughly marks the high point of the period.

The period denoted “Time of Troubles” was probably a period of fierce conflict between the city-states. In Eurasian civilizations it is normally a period of ruinous conflict.

The period denoted “Universal State” normally is a time in the life of a civilization where the civilization is dominated by an empire. In the case of Mayan civilization this time may actually have been a time dominated by a confederation of states that often had internal wars. It may have been analogous to the Parthian Empire, which consisted of loosely united, more or less independent provinces.

The history of Teotihuacan appears to follow the general pattern of Mayan civilization. It was founded during the period of great initial growth, reached its peak shortly after a peak in Mayan civilization and collapsed at roughly the same time as Calakmul was conquered.

Figure 4. The pattern of Mayan civilization.

VIII. A Sub-Saharan Civilization

There is little concrete data available on Sub-Saharan civilizations because much of their history is based on oral traditions rather than writings. Another difficulty is the general isolation of these civilizations from Middle Eastern, Asian and European civilizations primarily due to geographical reasons.

One Sub-Saharan civilization that does have some solid data on its history available is the Great Zimbabwe civilization⁴ which lasted approximately from 500 AD to 1600 AD. While there are no known oral or written historical records of this civilization there are impressive ruins of a large city (now known as Great Zimbabwe) between the Limpopo and Zambezi rivers east of the Kalahari desert that show the magnitude of this civilization. Shona speaking people started moving into the valley containing this city about 500 AD.

The country was capable of supporting a sizable population through livestock and farming. However the main reason for the development of the city and civilization of Great Zimbabwe appears to be gold. The city, unlike most cities, was not located on one of the rivers in the area. Instead it appears, in one view, that it may have been located on top of a rich gold deposit. The gold furnished the money needed to build the city and to import goods from other parts of Africa and also from India to some extent. (On the other hand, some archaeologists believe that the economy and power of Great Zimbabwe may not have been founded on gold mining. Great Zimbabwe lies on the routes from gold producing regions and Indian Ocean ports such as Sofala, Mozambique. African gold and ivory was traded for beads, cloth, and other goods. For example, Celedon pottery from the early Ming Dynasty was one of the most common imports found at Great Zimbabwe. From 1000 AD onwards Zimbabweans had access to Indian, Chinese, and Persian imports.)

The purpose of the city with its massive walls of up to 32 feet in height and sometimes reaching seventeen feet in width may have been to protect gold, and to act as a religious center for the worship of Mwari, their god, who they viewed as the creator and sustainer of life.

The most important of the Great Zimbabwe ruins is the “Elliptical Building” – a building with a circumference of roughly 800 feet and a diameter of up to 293 feet. Together with surrounding ruins it covers an area of roughly 1800 acres. Part of the purpose of the building may have been to act as a smelter and repository of the gold extracted from the mine beneath. It appears that up to 20,000 people may have lived in huts outside the Elliptical building.

Major growth in trade led the Zimbabweans, the Mwenemutapa, to centralize their government. Originally they had ruler-priests. As they rose to empire the Mwenemutapa transitioned to a military kingly government that became the greatest empire south of the Sahara.

The currently known chronology of the Great Zimbabwe civilization is:

- Arrival of Shona Speaking people: 500 AD
- Mwenemutapa or Monomotapa Empire: 1000 AD – 1400 AD

- Great Zimbabwe city constructed from 1250 AD – 1400 AD
- End of Great Zimbabwe civilization: 1500 AD
- First mention of Great Zimbabwe City by Europeans: 1531 by Captain Viçente Pegado, of the Portugese Garrison of Sofala, Mozambique.

If we take our standard societal level curve and apply it to the Great Zimbabwe civilization we need to set only one parameter – the point where the civilization began its rise. We set the beginning of the Great Zimbabwe civilization to the approximate arrival time of the Shona speaking people 500 AD. The known events of the history of Great Zimbabwe are in good agreement as shown in Figure 5.

The fact that the known features of this relatively isolated culture conform to the theory of civilizations strengthens the belief, expressed in reference [2], that we have found a fundamental multi-generation social feature of human societies based on a subtle combination of genetic components in the makeup of modern mankind.

Figure 5. The societal level of the Great Zimbabwe civilization compared to the known events in its history.

IX. Conclusion

The application of our general theory of civilizations appears to be consistent with the known facts of these prehistoric civilizations. Thus our theory appears to be a tool for the analysis of these civilizations. As archaeologists and historians piece together new data the theory provides a means of organizing the data and creating an overall perspective of the history of each prehistoric civilization. In addition new data will provide new tests of the scope and validity of this theory of civilizations.

In addition to showing the general validity of the theory, reference [2] also applies the theory to apparented civilizations showing a continuity in the successive civilizations of regions; extends the theory to describe the interactions of civilizations with each other, and also with “barbarian” societies; and develops models of the effects of an industrial revolution on a civilization based on the theory. It also accounts for arrested civilizations such as Eskimo civilization.

The generality and success of the theory seems to be based on inherent four generation trends in Mankind totaling approximately 134 years – the length of a rout or a rally. These types of trends appear to be present in all branches on Mankind on all continents. The only way that we can understand the universality of the four generation effect is to postulate a genetic origin involving a complex

combination of genes that establish multi-generational social/psychological trends. The origin of this complex behavior pattern must lie in some ancient competitive advantage that selected in its favor – perhaps tied to weather patterns.

It is interesting to note that a major branch of psychiatry – Jungian psychiatry – postulates the existence of certain common patterns of ideas and symbols in individuals called *archetypes*. In our present discussion we see a common, long term social behavior in masses of mankind called civilizations. The similarity is evident.

In the beginning of this paper we noted that the definition of civilization was an area of controversy. After seeing a common pattern that can be mathematically quantified the question arises: Can we use this pattern as a defining feature of a civilization? Certainly it is operationally well defined. Naturally we would add other qualifying features as well to frame a working definition of a civilization.

References

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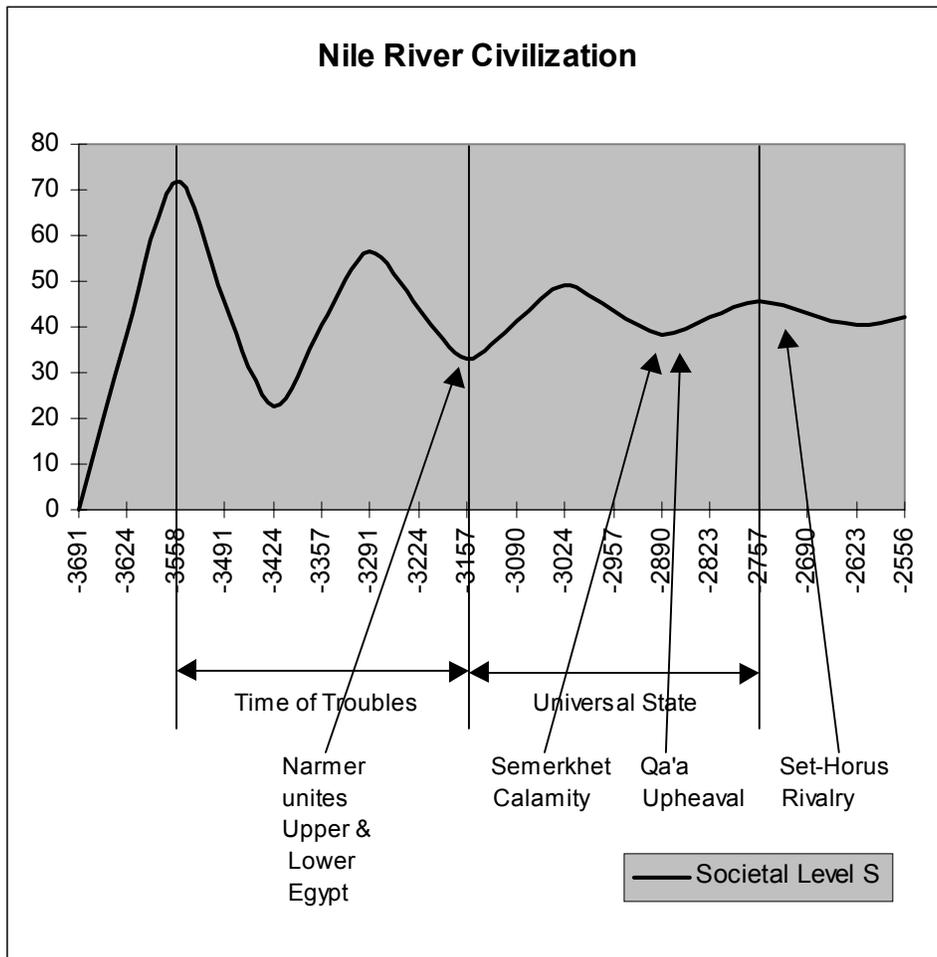


Figure 2. Societal Level curve of Nile River civilization.

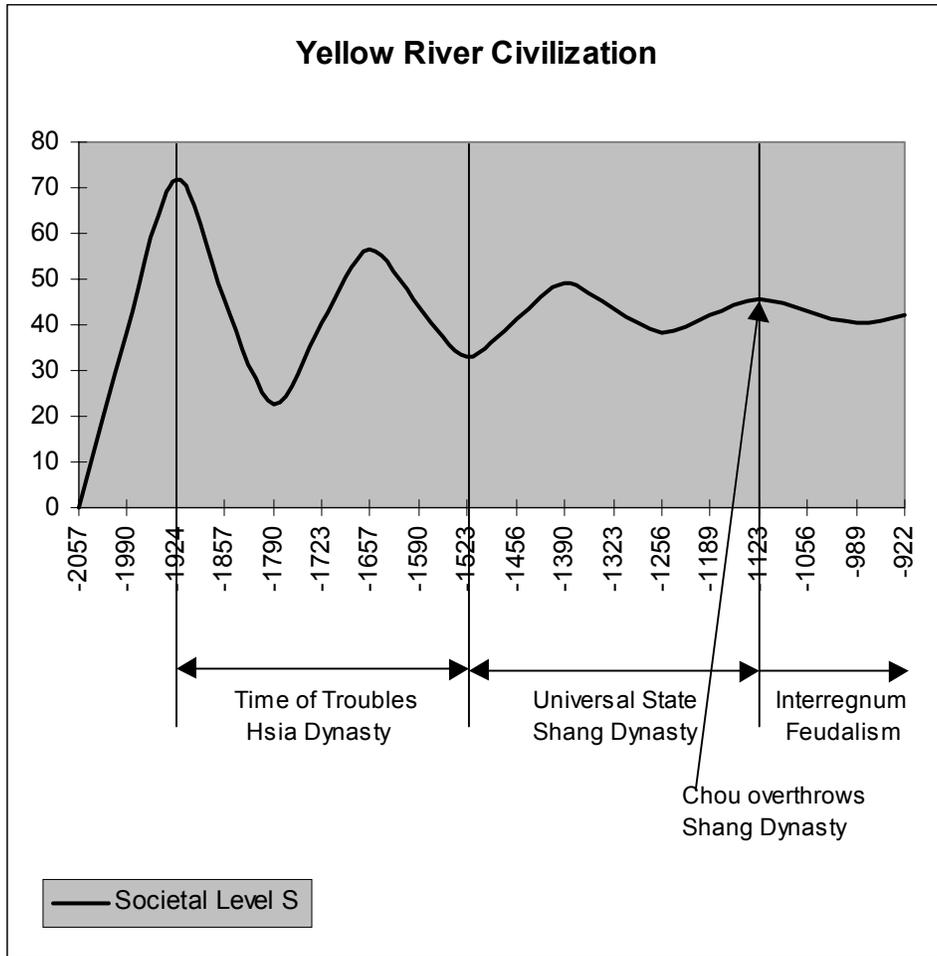


Figure 3. Societal Level curve of Yellow River civilization.

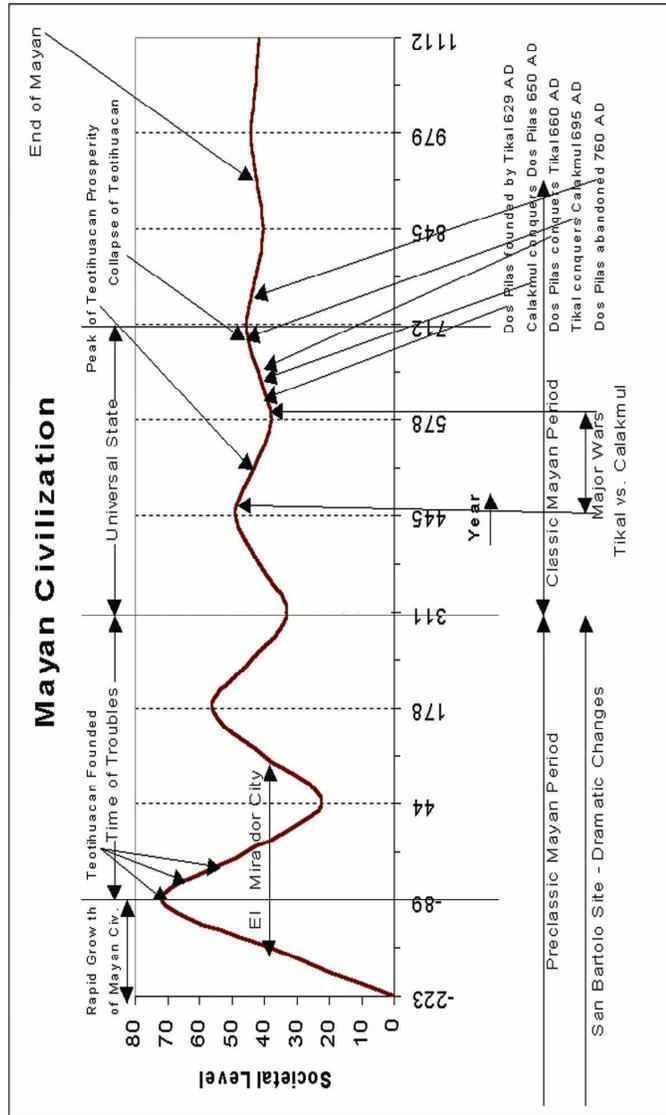


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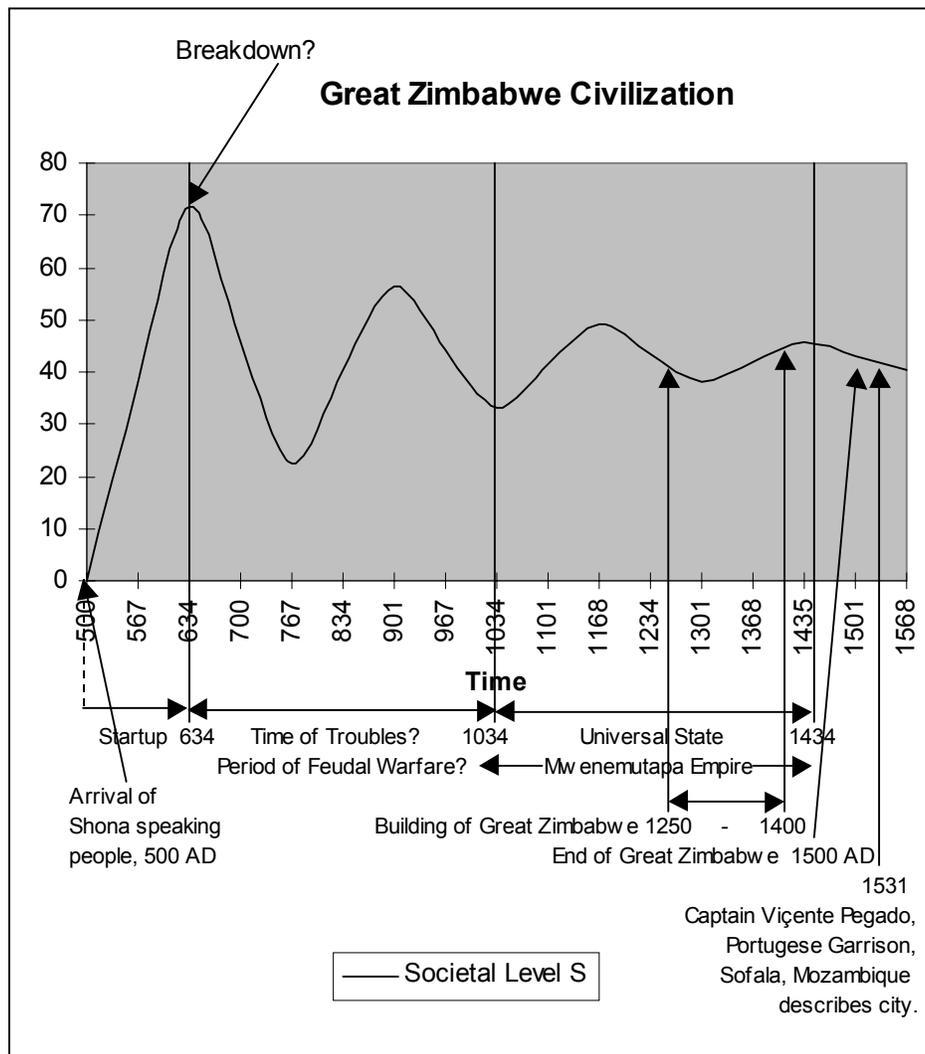


Figure 5. The societal level of the Great Zimbabwe civilization compared to the known events in its history.