

# *On The Cyclical Nature of Excellence*

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*Quantitative evidence which supports the cyclical nature of the rise and decline of cultures is presented. The data, together with a knowledge of history, permits the construction of past cycles involving the ancient world. The same data and the current developments lead to predictions about the next cycles.*

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In a number of cultures there is an implicit belief in the cyclical nature of phenomena. This belief is based partly on observation, for example, seasonal cycles and all that is triggered by them, and partly on philosophy. A number of historians and philosophers have developed theories to explain the rise and decline of cultures [1]. Ibn Khaldun, a world renowned Arab philosopher and historian of the fourteenth century, expounded a theory based on a concept called *asabiyah* or social cohesion, leading to the rise and decline of societies. Oswald Spengler (1880-1936), a German philosopher, believed that the west had passed through the mature creative stage of culture into the stage of reflection and material comfort and that the future would bring a period of decline. Arnold Toynbee (1889-1975), an English historian, believed that the decline was a process of exhaustion and the rise was not a result of superior racial qualities or geographical considerations but rather a result of challenge in a situation of special difficulty that rouses people to make an unprecedented effort. Finally, Ravi Batra, presently an economist at Southern Methodist University, used P.R. Sarkar's [2] theory of social cycles to predict the economic performance of western and eastern nations [3] into the next century.

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Being technically inclined, we set out to investigate whether quantitative evidence exists showing the rise and decline of cultures. We have discovered such evidence which has led us to write this paper. The discoveries lead to some interesting predictions about the future as we will see.

Ideally we would have liked to see included, several cultures from the ancient world (China, India, Egypt) as well as several from the pre- and post-Christian world (Greece, Great Britain, Germany, United States). Due to the difficulties associated with finding quantitative data pertaining to the ancient cultures, we limit our scope here to the latter four, for which reliable data are available. Investigations pertaining to the ancient cultures are underway and the results will be communicated in a future paper.

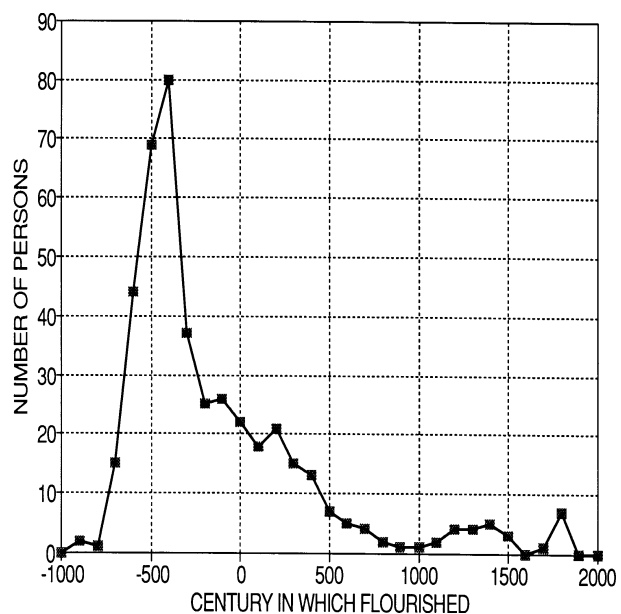
## THE DATA

Our principal source of information is the Encyclopedia Britannica [1]. The encyclopedia contains in-depth information on the western cultures. Persons with outstanding achievement are selected for inclusion in the encyclopedia after a careful scrutiny by a board consisting of international scholars. Thus we assume that an indication of how well a particular culture has performed or is performing may be obtained by examining the number of persons from that culture listed in the encyclopedia as a function of time.

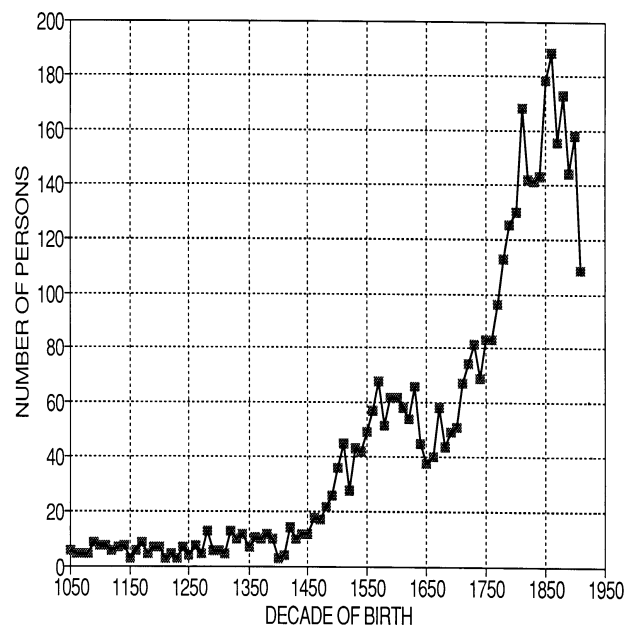
With this background, the data on Greece, England, Germany, and the United States were compiled. We found that 434 persons from Greece, 3850 from Great Britain, 1592 from Germany, and 4411 U.S. citizens are listed in the encyclopedia. These data were plotted and are shown in Figure 1-4. Figure 1 is indicative of the rise and decline of the Greek culture with an unmistakable peak at the fifth century B.C. There is little activity after about 500 A.D. Figures 2-4 show clear peaks at 1860, 1880, and 1900 A.D. for Great Britain, Germany, and the United States, respectively. The last three peaks are in terms of the decade of birth of the listed individuals and so in terms of the calendar year, the peaks probably occurred fifty or so years later.

## CONSTRUCTING THE PAST CYCLES

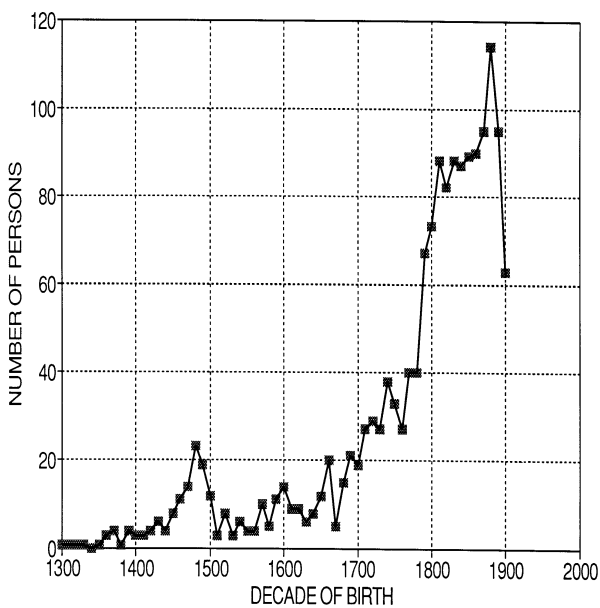
The pioneering contributions of ancient civilizations to humanity are well known. One example from the Indian subcontinent is illustrative of the awesome heights that the vedic Indians had reached. They wrote the vedas (in Sanskrit, veda means storehouse of knowledge), the earliest among which is the Rigveda that is estimated to be 4000 years old. The Rigveda contains 1,017 hymns. Assume for a moment that the vedic Indians believed in the cycles of excellence. Having developed deep knowledge, they must have wondered how they could preserve the knowledge for persons who would live in the next ascending part of the cycle of excellence, presuming that during a thousand years or more of decline between the cycles, their successors would not have the capacity to absorb it. They appear to have devised an ingenious plan. They wrote the knowledge in the form of hymns to be passed on from generations to generations in a oral tradition. They must have reckoned that attempts to preserve knowledge, say in astronomy, as dry facts would not have much of a chance of success; coding it in the form of prayers had a better chance. That they succeeded is evident by the fact that even in today's India there are people who know the four vedas by heart. However, they only know the surface meaning of the hymns. A number of examples can be cited that are indicative of how far down a society can slide but we will be content with just one. During a recent visit to India the first author presented a telephone bill at the telephone office in a major city along with funds to cover a year's charges in advance. No, said the cashier; advance payment required a written request justifying the need for advance payment and in such a case, payment must be made by bank draft (cashier's check)! A second example involves Greece. The culture that produced the likes of Aristotle, Plato, Socrates, Archimedes, and Homer is today considered by many to be the weakest link within the European community. Many of the other ancient cultures are today referred to as the third world. This background permits us to conclude that the ancient cultures have experienced rise and decline. The vision provided by the evidence in Figures 1-4, and this background permits us to construct the previous



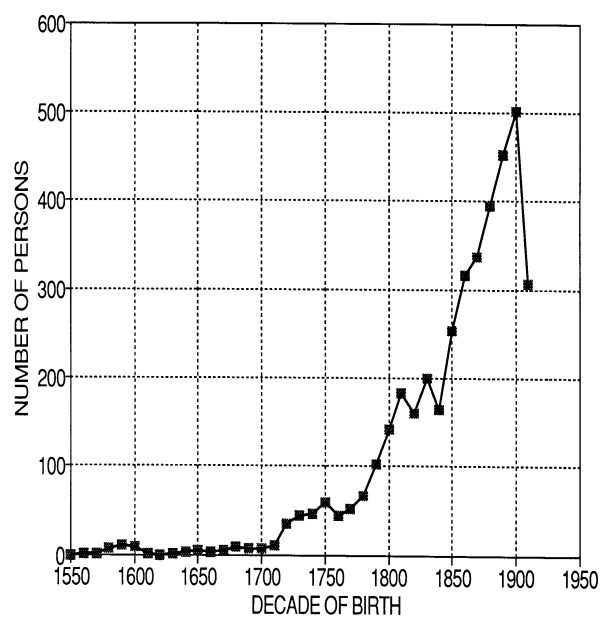
**Figure 1. Rise and Decline of Greece**



**Figure 2. Rise and Decline of Great Britain**



**Figure 3. Rise and Decline of Germany**



**Figure 4. Rise and Decline of the United States**

cycles pertaining to several ancient cultures. For some additional insights into the contributions of the ancient cultures the reader is referred to Michael Wood's *Legacy* [4]. Figure 5 shows a qualitative plot showing the rise and decline of several ancient cultures along with the same for pre- and post-Christian cultures. There is great deal of uncertainty about when the peaks associated with the ancient cultures occurred but there is little doubt about the existence of the cycles.

### WHAT THE DATA ALSO TELL US

Figures 1-4 lead to a number of observations.

1. Within the span of some 6000 years of known history, the cycle appears to have begun in the east and moved westward through Greece and onto the United States. Of course, if the rise and decline are indeed cyclical, then there is really no beginning and no end.
2. No one culture can claim timeless and perpetual claim to superiority. There is reason for pride based on the performance at a given point in time, but arrogance has no basis in fact since decline

is inevitable. Thus, when a Japanese cabinet level official makes derogatory comments about the characteristics of the U.S. labor force, he shows a certain lack of understanding about the cyclical nature of excellence. There is a lesson in these data too that there appears to be no valid basis for discrimination on the basis of intellectual superiority.

3. A study is said to be in progress in the United States whose aim is to identify genetic links to criminal behavior. This type of study is tantamount to taking a time slice from one of these figures presented and arriving at a certain conclusion. For example, a 5th century B.C slice would perhaps have shown that Greeks are uniquely blessed with a large number of geniuses, a conclusion that would be incorrect if applied in 1900 A.D. In the same 5th century B.C., one could have arrived at the erroneous conclusion that the English or the Germans could produce no significant works. We submit that such studies provide no information that is fundamental in nature and at worse they create unnecessary friction among races at a time when racial/communal harmony and understanding in the today's world of increasing diversity is the call of the day.

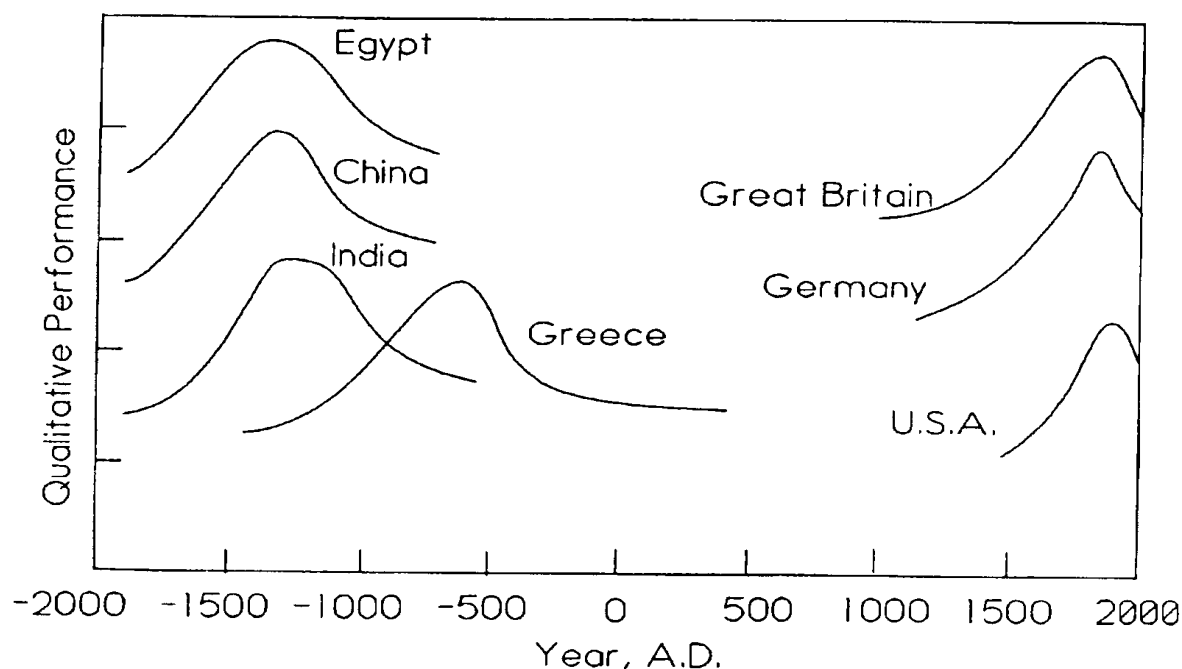


Figure 5. Cycles of Excellence; Past to Present

4. It should be mentioned that the achievements of the ancient cultures were due mainly to indigenous efforts. The rapid advances in communication technologies in recent years will have an interacting effect on the future cycles.

5. Now the million dollar question. Is the U.S. in decline? Figure 4 appears to indicate that the U.S. is in decline (see also [5] and companion articles in the same issue); the nation's ills prompted the former secretary of education, William J. Bennett, to compile an "Index of Leading cultural Indicators" [6]. However, several reviewers of this paper have pointed out that in posterity many persons could be added to the declining portions of the curve thus wiping out the negative trend. Our feeling is that the numbers required to wipe out the decline are so large (twice as many or more in many years) that trend reversal is not likely, but if that occurs, so much the better.

A second piece of evidence involves the share of U.S. patents awarded to the U.S. and to

Japan during 1963 - 1992. These data are shown in Figure 6. During this period, the U.S. share dropped from 83% to 56% while the Japanese share increased from essentially zero to 22%. In connection with the data in Figure 6 we point out that annual data prior to 1963 are not available; all that is known is that during 1963-1972 the U.S. share was 77% and the Japanese was 2%. The data shown in Figure 6 for this period are based on interpolations.

Some additional observations are in order. At the outset we recognize that unlike many other nations, the United States of America is a nation of immigrants. To shed light on the situation concerning the United States we borrow a concept from control theory. We visualize that creativity, productivity, and performance is a 2-input, 1-output problem. The inputs are genetics and the environment and the output is performance. In other words, creativity and performance are a function of both of these inputs. By environment we refer to all those factors which nurture and encourage productivity and performance. In some cases, genetics has the predominant effect; the prevailing environment does

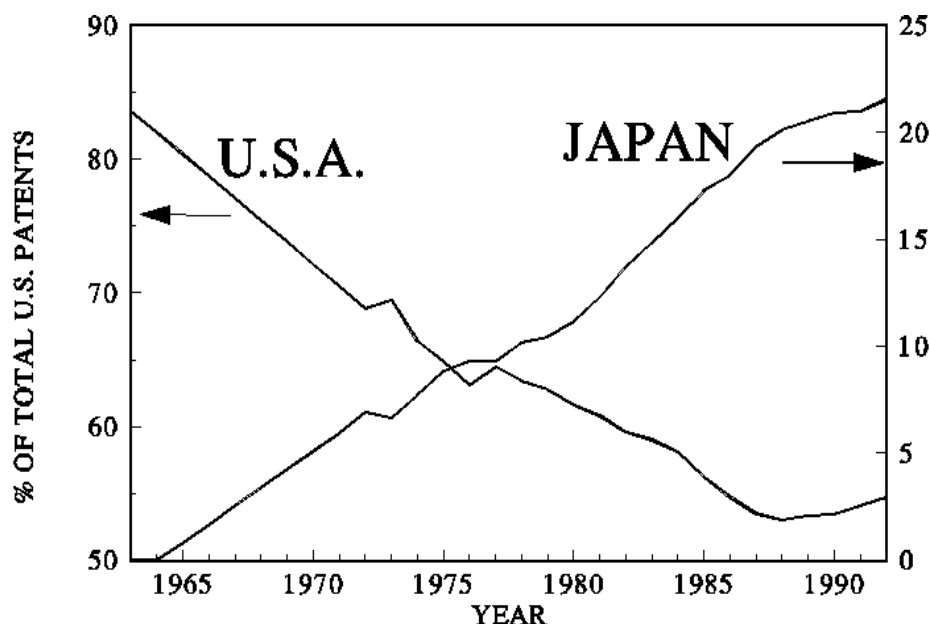


Figure 6. % U.S. Patents Awarded to U.S.A. & Japan

not affect the performance. Three examples among many in this category are 1) Amadeus Mozart who had mastery over western classical music at the age of five, 2) Dyaneshwar, living in rural India in 1290 A.D. interpreted the Bhagvadgeeta from Sanskrit into Marathi at the age of eighteen, and 3) Sir Isaac Newton was building mechanical toys as a boy. For a vast majority of individuals, however, the environment has a tremendous effect. This is the success story of United States; it is quite possible that providing a suitable environment to persons from cultures which are on the ascending part of the curves of cyclical excellence may have led to substantial accomplishments by these individuals. For example, the performance of individuals from eastern countries (China / Taiwan, Korea, India and the like) in the United States over past thirty years has been outstanding. Thus, when a U.S. politician says "Our Asians are better than their Asians" what it really means is that the environment has enhanced the performance of individuals from the ascending cultures. Thus although the data in Figures 4 and 6 appear to show that the United States may be in decline, it is possible that immigration has favorably affected the rate of decline.

A number of reviewers of an initial draft of this paper have cautioned against relying on limited sources, no matter how reputable, to draw conclusions about an entire society. We certainly respect this view and have inserted it here to bring it to the attention of the reader. If indeed the decline is real, then, one might ask, how can it be stopped or reversed? During the recent Presidential campaign, the Perot camp and the Clinton camp articulated the problems facing the country and outlined approaches to tackle them. We believe the problems they identified are symptomatic of deeper causes; merely tackling them may not be sufficient. In our estimation the fundamental problems facing the U.S. society are

i. Gender form of the almighty. The society needs to recognize that there are multiple paths in search of the truth; no one path is superior to others. There is no difficulty with the proclamation about the existence of the son of God or a prophet but the

implication that the almighty is a *he* leads to a number of significant problems, the most significant among them is discrimination against women. Such views are also not helpful in a society that is growing more and more diverse.

ii. The society needs to properly differentiate between what are dharmic (see, e.g, [1] under Emperor Ashok or refer to an English translation of Bhagvadgeeta) issues and which ones belong to the domain of civil laws. Failure to do this results in tension and turmoil. One may seek the appointment of individuals with a certain bent of mind to the highest court in the land and may well derive certain decisions, but the controversies will not end.

iii. Control desire, attachment, and the ego and find peace and contentment. The problems with the health care system are a good example of how greed can get the best of us. Those responsible for the mess not only include the providers of health care but also the receivers of that care, namely the members of the society. The eastern advise to shun desire and attachment is not practical for most people and the western approach is not working. The Greek proverb PAN METRON ARISTON , meaning moderation or balance, appears to be appropriate.

iv. In matters of relationships among spouses, move away from looking for perfect compatibility to compromise and sacrifice. Zero defect is a laudable goal for inanimate objects but is inappropriate for dealing with relationships among spouses. Former President George Bush correctly identified the breakdown of the family as a fundamental problem facing America.

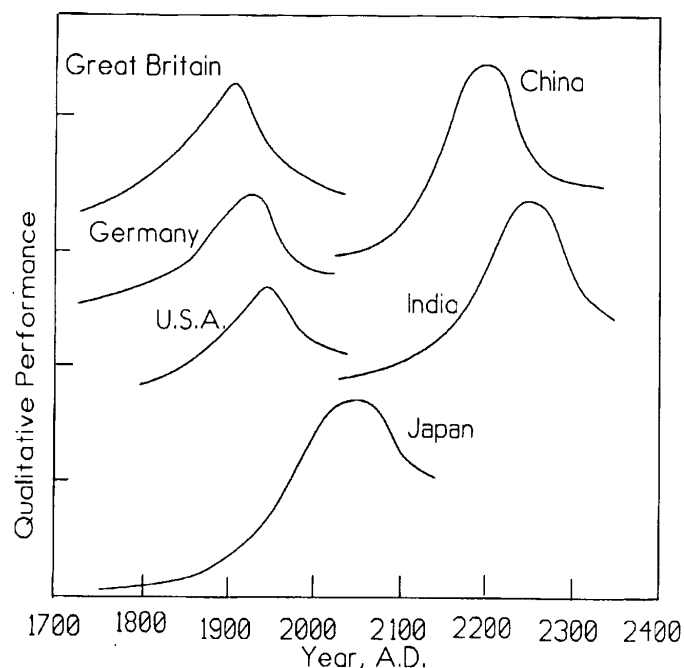
v. Recognize that Gaussian-type distribution applies to all cultures. Thus, while nonwhites (minorities) deserve special assistance in many cases, the members of the majority community at the lower end of the spectrum also deserve help. Failure to deal with this issue is likely to lead to increased racial tension in coming years.

vi. The stress level in the society appears to be too high. Yoga, meditation and biofeedback may help relieve some of the anxieties.

vii. The value system. The free market economy has a number of virtues that we are all aware of. However, one drawback is that it appears to warp one's sense of values. How else can one explain the disparity of income levels between a rock star (\$50 million per year or more) and say an English teacher.

viii. Literacy and education. All of the above will fall on deaf ears without proper and enlightened education.

We hasten to add that putting these ideals into practice is not at all an easy task. We certainly do not claim mastery over them. A related thought here is that if the society has not come to grips with the foregoing issues, then, perhaps it has not yet reached the peak, implying that the decline can be reversed. If or when the society reaches that ultimate level of enlightenment, then, we are afraid, there will be no where else to go but down.



**Figure 7. Cycles of Excellence; Present and Future**

## PREDICTING THE NEXT CYCLES

The plots showing the next cycles may be prepared based on the following observations. One is that the achievements of Japan and the neighboring small-size countries in the East over the past fifty years have been phenomenal. It was not much over thirty years ago that the Japanese products were known for shoddy quality. Today, some of the best products in the world are made in Japan. Also relevant is the observation about the impressive accomplishments of the persons of Asian origin in the United States and the performance of the Asian children in international mathematics and science competitions. Dr. Subhash Kak, an Indian-American Professor of Electrical and Computer Engineering at Louisiana State University, has recently unraveled the code in the hymns from the Rigveda [7, 8]. Finally, there is consensus among business circles that the financial center of gravity is shifting toward the East [9]. It is understandable that smaller countries in the East such as Japan and Taiwan are showing the effect of the cycle first because of much faster dynamics associated with small scale systems. But the rise in the large systems, namely China and India, appears to have begun. There is ample evidence of significant achievements in both of these cultures over the past fifty years. The foregoing discussion permits the construction of the next cycles as shown in Figure 7.

A comparison of the material progress in Japan in contrast to the same in China and India in the recent decades leads us to believe that the rise of Japan on the cycle of excellence has quickened in part due to the small size of the system where quick changes are possible, but is also due in part to the success of the Japanese in adopting, adapting, and improving western technologies. This observation leads us to state that if the rate of rise can be speeded up as shown by the Japanese example, then it may also be feasible for the United States to reduce the rate of decline as alluded to earlier.

Some reviewers asked for an explanation for the gaps that appear to exist between the cycles. We note that only a few representative cultures have been studied to make the point about the cyclical

nature of excellence. Other cultures may fill the gaps. On the other hand, we do not know of any fundamental reason why there can or cannot be gaps. It is an open question.

We have presented evidence of the rise and decline of several cultures from the past and present. There is evidence too that some of the early cultures are on the rise again, which leads us to ponder if the phenomenon is cyclical in nature. Unfortunately, reliable historical information is available only for several thousand years and therefore a categorical answer cannot be given.

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