

On Eratosthenes, Maui's Voyage of Discovery, And Reviving the Principle of

by Lyndon H. LaRouche, Jr.



Detail from a frieze of Pharaoh Ramesses III depicts Egyptian armies beating back an invasion of "Peoples of the Sea" in 1191 B.C. Their Viking-like, single-sail vessel can be seen clearly in the diagram (left). The "Peoples of the Sea" would later settle in Cyrenaica, now modern Libya.

Discovery Today



The following presentation keynoted the panel entitled “What Is Real History As Science?,” at the Nov. 21-22, 1998 European conference of the Schiller Institute/International Caucus of Labor Committees, held in Bad Schwalbach, Germany. Other panel presentations included “Homer’s Odyssey, Seafaring, and the Principle of Colonization” and “Wilhelm von Humboldt’s Study of the Kawi Language” [SEE page 29].

Introducing Mr. LaRouche was Dr. Jonathan Tennenbaum, Science Adviser to the Schiller Institute, who has been studying the history, language, and culture of China. Dr. Tennenbaum related a Chinese story, which dates from more than 2,000 years ago:

“THERE WAS AN ARTIST who painted four beautiful dragons on a big wall. But, people who saw this painting, noticed that there were no eyes on the dragons, which were otherwise very powerful and impressive.

“So, people asked the artist, ‘Why don’t you paint the eyes on the dragons?’ And the artist said, ‘Oh, no, no, no, I can’t do that. If I would paint the eyes on the dragons, they would fly away.’

“Well, people didn’t believe him. And, finally, under a great deal of pressure, the artist agreed to paint the eyes on just one of the dragons. And, as soon as he put the eyes on the dragon, there was suddenly a great storm of lightning and wind, and the dragon that had the eyes on, started to move, and flew up to the heavens. And the dragons that didn’t have eyes, stayed on the wall, where they were painted.

“That’s the story. Now, how is this used as a metaphor? It’s used very commonly in China, to refer to the following situation. If you are writing an article, or giving a speech, there are sometimes certain things which, if they are added—they might be very small—but, if they are added, they cause the article or the speech, or the painting, to suddenly become extremely powerful, more powerful than it would be if these elements were not added.

“The Chinese expression for this is ‘adding the eyes to the dragon.’ And, in accordance with that, I would say, Chinese-style, that our conference, up to now, is really a very powerful dragon. We’ve had powerful speeches, very important things to say. But I think perhaps in this panel, something very special will be added, that will cause the dragon of our conference to fly up to heaven, and to become even more powerful than it was up to now.”

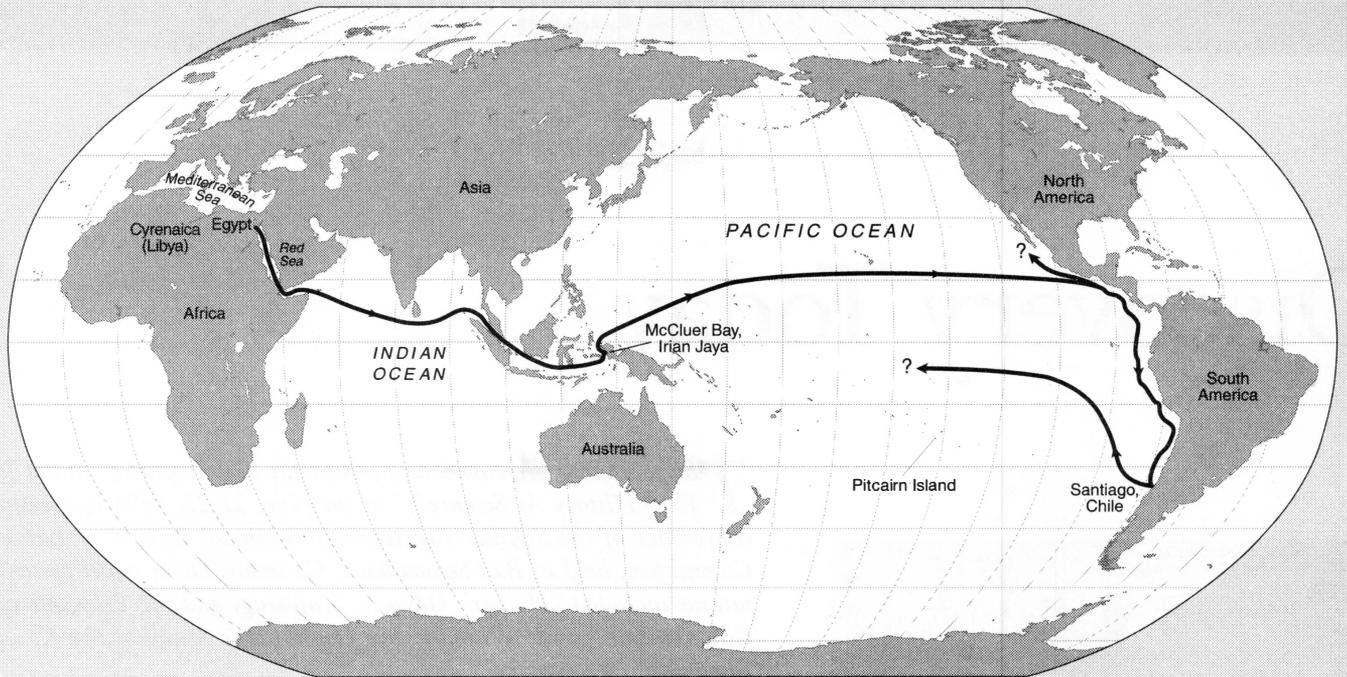


FIGURE 1. Probable route of the Egyptian voyage in 232 B.C.

A Voyage Around the World in the Third Century B.C.

A flotilla of ships set sail from Egypt around 232 B.C., during the reign of Ptolemy III, on a mission to circumnavigate the globe. The six ships sailed under the direction of Captain Rata and Navigator Maui, a friend of the astronomer Eratosthenes, who was head of the Alexandria library. The commander and navigator knew from Eratosthenes that the circumference of the Earth was 250,000 stades (approximately 28,000 miles), and they had state-of-the-art astronomical and navigational equipment. Although there is no record that the flotilla returned to Egypt, Maui and others left records of their voyage along the way.

The details of the expedition are known to us through written inscriptions and drawings left in caves, primarily in what are now called the "Caves of the Navigators" in northwest New Guinea (now Irian Jaya), near McCluer Bay; a cave near Santiago, Chile; and others from Pitcairn

Island and Fiji. The New Guinea inscriptions and drawings were discovered by a German exploratory expedition in 1937, led by Josef Röder of the Frobenius Institute of Goethe University in Frankfurt, and the Chilean inscription was found in 1885, by the Chilean-German engineer Karl Stolp, but they were not deciphered until the 1970's, when marine biologist and linguist Barry Fell figured out the connection between the Maori (Polynesian) language and a dialect of ancient Egyptian-Libyan [SEE Note on Decipherment, page 27]. Hundreds more ancient Maori inscriptions exist in the Polynesian islands, and, as Fell notes, there are also inscriptions in the ancient Egyptian-Libyan in North America.

Barry Fell's Hypothesis

In the early 1970's, Fell was teaching marine biology at Harvard University. A native of New Zealand, Fell was an exceptional linguist, with a working

knowledge of scores of languages, modern and ancient, including Maori. His passion for translating ancient inscriptions and his ideas about pre-Columbian settlements in America made him a controversial figure in archeology, and led him to write three books on the subject, the best known of which is *America B.C.* (New York: Simon & Schuster, 1976). The specific cave transcriptions discussed here appear only in the "Occasional Papers" of the Epigraphic Society, which Fell founded in 1974; they were not generally publicized.

Fell's supposition is that the expedition was sent out by Ptolemy III both to find new sources of gold for coins and to demonstrate Eratosthenes' "newly propounded doctrine." The flotilla of ships did reach South America, but never returned to Egypt. When the Egyptians did not find a navigable passageway through America, the supposition is that they turned back to return the way they

Why did 1,723 years pass between the discovery of South America by the navigator Maui, and the similar voyage of exploration conducted by Columbus?

had come, across the Pacific. One ship was apparently wrecked on Pitcairn Island.

Fell proposes that Rata, Maui, and the other members of the expedition became the founding fathers of Polynesia. In fact, he says, the actual names Rata and Maui appear in Polynesian legend. Further, he says, the ancient Maori-Libyan language, writing, and knowledge became the "initial heritage of Polynesia." Libyan inscriptions, according to Fell, were found in New Zealand "as late as A.D. 1450."

Later, geographer George F. Carter, Sr., recalled a cave inscription that had been copied by Karl Stolp, who had taken shelter in a cave near Santiago during a storm. Carter thought the script was similar to the Polynesian inscriptions. He was right: As Fell was able to translate it, the Santiago inscription gave the date as the "regnal year 16," which would have been 231 B.C., and also had Maui's name:

"Southern limit of the coast reached by Maui. This region is the southern limit of the mountainous land the commander claims, by written proclamation, in this land exulting. To this southern limit he steered the flotilla of ships. This land the navigator claims for the King of Egypt, for his Queen, and for their noble son, running a course of 4,000 miles, steep, mighty, mountainous, on high uplifted. August, day 5, regnal year 16."

—*Marjorie Mazel Hecht*

Mr. LaRouche drew his remarks from his essay, "Scrapping the Usual Academic Frauds: 'Go With the Flow'—Why Scholars Lied about Ulysses' Transatlantic Crossing," which appeared in the Nov. 20, 1998 issue of Executive Intelligence Review (Vol. 25, No. 46). We have incorporated some of the supplementary material which accompanied this EIR feature.

The argument essentially is this: Sometimes, in the course of history or scientific investigation, one is presented with a very fascinating and very challenging pattern of evidence. But, it's not yet conclusive. It teases you, it tempts you, it draws you into the subject matter. But, you can not finally draw a conclusion which settles the argument. It's something like a dog lurking in your backyard—it's just there all the time. You don't know to whom it belongs, you just know it's there. And you wait for its master to come by and claim it one day, or something else to happen, so that you may identify to whom this dog belongs.

Such is the nature of the matter we're dealing with today.

We'll start with the overall map, and we'll refer to this repeatedly [SEE Figure 1 and Box, facing page]. Now, the subject, the apparent subject, which is extremely tempting, and is especially tempting because there is an "eye" in this right away in Jonathan's sense, to begin with, is that a group of mariners under Egyptian direction, from an area then of Egypt, now of Libya, called Cyrenaica, set sail in a flotilla of ships which went down the Nile River and out to the Red Sea through a famous canal, which at that time connected the Nile River to the Red Sea.

These people then sailed—this was in 232 B.C.—they sailed to a place known to them, which is in the area today of Indonesia, which we'll refer to again. There, the chief mariner, the navigator of the expedition, a man named Maui, recorded a comment, which is a well-known comment, and recorded also an eclipse, which is a well-known eclipse, and gave the dating for that observation in a report which was painted in a cave, which they went to commonly.

Now, these were very large ships on this occasion, these Egyptian ships. They were not jokes. They were not balsa rafts. They were very serious ships, and I'll come to that in a while.

From thence, from inference we know, the expedition continued its journey from this West Irian location, across the Pacific Ocean, to probably about Panama. (I'll tell you why, later.) It then explored the South American coast, trying to find a way through the Americas, into the Atlantic Ocean, so they could get back to Egypt by way of the Atlantic.

Finally, after completing the exploration of the coast of South America, approximately 231 or 230 B.C., the chief navigator of the expedition, Maui, went into a cave area outside of what today is Santiago, Chile, and there made a record of their arrival, of their exploration, and claimed all of South America for Egypt. So you see, there are some Spanish land-titles that aren't too good these days.

The expedition attempted to return, but never returned to Egypt, because of a shipwreck—including one which occurred, according to record, on Pitcairn Island, which is the island known for the

sailors who escaped from the H.M.S. *Bounty*, the famous “Mutiny on the *Bounty*.” And they left a record of their arrival and shipwreck there on Pitcairn Island. The remainder of the expedition stayed in the Pacific, among people whose language they spoke, people we call today “Polynesians.” And they taught the Polynesians the art of transoceanic navigation.

The next time an expedition of this type is known to have occurred, was 1,723 years later, a little bit more than that, when Columbus, in October of 1492, reached the Caribbean in a transatlantic voyage.

Now, Columbus’s transatlantic voyage was based on a map, a map prepared for Columbus by a man who had entrusted a copy of it to a friend in Portugal. Columbus then corresponded with the author of the map, Paolo dal Pozzo Toscanelli, and got further advice from him on how to navigate across the Atlantic, to discover the land on the other side of the Atlantic Ocean.

Now, there are several crucial things, to talk about Jonathan’s “eyes on the dragon,” in this. There are several eyes.

The Collapse of Civilization

First of all, there was no civilization capable of making that kind of science-directed, transoceanic expedition, between 232 B.C. from Egypt, and Columbus’ voyage from Europe.

What does that tell you about the history of European civilization between the time of Maui, who was the navigator for this expedition, and the European civilization which finally came out of the mud to be able to make a *deliberate* transatlantic exploratory voyage?

What we’re talking about, is essentially a collapse of civilization, which dates from about the time that the Latins, the Romans, murdered Archimedes, until the Renaissance. Because it was the circles of Nicolaus of Cusa and his friends, including Paolo Toscanelli, who made possible the discovery and use of the knowledge which instructed Columbus on how to navigate to find land on the other side of the Atlantic.

In between that time, all European civilization was inferior, in its scientific and cultural development, to Egyptian civilization of the time of Archimedes and his friend, Eratosthenes. That is the “eyes on the dragon.”

That tells you, that the idea about culture and civilization, which is popularized in European and other histories since then, is a gigantic fraud, a deliberate fraud. One of the examples of the fraud is the case several centuries later, five centuries later, when a hoaxster by the name of Claudius Ptolemy, faked evidence—absolutely faked it—

using known evidence from a period of about five hundred years earlier, and faked the evidence to try to show that the Earth was the center of the universe, that the sun orbited the Earth, not the Earth, the sun.

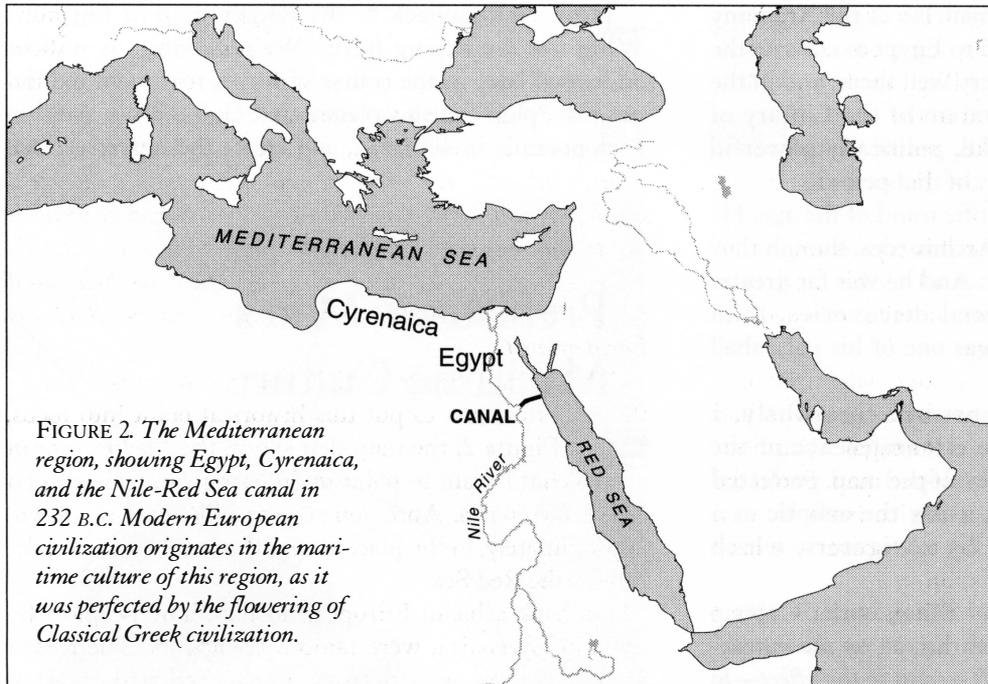
Whereas, five centuries earlier, *all civilized science knew, and had measured the fact, that the Earth was a sphere, or a spheroid, and had made measurements pertaining to the distance of the Earth from the moon, and estimates—not very good ones, but estimates nonetheless—of the distance from the Earth to the sun, around which the Earth orbited.*

The central figure of this, was the scientist Eratosthenes. Now, just to put this historical point into focus, look at Figure 2, the map that shows the Mediterranean area. What I want to point to, in particular, is the region called Cyrenaica. And, you see the Nile, coming down, approximately, to the place where the canal cuts from the Nile to the Red Sea.

Go back a bit in European history. The people who lived in Cyrenaica, were famous navigators. The reason they were famous navigators, is that they belonged to a group of people who were called at that time, the “Peoples of the Sea.” These were people who, from before the Second millennium B.C., were accustomed to using sailing ships, which looked very much like what we nowadays call Viking ships: single sail, able to tack into the wind, somewhat like the ships of Henry the Navigator later. And they were all over the ocean. All over the world. They were in the area of the North Sea, long before the Vikings.

Remember, the Vikings were not really a people. They were Saxon bandits who fled from Charlemagne, when Charlemagne invaded this area of Saxony. And this bunch of heathen, who were controlled from Constantinople, revolted. And when Charlemagne defeated them, they fled north into the area around Jutland. There, they became known as Vikings. They were mixed, a lot of different kinds of people, with one common denominator—they were all juvenile delinquents: robbing, stealing, raping, doing all these kinds of things that the British oligarchy does today.

But, a long time before then, you had an extended civilization, which was Atlantic. And the people of this Atlantic civilization, came down in their ships. And, as the glaciation retreated, they came more and more into the Mediterranean, and they came also down by the river system, which is essentially the system of the Danube, the Rhine-Danube connection, from the north into the Black Sea, and down. And, they became known—some of them became known later as Greeks, but they were known as “Peoples of the Sea.”



In the Second millennium B.C., you find sites, megalithic sites, in which the walls of the city are to the inland, not to the ocean—because the Peoples of the Sea had to protect themselves against marauders or barbarians *from the inland*. They were the people of the *sea*, the sea-raiders.

Now, in this process, a differentiation occurred. This began in the Second millennium or earlier B.C., when the Egyptians proceeded to try to civilize these Peoples of the Sea. And the Egyptians picked out a settlement of Peoples of the Sea, in Cyrenaica, which became, on and off thereafter, closely associated with Egypt. And Cyrenaica was, for Egypt, also associated with Ionia, which became the Ionian Greeks, and with the Etruscans, and others.

The Etruscans were the allies of Egypt and the Cyrenaicans, against the Carthaginians; that is, against the Phoenicians in the Western Mediterranean. Whereas the Ionian Greeks, together with Athens, which is one of the cities related to it, were the allies of Egypt against the Phoenicians, against the Canaanites.

So, in this period, Cyrenaica plays a key part as, essentially, the link between Greece, the Etruscans, and Egypt, during the entire period. So, with all the dark ages and fluctuations, and so forth, back and forth, there's this Mediterranean culture.

So, when you're talking about Greek culture, or Etruscan culture—which we know less about, because the Romans, the Latins, committed genocide against the

Etruscans, to try to wipe out and eradicate every evidence of Etruscan culture, just as they tried to pretend that Italian is a language descended from Latin, which it is not. It's a completely separate and superior language to Latin, which is something that the Humboldts understood. They got into trouble at the time when Wilhelm von Humboldt was the ambassador to Rome, over making the obvious philological point, that Italian was a separate language which had cohabited with Latin, and therefore had a lot of cross loanword relationships, but that the Italian was a separate

culture, probably a superior one, to the Latin culture of the Romans.

You had also in there, of course, the Magna Graecia culture, much of which was very closely associated, again, with Ionia, and with Athens, and with other centers. So, the entire history of civilization, of European civilization, emerges in this cockpit, whose points of reference are Egypt, Ionia, Athens, and the Etruscans, and developments in southern Italy—Sicily—which came out of this process. That's the center of civilization.

From the beginning of the Homeric legends, or the Homeric epics—which probably are to a large degree true, as Heinrich Schliemann and others have demonstrated—from this period, there emerged, earlier than the middle of the First millennium B.C., there emerged a great Greek culture, typified by the greatest works of the Ionians, such as Thales and Heraclitus, or Solon of Athens, who is part of the same process. Very closely associated with certain forces in Egypt, and always associated with Cyrenaica.

For example, when Plato formed and developed the Academy at Athens, one of the more important mathematicians was Theaetetus, who was from Cyrenaica. He was the person who first developed the concept of the five Platonic (regular) solids, a very crucial part of the whole picture.

Then, the case of Eratosthenes. Eratosthenes comes much later. He comes into the Third century B.C. He was born in Cyrenaica. He travelled to Athens, where he was

educated by Plato's Academy. He became particularly celebrated as the greatest mathematician of the Academy at that time. He was then invited to Egypt to educate the future Pharaoh. He succeeded very well there, and in the course of time, became the librarian of the Library of Alexandria, and a very powerful, politically powerful individual in the Egyptian history of that period.

He was also the greatest scientific mind of the age. He was a correspondent, an ally of Archimedes, though they had differences on certain things. And he was far greater in the profundity of his crucial discoveries, than Archimedes. But, Archimedes was one of his pals, shall we say.

He was the first to demonstrate rigorously, a method for demonstrating the circumference of the Earth. He was the one who developed and perfected methods for ocean navigation, using the ecliptic as a reference, constant reference by navigators, which shows up in this.

And thus, when the navigator Maui, under Captain Rata, set forth with a flotilla from Egypt, *on the instruction of Eratosthenes—and Maui left records to this effect—to explore the circumference of the Earth*, they successfully, with a series of steps, went eastward. Then they came into an unexpected object: the Americas. They couldn't get through it. According to the record, they explored about 4,000 miles of the coast of the Americas, chiefly South America, probably as far north as Baja California. Some records seem to indicate that some of the Arizona and related relics, were copies of records that had been made earlier in some nearby vicinity, which is probably Baja California.

So, this particular part of Mediterranean culture is the cockpit of modern civilization, for reasons I've given otherwise earlier. Then the story becomes even more interesting.

The Great Antiquity of Man

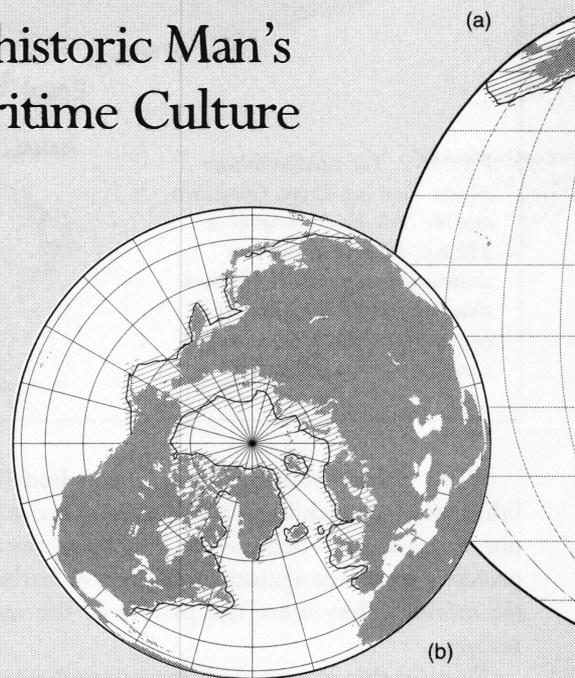
Over a period of time, these records took some deciphering by ethnographers, who later, in about the 1970's, began to discover how to translate these rebuses into actual messages, by discovering what language was being used [SEE Note, page 27]. And, in the middle 1970's, various groups of people, centered at Harvard University around a fellow named Barry Fell, in studying these matters, came to the discovery that this language was a language common to the Cyrenaicans, and also common to the Polynesians, with affinities with other languages of that Pacific region, such as the Malay language. And also traces of Dravidian and other kinds of things in there.

So, they recognized that this language, Maori, was the same language which is used by the Cyrenaicans. They

had a common language. "Wait a minute!"

Now, let's go back to the Pacific map in Figure 1. What are we saying here? We're saying, as will be addressed later in the course of today, that mankind did not just "plop" on this planet, that God did not stand in Mesopotamia in 4004 B.C., and create the universe. That

Prehistoric Man's Maritime Culture



During the last glacial maximum 20,000 years ago, sea level had fallen by as much as 350 feet, exposing extensive portions of the continental shelf, especially where these have broad, shallow slopes, as in the Arctic, and the archipelagos of Southeast Asia. Beginning about 14,000 years ago, as the glaciers began to retreat, sea levels began to rise, a process which accelerated circa 10,000-9,000 B.C., reaching a conclusion in the 6,000-5,000 B.C. period, at which point today's coastlines were established. This entire process, therefore, took place when human habitation of various parts of the world was well established—habitation of which we have only fragmentary knowledge today.

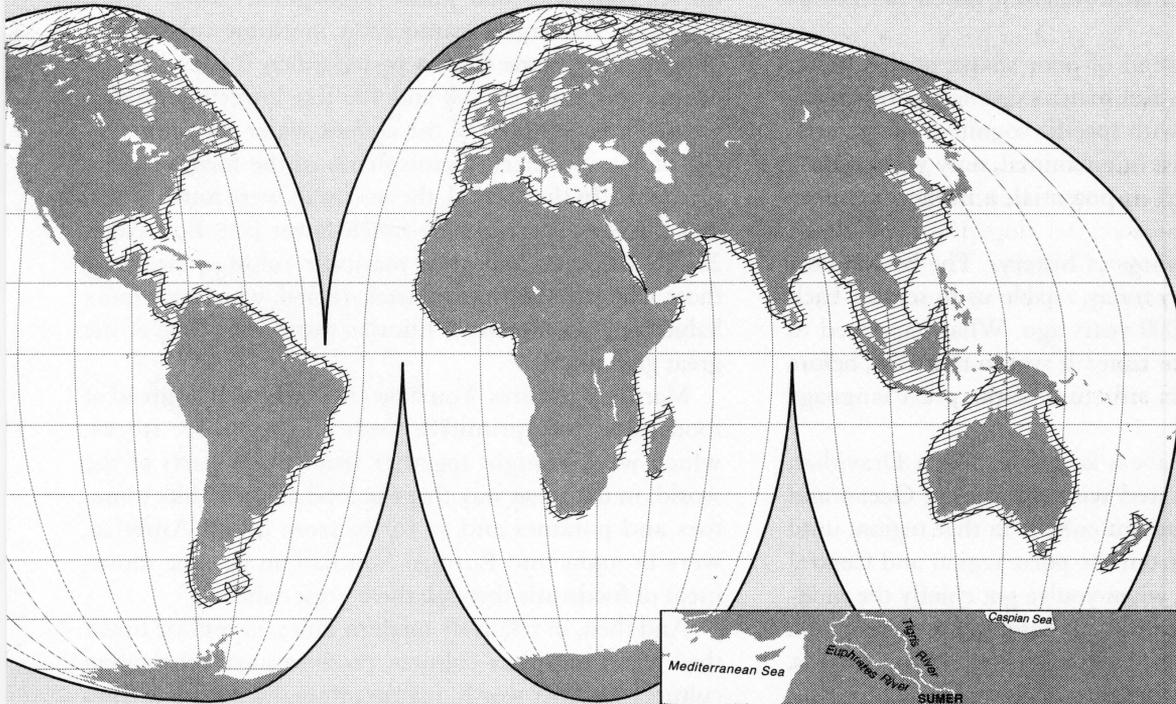
One reason our knowledge of this period is so limited, is because much of the archeological record is buried beneath the sea, on the once-exposed continental shelves (since the most reasonable hypothesis for the early development of human prehistoric society would be as a sea-going, maritime culture, located near the mouths of rivers, and based upon an economy whose foodstuffs derived largely from fishing and gathering shellfish).

(a) Coastlines of the continents today, showing the 200-

didn't happen. The universe is very old, and man is very old. The existence of man on this planet, is probably somewhere between a million and two million years, maybe longer.

Now, how do we recognize man? We recently had in Germany, out of a group working out of Göttingen Uni-

versity, a discovery of a site of throwing spears in a deep cave in the mountains, here in Germany, a site dated to about 600,000 B.C., in which the design of throwing spears, the well-balanced design of throwing spears, shows *what?* It shows something that no animal could do, no animal mind could do.

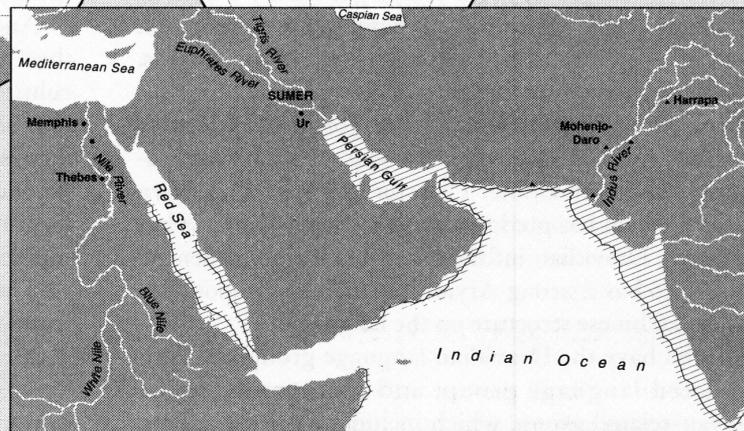


(c)

foot depth line of the continental shelf. Hatching indicates the approximate 350-foot depth exposed during the glacial maximum.

(b) Arctic region. One of the most dramatic aspects of lowered sea levels during the glacial maximum, was the extensive area of exposed continental shelf in the Arctic region, including the 1,000-mile-wide Bering Land-Bridge. This was certainly the primary pathway of early man's settlement of the Americas. (The northern shelf of Siberia was not covered by the spread of glaciers, owing to the extreme aridity of this region.)

(c) Indian Ocean littoral. A crucial area for the study of man's recent prehistory is the Indian Ocean littoral, from the western coast of India, to the regions of the Persian Gulf and Horn of Africa—an area which encompasses the seemingly diverse Egyptian, Mesopotamian, and Dravidian (Indus) civilizations of the Fourth and Third millennia B.C. From the standpoint of an ocean-going maritime culture, the existence of this area as an earlier, tightly integrated region of trade and cultural development incorporating the Indus, Tigris-



Euphrates, and Nile River basins—especially given the potential of semi-annual monsoon navigation—points a direction for significant breakthroughs in our knowledge of the early origins of human civilization in this region. The development of Mesopotamian Sumerian out of the Dravidian language group, as well as the extensive exposed coastal regions—including, for example, the entire Persian Gulf—are indicative of the sorts of evidence available for further study. Similar directions exist for tracing the impact of Dravidian culture, travelling by way of the Indian Ocean, on the development of Southeast Asia.

—Ken Kronberg

It shows that you had a very advanced form of human cognition, demonstrated by artifacts from 600,000 B.C. And obviously, this is a pretty far advanced part of man by 600,000 B.C. So, we have to go back somewhat earlier, don't we, to find man. And it's difficult, because the pattern of glaciation on this planet, affecting the Northern Hemisphere, goes back about two million years, on the basis of core samples that have been taken in various parts of the world.

So, we're really in kind of poor shape, at this point, for going much earlier. But man's existence on this planet as man, a genotype with specific cognitive characteristics—which do not exist in an animal, only with man—existed, fully developed as potential, a million or more years ago.

Well, what do we know of history? The best indications we have of history today, enable us to scratch back to about 10,000 to 12,000 years ago. What happened to man during all the prior time? It was in this time, before "history," that the basic structure of the great language groups emerged.

For example, you have a language, like a Dravidian group, which is associated with the Indian Ocean and Pacific, which is a dominant culture in that region; until the Aryan migrations from the polar region and Central Asia, down into India, when you've got chiefly the modern culture of the subcontinent, based on an interaction between a Vedic Sanskrit language group of the Aryans, and a Dravidian group, in terms of culture.

Look at Southeast Asia, you've got implications of Dravidian types of languages, crossing with Chinese languages from South China. Thai, for example. Thai has a structure which has predominantly Chinese origin. It has also strong Dravidian influences and cultural influences. And, it also has a strong Aryan cultural superimposition, on a basic Chinese structure on the language.

So, you have the Dravidian language group; the China-related language group; and then you have the Malayan-related group, which includes the Polynesians. These cultures. Then, you had the great polar group that we know of, which is the group from which the Aryan so-called group comes. We have another group, which we don't have much on (we have relics of it), which is a transatlantic group, which almost went out of existence, because it degenerated in the form in which the Europeans discovered the indigenous cultures of Central and South America later on. Probably from between 1000 B.C. and A.D. 1000, there was a great collapse of the quality of culture in what had existed in what we now call the Americas, so that most of the so-called indigenous cultures of the Americas, were greatly

degenerated cultures, which had come from a much higher level of culture, which had degenerated much earlier.

So then, you look at the history of mankind. You say there are certain groups of languages, which define the dominant cultural strain of humanity, strains which originate during the period of the last 100,000 years or so of the Ice Age, or earlier. These languages are *what?* These languages are largely transoceanic maritime culture languages. They come from a period when the level of the oceans was between 300 and 400 feet lower than today, when a great amount of the oceanic water was sitting on top of the Northern Hemisphere, in the form of great glaciation. In that period, the sea-levels were much lower, and the coastal areas were much lower [SEE Box, pages 20-21]. And you had great maritime cultures, including those which inhabited the Arctic region, which was more habitable than Northern Eurasia, during the time of the great glaciation.

Maritime cultures. You have the traces in the spread of foodstuffs from primitive seeds and primitive stocks, which were brought together from many parts of the world, in the same way that the food cultures, like tomatoes and potatoes and so forth, from South America, were brought into Europe. You had an oceanic movement of foodstuffs through these great cultures.

And then, in relatively modern times, in historic times, these great maritime cultures, produce so-called riparian cultures. In other words, man's culture did not come from the inland, from the inland land down the rivers to the oceans. What we know of man's culture, from the standpoint of languages, is that the great language groups came from maritime oceanic cultures, which are the great communicators of ideas and technologies.

These cultures, as they developed in a maritime environment, created the basis for the up-river culture. Of course, our great people from Hamburg would insist that the cultures of the inland of the Elba and Rhine, were developed by the Hansa. But, something like that did occur.

You have, for example, Mesopotamia, which in the Fifth and Fourth millennium B.C., was an area that was beginning to dry out, inhabited by Semites who were very ignorant, very brutish, no culture, no civilization to speak of. And along came some Dravidians, who settle colonies among the Semite populations. One colony was called Sumer, which was founded by Dravidians. It's a Dravidian-speaking culture, or a Dravidian language-speaking culture. This culture, which had the characteristics of Dravidian culture, degenerated in the way in which Dravidian cultures tend to degenerate.

And thus, after the degeneration of Sumer, you had the rise of the Semitic Akkadian culture, based on the legacies of Sumer's culture. You had the development of Ethiopia, which originally was a Dravidian colony, the center of Ethiopia. What we call Yemen today, was also a colony of the Dravidians. What we call the Canaanites, or the Palestinian area today, was originally a Semitic region, colonized by Dravidians, as Herodotus refers to this in his histories, and as the evidence corroborates Herodotus's commentaries.

You had another great influence on the Semites in this period: the Egyptians. The Mosaic religion, for example, comes out of Egypt, not out of Mesopotamia. The characteristics, the food culture, the taboos, all of these things, are *characteristically Egyptian* in character. They would be anathema, in a sense, to an ancient Mesopotamian culture.

And so, it was the Egyptians who were, in a sense, the authors of European civilization. But, something came out of that, which was not purely Egyptian. The great accomplishments of the Egyptians, were to lay the foundations for the development of Mediterranean civilization. But the great development of Mediterranean civilization, came out of what we call Greek or Hellenistic civilization later.

The Classical Idea

The great tradition of European civilization, comes from people like Thales, Heraclitus, the Homeric epics; from the Great Age of Pericles. You see it emblazoned in stone, in the Athens of Pericles, in the methods of sculpture of Scopas and Praxiteles, in which the triangle four-square conception of art was replaced, the tombstone conception was replaced, by *imbalance*, where the imbalance created metaphor. *The idea of metaphor in stone.*

The triangular culture, the Egyptian architecture, was symbolic. The primitive Archaic Greek culture was symbolic. It was not *cognitive*. Whereas, what we call Classical Greek culture, from which all European civilization comes, and all its contributions to the world come, are what we call Classical culture, the Classical idea. The systematization of the Classical idea we owe largely to Plato and his Academy.

The principle of paradox, the principle of metaphor, the principle of crucial experiment, by which we recognize that any idea which is popular, is probably absurd, on that evidence alone. We therefore find the fallacy in popular belief, by driving popular belief to its extremes, to extreme conditions. And, we're able to demonstrate

that popular belief is false, because it omits consideration of something which is a principle, which we've heretofore ignored. And, by crucial-experimental methods, we generate new principles, not only principles of physical science, but principles of art. You can't have one without the other. *The ideas of Classical art and Classical physical science, are unified. You separate them, you destroy the mind.*

Just think of an act of discovery. Now, there are people who have made an act of discovery—whether as an original discoverer, or simply replicating the original act of discovery as a student, by reworking, step by step, beginning with a paradox, getting the flash of insight which demonstrates the idea, which is the principle to be discovered, and then working through the experimental proof which demonstrates the validity of that discovered principle.

Now, think of the process that you go through mentally, in making such a discovery. You go through a process, which is *impassioned*. The first thing about scientific discovery, is *passion*. Logicians will never discover anything, except their own great burial place, which is a good place for them. *It's passion, the passion to persist, the passion not to break concentration.* The passion to spend days without interruption, fighting with the problem. The passion to maintain concentration.

What is passion? What is discovery? *It is concentration, highly energized, impassioned concentration.* You will not let the question go. You grab it by the neck, and don't let it go. *Passion.*

Where do we recognize this passion? We recognize it in great Classical art, as opposed to so-called "popular art," which has no passion in it, only lust, which is very quick, it passes very quickly. But, the persistence: A great discoverer is a person who devotes years or longer, to working through various stages of a great discovery—*passion* that will not let him go. The artist: passion which will not let him go.

Take the case of the work of J.S. Bach, the great work of passion which would not let him go—and then you get to the kind of discoveries which are concentrated in things like the *Musical Offering*, or sketched out in the principle of contrapuntal inversions, in *The Art of the Fugue*.

The passion that will not let you go, that commands your life from beginning—from childhood until death; the passion which characterizes Mozart in studying the work of Bach, in 1782-83, with van Swieten at his library in Vienna, and making a discovery from within Bach, which gave us modern Classical motivic thorough-composition.

Think of Beethoven concentrating on that, and in doing his later works compositions, concentrating on someone from the end of the Sixteenth century, Zarlino, and working on the work of Bach, on the *Art of the Fugue* by Bach, in preparing to work through the ideas which were expressed in his last works, including his last string quartets.

Passion! And a passion described by Plato, a passion for truth. Do not let yourself be controlled by a false idea. Know that many falsehoods have trapped your mind. And, you must never allow those traps, those beliefs, which you have learned but which you don't know; never let those guide you.

A passion for justice, which is based on the nature of Man as not a beast, but a creative mind. And that all people are sacred, not merely to exist, but they're sacred because they contain a developable potential of discovery, which enriches all mankind. And, therefore, justice requires not merely the sense of justice in the ordinary crude sense for the individual, but *justice for the existence of the individual*, which means, above all, fostering the development of the intellectual powers and character of that individual.

Justice and truth. Not letting yourself go, until you get it. Now, this quality is described by Plato, using a Greek

word, which was used with the same meaning by the Apostle Paul: *agapē*. This *passion*, this love for mankind, this passion for truth and justice, which in Plato's *Republic* distinguishes Socrates from Thrasymachus, the Adolf Hitler of the lot. And from Glaucon, the formalist. It's that kind of quality.

Now, how do you develop that kind of quality? Because you must not only have the insight into the way the universe is organized, but you must see that *man is increasing man's power over the universe*. So, you have to look at man, not dead nature. Not sticks and stones. You have to look at *how man's mind functions*. How does man's mind function to control the universe, to improve our power of the universe, by means of which we exist, by means of which we develop.

What is that? This is called Classical art. You don't like something, because it "feels good" to not like it? That's irrationalism. That's Thrasymachus. That's evil. Rock music is *evil*. If you like rock, you are partaking of evil *per se*, because you've rejected truth and justice, for passion of a cheap kind—mere lust.

And thus, you must have a critical sense about man, a critical sense about the mind, a critical sense about how people work together, or don't work together. It is that passion for truth and justice, which evokes the power to concentrate on a discovery—the power to go higher and deeper than ever before, to go further in the direction of largeness and smallness than ever before. The passion to say, "The universe is there, therefore, we've got to go out and explore it." You can not just sit back and use logic for that. You have to ennoble it with a passion for truth and justice.

So, we had that. And, you had a person who is characteristic, who lived toward the latter half of the Third century B.C., Eratosthenes. He was a poet, a geometer, a scientist, a nation-builder, a culture-builder. You had in Archimedes, who was perhaps not as brilliant a character, not as profound a character as Eratosthenes, but nonetheless the same thing, where you had these Roman soldiers killing this precious mind in Syracuse, as they tried to kill Etruscan culture, and suppress all other cultures.

And you realize, that the legacy which makes the difference in going from the greatest aspect of Greek and Hellenistic culture, as typified in the heritage of Eratosthenes and Archimedes, and people like that, to the rise of Roman culture and what that represented, was a great crime against humanity, from which civilization only *began* to recover in the Fifteenth century, in the Renaissance.

And then you look more closely, at the fine details of this process, and you see something more deeply: that

Who Was Eratosthenes?

Eratosthenes (c. 275-194 B.C.), perhaps the greatest scientist of the Hellenistic world, was also one of its most prolific and versatile: His work included investigations in astronomy, geography, geodesy, poetry, music, drama, and philosophy.

Born in Cyrene, he was educated in Alexandria, Egypt, and Athens by followers of Plato. At the age of 40, he became the head of the famous library at Alexandria, where he remained until his death.

In addition to his measurement of the Earth's circumference, Eratosthenes was the first to measure the angle of the Earth's tilt on its axis (the plane of the ecliptic). He also wrote "The Duplication of the Cube," and "On Means," which were treatises investigating the crucial mathematical paradoxes arising from the investigation of dimensionality. His work "Platonicus" deals with the mathematical and musical principles of Plato's philosophy. He published maps and works on geography and chronography.

Eratosthenes was also a poet, dramatist, and philologist, writing several poems and plays, only fragments of which survive, and a book on comedy. Other ancient writers attribute to Eratosthenes books on philosophy and history.

—Bruce Director

Toscanelli had not yet reached the intellectual level of Eratosthenes. Here are some examples.

Figure 3 shows a simple description of the famous, simple experiment of Eratosthenes. It is known, that long before Eratosthenes, the Egyptians did astronomy with the aid of deep-well observations. That is, you dig a very deep well—and you could do that in countries where you had to dig deeply to get water. And, if you look up from a deep well, you can see the stars at mid-day. That is, if there's not too much haze in the sky. And that method was commonly used by the Egyptians in earlier periods, the deep-well or similar kinds of observations. Line-of-sight studies.

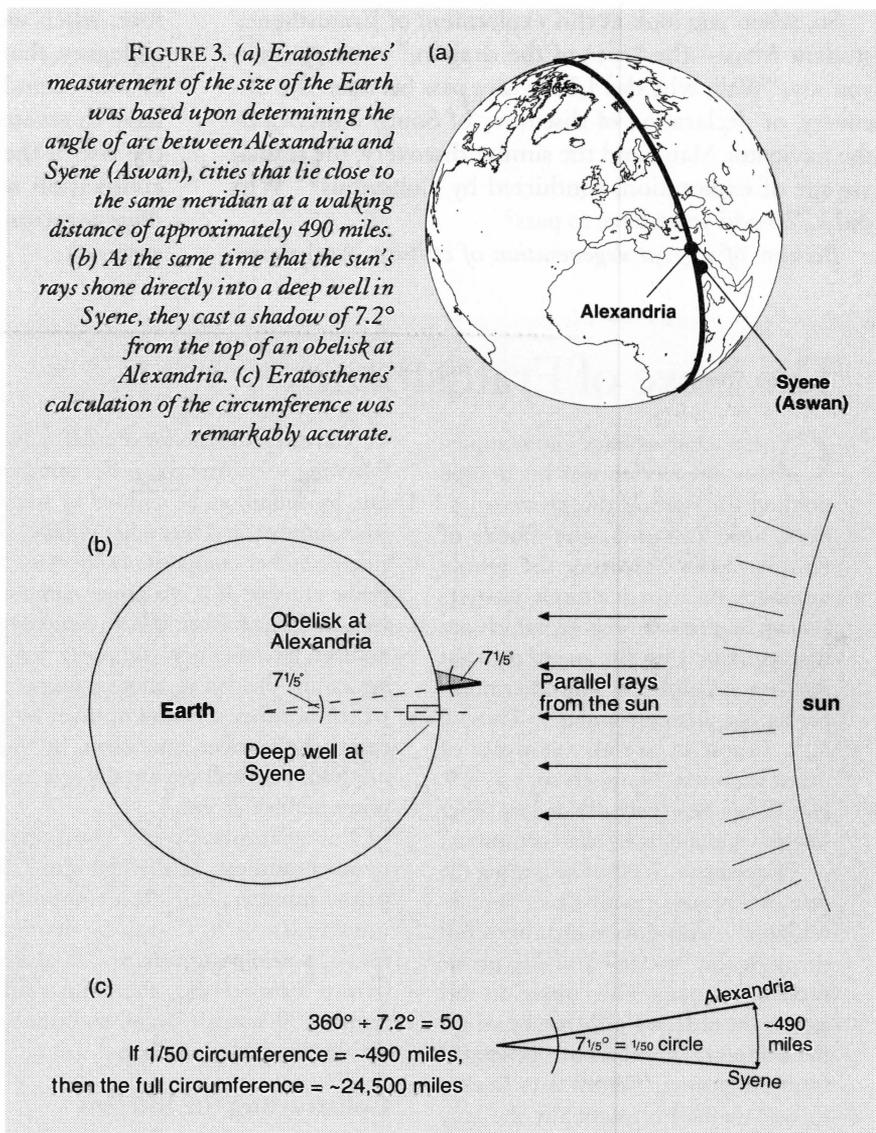
So, observing from a place near what we call Aswan today, which was then called Syene, Eratosthenes made a measurement of the mid-day position of the sun, and compared it to the same position determined by solar observation at a similar site at Alexandria.

By this study and other studies related to it, Eratosthenes was the first to estimate, with reasonable accuracy, the size of the Earth as a spheroid, within, relatively speaking, a very small margin of error. He also made other estimates, of the distance from Alexandria to Rome, along the arc of a great circle. And by this same method, he calculated the possibility of demonstrating how this would work for transoceanic navigation, going from Egypt to Egypt by way of the Pacific, into the Great Ocean, which is the Atlantic, and back into Egypt.

That was the experiment.

Or take another case, for example, the famous "Sieve of Eratosthenes," which again in the Nineteenth century, became extremely significant for us, as was demonstrated by Georg Cantor in his writings toward the end of the Nineteenth century, in dealing with a problem he called *cardinality*, which deals with how we make measurements, in terms of processes which are characterized as multiply-connected manifolds of the Gauss-Riemann form [SEE Box, page 26].

So you see, if you look at the internal work of an Eratosthenes, as the internal work of Plato and other members of the Academy earlier, you see a profundity of



mind, a precision of mind visible from a modern standpoint of modern science, which is greater than anything to be seen in the intervening period.

You say, "What happened to this?" Well, very simple. The method used by Eratosthenes and his associates is well-documented. It is the Platonic method, the Platonic method of Classical art forms, the Platonic method of physical science.

What happened to that method? That method went out of use. And, while that method went out of use as a controlling influence in shaping society, society went, for over 1,700 years, into a long period of degeneration of European culture. And it was not until the Renaissance of the middle of the Fifteenth Century, *when this specific method was studied and revived*, that Europe began the process of rising to and above the level of intellectual culture, which it had had in the time of Eratosthenes.

So, when you look at this exploration of Eratosthenes' student Maui—the “eyes of the dragon,” so to speak—you say, “Well, why did 1,723 years pass between the discovery, or declaration of discovery of South America by the navigator Maui, and the similar discovery, the similar voyage of exploration, conducted by Columbus?” Why did 1,720-odd years have to pass?

Because of a great degeneration of culture. And there-

fore, when we look at European civilization today, and its legacy, that is the first measuring rod you must apply to understand the history of European civilization. You have to account for a crucial fact: that, from the time of the rise of the Romans until the Renaissance, European civilization was in a process of moral and intellectual degeneration. And we have not fully corrected that error yet.

The Sieve of Eratosthenes

One of Eratosthenes' most important discoveries, was his unique method for finding the prime numbers, now known as the “Sieve of Eratosthenes.” Among the whole numbers, there exist unique integers known as prime numbers, which are distinguished by the property that they are indivisible by any other number except themselves and 1. Thus, 2, 3, 5, 7, and 11 are all examples of prime numbers. Numbers such as 8, 9, and 10 can be evenly divided by other integers and are thus called composite.

Eratosthenes' method of finding the primes functions exactly like a sieve, in which the composite numbers fall through the “mesh,” and the prime numbers remain. The “mesh” in this case, is the ordering principle by which the composite numbers are generated from the primes. To this day, Eratosthenes' method is essentially the only one for finding the prime numbers. More important, his approach of investigating numbers in characteristic classes, instead of one by one, establishes a crucial method for scientific investigation. This method was later applied in the physical domain by Gottfried Leibniz and Carl Gauss, and laid the basis for Georg Cantor's later development of transfinite numbers.

Greek scientists prior to Eratosthenes had investigated prime numbers, and Euclid (ca. 300 B.C.) recorded that knowledge in the *Elements*. Euclid showed that all numbers are either prime or composite, and that any composite number is divisible by some combination of prime numbers.

You can prove this for yourself, in the following way: Any composite number can, by definition, be divided by some other number, and that other number is either another composite number or a prime number. If it is a prime number, we need go no further. If it is a composite number, then that new composite number can be divided by another number, which is either a prime number or a composite number, and so on. By this method, you will eventually get to a prime number divisor.

For example, 30 is a composite number, and can be divided into 2, a prime number, and 15, a composite number. In turn, 15, can be divided into 3, a prime number, and 5, also a prime number. So, the composite number 30 is made up of, and can be divided by, prime numbers 2, 3, and 5.

Constructing the Integers

Euclid also proved that the number of prime numbers was infinite. Gauss was the first to prove (*Disquisitiones Arithmeticae*, Article 16) that a composite number can be decomposed into only one combination of prime numbers. In the above examples, no combination of prime numbers other than $2 \times 2 \times 3$ will equal 12. Likewise for 504, or any other composite number.

Hence, it is shown that prime numbers are those from which all other numbers are composed. The primes are primary. The word the ancient Greeks used for “prime,” was the same word they used for “first” or “foremost.”

This raises the question: What hap-

pens when you try to construct all integers from the primes alone? First, you'd make all the integers composed only of 2, such as 4, 8, 16, . . . Then you'd make all the integers composed only of 3, and of combinations of 2 and 3, such as 6, 9, 12, . . . , and so forth; then with 5, etc. As you can see, this process would eventually generate all the integers, but in a nonlinear way.

Compare that process with constructing the integers by addition. Addition generates all the integers sequentially, by adding 1, but does not distinguish between prime numbers and composite numbers.

The unit 1 is indivisible, with respect to addition. With respect to division, the prime numbers are indivisible. Both processes will compose all the integers, but that result coincides only in the infinite. In the finite, they never coincide.

This anomaly is a reflection of the truth that there exists a higher hypothesis which underlies the foundations of integers—a hypothesis which is undiscoverable if limited to the domain of simple linear addition. By reflecting on this anomaly, we begin, as Socrates says, “to see the nature of number in our minds only” (from Plato's *Republic*). Our minds ascend, as Socrates indicates, to contemplate the nature of true Being.

We ask, “If the domain of primes is that from which the integers are made, what is the nature of the domain from which the primes are made?”

—Bruce Director

A Note on the Decipherment of Maui's Inscriptions

In 1937-38, a group of German researchers from the Frobenius Institute, travelled to the islands in the Pacific, and in various sites along the western coast of New Guinea, at McCluer Bay, they examined an extraordinary number of drawings on the walls of caves, which had been preserved through the ages from the elements. The cave drawings had first been sighted by European travellers in 1878. Portions of the cave drawings are shown in Figures 4(a) and 4(b). In the case of Figure 4(a), here is what they thought they were seeing: "Man and tree, further drawings of people, and other unintelligible signs. 54 cm high." Figure 4(b) is identified as follows: "Ships of various types drawn on top of one another. Between them, numerous human figures in different stylizations. One human figure is drawn over a pronged circle (Zachenkreis?) (the sun?). 210 cm high." The questions raised by the findings of the Frobenius expedition were the obvious ones: What people had left these drawings? And what do the "indecipherable" notations mean?

It was only forty-five years later, that a maverick philologist from Harvard University, Barry Fell, seeing the drawings, recognized them as something else: not pictures, but words, messages written in some human tongue, communicating something of import. Fell realized that the full inscription, of which a portion is shown in Figure 4, is the theorem of Eratosthenes. Once deciphered, the text starts with an invocation:

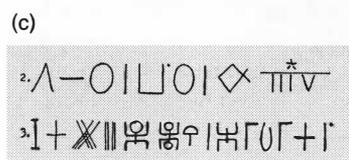
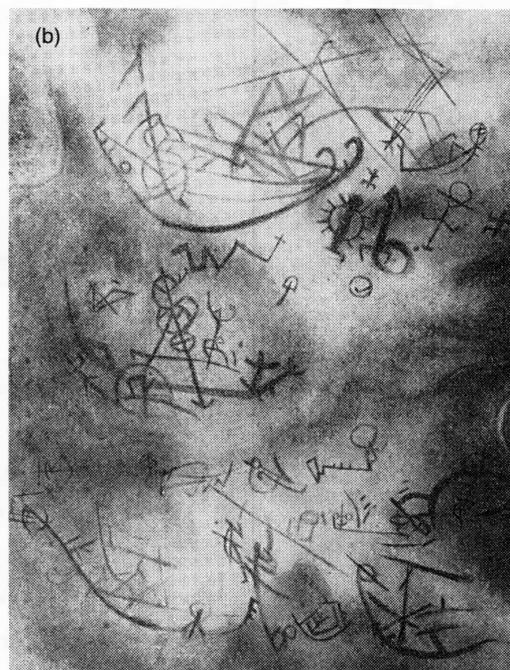
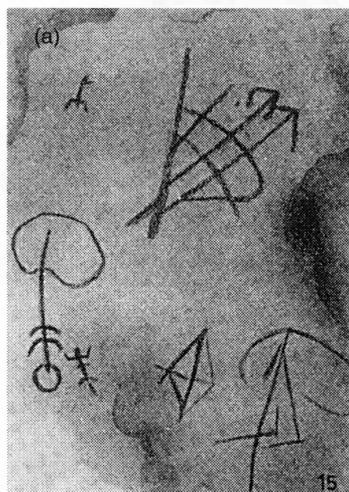


FIGURE 4. Wall inscriptions in one of the "Caves of the Navigators" in New Guinea. (a) Part of Maui's demonstration of Eratosthenes' experiment. (c) Copy of lines 2 and 3 of the invocation inscription, beginning "He has been absent . . ."

"To cast off the mooring-rope is Maui's delight, for he is content to be showered with the salt spray,
 "He has been absent from home on a foreign voyage these past eight years,
 "Yet through Thee, O Divine Morning Star, may he escape death, that Captain of the Mariners, to find new lands uplifted.

The inscription continues, with the accompanying drawings, as follows:

"This particular theorem Eratosthenes, an astronomer of the Delta country in Lower Egypt, disclosed to Maui. The sun's rays intercept the atmosphere at varying angles [or at various latitudes]."

Then the text is missing, but the diagram shows similar triangles. Then, the text continues:

"At Philae [modern Aswan], the sun can stand overhead, casting no shadow. From Philae northward to the coast is a distance of 5000 stades.

"When the sun casts no shadow at Philae, the shadow it casts at (triangle) is 2/100ths, i.e. subtends one fiftieth part of 360 degrees. Therefore the entire circumference of the earth equals 5000 divided by 2, times 100 stades.

"So behold the entire circumference of the earth is 250,000 stades [=circa 28,000 miles].

"Proposition proved by Maui."

Let us follow the steps taken by Barry Fell, and try to decipher the second part of the message, which remained obscure for a longer period of time. Perhaps, the first message, with all its geometrical diagrams, was therefore easier to decipher. Let us take this portion of the drawings, or rather inscription [SEE Figure 5].

First, Fell recognized that the signs were letters of an alphabet, used in Libya, which he called Maurian, and expressing a dialect of ancient Egyptian, which Fell happened to have studied. By rearranging the letters in a row, and transliterating them, according to the correspondences in the alphabet, we have the following

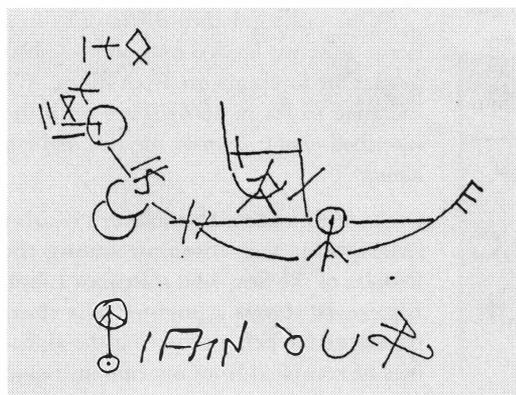


FIGURE 5. Part of rebus portion of "Caves of the Navigators" inscription.

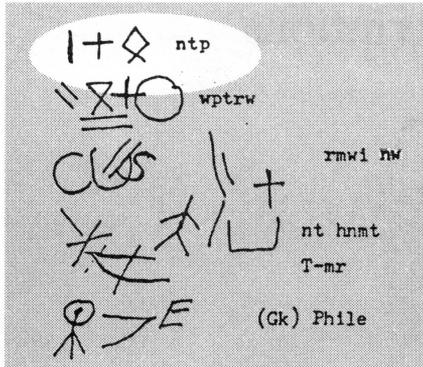


FIGURE 6. Fell's rectification of Figure 5.

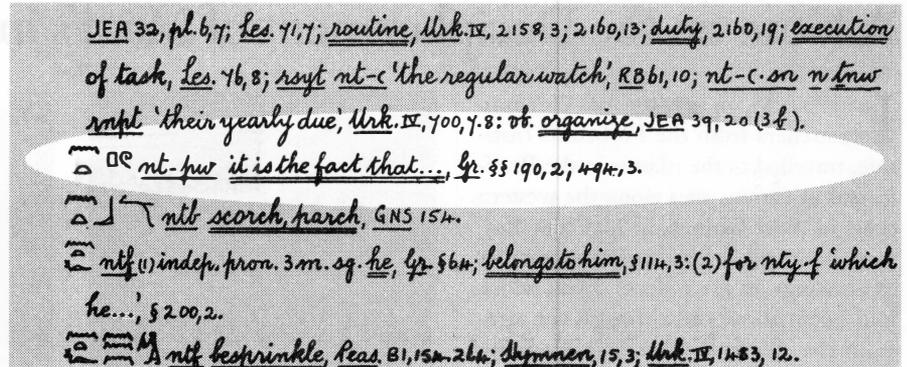


FIGURE 7. Entry for "nt-pw" in the "Concise Dictionary of Middle Egyptian."

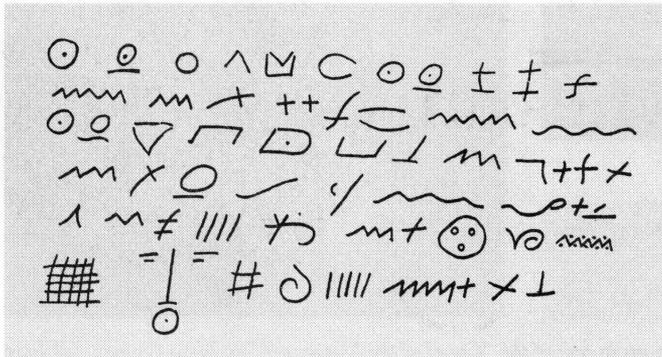


FIGURE 8. Inscription found in Santiago, Chile, in 1885.

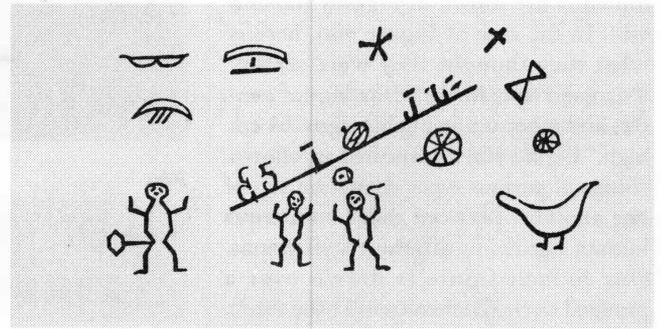


FIGURE 9. Pitcairn Island inscription, first reported in 1870. This circular inscription was read clockwise and then diagonally.

syllables: *ntp*, *wptrw*, etc. [SEE Figure 6]. And, looking up the syllables (which are words) in the dictionary of Egyptian, we can decipher the message: *ntp = it is a fact that*, etc. [SEE Figure 7]. This is an abbreviated rendition of the same theorem, almost in poetical form.

Similar inscriptions have been found in other locations, well over 1,500, including some bilingual inscriptions, in Maori (this language) and Latin, or in Maori and Punic script. Another cave inscription was found in 1885 by Karl Stolp, this time in Santiago de Chile [SEE Figure 8].

It is in the same script, and apparently written by the same person, Maui. This is the inscription in which he lays claim to Latin America, 4000 miles of coastland he had travelled, for the King of Egypt and his queen.

Finally, there is an inscription found on Pitcairn Island which is written in two different scripts, the standard hieroglyphic and the Libyan (Numidian) syllabic script [SEE Figure 9]. This inscription, first reported in 1870, was deciphered by Fell in 1974. If read clockwise and then diagonally, the

transliteration would be: Pedeta peno shenyta ta dwa, ta-pa-nu manwa niwt dwan Ra, menwe dwa: "Mi-ro-ne ra kai." And the translation, if read as Egyptian, would be:

"Our crew, wrecked in a storm, made land, thank God! We are people from the Manu region. We worship Ra in accordance with the scripture: 'We behold the sun and give voice.'"

If the same text is read as a Maori text, it would be:

"Our craft got into difficulties in a fierce gale, we landed and offered oblations. Our forebears are from Manu. We sacrifice to Ra in accordance with the inscribed chant: 'Honor the sun and cry aloud.'"

As Fell notes, the use of circular inscriptions was common among the Peoples of the Sea, who colonized Libya. Figure 10 shows a portion of a chart developed by Fell, comparing the alphabets he compiled from inscriptions found at various locations.

—Muriel Mirak Weissbach

letter	New Zealand	Fiji Tonga	Hawai'i	West Irian	Pitcairn	Javan Pyramid	Libya	Chile
p	⌘	⌘	⌘	⌘,⌘	⌘	⌘	⌘,⌘	⌘
b	.	⊠	.	⊠	.	⊠	⊠, ⊠	⊠, ⊠
t	⌘, +	⌘, +	+	⌘, +	⌘	⌘	⌘, +	⌘, +
t	∩, ^	∩, ∩	.	∩, ∩	.	∩	∩, ∩	.

FIGURE 10. Alphabet script equivalents from various inscriptions, compiled by Barry Fell.