1/ Introduction

The lines of Nazca, as well as the animal and plant geoglyphs associated with them, are amongst the most mysterious ancient works of pre-Colombian Peru, and in fact the world. Far less famous than the pyramids of Giza in Egypt, or Stonehenge in England, they do fit into the same class as these enigmas, as none of them have been completely decoded.

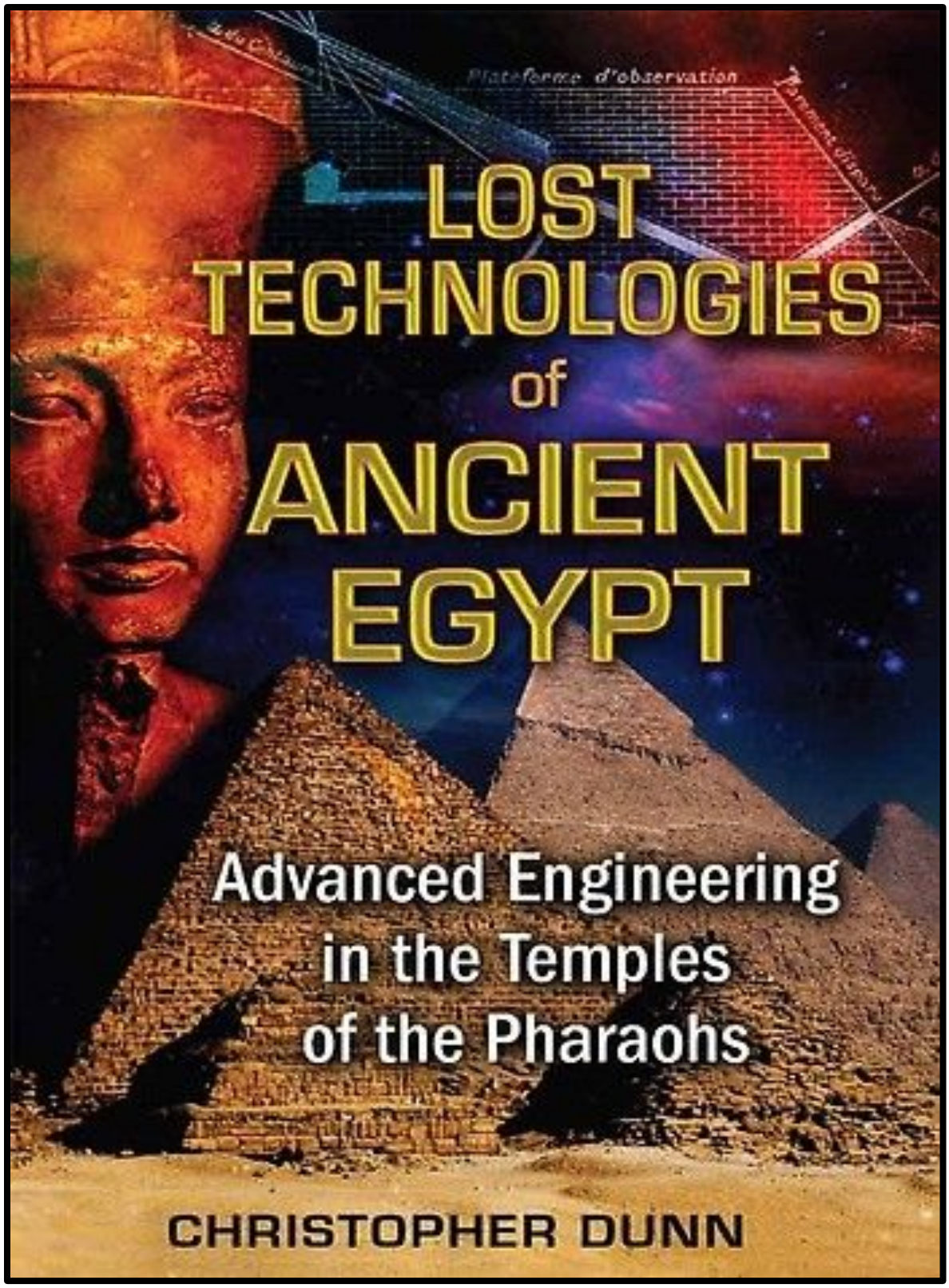
Conventional archaeology, or more particularly Egyptology insists that the Great Pyramid, as well as the 2 other main ones that exist on the Giza Plateau outside of, and rising above the city of Cairo were created by the dynastic Egyptians around 2500 B.C. Yet other researchers, including Graham Hancock, Stephen Mehler, and the School of Khemitology, amongst others believe them to be far older.

Stonehenge, which has been dated at having been constructed between 3000 and 2000 B.C., as regard what remain the large standing stones that we can still see today, is also hotly disputed by many who believe it to be far older.

What seems to be apparent is that the dating and explanation of ancient structures via conventional academics, whether in

Egypt, England, Peru or other locations is no longer the domain strictly of those with doctorates in archaeology.

Engineer Christopher Dunn for example, who has spent his entire life as a master machinist, and has worked with laser technology and other advanced techniques in the aviation industry in the United States has an amazing theory about the Great Pyramid of Giza. It is his assertion that this massive stone structure, weighing 6 million tons and being composed of 2.3 million stone blocks was not a tomb for the pharaoh Khufu, but an ancient power plant which generated electricity. Read more about Mr. Dunn and his theory at www.gizapower.com.



One of Chris Dunn's 2 books

In order to truly understand what the ancients were doing, and how and why they spent considerable amounts of time in constructing Stonehenge, the pyramids and other great works of the distant past may require a multidisciplinary approach. Having stone masons, engineers, chemists, physicists and other professionals add their opinions to the subject of ancient megaliths and other enigmas can do nothing but expand our understanding of them.

The Nazca (or Nasca) lines and geoglyphs are ancient works which in some ways are as troubling as those discussed above, in that they have never been properly explained. Ranked probably third in terms of popular ancient places to visit in Peru, with Machu Pic'chu clearly being number one and the Lake Titicaca area number two, Nazca receives hundreds of thousands of tourists per year. Those with the stomach for it fly over the vast Nazca plain in order to observe the mysterious etchings from the air. And others, somewhat apprehensive of climbing into a small plane in a foreign country tend to be satisfied with viewing a couple of the geoglyphs and some of the lines from a tower on the side of the highway.

What will attempted in this book is to cover all of the prevailing theories as to who made the Nazca works, why and when. Beliefs range from primitive Nazca native people carving them into the earth of the barren desert in order to appease gods, to ancient aliens making broad runways in order to land their extraterrestrial machines.

Were they artistic reflections of the cosmos, and was it even the Nazca who made them, or other Native people? I have found the local guides to be reasonably ineffective at explaining the origins of the lines and geoglyphs, and the same has been the case both as regard the Cusco and Machu Pic'chu ancient works, as well as those at Lake Titicaca. They tend to solely base their information on western academic archaeology, with perhaps a drop or two of local oral traditions.

Timelines are restricted to the presumed famous dominant culture of each area; in the case of Cusco it is the Inca, and in Nazca the Nazca culture.

The purpose of me writing this is the same as with my other 12 books; no such treatise exists that covers all of the possible answers as far as I can tell. I leave it to you to read what I have put here, ponder the possibilities, and make up your own mind. The only people that know who made these amazing wonders are those that did the works themselves, and they have been silent for centuries. My other e-books are available through www.hiddenincatours.com and www.amazon.com.

Brien Foerster Cusco Peru

2/ Where is Nazca Anyway?

Nazca in Peru

The Nazca Lines are a series of ancient geoglyphs located in the Nazca Desert in southern Peru. They were designated as a UNESCO World Heritage Site in 1994. The high, arid plateau stretches more than 80 kilometers (50 mi) between the towns of Nazca and Palpa on the Pampas de Jumana about 400 km south of Lima, the capital of Peru.

Access to the town of Nazca and the lines are via the highway from Lima, and most people visit using one of the many bus services that travel along the Pan Americana highway. Though limited air plane service can take you from Lima to the town of Pisco, which is about half the distance from Lima to Nazca, the local airport there has not yet opened for frequent commercial flights.

Also, although there is a small airport just outside the city of Nazca, its sole purpose is for the flights over the lines and geoglyphs. Bus or car transport from Cusco are also a possibility, as are similar conveyances from southern Peru.

Nazca is one of the driest places in the world with average annual precipitation up to a meager 25 millimeters. Its weather is controlled by the Humboldt Current which carries water from Antarctica up the west coast of South America.

This cold ocean water cools the marine air and limits the accumulation of moisture within clouds, and as a result though clouds and fog are able to form there is little rain and the region is exceptionally arid.

Geoglyphs and the Nazca Plain

Unlike Cusco, the capital of the Inca civilization and Peru's tourist epicenter, Nazca temperatures range from 10˚ C to 32 ˚ C with an average daily high of 21˚ Celsius. Summers months (November to March) are characteristically dry, sunny, and hot, when it is normally raining in Cusco. During the winter (June to August) fog from the coast rolls over the hills to keep temperatures in the moderate range, however the intense sun makes daylight hours seem warmer than the registered temperature.

A thermal induced wind is characteristic of the area much of the year, and actually makes it cooler than it would be otherwise. The wind tends to build in late morning, reaches a

maximum in midafternoon, and then dies down in the evening. It is for this reason that the flights over the Nazca lines are usually restricted to the morning time.

The Nazca culture is thought by many archaeologists to have been the civilization which flourished from 100 BCE to 800 CE beside the dry southern coast of Peru in the river valleys of the Rio Grande de Nazca drainage and the Ica Valley. Having been heavily influenced by the preceding Paracas culture, which was known for extremely complex textiles, the Nazca produced an array of beautiful crafts and technologies such as ceramics, textiles, and the famous geoglyphs (most commonly known as the Nazca lines).

However, a major theory that this book will put forward will not only question the time frame of the Nazca culture, but also their achievements. The key expert on this subject is Sr. Juan Navarro, director of the Paracas History Museum, in the small town of Chaco, located next to the Paracas National Reserve. Though not a credentialed academic, Sr. Juan grew up in the area, and has spent many decades studying the pre-Colombian cultures that lived there. These cultures spanned more than 2000 years, and included, in chronological order the Paracas, Nazca, Wari (Huari), Chincha and Inca. But more of that later.

After the fall of the Inca at the hands of the Spanish conquistadors, the area became dominated by them, and the Native people who they introduced from other parts of a fledgling nation called Peru.

There are two versions of the Spanish foundation of the town of Nazca. According to the writings of colonial Spanish chroniclers, it was founded on October 28, 1548, commissioned by Pedro de la Gasca and Alonso de Mendoza. The other version says that it was founded by Viceroy Garcia Hurtado de Mendoza, 5th Marquis of Cañete, in 1591.

Early on, Nazca was known for producing a grape brandy, similar to the more famous pisco, intended for slaves, and the local people called the distilled liquor Nazca.

The central plaza of Nazca

In colonial history, there were large and famous farms such as the Ingenio San Juan and San Javier property of the Jesuit

College of Cuzco. These enterprises were engaged in the making of wood carvings, grape cultivation, wine processing for Catholic worship, and the construction of two beautiful churches. In 1767 on the expulsion edict of King Charles III of Spain, these properties were made available to the Crown, and thereafter owned by *encomenderos*, which were an almost feudal system by which a Spanish land owner would virtually enslave those Natives living on the land.

During the wars for Peruvian independence from the Spanish crown, Nazca patriots received the liberating expedition of General Don Jose de San Martin on October 14, 1820 after the Battle of Nazca. Two days earlier, on October 12 General Juan Antonio Alvarez de Arenales, from Ica, was sent to the South, in pursuit of the royalist troops of Colonel Manuel Quimper.

The town of Nazca was established in August 29, 1821, and after that, on July 2, 1855 it was elevated to being a district and then it became a province on January 23, 1941. On 12 November 1996 at 11:59 a.m. local time (16:59 GMT time) a heavy earthquake of 6.4 on the Richter scale (the center of the earthquake was 7.7 in the sea) destroyed the city of Nazca and its surroundings almost completely. Because it occurred during the day there were only 17 fatalities, but 1,500 people were injured and around 100,000 left homeless. Almost all of the old houses made of brick and or adobe were destroyed, but within 12 years Nazca had been completely rebuilt, with some of the buildings reflecting those that had previously existed.

The economy of the Nazca area today is mainly agriculture, limited due to a lack of water, and tourism. All of the water is subterranean, and is accessed via wells and aquifers. 2000 plus years ago the climate was much wetter, and thus the area could grow more food and maintain a very large human population. The desertification of the area over time had a direct impact on the people and cultures of the area, who went from opulence and a rich social and ceremonial structure, to survival, and then abandonment of the area.

3/ The Peopling Of Nazca

Ceramic with classic Nazca colours

It is unclear when the first people inhabited the Nazca area. In terms of actual organized cultures, it has been populated by sedentary groups at least since the Formative Period (Initial Period, 1800-800 BC, and the Paracas culture, 800-200 BC). In the Early Intermediate Period (200 BC-600 AD), the region flourished under the Nazca Culture. At the end of the Nazca Period the extreme desertification led to a cultural decline. It was not until the Late Intermediate Period (1000-1450 AD), in a phase of increasing pluviality (increased rainfall), that the regional population increased again. (1) The groups that moved in were the Wari (Huari) from the highlands to the east, then the Chincha from coastal Peru to the north, and finally the Inca.

It is unknown if the Wari conquered anyone still living in the area, or if the collapse of the Nazca culture resulted in there simply being open territory to exploit. The Wari rose as a confederation of related people starting about 600 AD near the present day city of Ayacucho in the eastern Andean highlands, and many of the so called “Inca roads” of this area of Peru were in fact constructed by the Wari. But climate change, which began to take effect in about 800 AD began to cause cultural decline and fragmentation, and by 1000 AD little of the Wari’s power remained.

The Chincha people, a group of farmers, fishers and merchants lived in the fertile valley that is now named for them, north of Nazca. The Chincha nation existed in the area between the

years 900 and 1495 when they were folded into the Inca civilization.

The Chincha nation was a developed one, with dozens of cities and roads between them. They built grand temples and palaces of adobe on vast platforms with towering walls. The Chincha were great traders in coca, copper and mulla shells using boats going up and down the coast as far as Chile and Ecuador, returning with other precious items such as emeralds and gold. (2) The complexity of their trading network is evidenced by the materials they procured from other cultures of a very broad zone of influence. Coca came from the high Amazon cloud forests to the east, copper from Lake Titicaca and mulla shells from the coast.

The collapse of the Wari more likely allowed the Chincha to move into the Nazca area, but the Inca absorbed them as is stated above. The Inca, who by this time controlled a massive confederation of states, inappropriately called an empire became highly interested in the Chincha's extensive trade network and particularly in their access to the sacred mullu shell. They sent two armies to conquer the Chincha over the course of a few decades, the first by the high Inca ruler Pachacutec and the second by Manco Inca Yupanqui. Both attempts failed to overrun the Chincha defenses, but they knew conquest was unavoidable. They decided to join the Inca civilization in exchange for control over most of their trade routes, while providing the Inca with copper and mulla shell.

The Chincha built using dried abode mud resembling concrete once it had set, and the Inca extensions and buildings were also built with adobe bricks but their cultural styles are distinguishable. Especially evident in Inca works are trapezoidal inserts into the walls.

The fall of the Inca in 1533, when Cusco, the capital was overtaken and plundered by Francisco Pizarro and the Spanish “conquistadors”, resulted in the collapse of all Native civilizations in Peru. Foreign diseases more or less wiped out the indigenous people of the Nazca area, and in fact many areas of Peru, but the effect was particularly apparent along the coast. Spain ruled Peru as a viceroyalty for nearly 300 years after the conquest and regarded it more or less as a huge mine that existed to fill the crown's coffers, and the Native population were treated as animals.

The Spaniards felt that as a superior culture their customs and particularly the church were destined to bring “civilized” society to the Natives. The political and economic system they instituted to carry out their aims, called *encomienda,* granted soldiers and colonists land and mining permits, as well as the slave labor of the resident indigenous populations. Living and working conditions for the Native Peruvians on the farms and especially in the mines were horrendous; hard labor, malnutrition (exacerbated by the Spaniards' introduction of European crops and the elimination of many native ones), and

especially diseases wiped out an estimated 90 percent of the pre-conquest native population within a century. (3)

During this colonial period Spain passed legislation attempting to protect the Native population, but it was virtually ineffectual. Practices that were specifically outlawed, such as debt peonage, where subjects are trapped in an unending cycle of indebtedness for necessities of life which cannot be overcome through their labor, were in reality widespread. The influx of Spaniards taking advantage of these opportunities, as well as 100,000 African slaves, became part of a highly stratified society with European born Spaniards at the top, Peruvian born Spaniards (Creoles) next, and the urban working poor, the black slaves, and the indigenous population at the bottom.

Therefore, the population of present day Nazca is truly a mix of cultures, and very few Native people of the area derive much of their bloodline from the Inca, Chincha, Wari, Nazca or Paracas people. Influxes of indigenous people from the Peruvian highlands, whether by force or voluntary movement over the centuries has created a very heterogeneous population. Thus, any tour guide of the area claiming to be Nazca is most likely not a reference to the ancient blood line of the region.

4/ Why Did The Nazca Culture Collapse?

The great mystery of the Nazca area is of course, who made the lines and geoglyph animal and plant formations, and when? The Inca were not known for such enterprises, nor were the

preceding cultures of Chincha or Wari people. Thus, it must have been the Nazca, or someone even earlier.

Nazca priest one assumes, with “trophy head”

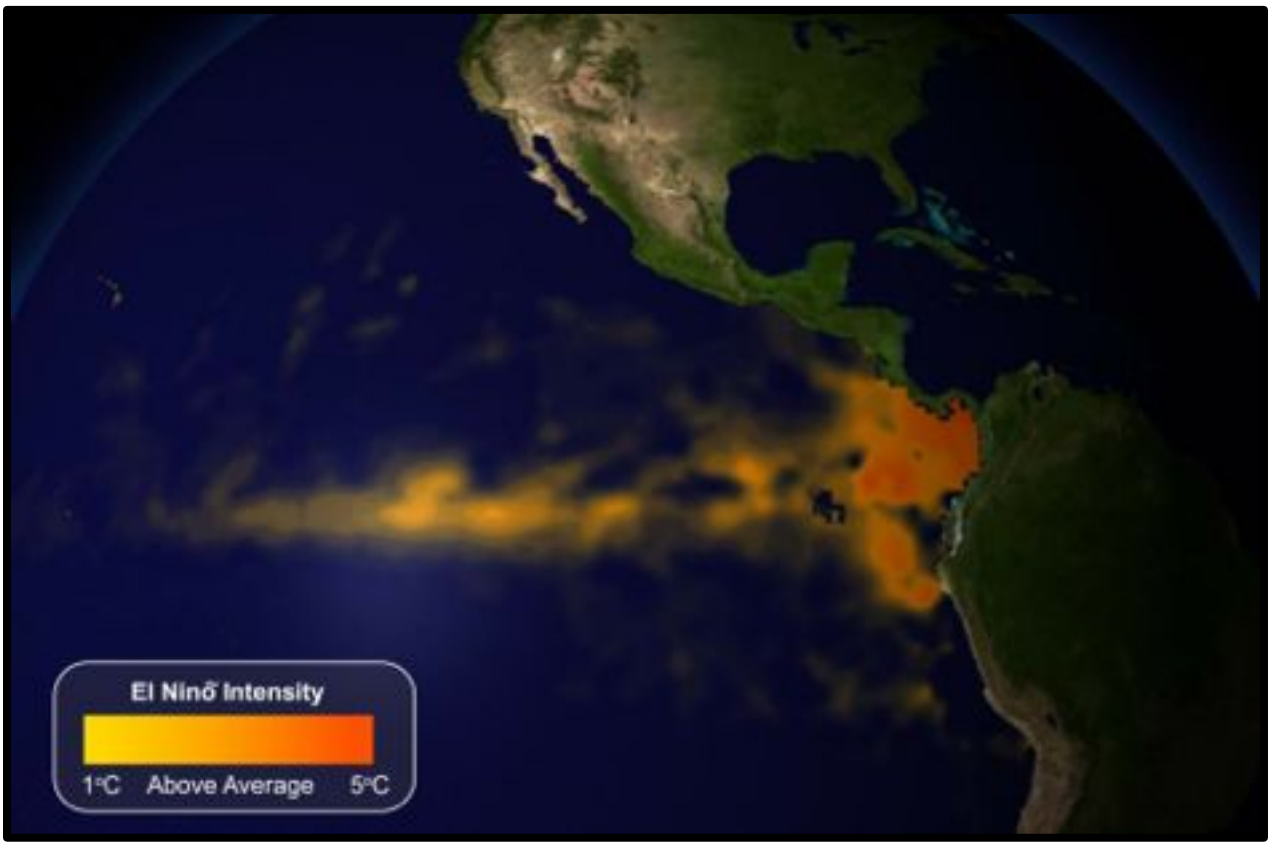
Most cultural academics, as in archaeologists, anthropologists and ethnographers basically agree that the Nazca, as a coordinated cultural entity existed between about 1 AD and 500 AD. Therefore, if the Nazca were solely responsible for the great geoglyph earth works, all of them would have had to have been completed during a timeframe of 500 years. But, since we know that they collapsed at about 500 AD, and that such undertakings would have required a well fed population and coordinated social structure, then could this reduce the time line to 400 years?

And, we would assume that the culture would have to evolve to the point where it was a cohesive entity. So; could this constrict the period to 300 years, or less? And from where would the knowledge of such a complex and coordinated undertaking have been derived?

Before we approach the subject of when they were made, let's see why the Nazca died out as a civilization. Archaeologists examining the remains of the Nazca have uncovered a sequence of human-induced events which led to their catastrophic collapse around 500 AD. Experts have struggled to explain why a society which clearly prospered during the first half of the first Millennium AD then collapsed into a bloody resource war and eventually vanished.

Some have argued that a "mega El Nino," which hit the region at around that time, may have been the cause. The El Nino/La Nina Southern Oscillation is a band of anomalously warm ocean

water temperatures that occasionally develops off the western coast of South America, especially Peru and Ecuador and can cause climatic changes across the Pacific Ocean. The 'Southern Oscillation' refers to variations in the temperature of the surface of the tropical eastern Pacific Ocean (warming and cooling known as *El Nino* and *La Nina*, respectively) and in air surface pressure in the tropical western Pacific. The two variations are coupled; the warm oceanic phase, El Nino accompanies high air surface pressure in the western Pacific, while the cold phase, *La Nina* accompanies low air surface pressure in the western Pacific. (4)



The El Nino effect

The extremes of this climate pattern's oscillations cause extreme weather (such as floods and droughts) in many regions of the world. Developing countries dependent upon agriculture and fishing, particularly those bordering the Pacific Ocean, are the most affected. In popular usage, the El Nino-Southern Oscillation is often called just "El Nino", and the terms comes from Spanish, meaning “the child” because it usually happens around Christmas time.

A “mega El Nino” would refer to the idea that this weather pattern could last far longer than normal, perhaps several years or even decades. Such seems to have also been the case in the highlands of Bolivia, in the 10th century, when a 40 year El Nino resulted in the ancestors of the Inca having to leave their ancestral homeland of the Lake Titicaca area and forge north to found the city of Cusco.

Writing in the journal Latin *American Antiquity*, however, a team of researchers led by Dr. David Beresford-Jones from the McDonald Institute for Archaeological Research at Cambridge University, suggest that the Nazca inadvertently wrought their own demise.

Using plant remains gathered in the lower Ica Valley, the team found evidence that over the course of many generations, the Nazca cleared areas of forest to make way for their own agriculture. Studies of pollen samples taken by co-researcher Alex Chepstow-Lusty, of the French Institute of Andean Studies in Lima, showed that the huarango tree, which once covered

what is now a desert area, was gradually replaced by crops such as cotton and maize. (5)

As the paper explains, however, the huarango was more than just a tree; it was a crucial part of the desert's fragile ecosystem, which enhanced soil fertility and moisture and helped to hold the Nasca's narrow, vulnerable irrigation channels in place.

Where huarango grow there is life

Eventually, they cut down so many trees that they reached a tipping point at which the arid ecosystem was irreversibly damaged. The authors do not dispute that a major, El Nino style

event then occurred, having found hard evidence of this for the first time. But they also find that the impact of this flood would have been far less devastating had the forests which protected the delicate desert ecology still been there.

‘These were very particular forests,’ Dr. Beresford-Jones said. ‘The huarango is a remarkable nitrogen-fixing tree and it was an important source of food, forage, timber and fuel for the local people. Furthermore, it is the ecological 'keystone' species in this desert zone, enhancing soil fertility and moisture, ameliorating desert extremes in the microclimate beneath its canopy and underpinning the floodplain with one of the deepest root systems of any tree known.’

‘In time, gradual woodland clearance crossed an ecological threshold, sharply defined in such desert environments, exposing the landscape to the region's extraordinary desert winds and the effects of El Nino floods.’ (6)

In the absence of huarango cover, when El Nino did strike, the river down-cut into its floodplain, Nazca irrigation systems were damaged and the area became unworkable for agriculture. This fits with other evidence that shows that the generations that came afterwards did not fare as well as their predecessors; infant mortality rose, while average adult life expectancy fell. The crops cultivated by their ancestors disappeared in the lower Ica Valley and the area was probably afflicted by a severe drought.

This flies in the face of the popular notion that Native people are always, and have always lived in harmony with their surroundings. However, it was most likely not their disregard for the environment in which they lived, but the result of an expanding population, and thus the need to grow more food. Similar cases have been cited for cultures such as those of the Anasazi of Chaco Canyon in the United States, and the Maya in Central America. More mouths to feed often results in the taxing of natural resources, and then a resource and environmental crash.

Such has often been written about concerning Easter Island (Rapa Nui) but recent evidence strongly suggests that it was the Polynesian rat after the arrival of the presumed first residents from Tahiti and colonial sheep and cattle farmers of the 19th century whose livestock destroyed that environment. Many writers, including Jerrod Diamond in his book *Collapse* have blamed the Native Polynesians for almost wanton destruction of their island. Most assertions are that the Rapa Nui people defoliated the forests, especially the giant palm trees which were once numerous for use as rollers to transport the giant stone Moai figures.

This is based on the idea that the traditional carving of these huge monuments, which had began as depictions of high chiefs had escalated to a fevered competition to make larger and grander ones. The result is said to have been a situation where the last of the palm trees was cut down for this enterprise, and

then the society became embroiled in a civil war. However, the descendants of the Rapa Nui have rarely if ever been consulted on this period of their history. The facts, according to those I have spoken with is that, again, the accidentally introduced rat, then European contact and finally sheep, goat, cattle and horse grazing led to their cultural collapse. For more on this, read *Easter Island: Guide For Inquisitive Minds* written by the author of the book you are presently reading.

5/ How Were The Lines Discovered?

If the Nazca people were responsible for creating the lines and geoglyphs, and if later cultures either did not know of their existence, and or didn't maintain them, then it is remarkable that they have lasted the 2000 to 1500 years from whence they are presumed to have been made.

Contrary to the popular belief that the lines and figures can only be seen with the aid of flight, they, or at least some are visible from atop the surrounding foothills. They were first discovered by the Peruvian archaeologist Toribio Mejia Xesspe, who spotted them when hiking through the foothills in 1927. He later discussed them at a conference in Lima in 1939. Xesspe Mejia was one of the foremost disciples of Julio C. Tello, whom he accompanied in the scans and the archaeological excavations carried out across the country.

1880 to 1947

Tello was the first Native Peruvian to get a doctorate in archaeology, and he achieved this through a scholarship from Harvard University in the United Sates. He is still regarded as

the father of Peruvian, and perhaps South American archaeology. Xesspe Mejia shared with Tello the merit of being the discoverer of the Paracas culture, between 1925 and 1927, with the findings of the cemeteries of that culture near the peninsula of the same name.

Tello and his team did not simply stumble across the Paracas culture, or more specifically their expansive and complex grave systems. They were in fact tipped off that Huaqero (tomb robbers) had been plundering the area, looking for gold and silver ceremonial objects, as well as ceramics and the very rare woven mantles (capes) that the high Paracas chiefs were buried with. Contrary to the later Nazca culture, who created enormous quantities of ornately painted clay vessels, the Paracas production of ceremonial objects was far smaller, and thus are far more valuable. One intact Paracas cape, called a *manto* in Spanish can fetch 1,000,000 US dollars on the international market, and usually black market. Fortunately the Peruvian government heavily restricts the exportation of pre-Colombian artifacts from the country, but some still make their way out, and at times through nefarious governmental and even national museum personnel.

Such was the case of the collection of Sr. Juan Navarro Hierro of the Paracas History Museum. In order to obtain a license to open and operate his private museum in Chaco, Paracas he was instructed by the government to have each of his artifacts documented. This required that the entire collection be taken

to the regional museum in Ica, and left for about a month while personnel there photographed, numbered, and wrote down a description of each piece.

Upon returning to the Ica museum to collect his artifacts, and presenting the authorities a complete list, he was then given a counter list by the museum staff. While his list contained over 200 priceless works, including 2 of the Paracas *manto*, the paper that the museum gave back to him was of only half of that number, minus the 2 *manto* as well as gold and silver masterpieces.

Paul Kosok, a historian from Long Island University in the United States is credited as the first scholar to seriously study the Nazca Lines. In the country in 1940 to 41 to study ancient irrigation systems, he flew over the lines and realized that one was in the shape of a bird. Another chance helped him see how lines converged at the winter solstice in the Southern Hemisphere. He began to study how the lines might have been created, as well as to try to determine their purpose. He was joined by Maria Reiche, a German mathematician and archaeologist to help figure out the purpose of the Nazca Lines. We will discuss the life and work of Maria Reiche extensively later, as she spent many decades studying at Nazca, and is regarded in Peru as a cultural icon. Kosok and Reiche proposed one of the earliest reasons for the existence of the figures; to be markers on the horizon in order to show where the sun and other celestial bodies rose. Archaeologists, historians and

mathematicians have all struggled ever since to determine the purpose of the lines, which we will delve into in some detail.

Beginning in the 1930s, Kosok became interested in irrigation systems of ancient cultures, and their relation to patterns of settlement. He devoted most of the next twenty years of research to that topic, during which he collaborated with the archeologist Richard P. Schaedel. For instance, together they identified and mapped more than 300 canals in ancient Peru, and found that they produced highly sophisticated means of shifting water from one valley to another. (7)

He soon realized that the Nazca Lines were too shallow to have acted as part of the irrigation system. Following his field studies on the irrigation systems, Kosok planned two volumes; one of general interest and one more technical. He was working on the general interest book on the irrigation of ancient cultures when he died in 1959, but it was published in 1965. His manuscript for a scholarly text needed work that was to be undertaken by the University of Texas. Including extensive mapping of canals through numerous valleys and innovative use of aerial photography, his book was praised as a "program of research about the significance of irrigation on the North Coast of Peru to both Andean and cross-cultural studies, a source-book of ideas and hypotheses for generations of field workers." (8)

Part of the brilliant Nazca aqueducts

6/ How Were The Lines And Figures Made?

Determining how they were made has been easier than figuring why they were made. Scholars have theorized the Nazca people could have used simple tools and surveying equipment to construct the lines. Archaeological surveys have found wooden stakes in the ground at the end of some lines, which support this theory. One such stake was carbon dated and was the basis for establishing the age of the design complex. However, dating one stake can hardly be hard enough evidence for dating all of the lines and figures.

Maria Reiche taking measurements

Maria Reiche, who is most famous for studying the Nazca phenomenon and did so for more than 50 years had her own thoughts as regards How old the lines and figures were;

‘The people who made the Nazca drawings lived in different valleys over a period of 3,000 years or more and left as a testament to their existence millions of layers in which are found fine gold and silver work, excellent pottery, and the finest cloth in the world. We do not know when they made the drawings. The immense quantity of drawings, each executed with utmost precision, must have taken at least half a generation to make. A Carbon 14 test made on a stick found at the end of a quadrangle in a heap of stones gives the year 550 AD, but I am sure that they are much older than that! We know

that the drawing activity extended through the time of the Inca because there are several drawings which are typical to the Inca style, sometimes drawn over older smaller figures, which are still visible underneath. This way, the drawing activity very well could have been extended over 2,000 years or more.' (9)

The fact that the majority of the Nazca Plain is as flat as a tabletop, making a straight line is not very complicated, and could have been done by very simple surveying techniques, using as little as three sticks. One stick would be places in the ground, vertically, and then another in front of it, in the desired direction. Then a third stick would be placed ahead of the first two, in direct line, much like a fence is often mapped out. The first stick could then be removed, and be put some distance in front of the third, and so on.

If one wished to make sure that the line was maintaining its straightness, the first stick could remain in place until the job was ended, ensuring accuracy. Not exactly a pursuit requiring "alien intervention."

The scholar Joe Nickell of the University of Kentucky has reproduced the figures by using tools and technology available to the Nazca people. The National Geographic called his work "remarkable in its exactness" when compared to the actual lines. With careful planning and simple technologies, a small team of people could recreate even the largest figures within days, without any aerial assistance. (10)

Nickell's doctorate is in English, not archaeology, but he is a renowned skeptic and debunker of such things as paranormal activities, book forgeries and seems to have disdain for author Erich Von Daniken's "ancient astronaut" theories, whose work we will discuss later. Quoting directly from Nickell, we get this insight into how he thinks the Nazca lines and figures were made:

'By far the most work on the problem of Nazca engineering methods has been done by Maria Reiche. She explains that Nazca artists prepared preliminary drawings on small six-foot-square plots. These plots are still visible near many of the larger figures. The preliminary drawing was then broken down into its component parts for enlargement. Straight lines, she observed, could be made by stretching a rope between two stakes. Circles could easily be scribed by means of a rope anchored to a rock or stake, and more complex curves could be drawn by linking appropriate areas. As proof, she reports that there are indeed stones or holes at points that are centers for arcs.' (11)

In Maria Reiche's own words;

'I am most interested in how the ancient people solved the technical problem of producing these huge figure drawings in such perfect proportions, at the same time not being able to recognize their shape from the ground. Enlarging the image from a smaller model could have only done this. But the model could not have been too small! For instance, it would take the figure of the monkey (18 meters in diameter), the toes having a

length of less than 2 meters. In order to have every detail of the figure appear on the chart in its proper size and direction, proportion, and position, within the figures in a way that could have been enlarged, the chart must have been at least the length of 2 meters. The only material for such a chart is cloth.' (12) As the cultivation of cotton was well known to the Nazca people, and widely produced, they certainly had the resources to produce such textiles.

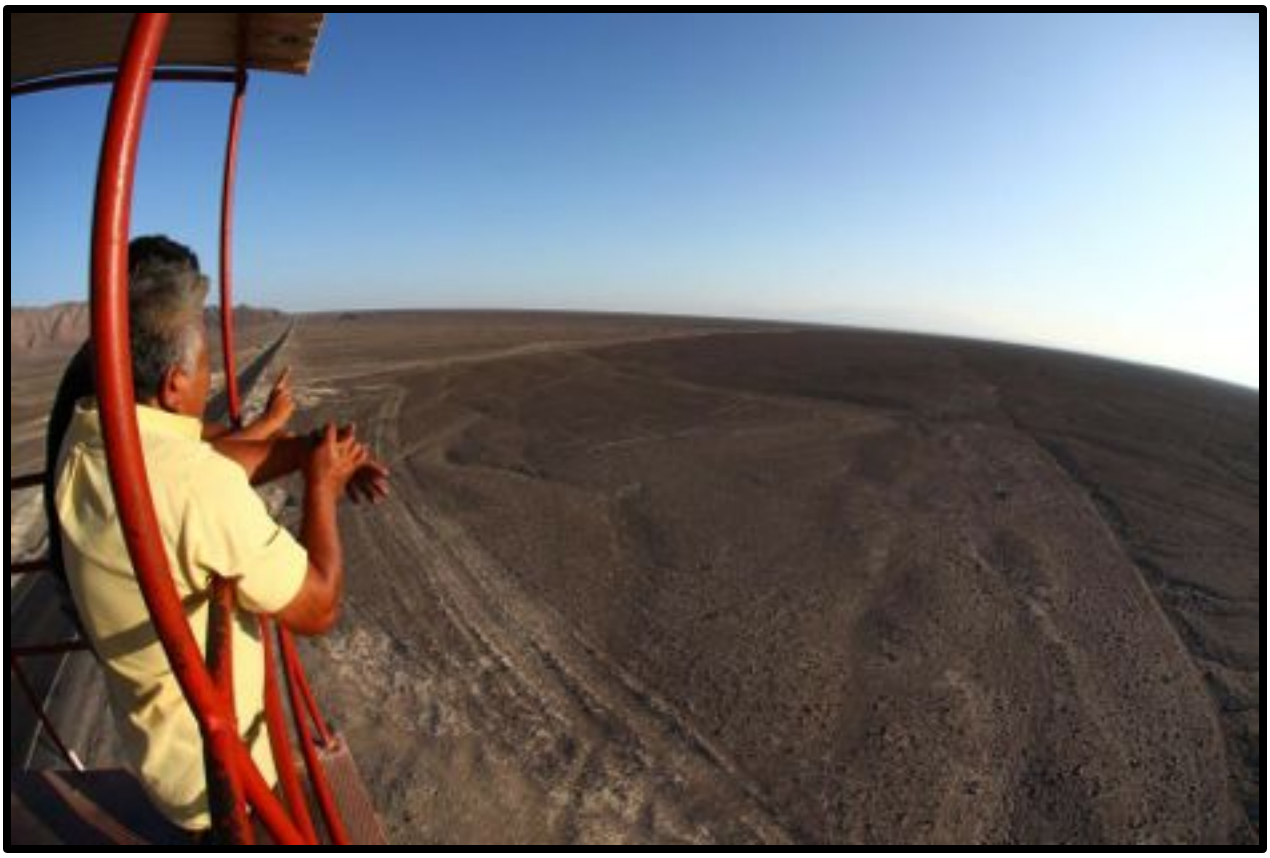
Maria Reiche's office with some of her drawings

Nickell then goes on to say: 'But Reiche does not detail the specific means for positioning the stakes that apparently served

as the centers for arcs or the end points of straight lines. In her book she wrote, ‘Ancient Peruvians must have had instruments and equipment which we ignore and which together with ancient knowledge were buried and hidden from the eyes of the conquerors as the one treasure which was not to be surrendered.’ Be that as it may, Maria Reiche, using scale models, has made major advances toward demonstrating how Nazca ground art was produced. Although more research needs to be done, the prehistoric engineering skills are no longer completely unknown.’

For his own experiment, Nickell describes to us the techniques he used to recreate one of the large animal geoglyphs: ‘I decided to attempt to reproduce one of the larger Nazca figures, the 440-foot-long condor using a means I thought the Nazca might actually have employed. I was joined in the project by two of my cousins, John May and Sid Haney. The method we chose was quite simple: We would establish a center line and locate points on the drawing by plotting their coordinates. That is, on the small drawing we would measure along the center line from one end (the bird’s beak) to a point on the line directly opposite the point to be plotted (say a wing tip). Then we would measure the distance from the center line to the desired point. A given number of units on the small drawing would require the same number of units, larger units, on the large drawing.

The work of Nickell shows that in theory the animal figures could have been made using a scale drawing or other related technique, and does debunk the idea that they could only have been achieved with the designer being in the air, such as in a primitive balloon, or “flying saucer.” There is a tower next to the highway leading into Nazca city from the north which the government set up for visitors to view two of the prominent figures. From this elevation of approximately 30 feet, the figures of the “hands” and “tree of life” are clearly visible, as are many of the straight lines which travel off to the horizon. It is possible that the technique used by the figure makers was the erection of a multi-stage tower of local materials, such as thin huarango tree trunks lashed together. Such a construction would be portable, and could be assembled quite simply and quickly.



View from the Nazca tower

On the ground, most of the lines are formed by a shallow trench with a depth of between 10 cm (3.9 in) and 15 cm (5.9 in). Such trenches were made by removing the reddish-brown iron oxide coated pebbles that cover the surface of the Nazca Desert, giving the area a brownish hue. When this gravel is removed the light colored whitish yellow clay earth which is exposed in the bottom of the trench produces lines which contrast sharply in color and tone with the surrounding land surface. This sub layer contains high amounts of lime clay which, with the morning mist, hardens to form a protective layer that shields the lines from winds, thereby preventing erosion. The deposition of all of this clay was most likely the

result of thousands of years of water moving down from distant hills when the overall climate of the area was much wetter. Flash floods do happen to this day, since the hills and mountains to the east are more influenced by damp weather in the highlands and Andes than the dry coastal areas.

The Astronaut surrounded by flood evidence

The Nazca "drew" several hundred simple but huge curvilinear animal and human figures by this technique. In total, the earthwork project is huge and complex; the area encompassing the lines and figures is nearly 500 square kilometers (190 sq. mi), and the largest figures can span nearly 270 meters (890 ft.). Some of the measurements for the figures include the Hummingbird which is 93 meters (310 ft.) long, the

Condor 134 meters (440 ft.), the Monkey 93 meters (310 ft.) by 58 meters (190 ft.), and the Spider 47 meters (150 ft.) in length. The extremely dry, sometimes windless and constant climate of the Nazca region has preserved the lines well. The Nazca desert is one of the driest on Earth and maintains a temperature around 25 °C (77 °F) all year round. The lack of wind has helped keep the lines uncovered and visible to the present day.

Before moving on to what the lines and figures could have represented to those that made them, and the various theories that have been advanced since they were discovered by the Peruvian archaeologist Toribio Mejia Xesspe, I would like to discuss the life and works of Maria Reiche. Though only one of those that studied the Nazca area, she devoted much of her life to this pursuit, as in more than 50 years, often being ignored by local people and government officials. It is frankly almost solely due to her that humanity at large even know of the existence of the Nazca lines and figures, and that they still exist. Numerous attempts were made during her time at Nazca to convert some of the areas where the lines and figures are to agricultural areas, gravel pits, etc. And such was the local level of ignorance and disrespect that cars and trucks drove across these ancient works with reckless abandon until the Peruvian government finally took action.

7/ Maria Reiche: Guardian Of The Glyphs

Before embarking on a description of Maria Reiche's accomplishments as regards Nazca, here is a quote from her as

to why she devoted more than 50 years to the study of the lines and figures;

‘It was a kind of destiny. When I first came to Peru by sea the ship went passing through the center of four consecutive rainbows, four arcs, one inside the other. It was a marvelous spectacle! It must have been some kind of prediction or something. Imagine a boat, a boat driving through the open sea, passing through arching rainbows that touched the waves.’ (13)

Maria Reiche; the face of determination

As briefly stated earlier, she spent many years, in fact decades completely ignored by the local people, who often regarded her as “La Loca Gringa” (The Crazy Foreign Woman) behind her back, and received little attention from the Peruvian government. When asked why she was so devoted to her study, this was her response;

‘Everything had prepared me for this life. The isolation into which I found myself, my parents putting me aside after my brother was born, my shortsightedness not being detected, all made me an introvert. It made me aloof because I was never the popular type. Now the tourists have made me popular. I was never popular! I sometimes wanted to be, but I could never be. What compelled me on this quest was my curiosity. I wanted to know!’

And here is another beautiful quote from Maria Reiche;

‘It seems almost incredible that ground-drawings made by superficially scratching the surface could have withstood the ravages of time and weather over such long periods. The climate is one of the driest of the globe. One could say that it rains for half an hour every two years. And although strong winds carry great quantities of sand, not encountering any obstacles on the vast tablelands open towards the north and south, they take it further north, where at seventy miles distance one can see huge dunes on both sides of the (Pan-American) highway. Moreover, close to the ground the air is becalmed considerably. Owing to their dark color, the surface

stones absorb much heat, causing a cushion of warm air to protect the surface from strong winds.' (14)

Maria Reiche camped out on the Nazca pampa

Maria Reiche was born May 15, 1903 in Dresden, Germany. She studied mathematics, astronomy, geography and foreign languages at the Dresden Technical University. In 1932 she began work as a nanny and teacher for the children of a German consul in Cusco, Peru, and in 1934 she lost one of her fingers to gangrene. The same year she became a teacher in Lima and made scientific translations, as she spoke five languages. When World War II broke out, all German citizens were detained in Peru.

‘I began my research in 1940, but then the war came and Peru joined the allies. We Germans were not allowed to leave Lima. In '46 I could see that the solstice lines existed in different places especially from centers, of which almost every one of them has one, or two, solstice lines. There are also solstice triangles! In general, one can say that not only straight lines, but also the edges of triangles and quadrangles, have specific directions which are repeated everywhere. More than sun directions there are moon directions, which is in agreement with the knowledge that the moon was observed before the sun.’ (15)

Around 1946 Reiche began to map the figures represented by the Nazca Lines and found 18 different kinds of animals and birds. After Kosok left in 1948, she continued the work and mapped the area. She used her background as a mathematician to analyze how the Nazca may have created such huge scale figures and found them to have a mathematical precision that was highly sophisticated. Reiche theorized that the builders of the lines used them as a sun calendar and an observatory for astronomical cycles.

Early photo of Maria Reiche in the field

Because the lines can be best seen from above, she persuaded the Peruvian air force to help her make aerial photographic surveys. She worked alone from her home in Nazca. Reiche published her theories in the book *The Mystery on the Desert* (1949, reprint 1968), which had a mixed response from

scholars. Eventually scholars concluded that the lines were not chiefly for astronomical purposes, but Reiche's and Kosok's work had brought scholarly attention to the great resource. It is widely believed that they were used as part of worship and religious ceremonies related to the calling of water from the gods. (16) But the details of all of the various theories we will get into later.

Modern flight over the nearby Palpa figures

Let’s hear from Maria Reiche herself as regards her convincing the Peruvian air force to let her see the lines and figures from above;

‘The figures, the drawings, are very superficial furrows never more than 30 cm in depth, and very shallow. For this reason the

wind has obscured them by filling them with small dark pebbles from the surrounding surface like grain, making them difficult to detect from the air. To make them more accessible for viewing I cleaned them with a broom, one broom after another throughout the years. I went through so many brooms rumors circulated that I might be a witch!

I presented the Peruvian Air force with charts of the figures of the Pampa, and this began a wonderful cooperation between us resulting in many photographic flights.

The number of drawings on the Pampa is immense. There are thousands of straight lines, hundreds of triangles and quadrangles, and dozens of figures. All this spread over 50 kilometers from north to south, and 5 to 7 kilometers from the foot of the Andes toward the sea. The biggest concentration of drawings is always found at the edges of the different plains where the descent to the valleys begin because this is the nearest place to where the people who made the drawings lived though they never lived among the drawings, nor buried their dead there.' (17)

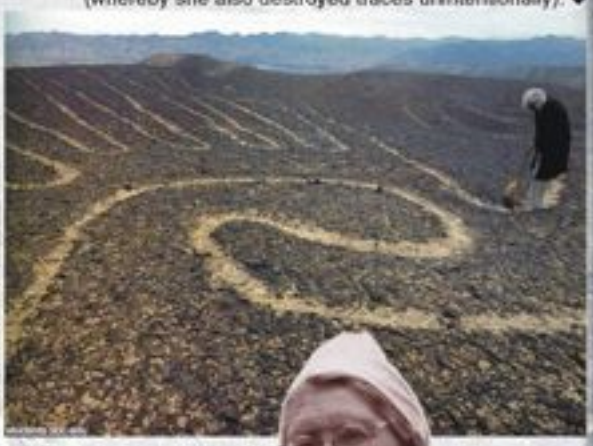
Maria Reiche – a whole long life for the geoglyphs

Maria Reiche, born in Dresden, Germany in 1903, emigrated to Peru in 1932 in order to get a job as a private tutoress. When the American Paul Kosok asked her to help him with the registration and interpretation of the just newly discovered geoglyphs she was all for it at once.
1946 she moved finally near Nazca and spent the rest of her life exploring the ground drawings. She lived in a small hut at the edge of the Pampa, cleared unnumerous miles of lines from inblown sand, mapped the ground drawings, published them and fought for their preservation – sometimes without success. Anyway, she could prevent a huge irrigation project and achieved that the area became world cultural heritage since 1994. Pretty fit up to an old age, she died in 1998.

Maria Reiche at measuring works in the pampa (left and right) and with Paul Kosok (2. from right) and at one of the Nazca lines. In the mid a photo of a crucial experience of Kosok and Reiche: winter solstice exactly in the direction of one of the lines. Since then she favoured astronomical interpretations, but never comitted herself wholly. ↖↑

← A senescent Maria Reiche infirm on the way at the edge of a huge trapezoid. Finally, she had to use a wheel chair.

For the locals, Maria Reiche was the woman sweeping the desert (whereby she also destroyed traces unintentionally). ↓



↑↓ M. Reiche with scetches of the geoglyphs

Stamp and newspaper report from 1955 about the "profesora"

Maria Reiche had a very wantless life in a shed at the edge of the desert (↓ reconstructed in the Maria Reiche Museum near Nazca). Even her appearance got more and more ascetical. →

Maria explains the aerial views to the Peru army pilots. ↙

She used the profits from the book *The Mystery On The Desert* to campaign for preservation of the Nazca desert and to hire guards for the property and assistants for her work. Wanting to preserve the Nazca Lines from encroaching traffic after one figure was cut through by the Pan American highway government development, Reiche spent considerable money in the effort to lobby and educate officials and the public about the lines. After paying for private security, she convinced the government to restrict public access to the area. She sponsored construction of a tower near the highway so that visitors could have an overview of the lines to appreciate them without damaging them. This is the tower or *Mirador* that I referred to earlier.

The tower that Maria Reiche helped to finance

Reiche's health deteriorated over the years as she aged. She used a wheelchair, suffered from skin ailments, and lost her sight. In her later years she also suffered from Parkinson's disease. Marie Reiche died of ovarian cancer on June 8, 1998, and was buried on the grounds of her house, which is now the Maria Reiche Museum near Nazca with official honors.

For years before the lines became a UNESCO World Heritage site, Reiche guarded them so zealously that even after she was confined to a wheelchair she was known to chase trespassers off the sand dunes near the lines. `This is a really painful and sad loss for Peruvian archeology,' President Alberto Fujimori told reporters during a trip to the United States.

'We will remember her as a scientist who made a mark of transcendental importance for the good of the lines. Perhaps the 'Nazca lines' should even be renamed after her,' he said. Reiche, who became a Peruvian citizen in 1994, died in an Air Force hospital in Lima surrounded by family members. German and Peruvian flags flew at half-staff in Nazca and authorities declared a day of mourning in the southern town. The museum that bears her name is open to the public, and is located right next to the highway, in between the towns of Palpa and Nazca.

Determined to study and protect until her last days

8/ Theories Of What The Lines Mean

Over the decades since their 20th century rediscovery, archeologists, ethnologists, and anthropologists have studied the ancient Nazca culture to try to determine the purpose of the lines and figures. Kosok and Reiche advanced a purpose related to astronomy and cosmology, that the lines were intended to act as a kind of observatory, to point to the places on the distant horizon where the sun and other celestial bodies rose or set in the solstices.

Many prehistoric indigenous cultures in the Americas and elsewhere constructed earthworks that combined such

astronomical sighting with their religious cosmology, and so this theory held sway for a long time, especially considering that Kosok and especially Reiche were the pioneers in the study of the Nazca area. One such example of another such figure is that of the Atacama Giant in northern Chile.

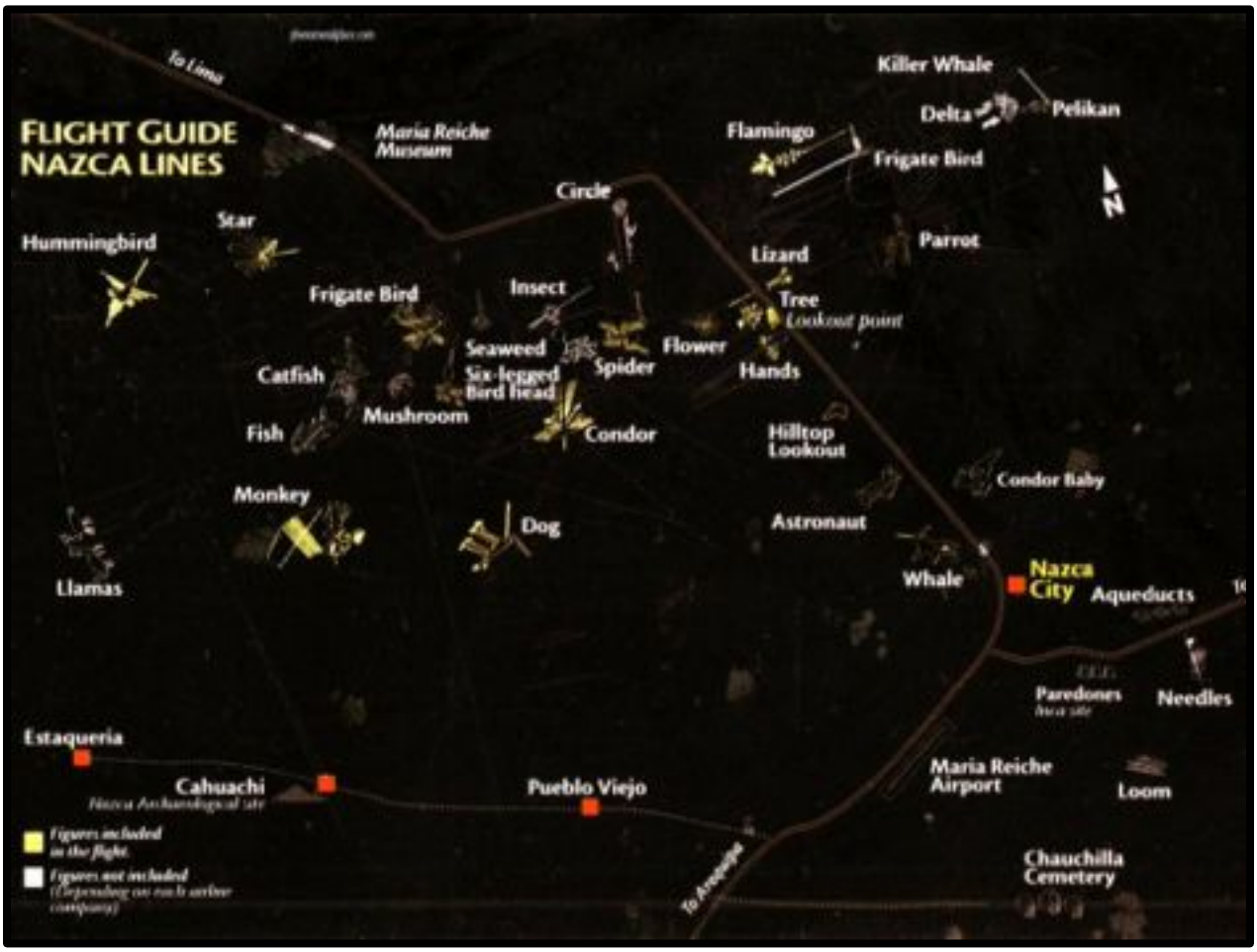
The Atacama Giant in the desert of northern Chile

But Gerald Hawkins and Anthony Aveni, experts in archaeoastronomy, concluded in 1990 that there was insufficient evidence to support such an astronomical

explanation. Archaeoastronomy is the study of how past people have understood the phenomena in the sky, how they used phenomena in the sky and what role the sky played in their cultures. It uses a variety of methods to uncover evidence of past practices including archaeology, anthropology, astronomy, statistics and probability, and history. Because these methods are diverse and use data from such different sources, the problem of integrating them into a coherent argument has been a long-term issue.

Reiche asserted that some or all of the figures represented constellations; 'In '46 I could see that the solstice lines existed in different places especially from centers, of which almost every one of them has one, or two, solstice lines. … More than sun directions there are moon directions, which is in agreement with the knowledge that the moon was observed before the sun…The geometric drawings are directed toward horizon points marking the rising and setting of the heavenly bodies and most likely served to mark the sowing and harvest time, and the distribution of food during the dry period of the year. The figures indicated the division of the year by way of constellations, with respect to their positions at night. The most important epoch of the year was, until now, December. This was the month the rivers would fill to the brim with muddy water that brought life to the fields. Now this has all stopped. There is an eternal drought here due to the contamination of air quality preventing the clouds from reaching the high mountains to fill the rivers. Years ago one could see the people

making furrows in the fields to prepare for the arrival of the water. In ancient times they knew when to begin this labor. Here the Big Dipper (our Big Bear) announces the water. This constellation is only visible between December and March and is seen here upside down with the handle curved upward. It's possible that the Dipper was represented by one of the large drawings, the monkey, and several straight lines point to the rising and setting of the largest star in the Dipper in the year 900 AD.' (18)



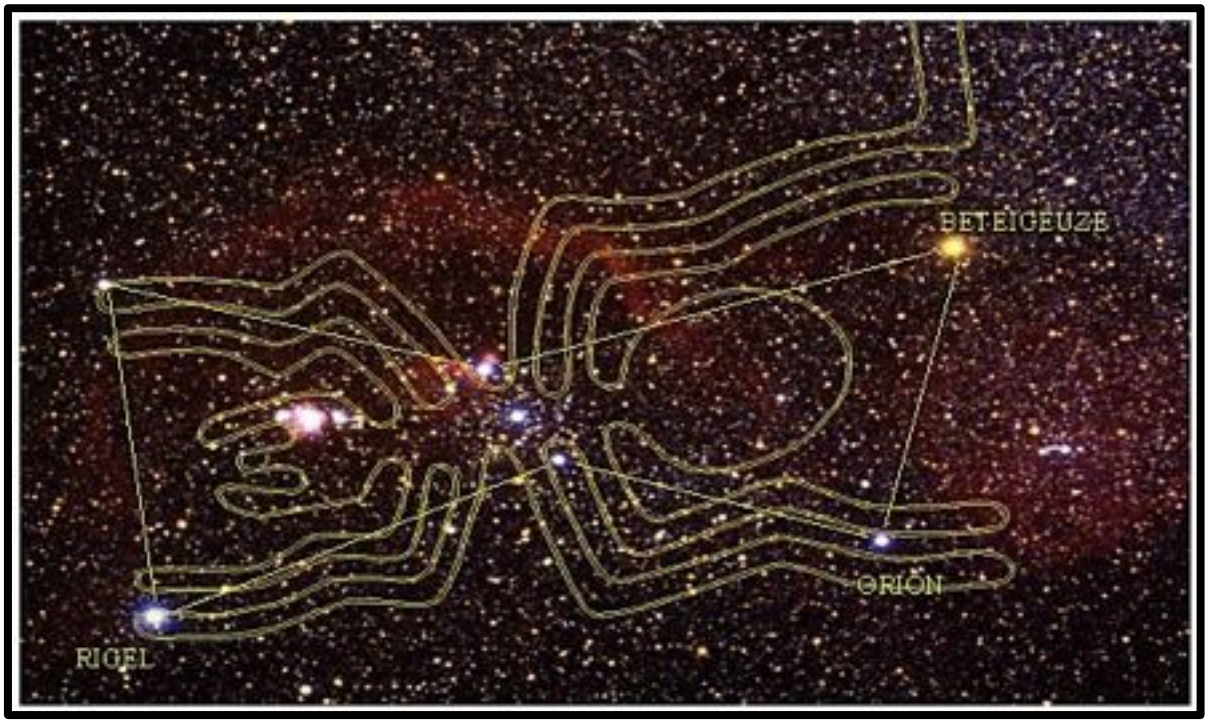
The complete Nazca map of lines and figures

But Gerald Hawkins, of Stonehenge fame felt he had disproved the theory of Kosok and Reiche. "Hawkins could find no correlation at all between the lines and the stars." However, and interestingly, archaeologist and geoglyph expert Persis Clarkson notes that there was "very little attempt (by Hawkins) to look at the Andean conceptions for constellations," leaving room for speculation that perhaps these lines in fact could be astronomical sightlines. (19)

Anthony Aveni believed that the lines pointed to water sources. He suggested that the eight hundred miles (1,300 kilometers) worth of straight lines map the direction of water sources and the highly advanced irrigation system which the Nazca had produced. Two-thirds of the lines seem to follow channels of the irrigation system. "The points at which water occurs on the pampa (Nazca plain), together with the direction in which it moves, correlate strongly with the radial line centers." It has been found that the axes of trapezoids and triangles parallel the orientation of watercourses and the points at which these lines intersect to create radial points seem to be points of water sources. These points at which create the center at which the lines converge (or diverge) are elevated, either naturally occurring high points in the landscape or built-up manually as if simulating the mountains. (20)

By 1998, Phyllis B. Pitluga, a protégé of Reiche and senior astronomer at the Adler Planetarium in Chicago, had concluded that the animal figures were 'representations of heavenly

shapes. But she contends that they are not shapes of constellations but of what might be called counter constellations, the irregular-shaped dark patches within the twinkling expanse of the Milky Way.' (21) She asserted that the giant spider figure is an anamorphic diagram of what we know of as the constellation Orion. She further suggested that three of the straight lines leading to the figure were used to track the changing declinations of the three stars of Orion's Belt.



Pitluga's theory about the Spider and Orion

In a critique of her analysis, Aveni noted that she did not account for the other twelve lines of the figure; he commented generally on her conclusions, saying:

'I really had trouble finding good evidence to back up what she contended. Pitluga never laid out the criteria for selecting the

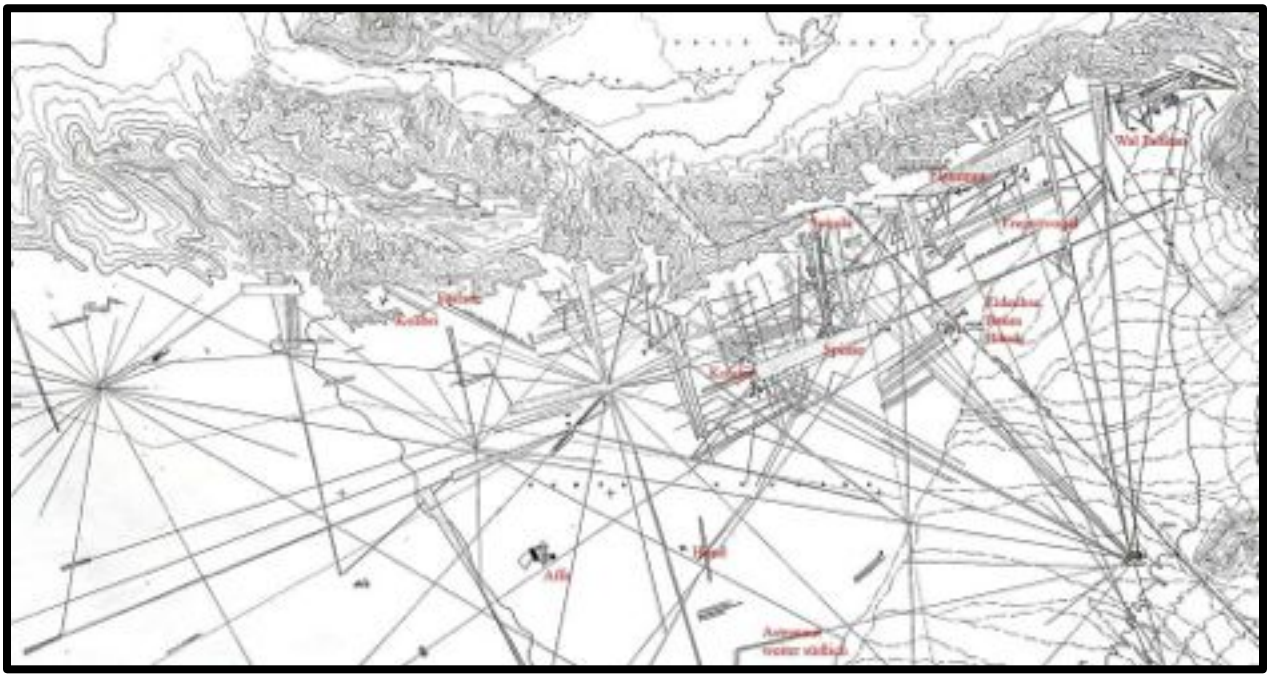
lines she chose to measure, nor did she pay much attention to the archaeological data Clarkson and Silverman had unearthed. Her case did little justice to other information about the coastal cultures, save applying, with subtle contortions, Urton's (Gary Urton of Harvard University) representations of constellations from the highlands.' (22)

In 1985, the archaeologist Johan Reinhard published archaeological, ethnographic, and historical data demonstrating that worship of mountains and other water sources predominated in the Nazca religion and economy from ancient to recent times. He theorized that the lines and figures were part of religious practices involving the worship of deities associated with the availability of water, which directly related to the success and productivity of crops. He interpreted the lines as sacred paths leading to places where these deities could be worshiped. The figures were symbols representing animals and objects meant to invoke the gods' aid in supplying water.

Reinhard is famous for his discoveries of Inca mummies, frozen sacrifices on the peaks of the Andes in Peru and Argentina. He also has explored the sacred valleys of the Himalayas and performed underwater archaeology in some of the world's highest lakes.

The unique constructions of the lines and animal as well as plant geoglyphs seem to indicate a possibility that they were a means of ritual pilgrimage or perhaps ritual in invoking the

benevolence of the gods in providing for the people. For example, spirals are conceived so that the path not only leads inwards but outwards without retracing ones' steps over the same path as seen in the tail of the monkey.



The complete Nazca map

The outline shape of the Condor, Cormorant, and Hummingbird as well as the other figural geoglyphs further supports this idea. Perhaps, the geoglyphs were 'forms of haptic art, which is intended to be experienced not by viewing but by moving over and through it;' the ultimate goal was the journey, not the destination. Reminiscent of the idea of the labyrinth in western religious vernacular, what links and seemingly unites these three theories is the common underlying theme: 'the idea of repeated ritual action.' (23)

The majority of the Nazca area's present day water, and quite possibly that of the past is and was subterranean. Snow melt from the high Andes to the east of course forms streams, and then rivers flowing downhill, and westward towards the Pacific Ocean, as well as eastward into the Amazon Basin. However, due to the dry nature of the Nazca area such westward moving surface water often evaporates before it can travel much of a distance. The only reliable sources of water for the people of the Nazca valley are the high mountains of the Andes. The rivers flow from their mountain sources for only two brief seasons. At some point in the past the Nazca built an impressive irrigation system to control the precious water. 150 kilometers of aqueducts, most of them underground, crisscrossed the region.

Example of the ancient Puquio water access system

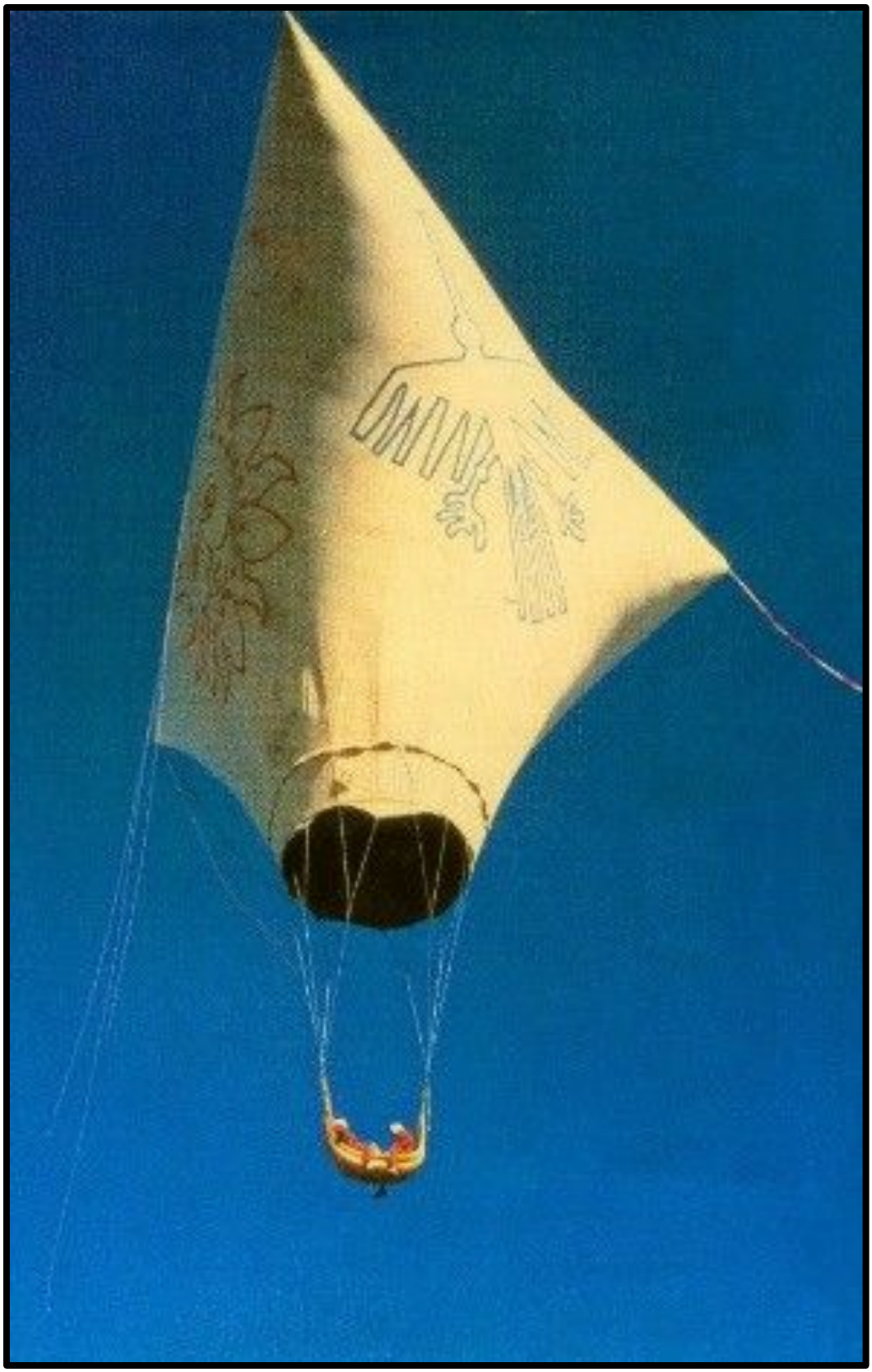
The ancient Nazca system is still in use today. The above photo is an example of a series of puquio. They give access to deep, subterranean tunnels which can become blocked with debris, and thus the puquio serve both as ways to get at the water and clean the system. More about this later. (24)

According to the work of David Johnson, and described in his book *Beneath The Nasca Lines and Other Coastal Geoglyphs of Peru and Chile* the Nasca Lines consistently map the source and course of aquifers. Five components were consistently present at each location, as if part of an equation; faults, aquifers, fresh water sources, geoglyphs and archaeological sites. Where one

or more of these features are found there is a high probability the others are present. He realized the Nazca Lines are a text imprinted into the landscape providing the inhabitants of the region, both past and present, with the solution to their water problems.

‘The geoglyphs were used to map aquifers from the mountains and across the coastal desert to where they intersect the valleys. The ancients realized in the mountains and on the pampa the aquifers were too deep for wells and puquios, however in several locations where they intersect a valley bottom one can dig deep enough to reach them. Thus wherever a fault, aquifer and geoglyphs intersect a river valley one can expect to find an archeological habitation site, cemetery, fresh water and agricultural zone.’ (25)

Jim Woodmann believes that the Nazca lines could not have been made without some form of manned flight to see the figures properly. Based on his study of available technology, he suggests that a hot air balloon was the only possible means of flight. To test this hypothesis, Woodmann made a hot-air balloon using materials and techniques that he understood to be available to the Nazca people, such as native cotton. The balloon flew, after a fashion, for a short period of time, but not enough to seem a credible theory. Most scholars have rejected Woodmann's thesis because of the lack of any evidence of such balloons.



Woodman’s balloon in action

Using cloth, rope, and reeds, Woodman and his associates actually made a balloon and gondola similar to those the Nazca might have made had they actually done so. Woodman and British balloonist Julian Nott then risked their lives in a 300 foot high flight over of the Nazca plain. Their balloon was descending rapidly and after they had thrown off more and more sacks of ballast they jumped clear of their craft some ten feet above the pampa. Free of the balloonists' weight, the balloon shot skyward and soared almost out of sight, only to finally crash and drag briefly across the ground. (26)

One of the most famous, and some would say audacious ideas as to what the Nazca lines and figures mean, and how they were created is that of Erich von Daniken who suggests the Nazca lines and other complex constructions represent higher technological knowledge than commonly believed to be existing when the glyphs were created. Von Daniken maintains that the Nazca lines in Peru are runways of an ancient airfield that was used by extraterrestrials mistaken by the natives to be their gods. His theory has not been accepted by scholars.

Born in Switzerland in 1935, his first and most famous book *Chariots of the Gods* was published in 1969, and was a huge best seller. In 1966, when von Daniken was writing this book, scientists Carl Sagan and I. S. Shklovskii wrote about the possibility of ancient contact and extraterrestrial visitation claims in one chapter of their book *Intelligent Life in the Universe*, giving some scientific legitimacy to the idea.

Erich von Daniken in Egypt

Many ideas from this book appeared in different form in von Daniken's books. Sagan has been very critical of von Daniken:

‘That writing as careless as von Daniken's, whose principal thesis is that our ancestors were dummies, should be so popular is a sober commentary on the credulousness and despair of our times. But the idea that beings from elsewhere will save us from ourselves is a very dangerous doctrine - akin to that of the quack doctor whose ministrations prevent the patient from seeing a physician competent to help him and perhaps to cure his disease.’

—Carl Sagan, *Foreword to The Space Gods Revealed* (27)

Von Daniken brought the Nazca lines to public attention, especially with *Chariots Of The Gods*, and attracting so many tourists that researcher Maria Reiche had to spend much of her own time and money preserving them. (28) Von Daniken said that the lines were built following instructions from some extraterrestrial beings, to be used as airfields for their spaceships.

In his 1998 book *Arrival of The Gods*, he added that some of the pictures depicted extraterrestrials. (29) Archaeologists, however, are sure that they were made by pre-Columbian civilizations for cultural purposes, and they have not bothered refuting this sort of speculation. Most likely the highest profile television show that continues to propel the ancient alien theory is in fact the series of that very name, Ancient Aliens, in which I appeared in 7 episodes. One of these focused on the Nazca lines, and showed me creating a short line segment by simply dragging my hiking boot across the surface. That simple act, taking about 3 seconds exposed the light coloured clay below the surface of the oxidized red, grey and brown stone.

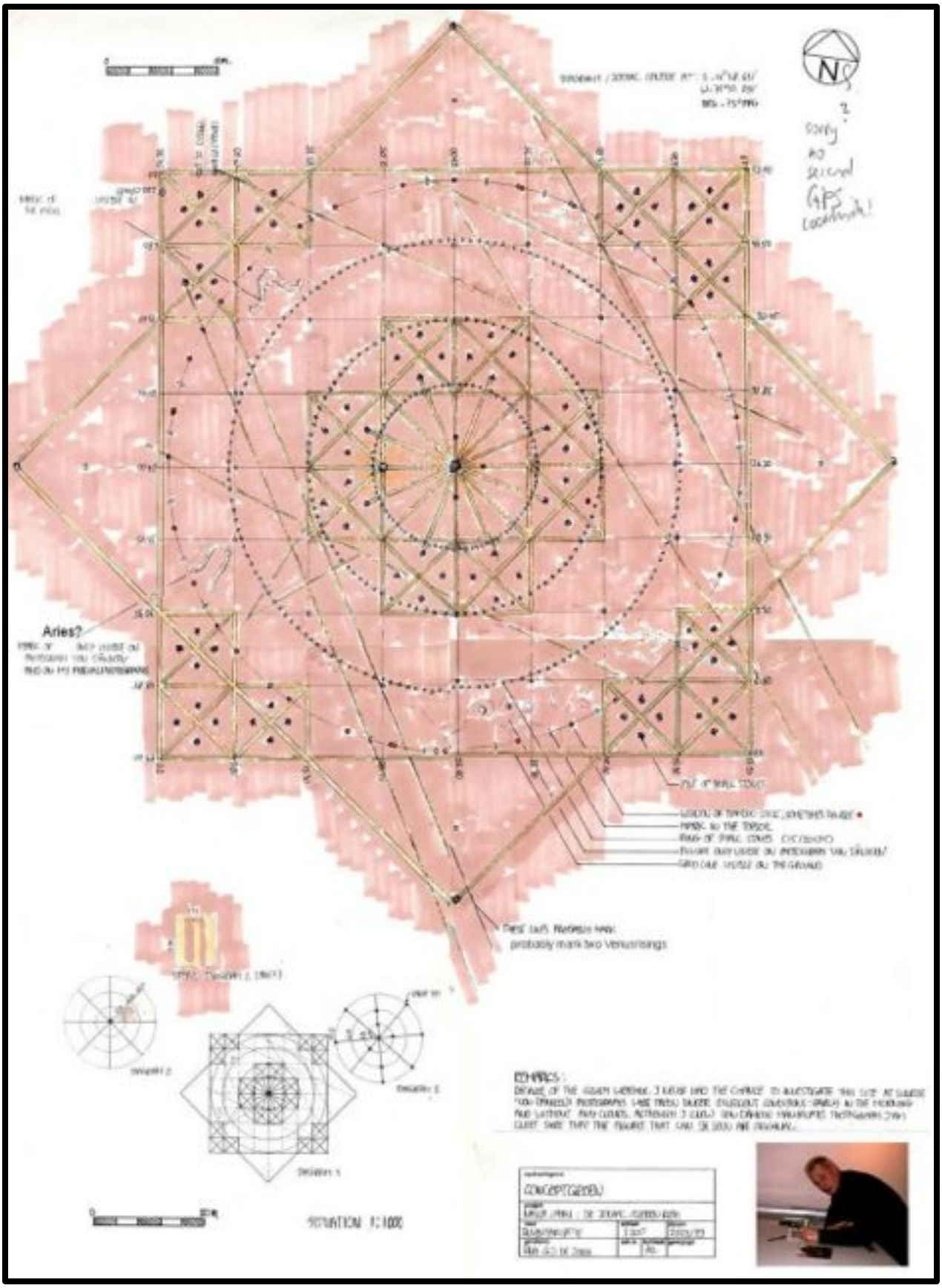
It does seem evidently clear that beings from another star system or even another galaxy, being capable of traveling through space over vast distances and perhaps faster than the speed of light, or through worm holes or folds in space, would not need a landing strip. Von Daniken's *Chariots Of The Gods*

was published prior to the Americans landing on the moon in 1969, and von Daniken clearly did not account for the rather basic idea that galactic travelers would have technology vastly superior to ours.

Even the poorest of movies made about extraterrestrial travelers notes that their vehicles would not fly like 20th century planes, but would be capable of vertical takeoff and landing, employing antigravity. Therefore, long straight runways would not be required, nor any kind of surface markings of any kind.

Researcher Gilbert de Jong visited and meticulously surveyed Nazca, measuring and plotting the features with GPS. He was especially interested in the so-called "mandala" figure. This geoglyph, a huge circle inside of a square, appeared to remind him of a zodiac map. This was further supported, in his mind by the image of a snake like creature, positioned at one point where de Jong expected to find the symbol for "Aries." However, Aries is usually a ram, not reptilian. The absence of any other zodiac signs is puzzling. Also, no one has yet figured out the significance of the many holes and pits that are an integral part of the structure.

Gilbert de Jong believes that the interpretation of the many other animal figures is likely to be different representations for constellations by an ancient culture. (30)


Aries?
probably mark two Venus risings

According to Alan F. Alford, the Tiahuanaco (or Tiwanaku) culture of the Lake Titicaca Bolivia area had a large population of Negro slaves that were forced to make these designs under harsh conditions. After a revolution the Negroid population rebelled and destroyed some of the figures, making zigzag and meandering lines to obliterate them. Later the Negroid population migrated north and founded Chavin (Peruvian culture in the Ancash region) and the Olmec culture of southern Mexico. (31) This theory I find to be one of the oddest, as where the evidence is that Negros ever lived in the Lake Titicaca area in pre-Colombian times is not self evident in the research of other academics to my knowledge.

The Chavin culture that Alford eludes to existed as a coherent entity from 900 to 200 BC, and the Olmec from 1500 to 400 BC. Not only do the time frames not match what most researchers believe to be when the Nazca lines and figures were made, but also no evidence has been brought forward that I know of as to where these so called slaves had come from and how.

One must also wonder why, if it was so difficult to make the original designs, why these people would invest the time and effort to obliterate and cover them with equally difficult patterns.

Robert Bast from Australia has a different theory. All these animal, plant and human-shaped figures are lying together on the ground, as if they were corpses remaining after some

catastrophic flood. So it could be a memorial place of the "big flood." Many cultures in the world have deluge-myths. But one has to question why these animals, of all the known species that exist, were selected. (32)

And then we have Robin Edgar from Canada who proposes that the Nazca figures were inspired by, and intended to be seen by the so-called "Eye of God" that is manifested during total solar eclipses. An extraordinary series of solar eclipses supposedly coincided with the construction of the Nazca lines. Some Lines are aligned with the winter solstice which is often considered as the "death" and "rebirth" of the Sun God. (33)

Evan Hadingham proposed that the ancient Nazca priests used powerful hallucinogenic concoctions that made them adept at "out of body" experiences. He theorized that the priests, or shamans, were able to transform into spirits and fly above the land. To amuse them or possibly honor them, the giant line art was created. The predominant medicinal and hallucinogenic drug of this area in ancient times was procured from the San Pedro cactus. (34)

Helaine Silverman, the co-author of Anthony Aveni (the archaeoastronomer discussed earlier) suggested that the figures are clan signs of different Indian tribes or families in the region of Nazca. This idea is supported by the fact that many clans in North and South America often use an animal, or "totem," to represent their migrations in petroglyphs. (35) But, that is about as far as that theory goes.

Close up of the Tree geoglyph

And then we have Albrecht Kottmann who tried another approach to the Nazca mystery. He divided the animal and plant figures into different parts or pieces and analyzed them in a geometrical way. For example he divided a bird of 286 meter length into 22 parts. He found that the head takes up two parts, the neck five, the body three parts and the other twelve parts for the beak (most likely referring to the famous Hummingbird geoglyph. The proportion between the beak and the rest is 6:5. Kottmann believes the geometric signs are a picture writing system with giant and small letters.

This type of writing system, known as "ligature writing," has been established to have been in the Negev (Israel) desert

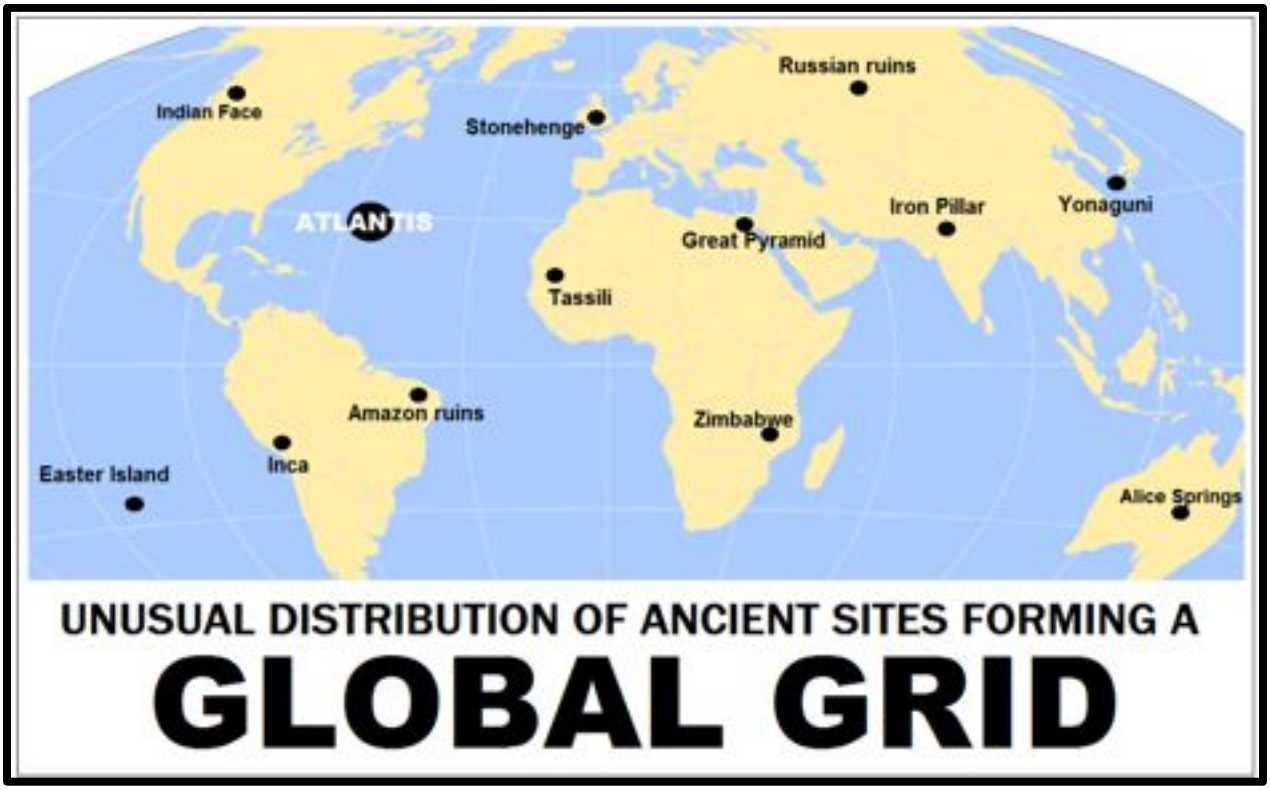
among the proto-Canaanites and even in Colorado among the Bronze Age inhabitants near what is now La Junta. The writing often combines alphabetical shapes to form an image suggestive of the word meaning. In this way, illiterate people could understand the writing. (36)

And finally we have The Code of Carl Munck: The Ancient Geomatria of Numbers theory (there are more hypotheses than this, but they honestly in my opinion are not worth considering.) This theory states that the ancient sites around the world are very precisely positioned on a global coordinate system in relation to the position of the Great Pyramid at Giza. The positions of the sites are given in the geometry of their construction. A very ancient system of numbers was used in the system, which we will call Geomatria. Geomatrian numbers are found in ancient myths and religions, including the Bible and were used in systems of weights and measures by ancient peoples, including the Greeks, Egyptians, Persians, Babylonians and the Romans.

The Code system uses mathematical constants, such as *pi* and the radian. The system also uses conventions that are still in use, such as the 360 degree circle, 60 minute degree, 60 second minute, the base-ten numbering system, the 12-inch foot, and the 5280 foot mile. The ancient Mayans used Geomatrian numbers in their very accurate timekeeping. The Nazca Line ground markings "locate themselves" on The Code Matrix

System. This theory is part of a new science called Archaeocryptography. (37)

The idea of a worldwide grid connecting many ancient sites has been proposed by various researchers, and the Nazca area is often included in many of these theories.



One version of the global grid idea

So now that we have looked at most of the theories as to how the lines and figures could have been made, and for what reasons, what would be the most logical theory to present?

The fact that many of the lines follow underground water systems gives credence to the theories of Aveni and Johnson, and to some degree Reinhard. It seems possible that all three are in some ways correct, in that the lines follow underground

water (Aveni and Johnson) and thus also took on a ritual role (Reinhard) in that walking the lines toward the water's sources would have been a spiritual practice. Since the Nazca society disappeared about 1500 hundred years ago we cannot know what specifically their spiritual practices were, as they left no direct descendants. Most scholars infer certain things from their interpretations of Nazca pottery and textiles, but this is clearly just insinuation; they can't get into the minds of a dead culture.

It seems often the case that modern scholars insist on making suppositions as to what animal and plant symbols meant to cultures who left us neither a written record nor intact oral tradition. The use of terminology such as feline, serpent or water "cult" to me is a way for academics, who have no tangible evidence as to an extinct culture's belief system, to simply fill in blank spaces.

And it is also very possible that their own beliefs and cultural upbringing can taint such ideas. Perhaps it is better that ancient symbols should just be left as enigmas, rather than making inferences that can wind up in the public arena as being cultural "facts."

The dryness of the Nazca environment, more harsh today than it was 2000 years ago, but still relatively severe at that time, made water an incredibly precious commodity. As the Nazca were clearly a spiritual people, rituals involving the obtaining of, and preserving of water supplies would have ranked highly.

Since some of the lines point at the hills to the east, from which the water would have flowed underground and downhill, ritual processions and their accompanying meditations concerning this life sustaining substance would have been quite logical, and comforting.

One of the great spiral figures. This one may be at Palpa

Even though Maria Reiche spent more than 50 years attempting to show direct relationships on the ground with some kind of cosmic reflection and relationships, computer modeling showed no direct correlation to specific constellations. It could be that the Nazca and others did not

view the sky and stars in the same way that we do. For example, in the Inca system of cosmology, stars did not form animal or plant shapes the way it did and does in other cultures.

Rather than looking at the bright spots in the sky, as in stars, the Inca looked into the dark spaces. From there images such as a giant llama, frog, snake and other animals took form, as well as the image of a human shepherd.

One also has to consider that Reiche and other researchers were either not aware of the precession of the equinoxes, or did not take them into account. In astronomy, the precession of the equinoxes or axial precession is a gravity-induced, slow, and continuous change in the orientation of an astronomical body's rotational axis. In particular, it refers to the gradual shift in the orientation of Earth's axis of rotation, which, similar to a wobbling top, traces out a pair of cones joined at their apices in a cycle of approximately 26,000 years. (38)

This means that every 72 years the apparent position of the stars changes by 1 degree with respect to the ground, and this is a key tool in archaeoastronomy. So over the course of 1500 years, the relationship of the lines on the ground with the night sky would have changes by more than 20 out of 360 degrees, and that would have been after the Nazca people had more or less ceased to exist.

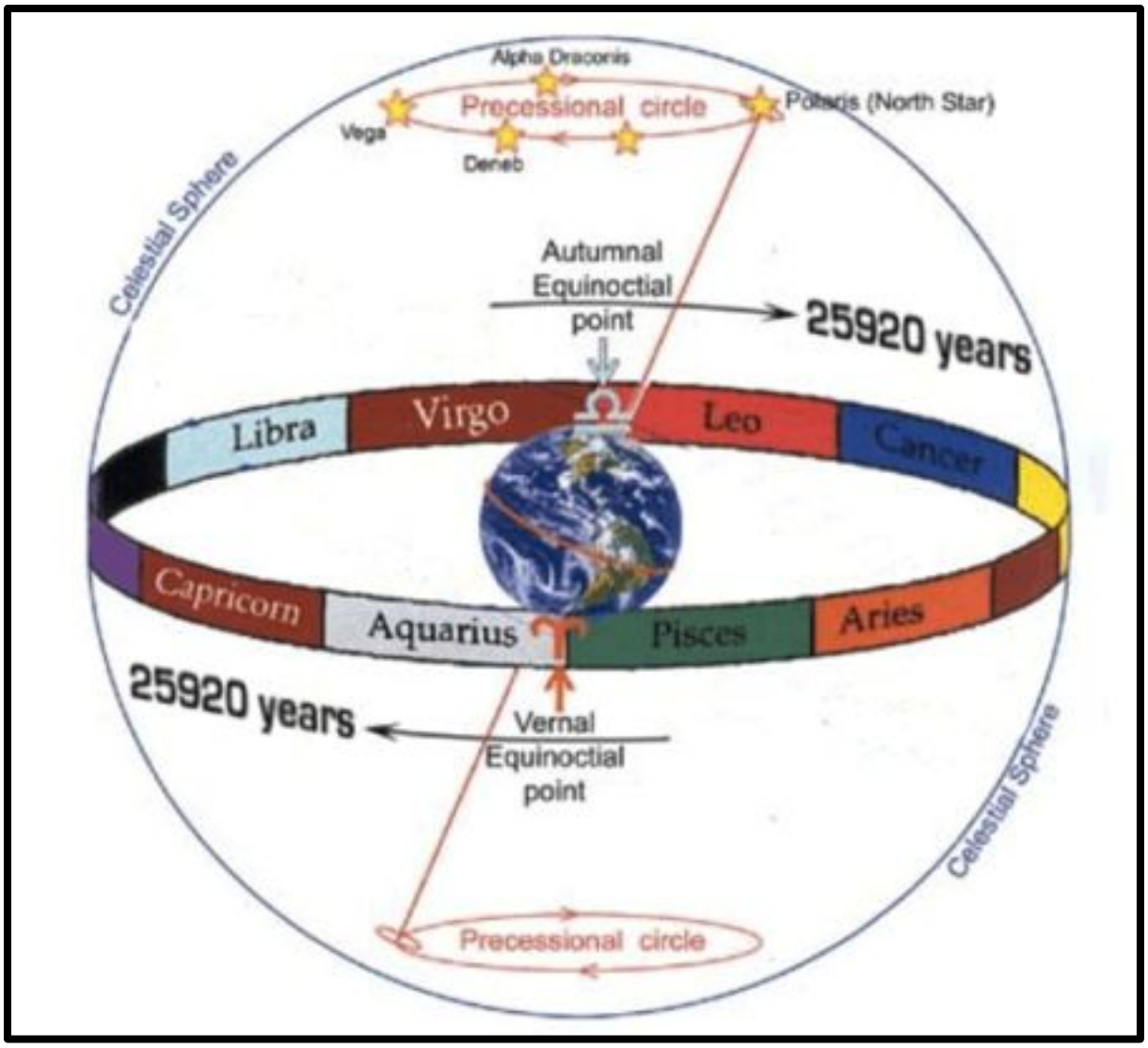
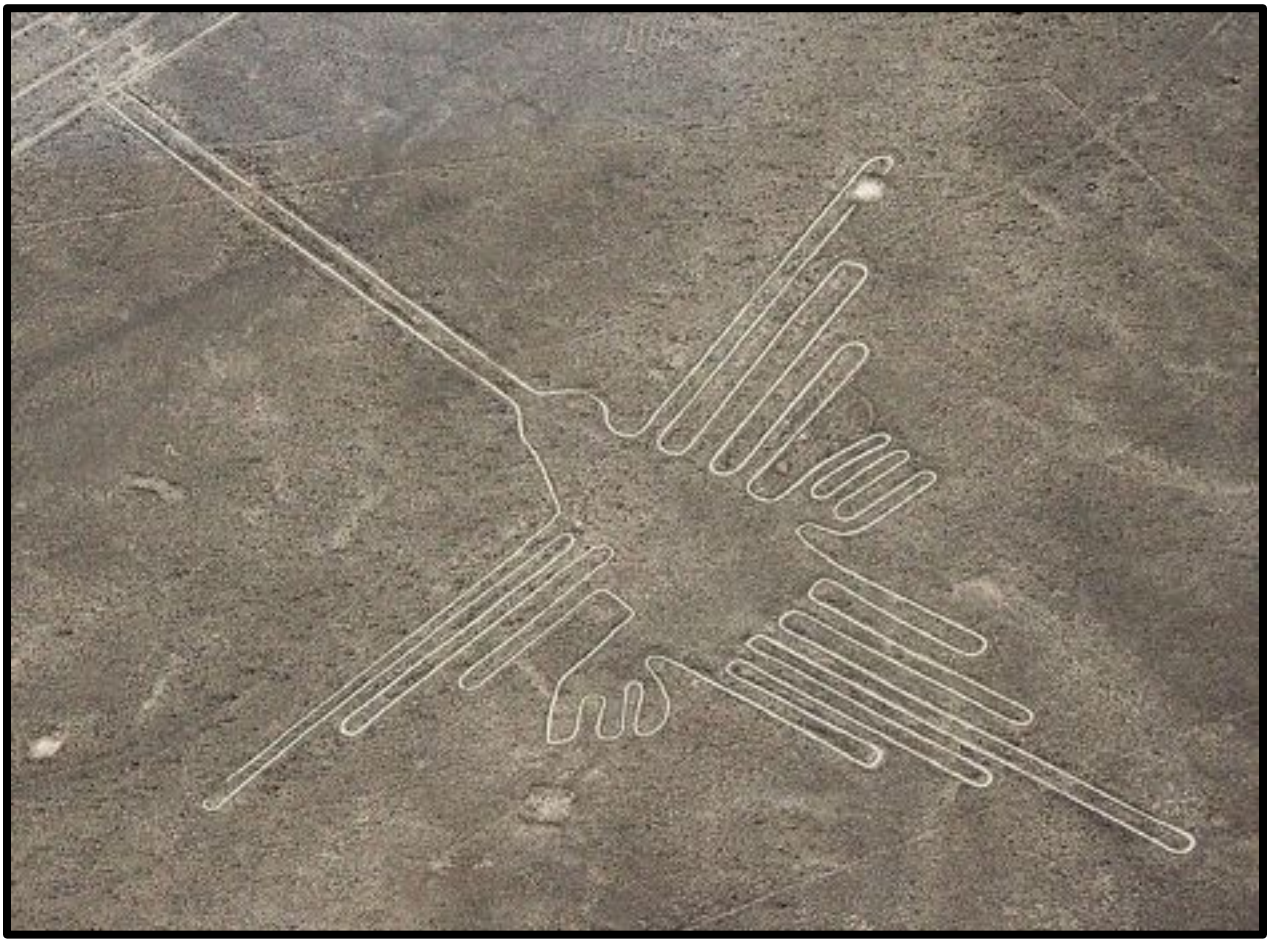


Diagram of the precessional cycle

The animal and plant figures I believe were used for some ceremonial purpose, and may not have been made during the same time as the lines. Evidence of this is the fact that many of the lines cut their path right through the figures, almost as if the line makers either did not know that the figures were there, or didn't care. That is, if the figures were made first. It could also be that if the lines were indeed made later, that their

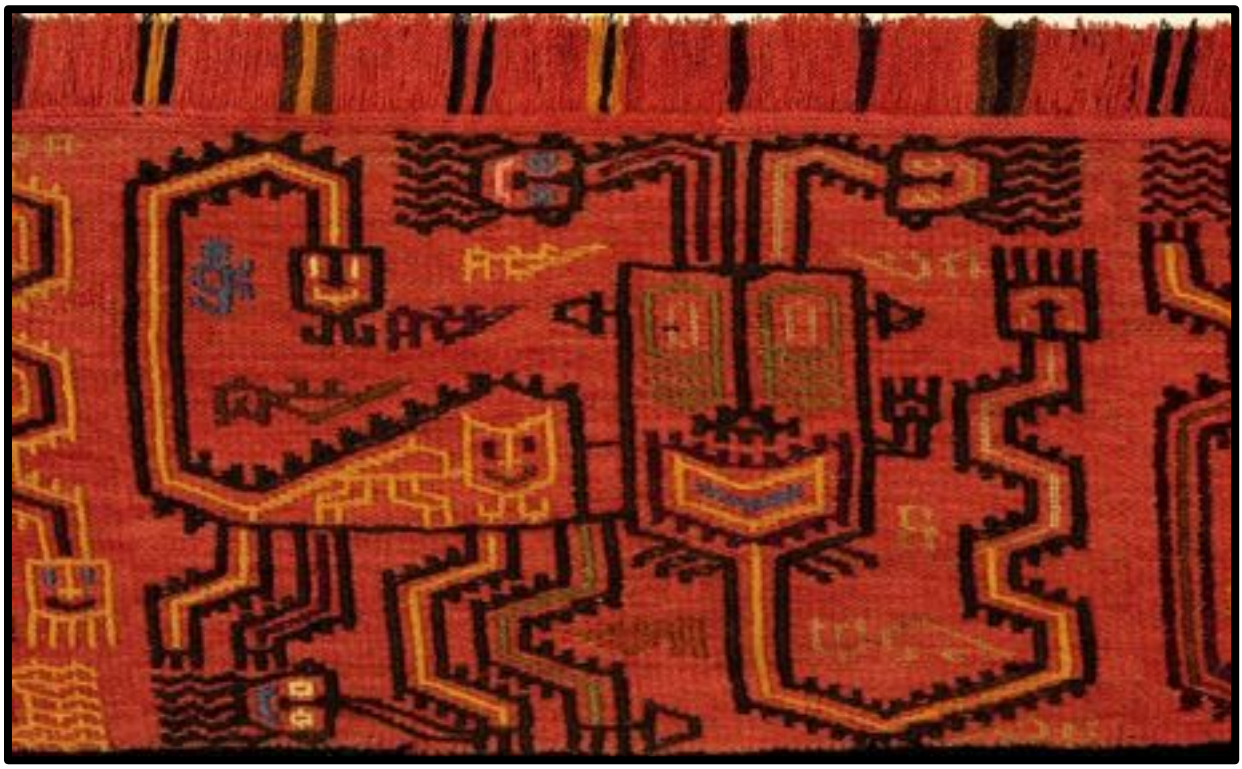
function of tracking the underground water system was deemed more important than the ceremonial figures.

Close inspection of many if not all of the major animal and plant figures shows that they are composed of a single line, but that the line is not continuous, in that the starting and ending point don't meet. There is often a gap between the beginning and the end, and this could be interpreted as an opening, but an opening for what? The gap may be the ceremonial entrance to the inside if the spider for example, and ceremonies could have been conducted in either a clockwise or counter clockwise manner.



The beak of the Hummingbird is open, and acts as the entrance

If in fact the lines and figures are of a different age, then were they all made by the same people, as in the Nazca? Henri Stierlin, a Swiss art historian specializing in Egypt and the Middle East, published a book in 1983 linking the Nazca Lines to the production of ancient textiles that archeologists have found wrapping mummies of the Paracas culture. (39)



Segment of a Paracas noble's cape or *manto*

He contended that the people may have used the lines and trapezoids as giant, primitive looms to fabricate the extremely long strings and wide pieces of textile that are typical of the area. By his theory, the figurative patterns (smaller and less common) were meant only for ritualistic purposes. This theory is not widely accepted, although scholars have noted

similarities in patterns between the Paracas textiles and the Nazca lines, which they take as sharing in a common culture.

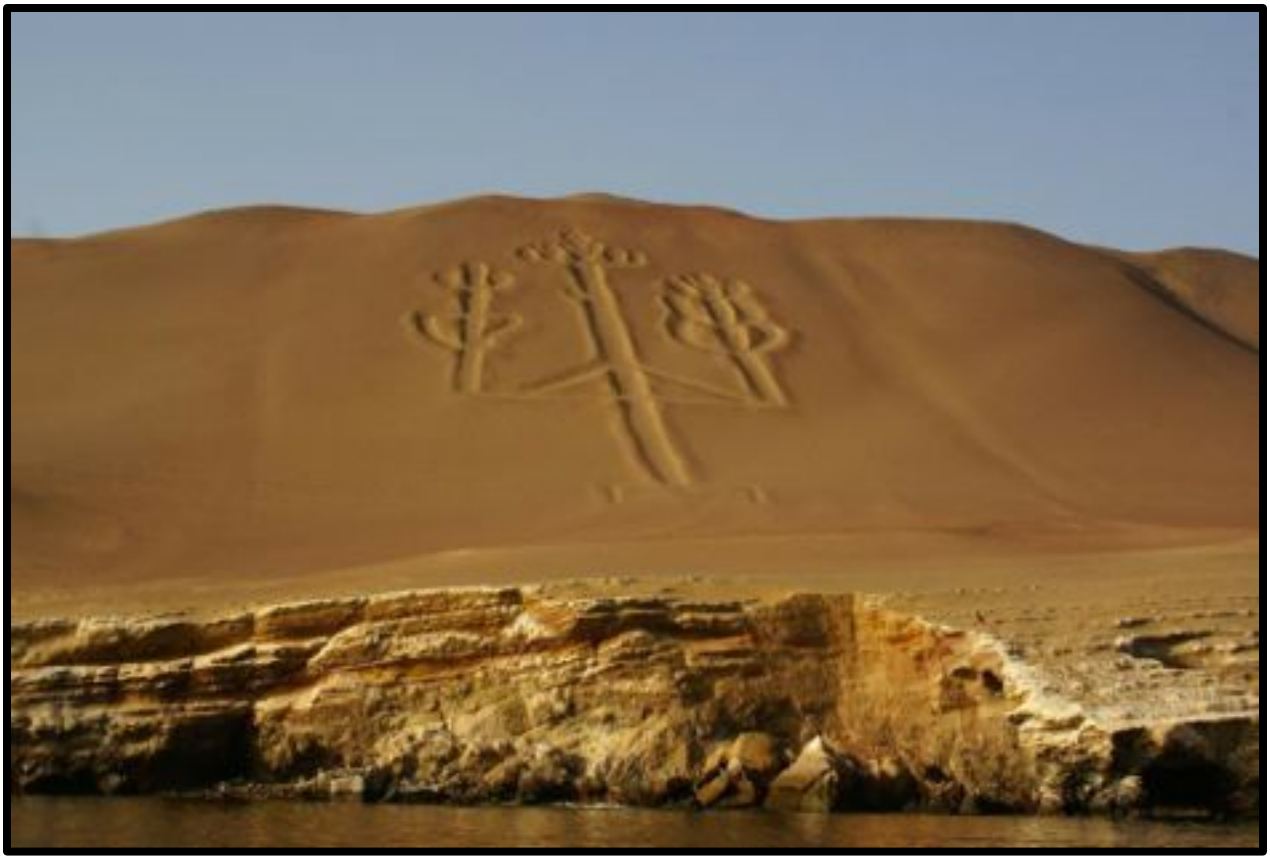
But the above idea about a common culture is not the case. The Paracas preceded the Nazca, and actually it is my contention that the Nazca in fact were responsible for the eradication of the Paracas as a distinct civilization. One piece of evidence which can lead us to this conclusion is that the Paracas are perhaps most famous for having elongated skulls. This was usually the result of artificial cranial deformation, a practice by which the shape of the skull was intentionally altered soon after birth before the bone had calcified. The subject of this as a global phenomenon is covered in a book I wrote with David Hatcher Childress called *The Engima Of Cranial Deformation.*

Normal skull on the left and Paracas elongated skull on the right

In general, it seems that this practice was achieved by binding the skull with textiles or rope, often with a wood or other hard material placed in front and or at the back to flatten the cranium.

This process was solely performed on members of the Paracas royalty, as evidenced by funeral objects which were found in the tombs of the deceased. Very fine ceramics, extremely complex and colourful fabrics, reputed by many scholars to have been the best ever made in Peru, and bird feathers from the Amazon basin accompanied the royal Paracas dead.

The major cemeteries of the Paracas were at Cerro Colorado, Cabeza Larga (which is Spanish for elongated head), Chongos and Camacho, which are all found in the vicinity of the Paracas Peninsula, about a 4 hour drive north of Nazca. It is here too that the famous Candelabra can be found, a 500 foot tall trident shaped geoglyph which can only be observed from the ocean.



The Candelabra as seen from the ocean

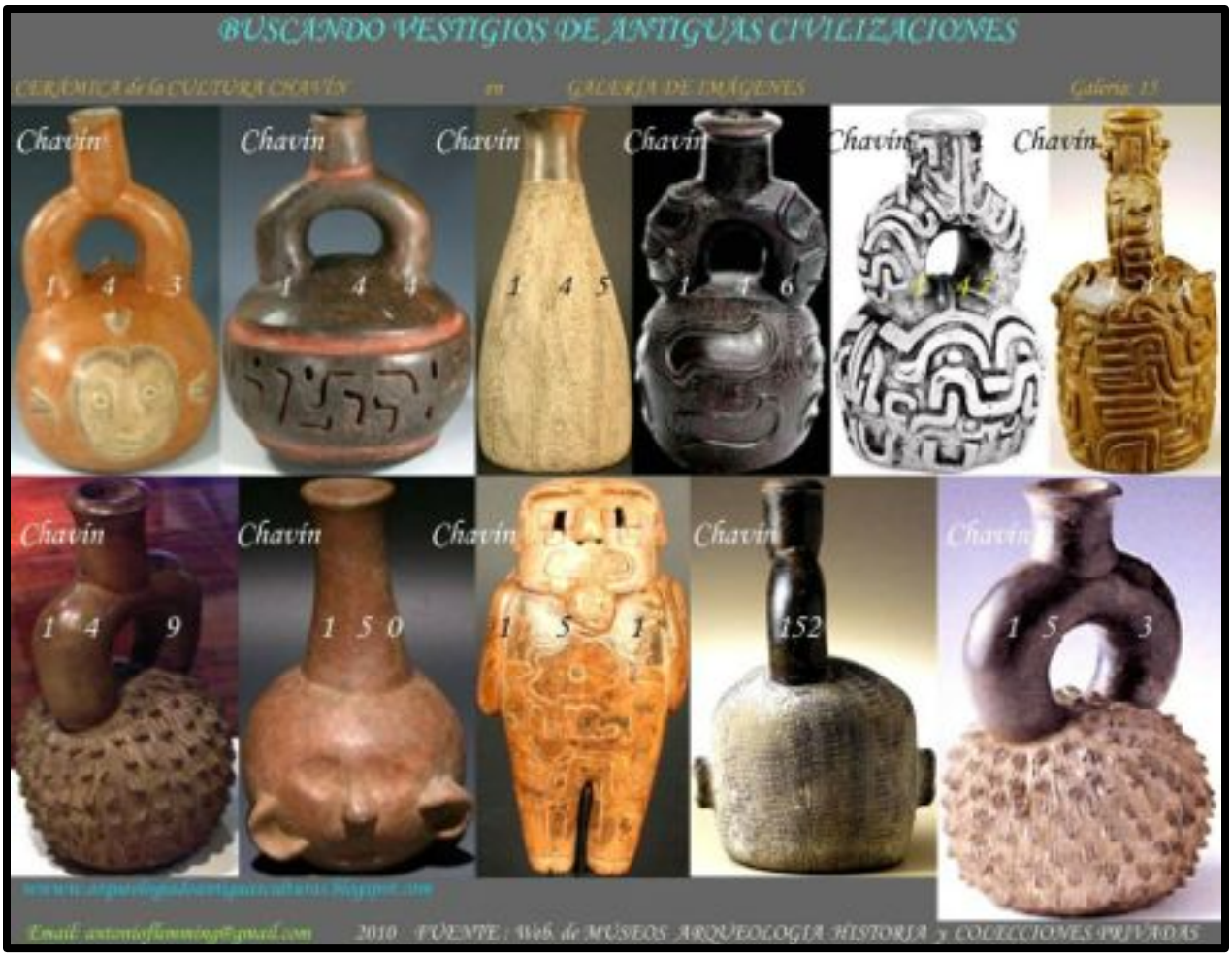
It appears to have been made using the same techniques as the Nazca figures, and some researchers have stated that the three fork like projections of its “trident” design face Nazca to the southeast, but this is not the case. The Candelabra is in fact

directed due south. We shall discuss its relationship to Nazca later.

Very few if any elongated skulls have been found to my knowledge that can be directly attributed to the Nazca culture. Since carbon 14 testing, which is very basic to archaeology but has been seldom used in Peru can tell the date of a skull within 20 or 30 years, it would be the simple tool that could distinguish between a Paracas skull, and that of a Nazca.

According to most sources, the Paracas existed as a culture between 800 BCE and 100 BCE, with an extensive knowledge of irrigation and water management. It developed in the Paracas Peninsula, located in what today is the Paracas District of the Pisco Province in the Ica Region of Peru. Most information about the lives of the Paracas people comes from excavations at the large seaside Paracas site, first investigated by the Peruvian archaeologist Julio C. Tello in the 1920s.

The greatest mystery about them is that no one seems to know where they came from. Julio C. Tello believed they were descended for the Chavin culture. The Chavin were a civilization that developed in the northern Andean highlands of Peru from 900 BC to 200 BC. They extended their influence to other civilizations along the coast, including Paracas to some extent. (40)



Ceramics typical of the Chavin culture

Tello based much of his theory of the Chavin being the precursors of the Paracas on a similarity in ceramic style and ornamentation, but though I personally can see some artistic relationship, I would hardly call the Paracas works a natural progression.

Classic Paracas vessel

Though possibly influenced by the Chavin, through trade and cultural exchange, the Paracas differ from them in two very important ways, cranial deformation and the presence of genetic red hair amongst the Paracas. If the Paracas were directly descended from the Chavin, we would expect the latter to have shown some development of cranial deformation, as it

was so important to the Paracas elite, but that is not the case. Also, the presence of genetic red hair is also not a Chavin trait, nor a trait of most Native people of the Americas. However, some Nazca period tombs contain skeletons and mummies with reddish hair, but this is likely the result of the Nazca having some Paracas ancestry. Thus, the origins of the Paracas remain a mystery.

Due to the proximity of their main centers to the ocean, it is possible that at least some of the Paracas heritage came from another region of Peru, the Pacific Ocean or even farther away, a subject I cover in some detail in my book *Crimson Horizon.* This book tracks the presence of ancient people who lived on Easter Island, New Zealand, Tahiti and Hawaii prior to European contact, and had dark red hair.

Classic example of Paracas nobility with auburn red hair

The other main site where elongated skulls have been found, and attributed to the Paracas culture is the ceremonial adobe

city of Cahuachi, near Nazca. Cahuachi is one of the largest sets of pyramids and squares built during pre-Hispanic times. It has been confirmed to have been at least 24 square kilometers in size. (41) It was the capital of political and religious power of the rulers of the Nazca culture, but its history dates back to Paracas times.

Again, the basic time line of the Paracas was 800 BC to 100 BC, while that of the Nazca is usually stated to have been 100 BC or 1 AD to 500 AD. Cahuachi, which is the only major ceremonial complex in the area is believed to have begun around 400 BC, with the construction of adobe walls. The truly monumental phases began at about 200 BC, and continued until the entire site was buried on purpose around 450 AD. Walls were broken down and the pyramids and other buildings buried to resemble natural hills.

This was most likely the result of the increasing desertification of the area, but why the Nazca put in what would have been incredible human effort to bury their largest religious shrine is a mystery. (42) Smaller religious centers called Turaga and Las Trancas were later built, but not of the grandeur of Cahuachi.

Archaeologists have established that even earlier people lived in the Cahuachi area from 3000 to 1800 BC, but they were pre-ceramic and thus did not leave much evidence of their presence.

The only building at Cahuachi that has been restored

Looking back at the dates presented for Cahuachi, we can see that its construction began before the existence of the Nazca as a distinct culture. The presence of elongated skulls seems to show that the Paracas were there first, and they were still a viable culture at that time.

Since, to my knowledge no elongated skull has been attributed to the Nazca culture, and none in the area has been carbon 14 dated to be less than 2000 years old, one would presume that the cultural process of cranial deformation ended with the fall of the Paracas. But what happened?

While the Paracas culture developed in this region between about 800 BC and 100 BC, the Topara culture is thought to have invaded from the north at approximately 150 BC. Topara is a small creek located on the border of the departments of Lima and Ica, an area where there are several archaeological sites. Farther south lies the wide valley of Chincha, which apparently was the regional center of this culture, judging by the monumental buildings that are still standing. However, little is known about the Topara, and the buildings attributed to them may have been the work of others.

The two cultures, Paracas and Topara presumably coexisted for one or more generations, both at Cahuachi and in the nearby Ica Valley, and their interaction played a key role in the development of the Nazca culture and ceramic and textile traditions. Though the elaborate textiles have only been preserved in the coastal desert sites, there is growing evidence that people associated with these cultures lived and traveled between the Pacific lowlands and the Andean highland valleys and mountain pastures to the east.

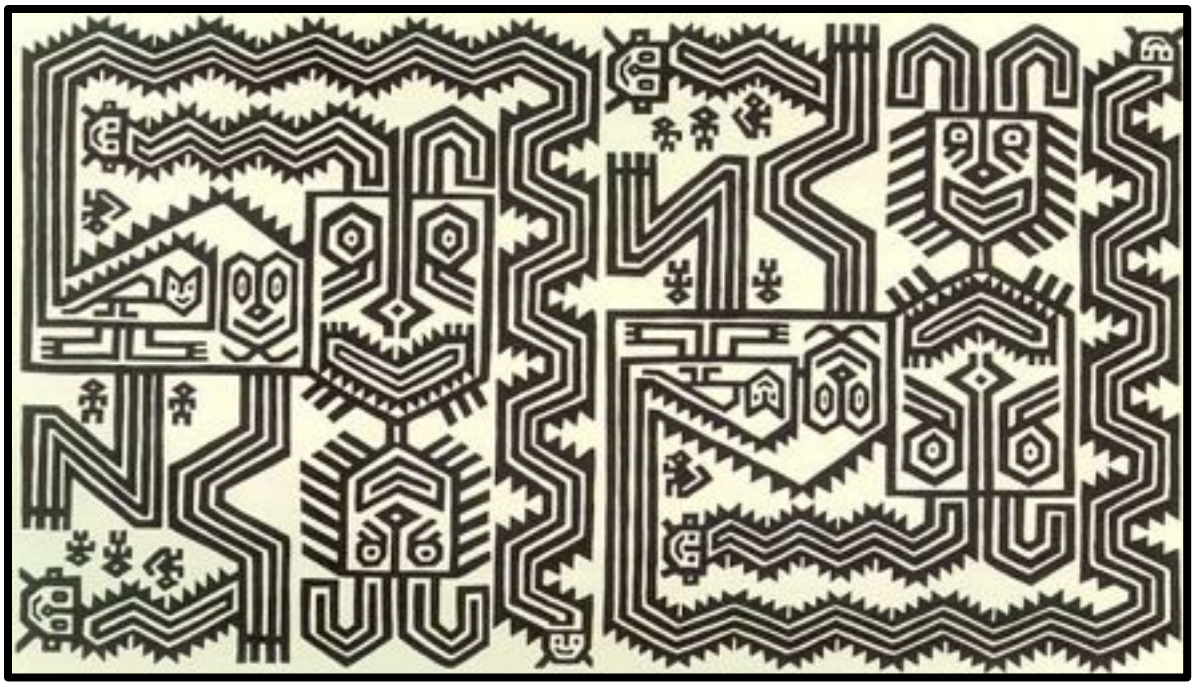
Llama and alpaca wool were used extensively by the Paracas, and the homeland of these animals is and was the highlands of Peru, and not the coast.

Now by using the terminology “played a key role in the development of the Nazca” I think we can reasonably presume that we are talking about the extinction of the Paracas, and then the rise of the Nazca. As Ann H. Peters writes;

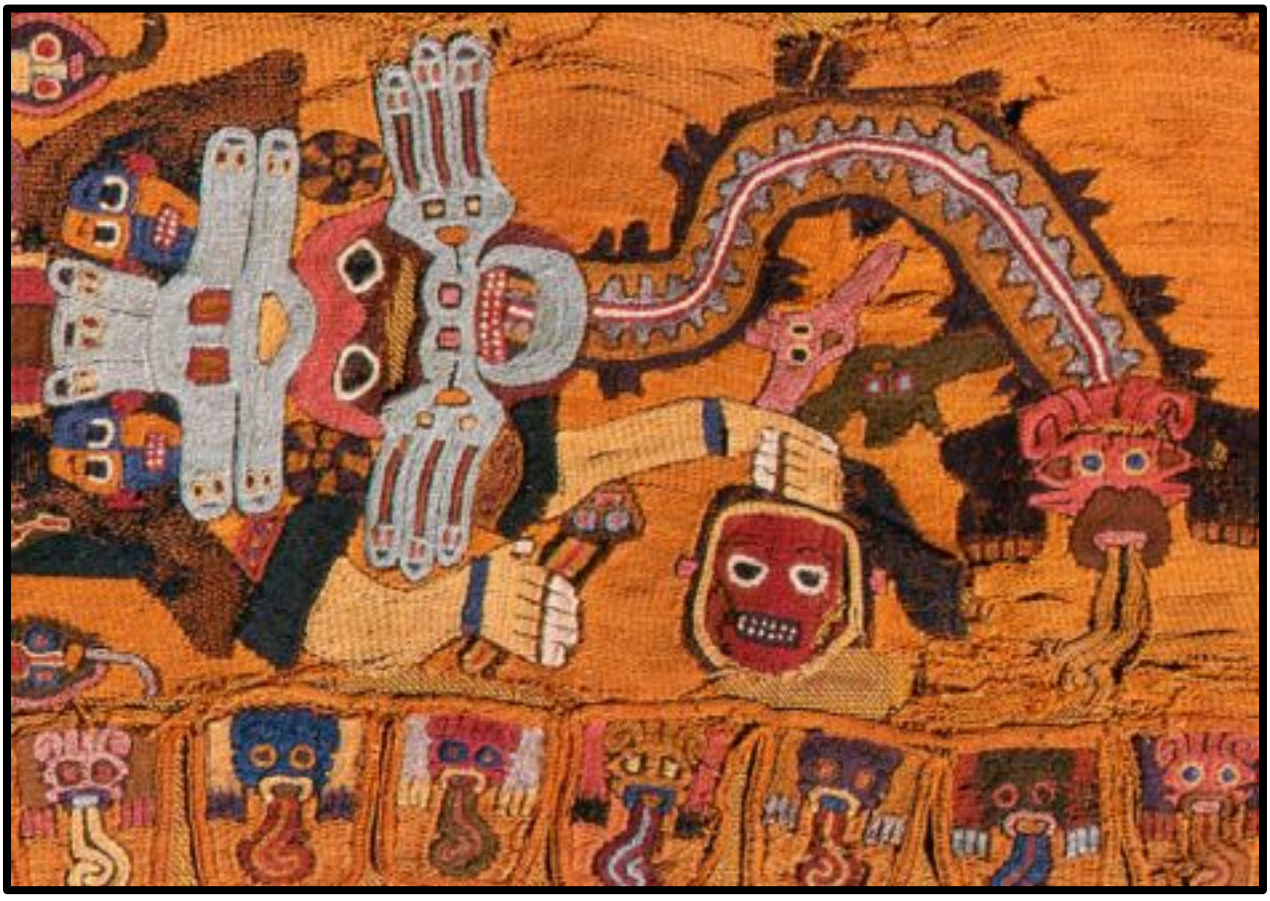
‘I argue that this institution (mummification practice) was the vehicle for social, political, and religious leadership in social groups of the Topara tradition and for their dominance or influence over neighboring social groups of the Paracas tradition. Interactions between these two societies, or cultures, led to their mutual transformation and the birth of the Nazca tradition.’ (43)

So now we have a good theory as to when the Nazca first appeared and where. And this could also lead us back to a discussion of the lines and animal and plant geoglyphs. If we presume that the figures were made solely for ceremonial purposes, and the lines for primarily reasons, we could be looking at the idea that two different cultures made them.

The Swiss art historian Henri Stierlin as you will recall believed that the animal and plant figures were made by the Paracas. As an art historian he would have a better eye for design than would most archaeologists, such as Julio C. Tello who saw similarities in the Chavin and Paracas pottery, and thereby assumed that the latter came from the former.



Typical Paracas geometric pattern



A more elaborate example of Paracas textile design

9/ The Palpa Lines And Figures

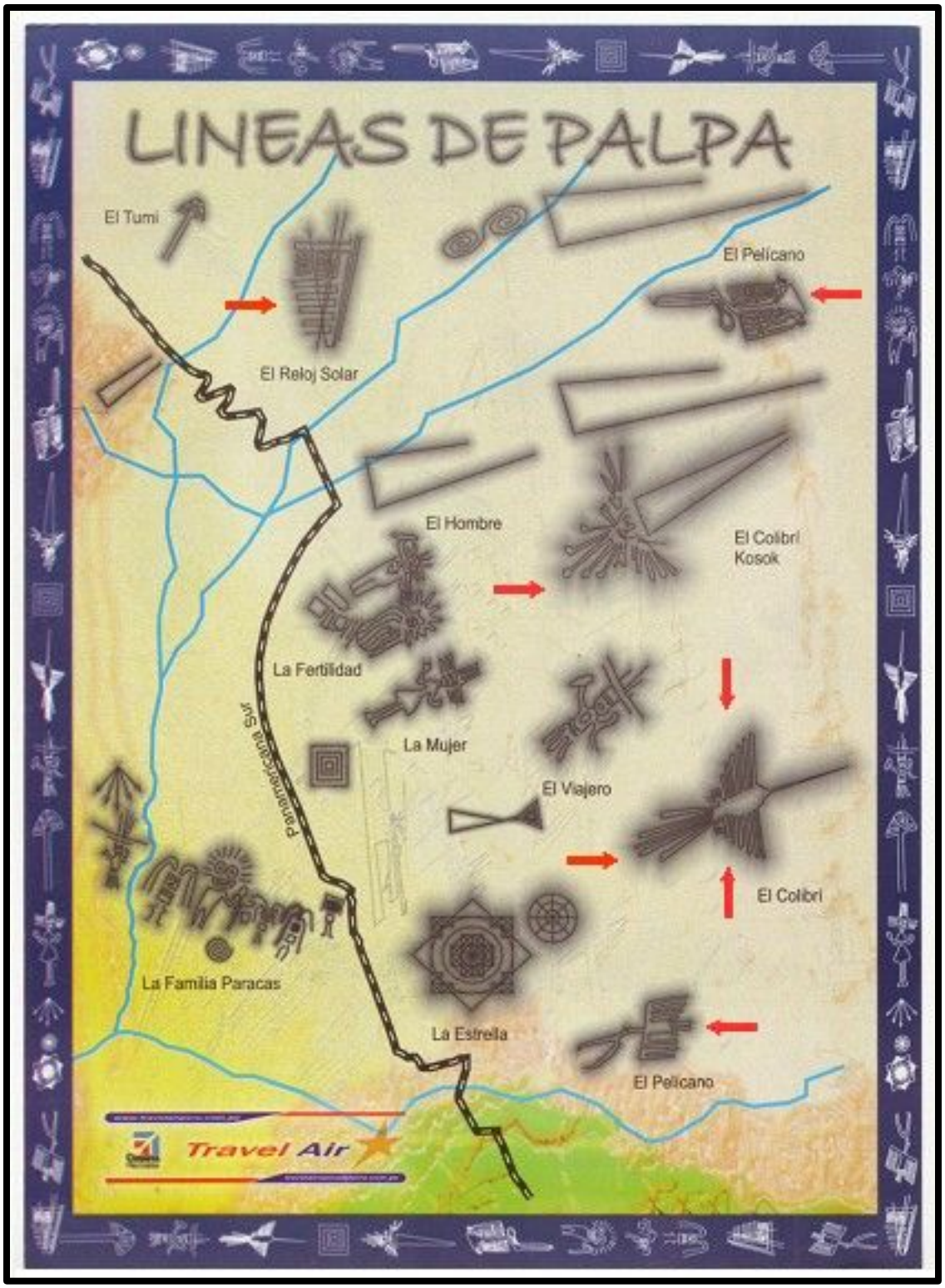
It is to the Palpa lines and figures that we now shift our attention. Palpa is a small agricultural town located about 60 kilometers north of Nazca on the Pan Americana highway and is bordered by two small rivers. The so called “lost city” of Huayuri is nearby, and most of its stone and clay mortar construction dates from the Chincha and Inca cultures, 1100 to 1476 AD. (44) It is also believed that it was inhabited by the Nazca after they had to abandon the Nazca area around 500 AD due to the extreme drought that gripped that area.

The evidence of the Paracas culture in the Palpa valley is very slim, but Jauranga was one of continuous Paracas occupation between 600 BC and 200 BC. It is located in the middle of the Palpa Valley, on the left bank of the river namesake, on a wide fertile plain near the confluence of the rivers Viscas and Grande. (45) Detailed excavations carried out by a German team headed by Reindl (46) discovered that the ruins were found to have consisted of three layers, the upper most layer was from the Middle Nasca Period (250 to 450 AD), the middle layer was from the Paracas Period (400 to 200 BC), and the lowest was from 600 BC.

More and more evidence is indicating that the Palpa lines and figures were created by the Paracas culture, before the presumed existence of the Nazca lines and the Nazca culture.

Examples of some of the Palpa lines and figures

The reason the geoglyphs of Palpa received less attention than those of Nazca may be because the geography of Palpa and Nazca are significantly different. The Palpa region is strewn with continuous abrupt peaks, quite different from the pampa of Nazca where sands and stone stretch out endlessly over a plain which affords a great deal of visibility. Figures drawn on the mountain side in the Palpa region are less visible, and even disappear depending upon the direction from which they are viewed.



The major lines and figures at Palpa

While most of the Nazca geoglyphs were drawn with one stroke and connected to lines, those of Palpa are more varied. Some are drawn with one stroke like those of Nazca, while others exist independently on inclined surfaces. And whereas there is a certain degree of consistency in the style of the patterns in Nazca which embody living things, there exist different levels of figures in Palpa. (47)

The figures went through changes from human beings to deformed iconography and geometric figures. This is not disconnected to the fact that people in Paracas who had advanced textile techniques actualized their talents in drawing by simplifying lines.

"The Family" designs at Palpa

According to Reindel et al., (48) it was around 1800 to 800 BC when people moved into Palpa. This region had plenty of water

at that time and was able to be used as meadow land. It entered a dry period during the Paracas Period (800 to 200 BC.) As it entered the early Nazca Period, the population increased and trading relations with the highland and coastal areas of the Andes were established; however, the weather was becoming more serious. Desertification worsened while unexpected flooding devastated the region a number of times. Therefore, people were forced into the situation where they had to move out of the area. It seems quite clear that they moved to the Nazca area.

At Nazca, The canvas expanded without limit. Various sizes of figures connected to platforms were created. There is no doubt that people suffering a serious water problem connected figures with water. Continuing analysis since the early stage of geoglyph research shows that both the zigzag patterns seen here and there and the continuity of the straight lines, repetitive and pleat like, indicated the streams of water.

Karsten Lambers, who is a German archaeologist has been mapping and studying the geoglyphs of the Palpa area since 1999, and has so far found at least 1500 geoglyphs over an area of 89 square kilometers. (49) Since these ancient works are far less famous than their Nazca counterparts very little is being done to protect them from intrusion by foot traffic, and more dangerously, motorcycles and off road vehicles.

So far, we have seen that the area covered by geoglyphs in this area of Peru is immense. They begin with the Candelabra of

Paracas, next to the Pacific Ocean, and extend, in a southeast fashion to the Nazca area. The cultures involved in the whole process appear to be the Paracas, and then there is a progression into the Nazca via the Topara culture.

The Paracas Candelabra, also called the Candelabra of the Andes, is a well-known prehistoric geoglyph found on the northern face of the Paracas Peninsula at Pisco Bay in Peru. Pottery found nearby has been radio carbon dated to 200 BC, the time of the Paracas culture. The design is cut at least two feet into hard compressed sand impregnated with salt, with stones possibly from a later date placed around it. Its depth is much greater than the Nazca lines and figures. The figure is 595 feet tall (estimates vary) and is large enough to be seen from 12 miles at sea. (50) Prevailing winds come from the south, and thus the Candelabra has been sheltered from degradation brought about by both wind, and rain, of which Paracas receives less than an inch per year.

View of the entire Candelabra

Again, it must be stressed that although many authors have stated that the trident like Candelabra points to Nazca, in the southeast, it in fact is directed almost due south. Many theories abound as to what, if anything it functioned as. Author Frank Joseph thinks it looks like a Jimson weed, from which mind altering drugs have been extracted for thousands of years. Furthermore, he states that there is a miniature version of the Candelabra drawn on a rock in California's Cleveland National Forest. Joseph associates the two candelabras in this way:

‘the ancient inhabitants of Peru voyaged to California to collect Jimson weed and other hallucinatory drugs. When they sailed back to Peru with their cargo, they used the Pisco geoglyph as a navigational aid.’ (51)

Along these lines, local tour guides generally believe that it represents a local cactus, the San Pedro, from which a powerful hallucinogenic is and has been taken for thousands of years. Charles Berlitz, in his book, *Mysteries from Forgotten Worlds*, states that the Spanish conquistadors noticed the Candelabra and took it as a sign from heaven, the Holy Trinity, interpreting it as a good omen which encouraged their quest to conquer and Christianize the locals. Upon examining the carving, the Spaniards discovered a huge rope attached to the central fork, and indications that other cords and ropes, connected to the other outer two arms, comprised an apparatus of unknown use. Various theories have arisen from these findings, and all seem to point toward a crude pulley system. Some scientists favor the theory that the Candelabra may have been a tidal calculator for sailors, although no one is quite sure how it would have operated.

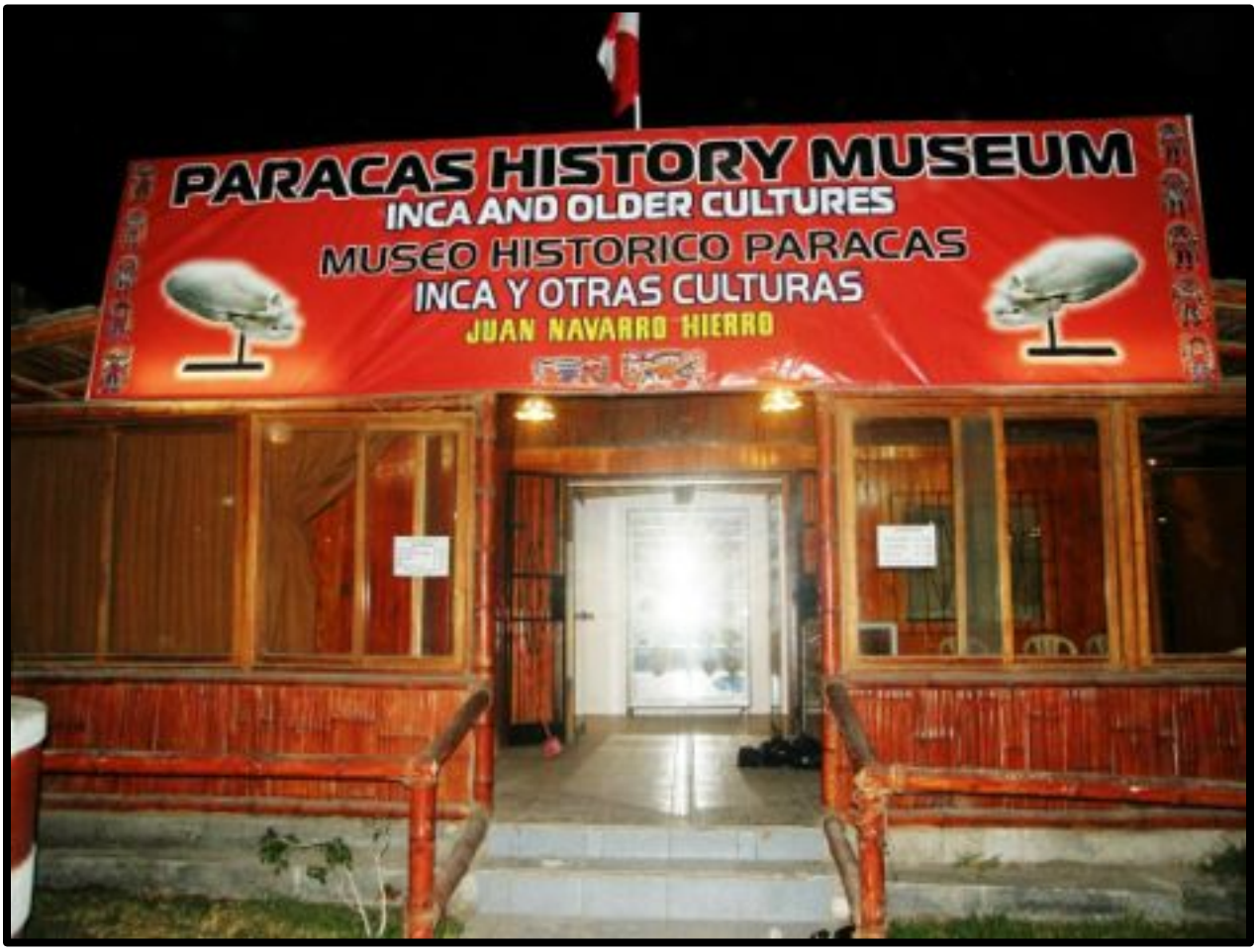
Baltran Garcia, a Peruvian researcher thinks that the Candelabra may have been more than a tidal calculator, that ‘[this] system, equipped with counterweights, graded ladders and ropes sliding on pulleys constituted a gigantic and precise seismograph, able to register telluric waves and seismic shocks coming not only from Peru, but from all over the planet…’ (52)

Tony Morrison, a celebrated writer, researcher, and photographer who has documented the Nazca lines for the BBC and in books, has delved into the mystery of the Candelabra as well. He found that the overall consensus of local folklore pegged the Candelabra as a landmark made by early sailors, with no serious evidence pointing toward any other motivation for building it. This information was verified through talks with a local Englishman, Duncan Masson, who had lived on a farm in Ica (some 130 miles south of the Candelabra) most of his life. Duncan heard firsthand accounts about the Candelabra from people who were born in the early 19th century. In addition, Mr. Morrison notes that the Paracas Coastline, which includes Pisco Bay, has been a stopping point and layover for sailors for centuries, starting with the Spanish in the 16th century. He points out that these early sailors would have had many inactive months to complete the carving and that the symbolism of its three branches seems European, examples being the three armed tree of life and the Holy Trinity. (53)

However, when Mr. Morrison speaks of “early sailors”, how far back in time did he research? Only as far back as the Spanish? The Paracas culture as we now know dates back more than 1500 years before the Spanish, and there is evidence that they may have been sea farers.

The Paracas History Museum, across the street from the central plaza in the town of Chico, Paracas holds the evidence to this idea, both in the artifacts contained, and in the mind of Sr. Juan

Navarro Hierro, who is the museum owner. Sr. Juan was born in the area, and has been collecting items of the Paracas and other cultures for much of his life. His collection is so large that it prompted him to open the museum in 2010 with the assistance of Mayor Miguel A. Castillo Oliden.



Paracas History Museum in Chaco, Paracas

Behind glass cases, meticulously maintained by Sr. Juan are artifacts from the local area which help us piece together who the Paracas were. Since we have seemingly established that they were amalgamated into the Topara people about 2000

years ago, all artifacts pertaining to them as a distinct culture are 2000 plus years old.

The most visually remarkable things in the exhibit are the elongated skulls, more than 35 of which grace the museum with their enigmatic appearance. But it is the subtler crafts which they produced that is of importance here; spondylous shells from the ocean, and emerald beads, both of which came from Ecuador. Either these items were brought by land through a series of ancient trails, or someone brought them by sea.

There are no accounts I have found which suggest that the Ecuadorians of that time had sailing capabilities, but the Paracas may very well have. They depended on the sea for much of their diet, and a pair of sea lion sandals in the Paracas History Museum would suggest that they had to have boats of some kind to hunt them. Also, whale bones are evident in some of the archaeological sites of the area, and although there is a chance that whales had beached themselves in and around Paracas, it is also possible that they were the prey of sea born Paracas hunters.

But what material would the Paracas have used to make boats? Trees are mostly absent in the area now, and that may have been the case 2000 years ago, but there is an abundance of totora reed, which is indigenous. Totora is most famous for growing, and having been used by the native people of Lake Titicaca, in the altiplano highlands of Peru and Bolivia, but is also found on the coast of Peru and on Easter Island. In all three

cases, there are many examples of this material having been used by local people as a boat building material for thousands of years.

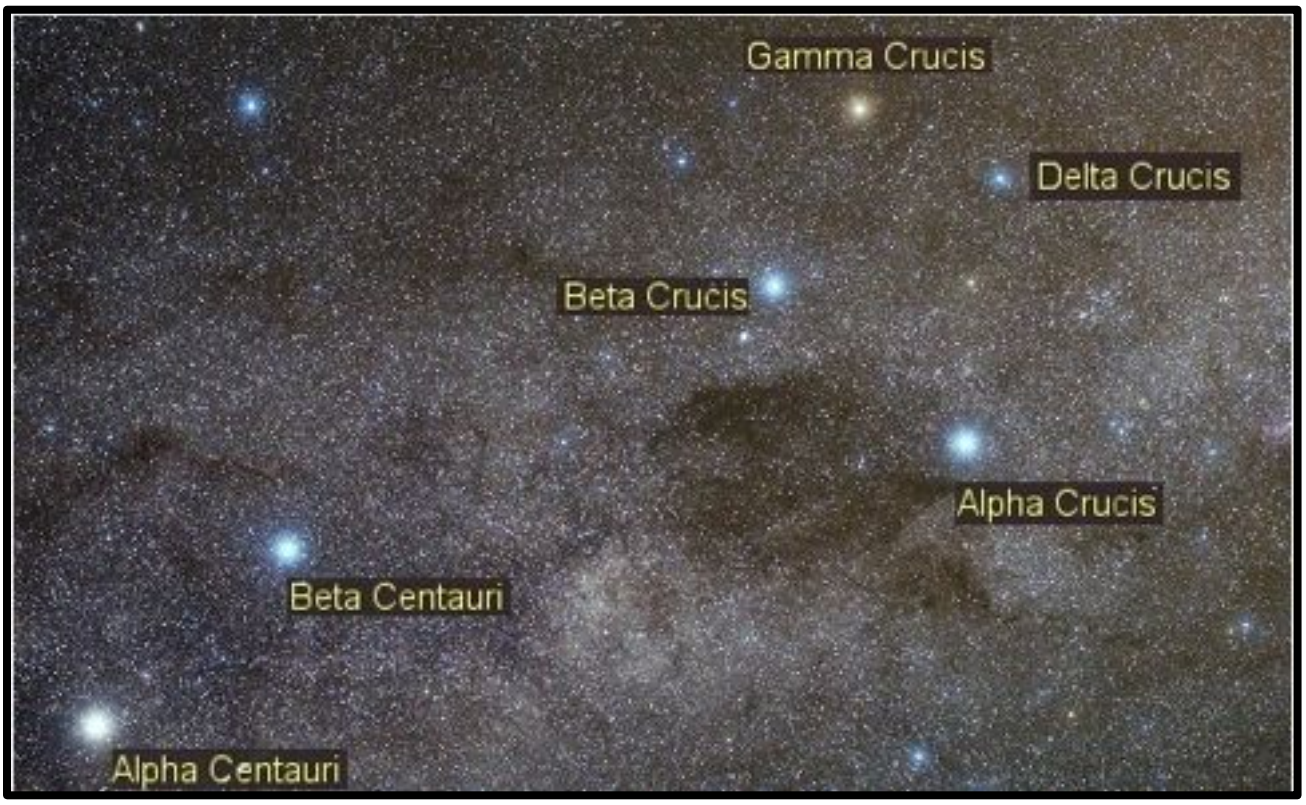
Totora boats of Lake Titicaca

So it is possible that the Paracas, first as fishermen and then explorers could have sailed to Ecuador, and returned. The predominant winds, as has already been stated prevail from the south, and travel up past Ecuador before shifting westward into the Pacific. Thus, even a crude totora reed raft, equipped with a sail made of cotton, which is also indigenous to the area could have sailed north. The winds do shift to the south on occasion, so a return trip home for the Paracas could also have been possible.

How boats are made using totora reed at Lake Titicaca

What the Candelabra may have been then is a homing beacon as Frank Joseph suggests. Being of such great size, and visible only from the ocean, it seems like a logical supposition. Also, as to its design, Sr. Juan Navarro Hierro has a theory which also would make sense to a maritime people. His idea is that the Candelabra represents the Southern Cross star constellation. This group of stars is easily visible from the southern hemisphere at practically any time of year. It is also visible near the horizon from tropical latitudes of the northern hemisphere for a few hours every night during the northern winter and spring. (54)

Since the southern sky lacks an easily visible pole star, Alpha and Gamma (known as Acrux and Gacrux respectively, the top and bottom stars) are commonly used to mark south. Tracing a line from Gacrux to Acrux leads to a point close to the Southern Celestial Pole. (55) And that is why mariners have used the Southern Cross for thousands of years.



The Southern Cross constellation

The idea that the Paracas were sea people may also explain where they came from, since certain of their cultural characteristics do not fit in with other people of the area, or Peru in general. Number one on this list is the natural reddish hair which the elite members of their society seem to have had, and samples of this were confirmed genetically red by scientists working with author L.A. Marzulli in 2013. Native people of the

Americas, prior to contact with Europeans overwhelmingly had jet black hair.

A 2010 German study from the American Journal Of Physical Anthropology, by Lars Fehren-Schmitz, Markus Reindel, Elsa Tomasto Cagigao, Susanne Hummel, and Bernd Herrmann sheds light on this. Their study was of 218 individuals, originating from chronologically successive archaeological sites in the Palpa region, the Paracas Peninsula, and the Andean highlands of southern Peru from approximately 800 BC to 800 AD. What the report found was that in all, there was a strong genetic affinity between pre-Columbian coastal populations from southern Peru, together with a significant differentiation from ancient highland and all present-day Peruvian reference populations, best shown in the differential distribution of mitochondrial haplogroups. (56)

What this tells us is that the Paracas did not exclusively come from the highlands of Peru, and thus at least some of their ancestry had to come from somewhere else.

10/ The Major Geoglyphs

We will now look at the most famous of the Nazca geoglyphs in detail, starting in the south, near the airport, then proceed north, and then to west, towards Palpa. My thanks to Tony Dunnell who is a writer in Peru for much of the information found below. You can reach him at: http://goperu.about.com/contact/Tony-Dunnell-95988.htm

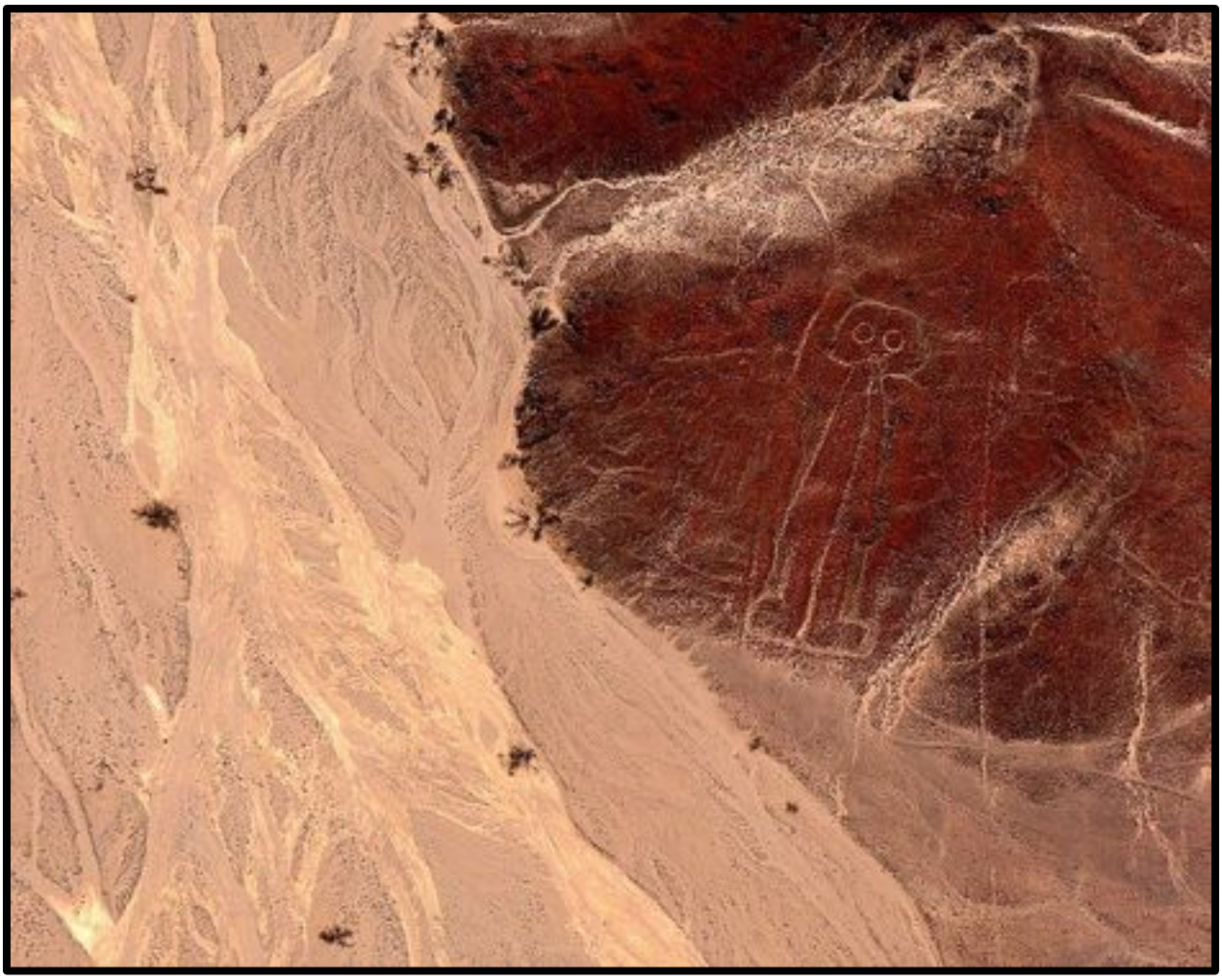
The Whale

The Whale is often the first geoglyph you'll see after taking off from Maria Reiche Airport. It is one of the simpler designs and easy to make out from the air, offering a good chance to train your eye to the desert landscape below. Its head is pointing slightly northeast. As you can see in the photograph, a massive line cuts through it. So was the whale made first, or the line? If the former, then why would a culture deface it that way?

The Whale geoglyph with a major line running through it

The Astronaut

The Astronaut is a Paracas era geoglyph, supposedly predating many of the other famous designs. Its hillside location is a common trait of geoglyphs from this period (many of which can be seen from ground level). The figure is approximately 105 feet (32 meters) tall. The fact that it is carved out, rather than a simple line tracing makes it much more like the Palpa figures than the Nazca ones, and thus is most likely of Paracas culture origin. His head faces due east. The fact therefore that his body and hand gesture face west, toward the ocean could show a relationship with the Pacific Ocean. His presence in Nazca shows that the Paracas most likely had a strong presence in the area before the Nazca people even existed.



The Astronaut

Detail of the Astronaut

The Hands and Tree

The Tree, which could represent the huarango or even “Tree Of Life” consists of a central trunk with radiating branches and a series of roots. The Hands geoglyph presents a more mysterious sight, with one obviously human hand (four fingers and a thumb) connected to a four-fingered hand (which appears to have three fingers and a thumb). They are located side by side, with the “tree” located to the northwest of the “hands.” One curious thing that many people bring up is the fact that Maria Reiche was missing one finger, surgically

removed due to gangrene. The tower which she helped finance allows you to see both figures, right next to the Pan Americana highway. Both the trunk of the “tree” and the “hands” face almost due west.

The Parrot

The Parrot is one of the less obvious Nazca Lines geoglyphs you’ll see during your flight. It’s not too hard to spot, despite the presence of a number of interfering lines. It is located to the northeast of the “tree.”

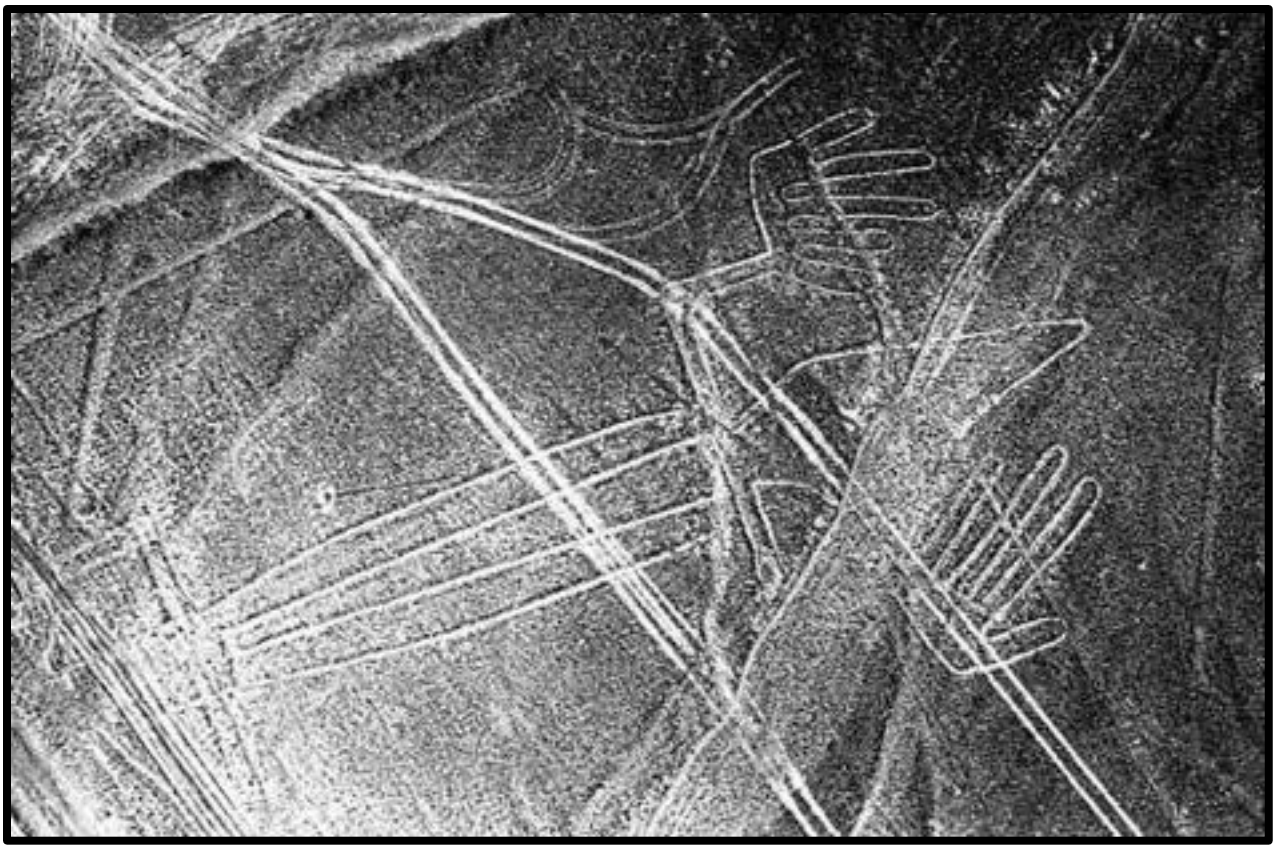
The beak is the easiest detail to look for, with what appears to be a wattle (perhaps a crest) hanging from its underside. The final quarter, perhaps third, of the Parrot appears to be hidden beneath later lines. The beak of the parrot faces west.

Outline of the Parrot

Another view of the Parrot

The Lizard

The lizard measures 188 meters long. However, its hind legs were erased when the construction of the Pan Americana highway cut the geoglyph in two. Its tail is aligned almost exactly to the west.



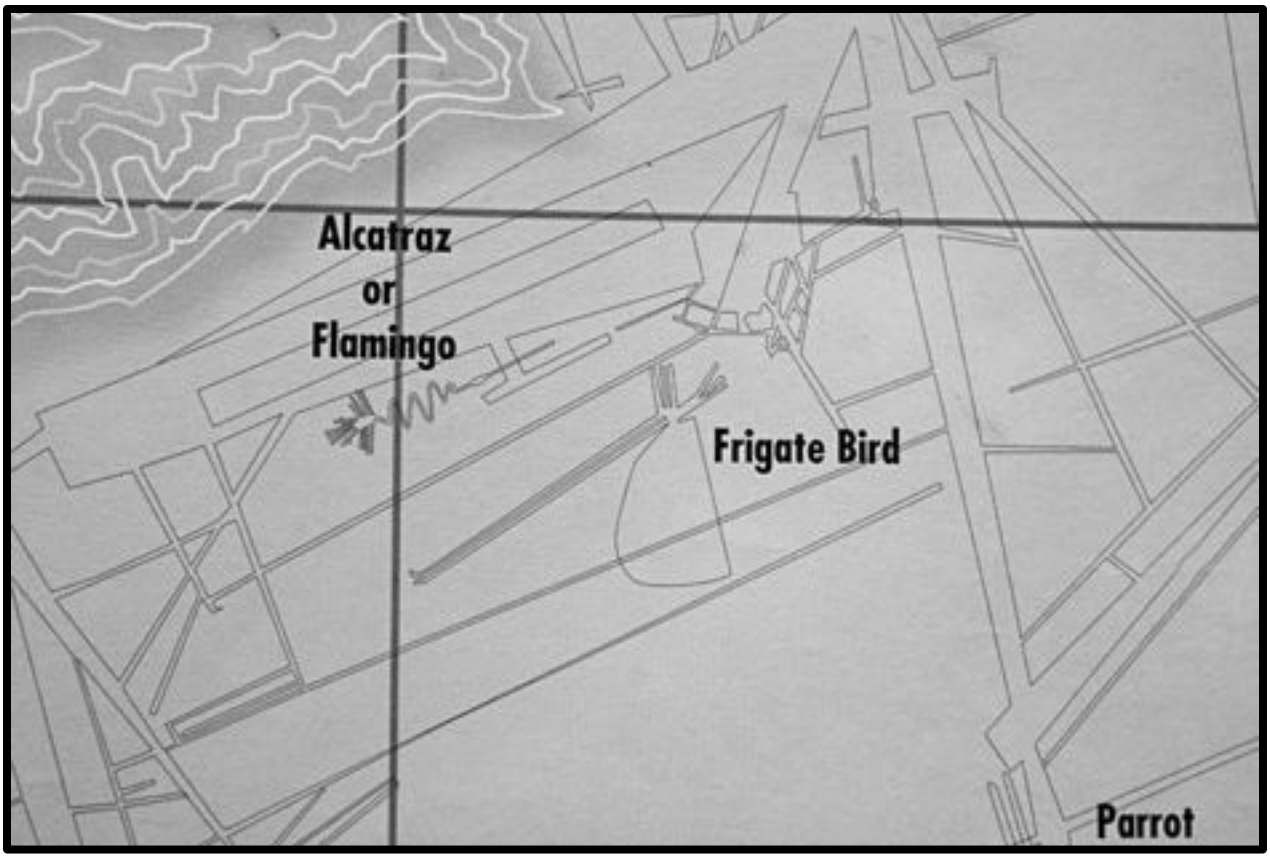
View of the Lizard, heavily damaged

Lizard on the left, Tree in canter and Hands on the right

The Alcatraz

Measuring 935 feet (285 m) in length, the Nazca Lines Alcatraz is one of the largest zoomorphic figures in the Nazca Desert. Its winged body, trailing legs and tail feathers sit at the end of an impressively long, zigzagging neck. The Alcatraz geoglyph is also known as the Pelican (and occasionally as the Phoenix, the Flamingo or the Cormorant). It is due north of the lizard, on the right side of the Pan Americana highway, and like the lizard has a tail facing west, and beak to the east.

Almost complete view of the Alcatraz



View of the Alcatraz in relationship to the Parrot

The Spider

Despite being smaller than most of the main geoglyphs, the 150-feet long (45 m) Spider is easy to spot as you fly over the Nazca Lines, and is one of the most famous. It was one of the first figures seen by Paul Kosok in the 1930s. Another researcher, Phyllis Pitluga of the Adler Planetarium & Astronomy Museum, claimed that the Spider was an anamorphic representation of the Orion constellation. It is located on the western side of the Pan Americana highway, southwest of the Alcatraz, and its head faces due west.

View of the Spider with lines cutting through it

Spider in greater detail

The Condor

The 440-feet long (134 m) Condor is one of the largest zoomorphic geoglyphs in the Nazca Desert. The geoglyph is also known as El Chaucato, the local name for the Long-tailed Mockingbird that lives along the southern coastal regions of Peru. In 1982, Joe Nickell of the University of Kentucky successfully recreated the Condor in a field in Kentucky. Nickell and his team used tools and technology that were available to the Nazca people, proving that the geoglyphs could be made

without any outside, or extraterrestrial, assistance. It is southwest of the spider, and its tail faces north northwest.

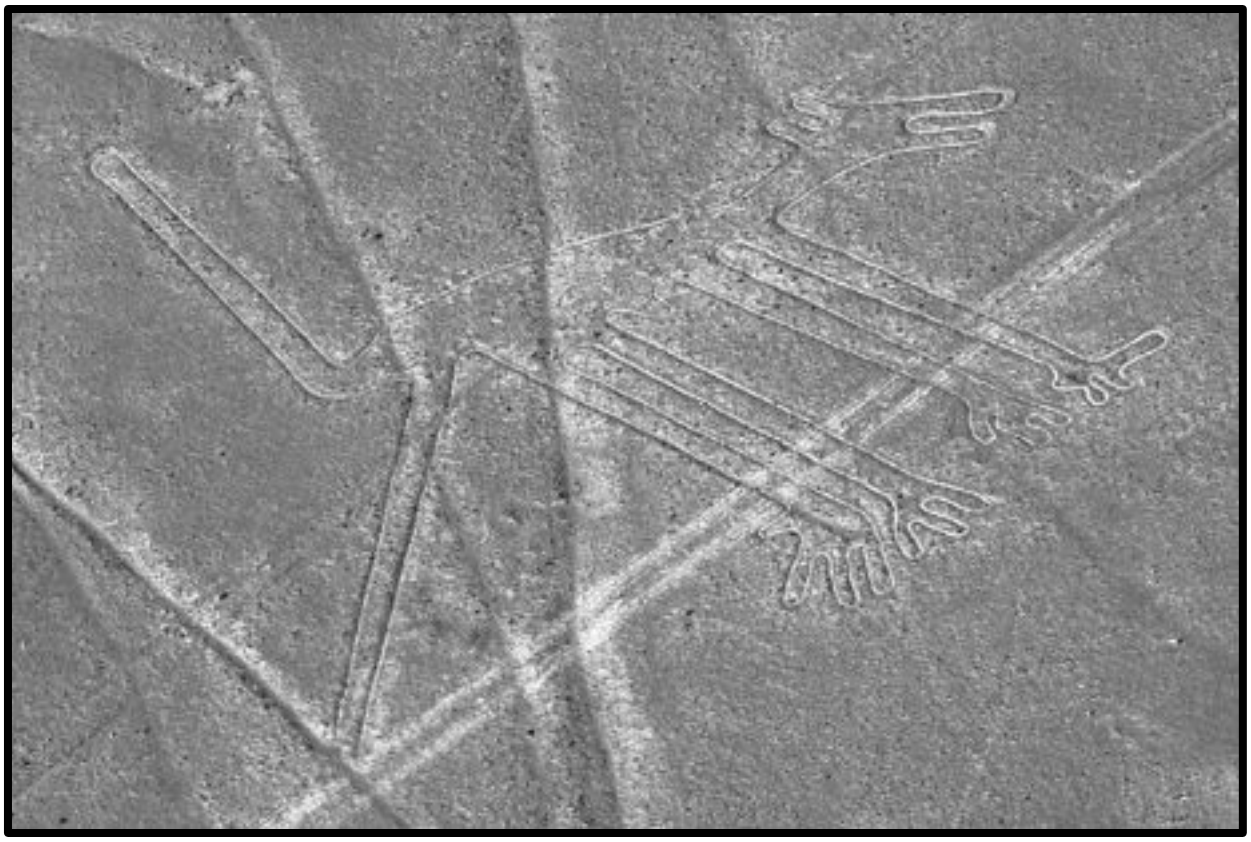
Condor with numerous lines running through it

Another view of the Condor

The Dog

The Nazca Lines Dog can be hard to spot from the air at first glance, partly due to separate lines that cross through its upper and lower parts. At about 167 feet (51 m) long, however, you'll soon recognize it once you have found part of the outline. It's possible that this particular dog represents an ancestor of the modern-day Peruvian Hairless Dog, a breed that was kept by pre-Inca cultures living along the Peruvian coast (and later by the Incas themselves). The dog is located southwest of the condor, and its nose faces northwest.

The Dog with lines are car trucks passing through it

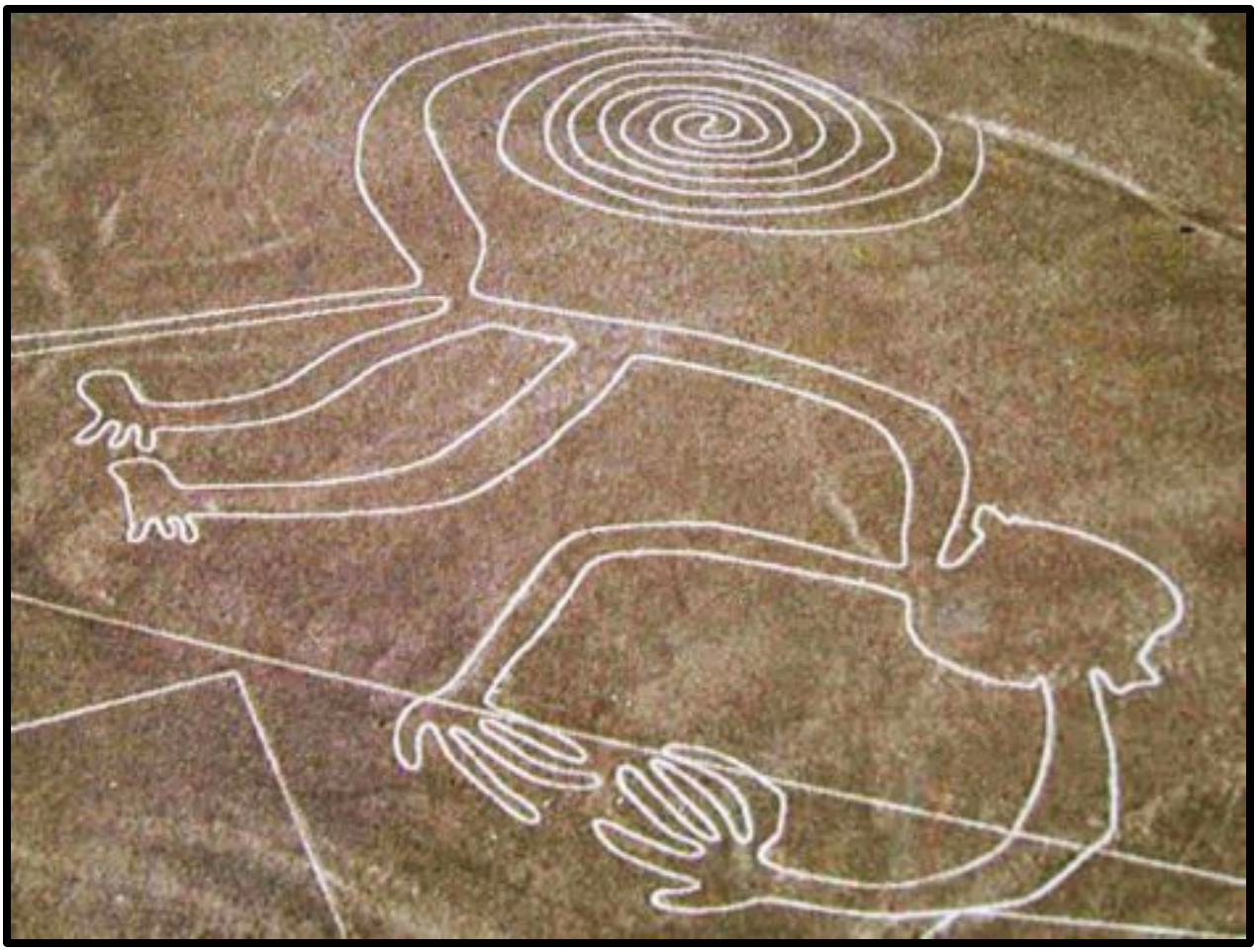


The Dog in greater resolution

The Monkey

The spiral-tailed Nazca Monkey is approximately 328 feet (100 m) long and 190 feet (58 m) tall. Similar monkey representations appear on Nazca ceramics. The Monkey, like many Nazca geoglyphs, is a single line drawing. If you step onto the Monkey's hand, for example, you could walk all the way to the center of its tail without stepping off the line. It is west of the dog, and its tail faces north, with the head being south.

View of the Monkey



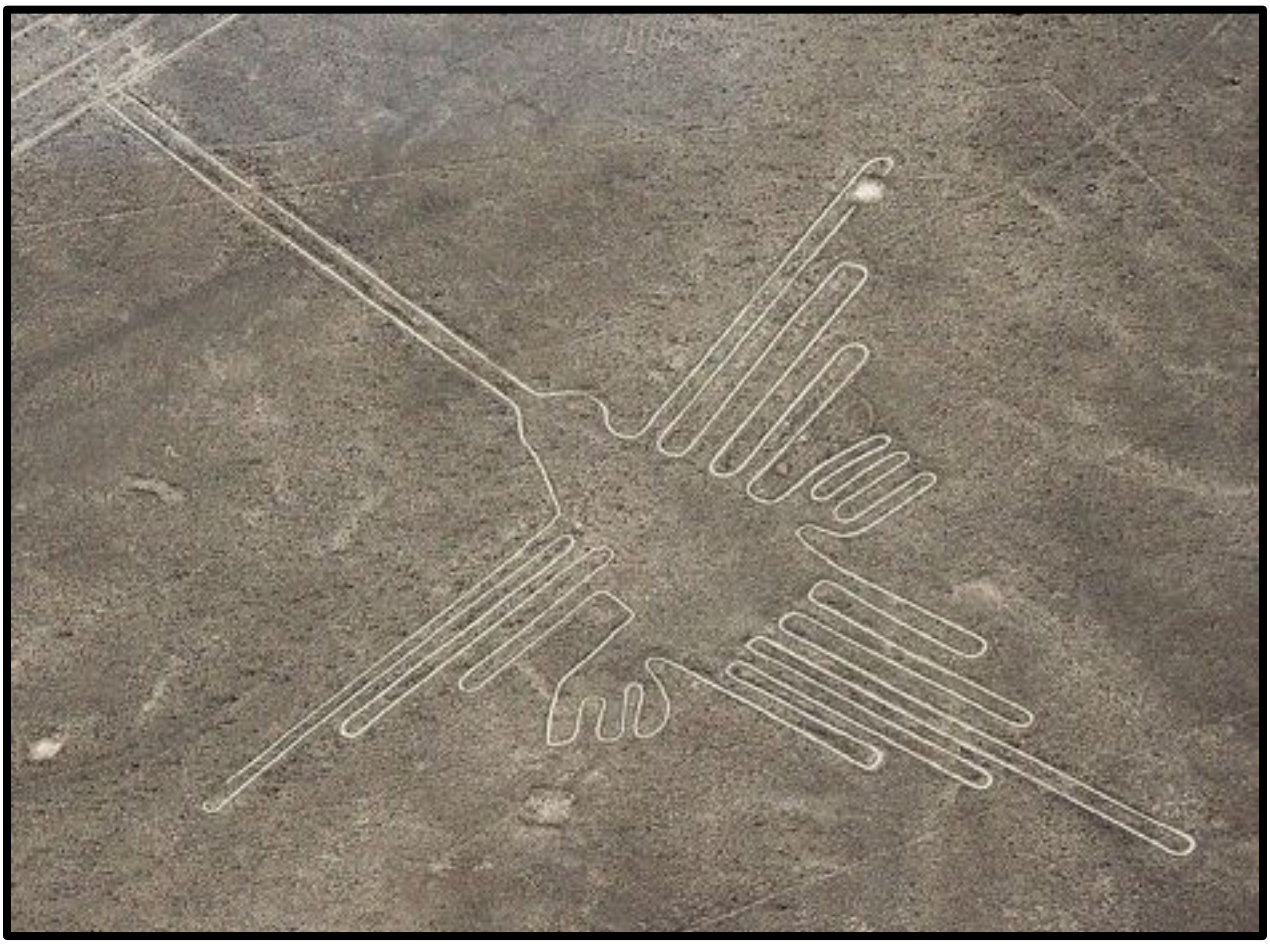
The Monkey enhanced showing detail

The Hummingbird

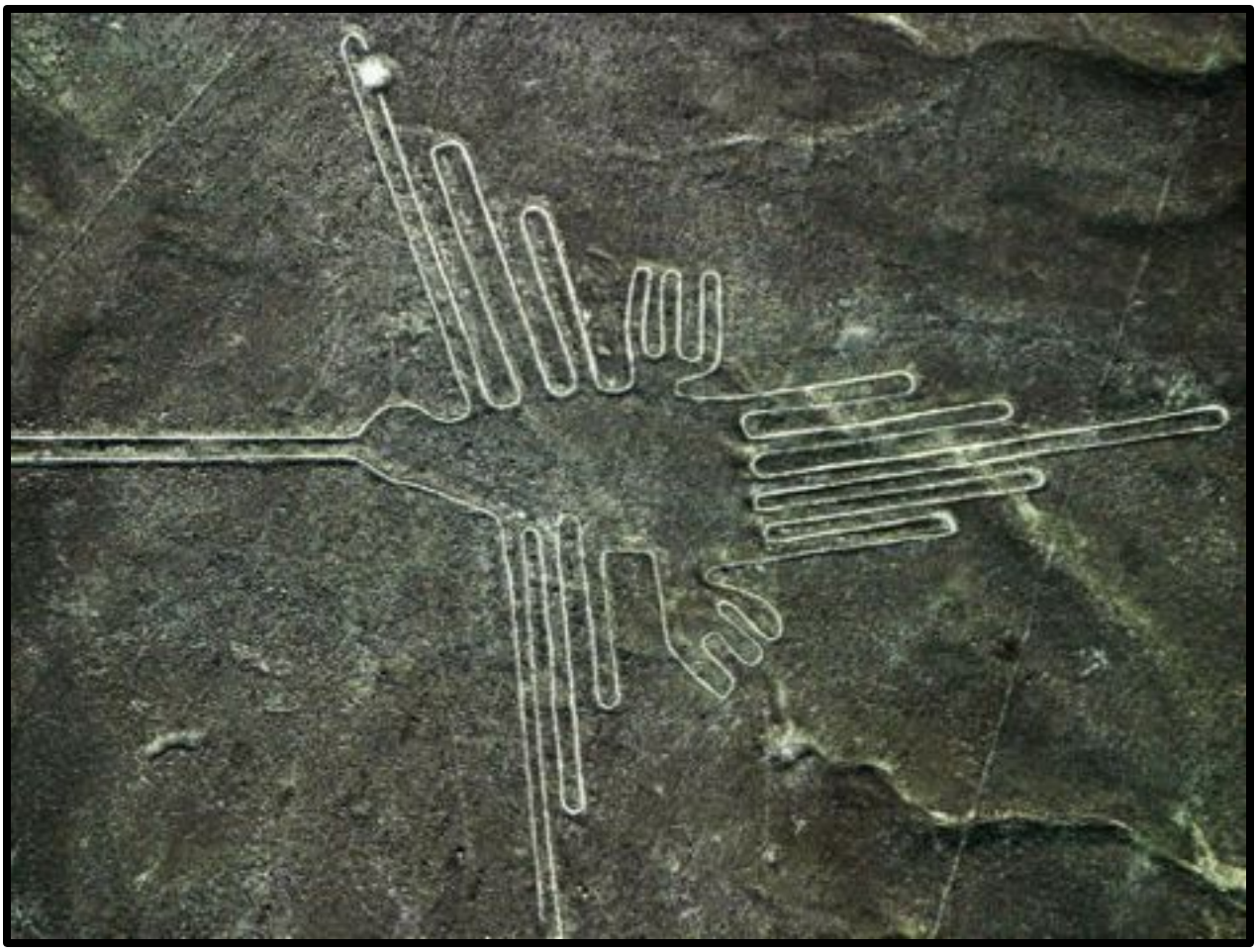
The Hummingbird is one of the most famous of all the Nazca geoglyphs. Hummingbirds are among the smallest birds in the world; the geoglyph, however, is about 318-feet (97 m) long with a wingspan of 216 feet (66 m). It is located on a raised plateau, making it easy to spot from the air, is north of the monkey, and its beak faces northeast.

There are of course many more Nazca figures, including the alligator, plants, sea birds, another so called parrot and various

geometric shapes including triangles, trapezoids, and rectangles. The majority of the prominent geometric configurations are east west in orientation, as are the astronaut, hands, tree, lizard, Alcatraz, spider, and some of the other plant shapes. The obvious reasoning behind this would be orientation to sunrise and set. However, only by the use of archaeoastronomical techniques could the accuracy of this positioning be verified. Another theory would be some relationship to the ocean, which lies in the west, however, this is clearly speculation.



The Hummingbird; one of the most intact figures



Another view of the Hummingbird

11/ Conclusions

Having looked at all of the predominant theories, and as much archaeological and anthropological information as seemed pertinent, what conclusions can we draw?

In my opinion the Nazca lines and figures were not created solely by the Nazca people, and not entirely within the time span of 1 AD to 500 AD. They are part of a much larger geographic fabric of land which begins at the Candelabra in

Paracas, extends through Palpa, and ends up in the Nazca pampa.

The Paracas would have been the first to create the shapes, especially the Candelabra and at Palpa, and over time the works progressed into Nazca. As incredible artisans of mysterious origin the Paracas may have simply been creating fanciful designs on hillsides, but why depictions of humans with extensions coming out their heads at Palpa is a matter of conjecture.

The Paracas, for the majority of their existence lived a rich life. Seafood was plentiful and they were able to grow vast amounts of food thanks to their amazing knowledge of how to deal with limited water supplies.

There are locations inside the Paracas National Reserve which still has evidence of ancient Paracas culture farming technology. Such locations are known by Sr. Juan Navarro Hierro, and he showed them to me on one of my first visits with him. What we see is that the Paracas knew, quite extensively how the waters of the Andes and highlands to the east flowed underground, obeying gravity on their way to the Pacific Ocean. In response the Paracas people made their fields as much as 2 meters or more below the general land surface.

By doing this, they were able to raise corn, cotton and other crops without much need of irrigation, as the roots of the plants would find the underground water. Their civilization and sphere of occupation went from the Pacific Ocean to the

present city of Chincha to the north, east into the highlands, and south at least as far as Nazca and Cahuachi. There are no geoglyph lines at Paracas, and thus one can presume that knowledge of where the underground water was at that time was known, and may have been plentiful.

The Topara moved in and amalgamated with them, forming a new culture which became known as the Nazca. Again, I believe that this was not a peaceful alliance, but resulted in the overthrow of the Paracas and their lands. Evidence of this I suggest is the disappearance of the elongated skull cranial deformation phenomena which was a hall mark of the Paracas elite. Also, the much of the Nazca art form can be directly attributed to the Paracas.

What changes in the pottery ornamentation from the Paracas to the Nazca is that the former tended to depict fanciful representations of animals and people with smiles on their faces, while much of the Nazca works take on a grimmer tone. Many Nazca ceramics portray decapitated human heads dripping with blood which one can presume depict acts of extreme violence, and against whom?

The Antonini museum in Nazca city, which is exclusively comprised of artifacts from the Cahuachi pyramid complex has a display of Nazca culture “trophy heads.” Some of these are elongated skulls, and it is plausible that such skulls were those of the Paracas elite, who occupied Cahuachi before the existence of the Nazca. As their culture began to decline due to

defoliation of the huarango forests, as well as a prolonged El Nino and resulting crop failures, the Nazca may have used the Paracas elongated skulls as ceremonial instruments. By praying to the ancient Paracas, the Nazca may have asked for the plentiful waters to return.

Trophy skulls of the Antonini museum in Nazca. Notice the elongated one.

One textile in the Paracas History Museum of Sr. Juan Navarro Hierro, which is plain embroidered cotton and is very rare, shows animal depictions which are simple outlines but look very much like the geoglyphs at Nazca. The textile is clearly of

Paracas culture manufacture, and Sr. Juan believes that this gives credence to the idea that the Paracas were responsible for the animal and plant geoglyphs on the Nazca Plain. If this is the case then the Nazca figures were made first, hundreds of years before most or all of the Nazca lines.

Following along this thread of logic, the Nazca then, as a distinct culture, with food resources dwindling from the decimation of the huarango trees and El Nino effects made the lines as a way to map the underground streams of the area. Major lines may have been made prior to this act of civil engineering as pathways to distant outposts as trade routes, and as well to map solar, lunar and stellar alignments.

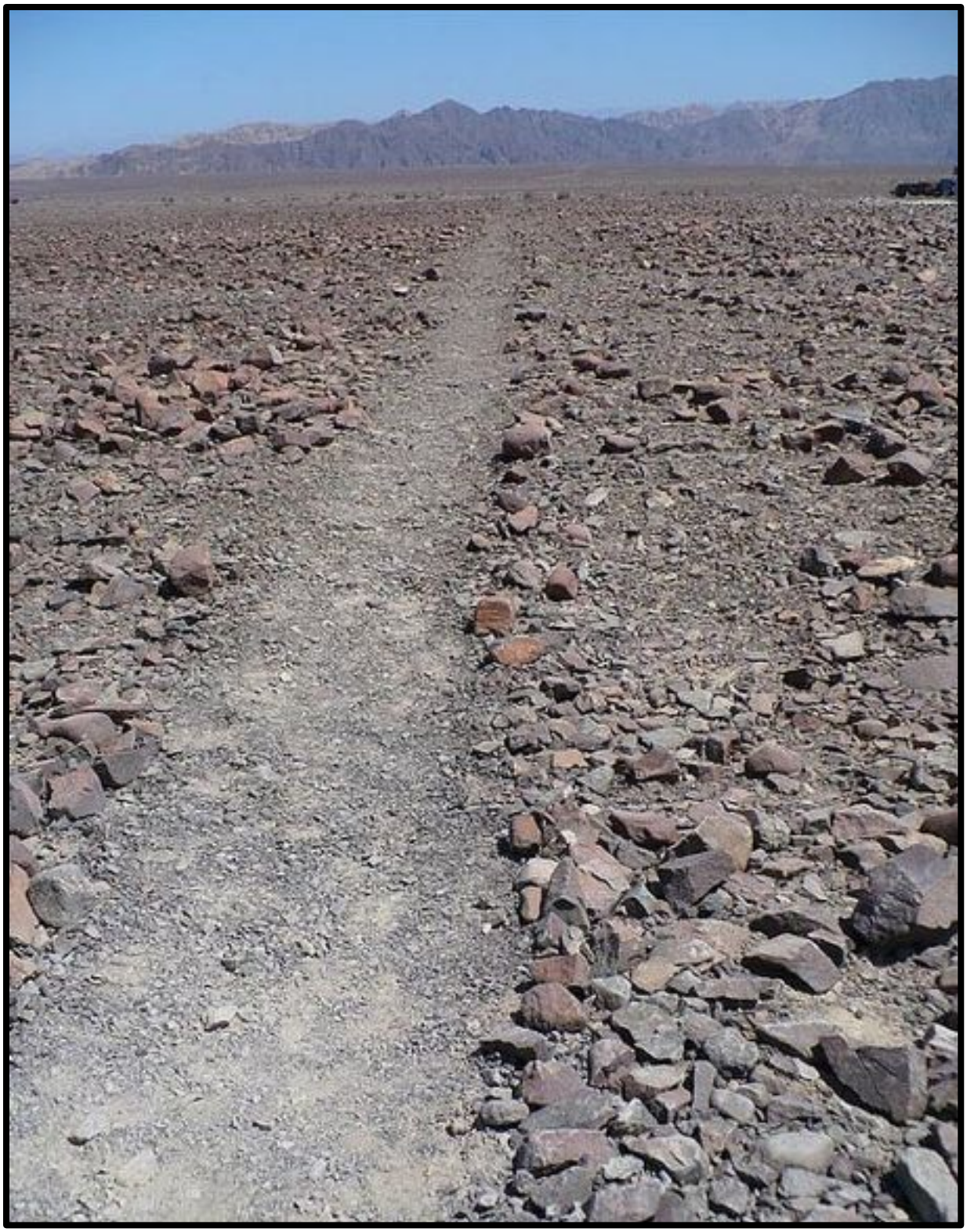
And that could be why so many theories have arisen. No one hypothesis can adequately explain the entire Nazca geoglyph phenomenon, and thus the explanation probably comes from different constructions over the course of several centuries, by different people for varied reasons.

I personally find the ancient alien landing strip theory the least plausible, as explained in this book. And the idea that the Nazca constructed the lines and figures to pay homage to extraterrestrial visitors begs the question; why? What would aliens find appealing about the Nazca area? What resources would there be for them to utilize? Certainly not water.

Gold or other metals is one theory espoused by such writers as Zecharia Sitchins of *The Twelfth Planet* fame as well as other books about ancient Sumeria, and there has been gold mining

in the Nazca area for thousands of years. The reason for the abundance of the precious yellow metal in the area is the result of the fact that the Andes Mountains to the east are volcanic. Thus, gold and other metals have been carried down from these lofty mountains for thousands if not millions of years westward and eastward by water.

However, any ancient alien contact theory in some ways poses the idea that the Paracas and Nazca were too stupid to do the work themselves. Such assumptions may be viewed as both elitist and perhaps even racism on the part of the authors of such ideas. The fact that ancient people around the world had both skill and intelligence is not only a testimony to their brilliance, but also to us as their collective descendants. As I stated at the beginning of this book, I leave it to you to draw your own conclusions, and invite you to explore Nazca, Palpa and Paracas for yourself.



Brien Foerster

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