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From the Golden Age to the Age of Aquarius

THE HARMONIC TRACÉ or THE SECRET OF CHAVIN

(Translation from French by Helga Preuß)

"Everything comes from Unity and returns to Unity."

Plato

(Translator's note: For the French term "Tracé", a wide variety of words are suggested for translation into German, such as ground plan, lines, etc., which would certainly be appropriate at one point or another, but all of which can only be considered a translation for the French word to a limited extent, since the word "Tracé" already has a spiritual dimension that the German words do not reflect. In this translation, therefore, the French term is always used and only sometimes supplemented by a German term).

The "harmonic tracés" are the geometric processes of a unique tradition. They were used in ancient times to draw the plans of buildings. We will see that these tracés were not only "secret techniques of a profession", but also contained a deep metaphysical knowledge. The principles of these tracés reflect a crystal-clear simplicity and to carry them out requires nothing but the angle and the compass (or the "knotted rope" that allowed drawing directly on the ground). Finally, these harmonious floor plans create a beauty, a harmony that still leaves one awestruck when standing in front of a Parthenon, an Egyptian or Cambodian temple or a cathedral.

The basic principles of the Tracé derive directly from the properties of Pythagoras' theorem (in Euclid's words: "The square of the diagonal of a right-angled triangle is equal to the sum of the squares of the other two sides", although it should be noted that these triangles were clearly used long before Pythagoras and Euclid). In fact, all motifs used in antiquity can be constructed from Figure 1.

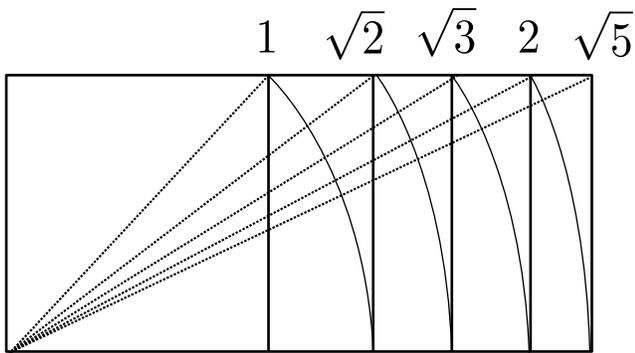


Fig. 1: Derivation of all themes of harmonic lines starting from the square.

According to the theorem, the diagonal of the square is equal to any unit base (meter, fathom, Egyptian cubit, etc.) like $\sqrt{2}$. By rotating the diagonal by 45° , you get two sides of the harmonic rectangle with the aspect ratio $1 : \sqrt{2}$. This rectangle is called harmonic because it can produce itself. And indeed, the division of this rectangle into two equal parts results in two $\sqrt{2}$ rectangles which are themselves $\sqrt{2}$ rectangles (i.e., have the aspect ratio of $1 : \sqrt{2}$). And so we can continue this division to infinity. (Figure 2)

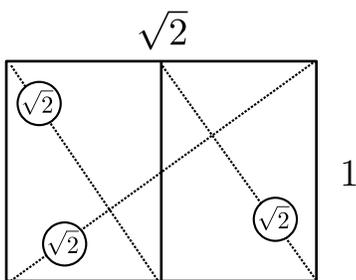


Fig. 2: Simple harmonic division of the rectangle from this theme $\sqrt{2}$

Let's return to Figure 1: the diagonal of a rectangle with the theme $\sqrt{2}$ has a value of $\sqrt{3}$, (because it corresponds to the value of $\sqrt{1+2}$ and by turning it downwards, we obtain the harmonic rectangle with the theme $\sqrt{3}$ (which in turn creates itself by dividing it into three equal parts). The diagonal of the rectangle $\sqrt{3}$ has a value of $\sqrt{4}$, which is 2, the base of the double square. Finally, the diagonal of the double square is used to draw the theme rectangle $\sqrt{5}$.

The three rules of the harmonious floor plan of the "ancients" display an extraordinary simplicity:

1. there are only three harmonic themes $\sqrt{2}$, $\sqrt{3}$ and $\sqrt{5}$.
2. these three themes are never combined.
3. the figure of the square and the double square belong to *all* themes.

The knowledge of the Tracés or the "Art du Trait" and its application, was passed on exclusively by oral tradition through the initiation channels of antiquity. Among the solemn commitments made by the newly initiated was that of silence. Therefore, it is not surprising that written testimonies concerning the planning of the floor plan are extremely rare... Plato was the first in the Western world to lift some of the corners of the veil (among other things in his comments on the golden ratio in "Timaios"). And although we do not have any writings by Pythagoras himself, some of his students and commentators were less discreet. We have many texts on arithmetic or geometry in hieroglyphics and in Greek, but none of them clearly expounds the science of Tracé. And yet all Egyptian and Greek buildings of all eras have been designed according to these same traditional rules.

Closer to home, Villard de Honnecourt, a 13th century architect from Picardy who lived in the heyday of the Romanesque and Gothic periods, is the only medieval master who left annotated architectural plans. And we have the complete original plan of the cathedral of St. Gallen in Switzerland with the unencrypted annotations accompanying the tracé. Finally, Philibert de l'Orme (1515-1570) and Blondel (1617-1681) seem to be among the last initiates who were both theoreticians and practitioners. Indeed, under Louis XIV, the famous dispute between the ancients (those who knew the "Art du Trait") and the moderns (those who ignored it and wanted to free themselves from it) ended with the victory of the latter, thanks to the support of Colbert. The Age of Enlightenment and Revolution ultimately led even the architects to forget that the tradition of the tracé had ever existed. This goes as far as an architecture professor claiming without hesitation that there is no architecture produced today, only construction (one of the few contemporary architects who have made use of traditional knowledge is Le Corbusier, whose "Modulor" is based on the Golden Section).

Yet no sooner had the practice and knowledge of the Tracés fallen into oblivion than some, a few everywhere, tried to reinvent them. The works of Viollet-le-Duc are the most famous in this regard. The more or less successful (and sometimes freely invented) tracés of the pantheon or the pyramids are no longer counted. Despite an often remarkable encyclopedic knowledge, these various methods have never achieved the extraordinary simplicity of the original tracé, which were based on the rules of tradition. We had to wait for the 20th century to rediscover, with Jay Hambidge and Matila C. Ghyka, the theoretical foundations of the harmonic or dynamic traditional Tracé. More recently, the architect Georges Jouvan has used them to create a remarkable synthesis with practical applications in Egyptian, Greek and Romanesque architecture, as well as that of the Middle Ages and the French Classical period.

Who is behind these patterns? The Egyptians attributed the invention to Imhotep, the ingenious architect of King Zoser (Djoser) of the Old Kingdom (3rd dynasty) out of whom they made a demigod. Moses received the tracés of the tabernacle and Solomon received those of his temple through revelations that came directly from Yahweh. But long before Moses, Solomon or Imhotep we find some Sumerian temples designed through the same method.

Alexander Thom proved the use of these plans even among the megalithic stone circles. In this study we will see that this same art of l'Art du Trait has completely determined the construction of the temple of Chavin, and this from the first period (the temple of Lanzón: 1800 BC). This theme is, incidentally the same as that used by Ictinos for the Parthenon (5th century BC), or Philibert de l'Orme for the Garden of Tuileries (1564), specifically the $\sqrt{5}$ theme.

The surveys and the theme of Chavin

"Ars sine Scientia nihil." ("Art without science is nothing.")

Saint Bonaventure (1212-1274)

1. *The plans used*

All those who created "Tracés Secrets" (secret building plans) were faced with two great temptations: that of inventing a system adapted to the building in question, and that of adapting the plans to the conceived system, invoking the "construction mistakes" of antiquity. First we will strictly abide by the three rules of the traditional harmonic tracé, and second, we will base the plans on the surveys carried out by the experts who know each area of Chavin best and who have worked on site with precise triangulation. The first comprehensive study of the Lanzón area was carried out before the Tello war, that is, before the 1946 landslide that devastated the entire upper part of the Temple of Lanzón. Tello's survey will thus serve as the basis for the Gallery of the Lanzón (Plan I, IIIc and III d. All illustrations in Roman characters refer to these pictorial plates). For the floor plan of the Temple of Lanzón with the "Place Circulaire" and the "Galérie des Offrandes", discovered by Lumbreras, we will use the plans drawn up by him (Plans IIIa and IIIb).

Finally, for the overall plan of the New Temple, the topographer Costa carried out a complete triangulated survey to enable Maria Scholte de D'Ebneth to produce an attempt at an original ground plan (tracé). This study is, by the way, to our knowledge the first and only attempt of a ground plan (Tracé) of the Chavin site. This work is interesting, but the proposed system does not refer to any external tradition and leads to a complex jumble of graphics⁴. However, it has the advantage of referring to measurements of the entire plan of Chavin, which are recent and very accurate. We will use these plans for this part of the Tracé (Plans II and IV).

2. The Theme of $\sqrt{5}$

⁴ M. Scholten de D'Ebneth: "Chavin de Huántar: Disen arquitectónico del conjunto arqueológico" (Lima, mars 1980). Their system of "ground plan planning" (tracé) is based on a new, American 332-meter-long unit of measurement. She also uses as her own unit - by Chavin - the diagonal "D" of a rectangle of 7 to 8 American units. With this measure she constructs a complex ensemble of squares and circles in the measures of multiples and sub-multiples of D, of D, of (D-D), etc.

The theme of $\sqrt{5}$ is the richest of all themes, because it describes a rectangle with amazing properties, the golden ratio rectangle (that is, the rectangle built on the golden ratio:

$\Phi = \frac{1 + \sqrt{5}}{2} = 1,6180349\dots$). Five types of rectangles can be derived from the $\sqrt{5}$ theme, but

we will be content here with a graphic representation and some essential characteristics:

these are the rectangles $\sqrt{5}, \sqrt{5}, \Phi, \frac{\Phi}{2}$, and Φ^2 : see Figures 3,4,5,6 and 7⁵.1 respectively

Finally, let's remember that two other figures are part of the $\sqrt{5}$ theme (like all other themes, by the way): the square and the double square. So there are a total of seven basic tools for the plans (tracé) for the $\sqrt{5}$ theme. All were used in Chavin ...

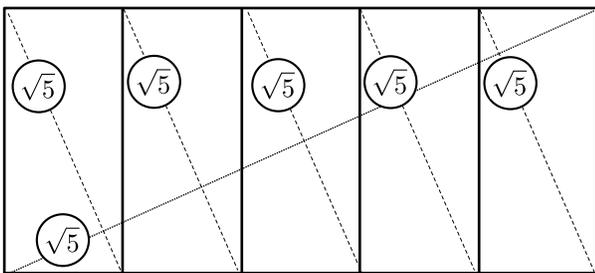


Fig. 3: The $\sqrt{5}$ rectangle, and its harmonic simple division into five $\sqrt{5}$ rectangles.

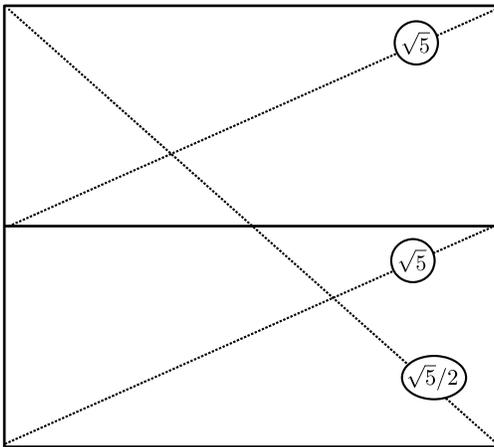


Fig. 4: The $\frac{\sqrt{5}}{2}$ rectangle by definition: two $\sqrt{5}$ rectangles, joined by their long sides.

⁵ We graphically represent a harmonic rectangle by drawing its perimeter and a diagonal on which we annotate the type of rectangle, etc. See Hambidge, Ghyka and Jouven for a more complete study of the amazing properties of these rectangles.

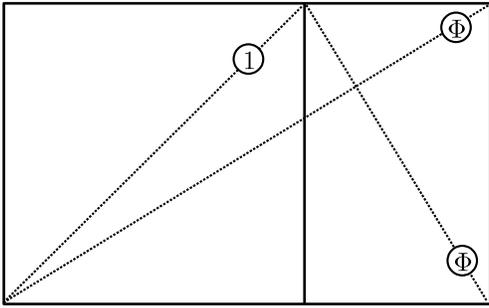


Fig. 5: The rectangle in the Golden Section Φ and its simple decomposition: by subtracting a square we obtain a new rectangle in the Golden Section oriented in the opposite direction (Φ is in fact the only number that when it's subtracted from the unit reverses, as

$$\Phi - 1 = 1.618... - 1 = 0,618... = \frac{1}{1,618...} = \frac{1}{\Phi})$$

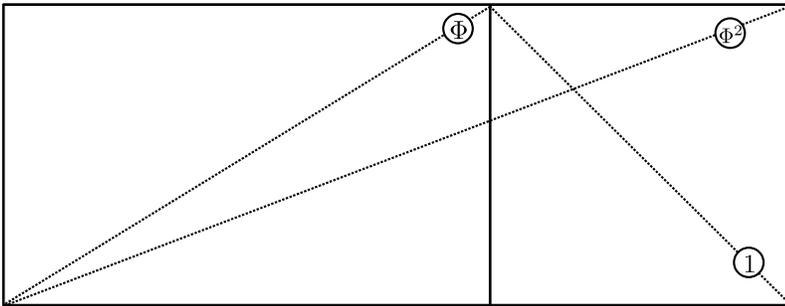


Fig. 6: The rectangle Φ^2 (by definition a golden section rectangle to which the square is added). This is the geometric representation of another amazing property of the Golden Section: it is the only one that multiplies by itself when the unit is added to it, as

$$\Phi + 1 = 1,681... + 1 = 2,681... = \Phi^2 .$$

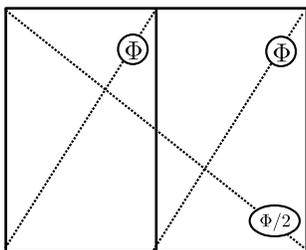


Fig. 7: The rectangle $\Phi/2$, a fifth and last rectangle in the $\sqrt{5}$ theme (by definition: two Φ rectangles connected by their longer sides).

The floor plan of the Old Temple

"Arise and measure the temple of God."

Apocalypse 22, 1

It's apparent that the ancient temple, also known as the temple of Lanzón, is the first structure of the Chavin complex to have been built. This is where we will start our search for the Tracés: first in the "gallery" of the Lanzón itself, then in the rest of Old Temple (including the pyramid and the "Place Circulaire"), both in floor plan and cross section.

1. The floor plan of the inner "gallery" of the Lanzón

As we know, the gallery of the Lanzón is completely hidden inside the pyramid and therefore not visible from the outside. From the south-eastern corner of the gallery, it is possible to reach the long gallery of the Lanzón, where the monolith of the god is erected in the center of the cross. The basic structure of this complex is defined by two large $\sqrt{5}$ rectangles that are symmetrically arranged around the center of the Lanzón (point L) and define the outer limits of the structure (that is, the outer limits of the galleries). All the dimensions of this access gallery are based on four $\sqrt{5}$ rectangles, the base of which is the These are three double squares and two rectangles in the Golden Section, which have their starting point exactly in the center of the entrance of the "gallery" of the Lanzón itself (point G). We will see this point G and its rectangles in the Golden Section later in Plan III when drawing the cross-section of the temple. Let us note here that *these plans (tracés) were executed in three dimensions.*

Let us follow the tracé from G towards the lancet, with two large $\sqrt{5}$ rectangles embedded in the previous ones, which form the foundation upon which the cruciform construction of the lancet manifests. On the axis defined by these rectangles, point A is perpendicular to the beginning of the horizontal construction of the Upper Temple – which no longer exists today, but did at the time Tello surveyed this site: it is marked on the plan with blue dotted lines. From this point A, two last $\sqrt{5}$ rectangles lead us to the perfect small square that surrounds the Lanzón.

The cross-shaped galleries of the Lanzón seem symmetrical at first sight. In fact, they are not: Tello gives as measures for the arms as length 2m40, 2m50 and 2m60 respectively. Maria Scholten von d'Ebneth concluded in her study that there were "construction errors that were normal for the time", as this asymmetry could not be integrated into her plot system based on circles and squares, whereby a 20 cm deviation over 2m40 represents an error of more than 8%. In the rest of this structure, however, the errors are typically in the order of 1 to 2 cm, i.e. less than 1% (the largest error we found in the graph is 5 cm, representing less than 2.5%). In reality, the cross can be drawn on a perfect double square on the left (A'BCD') and a $\sqrt{5}$ rectangle on the right (A "D "XY). Even more curious is that the southern arm (left) is delineated by subtracting from the double square two $\frac{\sqrt{5}}{2}$ rectangles created from points B and C, while the opposite arm is delineated one one side by subtracting a $\Phi/2$ rectangle (in X) from the $\sqrt{5}$ rectangle and on the other side, a perfect square (in Y). This lack of symmetry

fascinated us for a long time, since everything else is strictly symmetrical, and we were even tempted to agree with Scholten by D'Ebneth in her conclusion. This was true until we found the same arrangement, in the same order, with the same orientation, but in the open terrain on more than one hectare on the site of the New Temple (we will come back to this later). Coincidence or "errors" can therefore be excluded. Finally, it should be mentioned that the only missing element (the lower boundary of the western arm, starting from point D) consists of two Φ^2 rectangles that fit together like a final piece of the puzzle.

2. The tracé of the temple of Lanzón (Plan II)

The floor plan of the Old Temple is structured around seven large rectangles (the first one in front of the entrance to the Place Circulaire is based on Φ^2 , the six others are identical double squares). These seven rectangles define all the essential points of the plan: the beginning, the middle and the end of the Place Circulaire, the wall that delineates the inner courtyard of the temple, and of course the lancet itself and the outer limits of the complex. The corners of the main intermediate terrace are delimited by a rectangle in the Golden Section at the foot of the stairs leading from the Circulaire to the pyramid. This rectangle in the golden section is found at the same point in the cross section, which once again illustrates the mastery of the three-dimensional planning of the complex in Chavín. The terraces in between are defined by Φ^2 rectangles starting from the lancet and the center of the square. Finally, the other elements of secondary importance, such as the walls parallel to the axis, are defined by squares and double squares inscribed in the Φ^2 rectangles (but for the purpose of clarity were not drawn in the plan). It is almost certain that this entire plan was originally doubled symmetrically on the other side of the temple's axis, as can be seen from the few remaining landmarks on the north wall, which was particularly affected by the alluvial deposits of 1946. The ensemble thus exhibits a plan (Tracé) that is as unembellished as it is harmonious.

3. The sectional drawing of the temple of Lanzón

The cross-section of the Old Temple complex runs from east to west (see plan IIIa). It initially shows two identical underground galleries (des Galeries Jumelles - twin galleries) under the hill that borders the Place Circulaire. From the Place Circulaire, two successive flights of stairs lead from different angles to the entrance of the access gallery of the Lanzón. Note that the base of the pyramid on the west side is at a height absolutely identical to that of the Place Circulaire. Finally, thanks to Tellos' notes, Lumbreras was fortunately able to determine the original height, which is very useful for drawing the cross section. This floor plan (tracé) of the Old Temple is perhaps the most beautiful and moving of the whole complex. This floor plan (Tracé) of the Old Temple is perhaps the most beautiful and moving of the whole complex. It is based entirely on seven rectangles masterfully interlaced in the Golden Section. At the eastern end, the two Golden Section rectangles begin in front of the center of the Place Circulaire at the level of the twin galleries, i.e. underground. From the center of the Place

Circulaire, the entire plan is on the same level. Inside the pyramid itself, the ground plan becomes even richer. The Lanzón seems to be built on two double squares (at point L). These are the only rectangles of the entire plan (tracé), which are not rectangles in the golden section. We will see that the symbolism of this exception is indeed very significant, since these double squares symbolically represent the earth.

So the Lanzón is literally placed in the "center of the world". However, towards the top, the Golden Section immediately reappears, which demarcates the upper corner of the temple as well as the vertical of the famous entrance to the Lanzón Gallery (point G of the Lanzón Gallery in plan I). From this point G in the heart of the temple, where Plan I showed the only Golden Section rectangles used in the plan, we now see that four Golden Section rectangles radiate in all directions, on one side defining the borders of the small Upper Temple of the Tello plan and on the other side the end points east of the temple. Finally, as if to playfully overcome the complexity, two huge Φ^2 rectangles (one of which is underground between the twin galleries and the other in the lower western corner of the temple) are superimposed on each other from the two outermost sides over the entire surface of the plan, so that they meet exactly at the upper edge of the temple's facade, thus covering the seven rectangles in the golden section. Although this plan (tracé) provides us with practically all the essential points, we are still missing two or three details, such as the measure of the difference in height between the Place Circulaire and the square courtyard in the middle of which it is located, the angle of the second staircase leading to the temple, or the exact dimensions of the two underground galleries (of which we only have the point in the middle so far). The lines shown in IIIb (tracé) complete each of these details. Note that the angle of the steps of the Place Circulaire corresponds to the diagonal of the rectangle in the golden section of this point, and that the angle of the second, steeper staircase corresponds exactly to the diagonal of the rectangle. These two straight lines meet again exactly perpendicular to point G of the Gallery of the Lanzón. We also drew the plan of the small Upper Temple, which was destroyed in 1946. It is structured around a central square that is perpendicular to the niche in which the Lanzón is embedded.

In IIIc we present an enlargement of the cross-section of exactly this area of the Lanzón. This is the plan of Tello, which still shows the small temple above the Lanzón, which is still covered by debris. This plan is the only surviving document that provides the dimensions and the floor plan of the small upper temple. At first sight this plan (tracé) is very simple. The entire visible part of the Lanzón is enclosed in a large $\sqrt{5}$ rectangle, above which the cross section of the small Upper Temple is defined by a rectangle in the Golden Section. Inside the latter there is a double square that is perpendicular to the niche in which the Lanzón is embedded. However, this apparent simplicity is misleading, since there is also a second reading, which is as precise and as valid as the first (see IIIId). In fact, the double square of the Upper Temple is closely linked to the plan of the Lanzón (thanks to a small rectangle in the Golden Section inserted in the first one). We will see later that it is precisely these duplicities of frequently

occurring significant plans (tracé) that are in fact intended, because they have a remarkably precise symbolic meaning. For the lovers of detail, it should be noted that even the two small empty rectangles that immediately surround the upper and lower borders of the Lanzón (cf. IIIc) are $\sqrt{5}$ rectangles (not shown in the drawing). And that the areas of solid stone that border these small rectangles are themselves two rectangles in the golden section at the top and two double squares at the bottom.

One last point: Lumbreras had repeatedly put forward the hypothesis that the Tello-obelisk was actually originally located in the center of the Place Circulaire. The drawing of the ground plan (tracé) allows us to verify the validity of such a hypothesis, since such a striking and symbolically significant point of reference would not be conceivable without integration into the overall plan. We know that the Tello Obelisk has a height above the ground of 2m52. If we draw it in the middle of the Place Circulaire, we can see that the top of the obelisk is marked by two $\sqrt{5}$ rectangles that fit into the golden rectangles that border the Place Circulaire. Lumbreras seems to have been right.

In the whole drawing of the cross-section we can see that the rectangle in the Golden Section systematically dominates the scene. Why? Traditionally, the golden section stands for perfection and, deriving from this, by definition, for heaven and the desire for communication between man and this heaven. "This temple is like heaven in all its proportions," says the central inscription of the temple of Ramses II, which is also based on the theme of the golden number. Is there any more beautiful illustration of the thinking of the initiates of Chavín than this flight of the seven rectangles in the golden section of the temple into the sky? Yet, it must be noted that these lines are today invisible to the eye, and even then at the time when the temple was still intact. So even in Chavín the essential is invisible to the eyes!

Some more tracés in Chavín

"Everything has shapes, because everything has numbers."

Augustine

Since the temple of Lanzón is clearly based on the $\sqrt{5}$ theme, can this technique and theme be found in other epochs of Chavin and in areas other than its architecture?

The Falcon Portico at the entrance of the New Temple is the starting point of its entire "tracé". You can see the two columns with 16 falcons and the first of the seven monoliths to the right and left.

1. The floor plan of the New Temple

Considering that the New Temple was built almost a millennium after that of the Lanzón, it is normal that the style of sculpture and architecture had evolved. And in fact, one only needs to

compare the Raimondi Stele with the Lanzón to understand that the world of Chavin has by no means stood still. The style of the New Temple has often been described as Baroque, compared to the harder and drier features of the Lanzón period. One could therefore also assume that the art of the "Art du Trait" changed during this period, that extensions of various themes were made or this knowledge was even lost. It should be noted that this is exactly what happened in the West: our Baroque period introduced different themes from the three traditional ones, and since Louis XIV HH the "Art du Trait" has lost more and more of its importance - only in the end to fall completely into oblivion.

But in fact, a simple glance at the plan gives us the answer: throughout the ages, the "Art du Trait" and its theme have been thoroughly respected in Chavin. The entire tracé of the New Temple starts from the center of the Falcon Portico (point F), which gives access to the main pyramid. A golden section rectangle and a double square symmetrically demarcate the two small temples on the pyramid. Following the axis in the opposite direction (from the same point F), a series of four $\sqrt{5}$ rectangles not only delineates the main staircase and its terraces, but also leads us directly to the large Place Carrée. Here we find again the interesting asymmetry around the central square of the Lanzón in the Old Temple: the south side is defined by two $\frac{\sqrt{5}}{2}$ rectangles, the north side by a perfect square and a rectangle in the golden section. This asymmetry in turn affects the design of the large terrace in front of the Falcon Portico (one rectangle in $\Phi/2$, the other in $\frac{\sqrt{5}}{2}$). In order not to overload the drawing, we have not drawn the tracés of the other important secondary points. For example, the corner of the terrace where the two small square temples are located is connected to the center (F) of the Falcon Portico by a golden section rectangle; and also the center of the Place Circulaire of the Old Temple is integrated into the overall layout by a perfect square at the junction of the four $\sqrt{5}$ rectangles on the main staircase, and by a golden section rectangle at the foot of the first staircase of the Place Carée, etc. In summary, the master builders of the new temple not only used the same tracé technique and theme, but even integrated the new tracé into the old one.

2. The tracé of the entire archaeological area of Chavín

Let's change the scale decisively and consider the whole archaeological area of Chavín. This extends over an area that is more than half a kilometer long and almost as wide. To give an idea of the size, let's point out that building A on this plan is the Temple of Lanzón, B is the New Temple and C is the large square (Place Carrée). Again the same theme appears, but this time on an area of several hectares.

3. The tracé of some sculptures of Chavín

Let us now turn to the other end of the scale and look at the sculptures and small bas-reliefs found on the site. Only a few examples will be given, as all sculptures seem to be tracers. For example, the sculptures representing anthropomorphic figures or jaguars are all drawn according to the $\frac{\sqrt{5}}{2}$ theme. In addition, sophisticated harmonic breakdowns have been used to define the key points of the depicted figures. Thus the famous Raimondi stele is also designed on a Φ^2 rectangle (tracer), whose simple division into a square and a rectangle in the Golden Section clearly divides the stele into significant areas. (This division of $\Phi^2 = \Phi + 1$ is marked in large red lines with the inscription of the corresponding rectangles on the left side). Note also the richness of the harmonic division, which was realized exclusively on the Golden Section rectangles (Φ , Φ^2 and $\Phi/2$). The anthropomorphic jaguar is marked in the lower square by a golden section rectangle; this square is also divided into four $\Phi/2$ rectangles. As for the upper golden ratio rectangle, its particularly brilliant harmonic dissection consists of five golden ratio rectangles, plus a last one at the top of Φ^2 . In short, from the largest to the smallest, all the rules of the traditional harmonic tracé and the $\sqrt{5}$ theme are strictly observed.

The key numbers of Chavin

"I see the seven realms that contain the visible and the invisible world.

Hermes Trismegistos

Two key numbers appear systematically in the tracés of Chavin:

- the 2 (plan of the Old Temple in double squares, the extensive symmetries around the main axes, the two small square temples on the New Temple, etc.)
- and the 7 (the seven rectangles in golden section in the cross section of the Old Temple, the seven double squares in its plan, the seven rectangles of the $\sqrt{5}$ theme, etc.).

One way to test the tracé would be to see if there are any other significant elements in the complex that lead us to these numbers. And indeed, there is no lack of elements that represent these two numbers and their direct derivatives; the derivatives are $7 + 2 = 9$ and $7 + 9 = 16$. This last number, by the way, is reduced to $1 + 6 = 7$ according to the rules of numerological reduction.

Thus, the two staircases that give access to the Place Circulaire of the Old Temple have seven steps each. In each of the areas of the Place Circulaire defined by the tracé, there are seven bas-reliefs of jaguars and seven anthropomorphic figures. Furthermore, all the figures on the north side are in black stone and all those on the south side are in white stone, which is a beautiful example of the number two in color. All these figures have turned their faces towards the center of the square and thus look at the obelisk Tello in its original location. It is

also noteworthy that after the seven steps of the Place Circulaire staircase, we have a first terrace, which we reach via two steps, and then finally reach the top via the large open staircase of sixteen steps.

The same numbers are also found in the New Temple. The large portico that forms the entrance to the New Temple is built on two large columns in which sixteen falcons are engraved. The lintel is made of two-colored stone with seven black birds looking to the north and seven white birds looking to the south. On both sides of the portico, huge monoliths, perfectly polished, delimit the façade of the portico: seven black monoliths to the north and seven white ones to the south. By the way, the same two-colored structure can also be found on the large access staircase in front of the Falcon's Portico. We should also remember the appearance of the numbers Two and Seven in several places on the obelisk Tello. The Raimondi Stele hides in the upper large golden rectangle seven large volutes running along the two edges of the monolith, surmounted by seven large snakes. It is necessary to add the two volutes and the two snakes that line the upper edge. This gives a total of sixteen volutes and sixteen serpents. And finally, the altar of the "Choque Chinchay", name of the constellation Jaguar, which corresponds to our constellation Orion, has seven circular hollows (fruit cups) placed in the same order as the seven stars of this constellation.

Some elements for a symbolic reading of the Tracés of Chavin

"Those who refuse to go beyond the facts rarely reach them."

Theodore Huxley

Why this systematic repetition of the same significant numbers? Why was the same tracé used in Chavín, as in thousands of other Egyptian, Greek, Roman or Christian temples? What do these tracés mean? To answer these questions, we need to look into the world of symbols. But a few words of caution will be essential before doing so.

1. Science and knowledge

The ancients made a clear distinction between two ways of approaching reality, namely that of science and that of knowledge, which they regarded as complementary. Our world is so dominated by the first approach that we do not even understand what the second approach means. And yet we must use the second approach to work with the symbols. Science deals with the outer material world, knowledge with the inner reality. What they have in common is that they use experience as a means of investigation. But scientific experience can be communicated verbally or mathematically, while inner experience can only be communicated when it is experienced by others (which means that those who have not experienced it do not believe in it).

The goal of science is the description and prediction of physical mechanisms, the goal of knowledge is the awakening of consciousness, the Satori of the Orientals, what Jung called individualization. The language of science is the language of discursive *logic*, which uses words and equations (i.e. based on deductive and linear logic); the language of knowledge is the language of *analogy, which uses symbols* (i.e. based on intuition and non-linear global perception). Physiologists have even been able to show that these two approaches stimulate different hemispheres of our brain: linear logic mainly stimulates the left hemisphere, analogy mainly the right hemisphere. There is therefore a certain difficulty and even a certain danger in trying to explain symbols with words, especially in a world where we have all overdeveloped the left part of our brain. And yet only by taking this risk can we begin to understand what the initiates of Chavín wanted to tell us. First, we will talk about the symbolism of the number seven, which we have encountered so often. Then we will talk about the symbolism of rational numbers and the lesser known symbolism of irrational numbers, as found in the various rectangles of the $\sqrt{5}$ theme. Finally, two examples of the interpretation of a "symbolic phrase" in the temple of Chavín are given.

2. *The symbolism of the number seven*

Traditionally, the number *seven* is regarded as the manifestation of the cosmic order and organization. The Atharva Veda, one of the oldest Hindu texts, reminds us that "time moves on seven wheels, it has seven nerves". In the Bible, the steps of creation and organization of the world are also marked by this number. Thus God completed his work on the seventh day: "And on the *seventh* day he rested from his work; and God blessed the *seventh* day and sanctified it" (Genesis 2). In the same way, after he had decided to destroy his creation by the Flood, Yahweh gave the instructions to Noah, who was to contribute to the reorganization of the earth: "You will take *seven* pairs of pure animals, the male and his female ... *seven* pairs also of the birds of heaven ... for in *seven* days I will make it rain on the earth"; (Genesis 7:2). Both the Old and the New Testament are full of allusions to this number. In the Greek, Aeschylus describes Apollo, the sun god of order, as the guardian of the *seventh* gate. He was born on the *seventh* day of the month, and his feasts are always celebrated on the *seventh* of the month. When he was born on the island of Delos, the swans, which are his symbol, circled the island *seven* times. His lyre has *seven* strings, where the *seven* tones of our scale come from, which create order in the world of sounds.

The cosmic order is organized around the polar axis, which is defined by the *seven* stars of the Little Dipper and the *seven* stars of the Big Dipper. The Romans called them the *seven* oxen or "Septem Triones", from which the word "Septentrion" comes. The sunlight itself consists of *seven* colors that become visible by diffraction in a prism or through the rainbow. Even today our time is still organized around the *seven* days of the week, named after the *seven* traditional planets. The Hindus also speak of the *seven* chakras of the human etheric body, which should lead to the *seven-step* Mithraic initiation. As we know, even in the crude

game of dice, whose origin is lost in the mists of time, the numbers are not randomized: the sum of the opposite values is always *seven* (6 versus 1, 5 versus 2 and 4 versus 3). Similarly, when rolling two dice, the value of the sum obtained with the highest probability is significantly seven. Einstein claimed that "God does not throw dice". He may well have been mistaken in this statement!

Is it because we unconsciously know all this that a statistically significant majority of people who are asked to choose a number between 1 and 10 will "randomly" choose *seven*? Try it, and you'll see! We could multiply the examples almost infinitely, but it's clear that in Chavín the meaning of the number 7 was well known, as it is found as a leitmotif both visible (sculptures, steps, etc.) and invisible (plan and sectional drawings) in the proportions of the temple rooms.

3. *some other symbolic numbers used in Chavín*

To analyze the symbols of numbers, colors, animals or anthropomorphic beings found in Chavín in the necessary level of detail it would go too far here. However, each of them deserves the same attention that we have given to the symbolism of the number seven. But here we must be satisfied with giving a summary overview, a synoptic picture of the most important symbols. This is what we will use when we read one of the "symbolic phrases" of the tracé of the temple of Chavín, with some brief references among the most obvious ones.

- *The 1*, represented by the square and the cube, is the *Absolute*, that is, God. On the one hand, the 1 can only ever be generated in itself, i.e. it does not change by multiplication: $1 \times 1 = 1$. And this up to infinity, $1^n = 1$. On the other hand the 1 is the base of all integers by addition. Plato alluded to these properties when he said: "Everything comes from unity and returns to unity. The holy of holies in the Temple of Solomon was a perfect, empty cube, which nobody could enter. And Athanasius confirmed: "The God of the Christians is the God One."
- *The 2*, represented by the double square, is the will of God to manifest His earthly dwelling place, i.e. the temple, by derivation. The first act of God's action in Genesis is the creation of duality: "God separated the light from the darkness. The Temple of Solomon, the façade of the Parthenon and countless Egyptian or Christian temples, are all constructed based on the double square.
- *The 4 is the Earth*, the materialization of creation, that is, the four elements that make up matter - earth, air, water and fire - the four directions of the horizon, which explains why, according to tradition, the earth is square. For the Chinese, the emperor ruled over a square empire. Likewise, the Quetchua name of the Inca empire was Tahuantinsuyo, meaning "the empire of the four directions", and the Tracé of Cuzco was square according to this idea.

- *The 5 is the incarnation*, i.e. the number of the human being. In the various "creations" of man we always have God (1), who breathes life into the mud or the earth (4), i.e. $1+4=5$. The star of Bethlehem has five rays, Leonardo da Vinci or Vitruvius drew the human body in the pentagram, etc.
- *The golden section*(Φ), is perfection, and therefore - by derivation - the sky or the desire to communicate with it, that is, the desire for spirituality and for the development of man.
- $\sqrt{5}$ is the essence of man, his origin, his "quintessence"; (his fifth essence), i.e., the divine in man. Multiplication is connected with procreation. The power of two is the special case of multiplication of a number with itself, i.e. of procreation without the presence of duality. See for example the myth of Isis, which Horus procreated without the intervention of the male god Osiris. The square root is thus the search for the number that can multiply with itself, that is, the search for the hidden heart, the origin, the deep and invisible being. The square root of 5 is thus the invisible essence of man. Another example: $\sqrt{4} = 2$ reads: "The deep being ($\sqrt{\quad}$) or the origin of the earth (4) is the will of God to manifest".
- $\frac{\sqrt{5}}{2}$ is man in his attraction to matter, the inferior man, materialism, the attraction to involution. The division by two is the injection of duality, that is, the opposite of the path to unity.
- $\Phi/2$ is the divine perfection, as it is accessible to man.

Let us pay close attention to the fact that these symbolic terms are not arbitrary! Pythagoras claimed that "the numbers contain the mystery of things". So it is not a simple artistic convention to be used like a dictionary or code. Rather, each of these terms is connected to the others by relationships that reveal precisely "the secret of things" to which the Master of Crotona refers. We will mention only one example: the symbolic message of the creation of the theme $\sqrt{5}$ itself. We remember that this theme was defined by the diagonal of the double square, i.e. a Pythagorean triangle of 1 to 2.

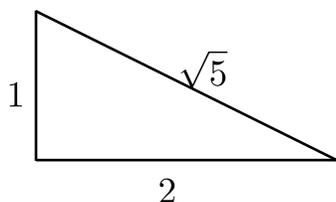


Fig. 8: Generation of $\sqrt{5}$ by the double square.

These are the three possible symbolic readings of these relations:

1. god (1) and his will to manifest (2) creates the divine in man ($\sqrt{5}$).
2. the common ground between the essence of man ($\sqrt{5}$) and the temple (2) is God (1).

3 God (1) works in the divine of man ($\sqrt{5}$) to build his temple (2).

Understanding the full meaning of the symbols of this simple triangle could perhaps easily replace many courses in philosophy or theology. Note that the third reading of the Pythagorean triangle, which is based on the double square, provides the answer to one of the questions asked at the beginning of this chapter: Why did the initiates use these harmonic tracé in the first place?

In fact, the aim is not found on an aesthetic level (as was believed in the 19th century) or on a technical level (as was said in the 20th century, although the *Art du Trait* also clarified the aspects of these two aspects), but on a clearly metaphysical level.

Strange as it may seem to us "in our modern eyes", the designers saw themselves above all simply as mediators for a divine message that went beyond them: their name was of little importance, and only in exceptional cases was a trace of their identity preserved. The constructors drew (tracers) according to the rules of tradition in order to resonate with the cosmic order in direct harmony with the Great Architect. The unconscious of the simple layman who visits these "holy places", even if he does not consciously understand the reasons for his state of mind, is nevertheless modified, awakened, precisely by the effect of what he experiences. The depth psychology of C. G. Jung has furthermore shown that this old belief is well-founded and that the concrete actions of man are changed by this process much more subtly, but also more permanently and profoundly than by rational science.

4. Attempt at a symbolic interpretation of a tracé in Chavín

The axonometric scale representation of the area of the Lanzón, which shows the most important three-dimensional tracé, will provide the material for a first attempt to interpret a "symbolic sentence-phrase" in Chavín. It will also be useful to refer to the tracés I and II, as well as sections IIIa, IIIc and III d, in order to follow the description.

Everything begins with the One, the elusive Absolute, with God (represented by the perfect and empty cube that the small upper temple encloses; it is the same symbol as the Blessed Sacrament in the Temple of Solomon), *who wants to express His will of manifestation* (the cube is cut in half). All this is done in a rectangle in the Golden Section (i.e. HH, in perfection, in "heaven"). On the floor below, this manifestation will take on the anthropomorphic form (i.e. The Lanzón defines a space, with a square base (therefore divine) and a height of $\sqrt{5}$ (therefore human). It should be noted that the contact between the original cube and this human materialization is nevertheless guaranteed thanks to a rectangle in the Golden Section (desire for perfection). It keeps even this materialization in activity, even if this contact is not materially visible to the layman (it is the perfect small cube that fits into the ceiling of the lower gallery and keeps the lancet in place).

This materialization takes place in the center of the Earth, defined by the junction of the four large lower parallelepipeds - each of them constructed on the double square - on which the lower tip of the lancet rests. So the lancet is really planted on the "navel of the world", like the omphalos of Delphi. By the way, "Chaopin", the Quetchua etymology of Chavín, means "navel"! It is therefore the link between an upper and a lower world. "I am the son of the earth and the starry sky", it says in the Mysteries of Eleusis.

How can one reach this absolutely holy place? Only through a long tunnel, whose cross-section and lateral plan are based on the number Φ^2 . Remember that by definition $\Phi^2 = \Phi + 1$ is, i.e. *the desire to communicate with perfection, plus divine intervention*. To offer a more understandable parallel in the context of our Judeo-Christian civilization, let us recall that the Gospels say: "Be perfect, as my Father in heaven is perfect", to which it's necessary to add divine "grace" (Mt 5:48).

So what is the synthesis of this "symbolic message"? In fact, it was the creation myth as seen by the constructors of Chavín, i.e. the myth of the Huari, which was analyzed by A. Gilardi. The Lanzón is thus the anthropomorphic concretization of the original cosmic force that penetrates the center of the earth to reappear in the form of the Huari, the bearer of all the seeds of life on the planet. However, the Tracés have expressed precisely this message in a more refined and precise way, more synthetic and above all much more profound than is possible with all words.

5. *the asymmetry of the tracé from the cross of the Lanzón*

The strange asymmetry of the cross around the Lanzón, the only one of the tracé of the Old Temple, had already caught our attention before. Does it have a meaning, and what is it? To answer this question, we need only describe exactly what we see in tracé 1. On the south side we see a double square (A'BCD'), from which we subtract a $\frac{\sqrt{5}}{2}$ rectangle on each side to obtain the shape of the gallery.⁶ It is thus the will of God to manifest, minus the materializing tendencies of the subordinate human being, the tendencies of involution $\frac{\sqrt{5}}{2}$. Is this not a fairly good definition of what we call the good?

On the north side, however, we have a rectangle that emerges from the central axis (A "DXY"), from which we must subtract a perfect square (1) on the one hand and a $\Phi/2$ rectangle on the other. Let us read the "symbolic sentence": It is about the essence of man ($\sqrt{5}$), from which we must subtract the divine (1) on the one hand and the divine perfection on the other hand, as it is accessible to man ($\Phi/2$). Is there a better definition of evil?

⁶ It should be noted that this way of "reading" / interpreting surfaces by subtraction in the tracé has parallels that have been known in Egypt since the Old Kingdom: 1/7 for example was recorded by the Egyptians as (1 - 6/7)

For those whose rational part of their brain is somewhat shocked at this point: let us remember that "by chance" the northern semicircle of the Place Circulaire is made of black bas-reliefs and the southern semicircle of white bas-reliefs. The same distinction is repeated to infinity around the Falcon Portico of the New Temple.

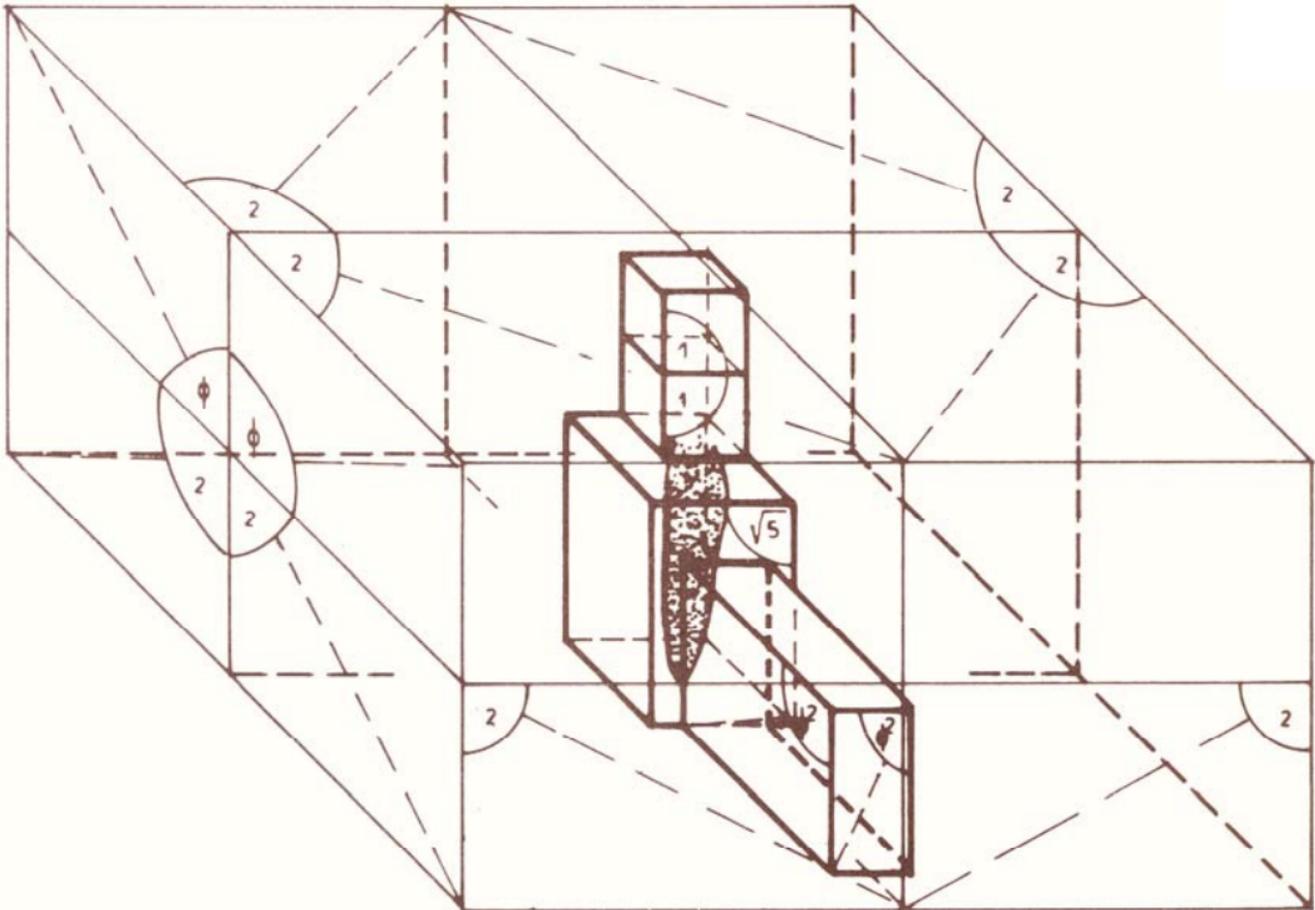


Fig. 9: Axonometric representation of the area of the Lanzón, with the space demarcated by it in the small Upper Temple, all based on the tracé depicted in I, II, IIIa, IIIc and IIId. This representation is not true to scale, but is only intended to provide a schematic vision in space (drawing by Alain Meaulnes).

The cross of the Lanzón would thus be a symbol of the tree of life of the Hindu mythologies (the tree of Mount Merú, on which two birds, the Atma and the Jivâtmâ, sit), the Nordic mythologies (the Iggdrasil), the Ismaili mythologies (the tree that feeds on the earth and towers above the sky), symbol of the Haqîqat (d. i.e. The Gnosis), the Chinese (the connected tree representing the Yin and the Yang, whose branches unite to form one), or even the central post of the Siberian shamans or Haitian voodoo. It is the same tree from which the serpent breathed into Eve's ear: "If you eat of the fruit of the tree in the middle of the garden, your eyes will be opened and you will be like gods, conscious of good and evil." (Genesis 3, 3-5)

And since we are on the subject of duplicities, we would like to point out that if a person were to be crucified on the cross of Lanzón, his left hand would reach into the "black" branch of evil (the "senestre", as it is called in Old French, from which our word "sinistre" is derived) and his right hand into the branch of good. Black magic is also called the "left way", while white magic is the right way.

A threefold conclusion

"From the past we want to take the fire, not the ashes."

Jean Jaures

Three conclusions can be drawn. First, the systematic appearance of a single technique of tracé and even a single theme (the theme) throughout all periods and in all the monumental and sculptural forms of Chavin must be considered a mathematical proof that the Art du Trait was also known in Chavin by Egyptian, oriental and western initiates. And this with a remarkable precision of the symbolic message and the same virtuosity of execution since the first constructions in the 19th century BC. Moreover, the symbolic reading of these tracés expresses with undreamt-of depth some of the most essential and universal myths that we also know in our part of the world. Does all this not represent rigorous and scientifically verifiable proof of the existence of a primordial tradition in which all ancient cultures, including our own, find their deepest sources?

The second conclusion would be to support a suggestion already formulated by Georges Jouven: "Until now, official science, which, it must be said, has been frightened by the fantasies of the pyramidists (Pochans' neologism is a perfect illustration of this), has stayed away from graphic analysis and the esoteric archaeology resulting from it". Can we hope that the vast store of hidden information in the built environment of our planet will soon be officially explored? The history of religions, philosophy, mathematics, and architecture will benefit from this; it would also mean rectifying an unacceptable forgetting and showing a proper appreciation for the spirit of antiquity.

We would like to add another reason to this appeal: The "hidden information" thus collected could even prove useful at the end of this century (editor's note: this text dates from the early 1980s), while our planetary civilization is searching for new foundations for which all the wisdom of history, including the ancient ones, could perhaps play a role.

Now, while we have been able to shed light on some little-known aspects of human adventure that are often despised by our contemporaries, one fundamental question remains: how is it possible that such sophisticated and abstract concepts as "L' Art du Trait" and its underlying metaphysics could appear in cultures as geographically and culturally distant from each other as those that made up our Western megaliths, Egypt, China and the oldest Andean Empire?

The theory dear to the diffusionists (Elliot-Smith, Heine-Geldern, etc.) could perhaps find some arguments here. But if sufficiently frequent and prolonged contacts have taken place between all these cultures to convey the same "L' Art du Trait", why have techniques as useful and simple as the wheel not been "spread" at the same time? Even in the later cultures of the Peruvian or Mexican coasts, no traces of the practical use of the wheel have been found, even in places where the terrain is rather favorable for it. In our eyes, the discovery of the tracés in Chavin, which are in keeping with tradition, extends above all a question about their real dimension: namely, the mysteries of their origin, that is, the mysteries of *our* origin.

There is knowledge and vision in heaven. On earth, knowledge is memory. "

Pindare