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ANCIENT EGYPTIAN REPRESENTATION OF SPACE AND SPATIALITY

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It is common knowledge that an artist's objective is to convey three-dimensional space on a two-dimensional surface. The *type of space* is hardly ever specified, however, if only because it is the space of *visual perception* that artists have always sought to depict since the times of the Antiquity. The situation was different in ancient Egypt where artists were supposed to convey the *objective space* in which people lived and moved and which was radically different from the subjective space of visual perception. Indeed, rails are always parallel in the former space and converge on the horizon in the latter.

Modern artists are no longer interested in methods of conveying objective space although these have been developed in great detail in technical drawing and used successfully by thousands of engineers. To illustrate our statement on the ancient Egyptians' choice which modern man finds unusual, let's compare their pictorial representations with modern technical drawing.

Technical drawing is characterized by three special features: use *of orthogonal projections, conventional methods of depiction* and *symbolic imagery.*

Orthogonal projections have a number of obvious properties. Thus, the size of the image of an object based on such a projection is independent of the distance to that object. The earth's surface can only be shown in plan while its lateral view (from either the front or the side) can only be depicted as a horizontal line. Both these features are well known to Egyptologists.

Finally, in technical drawing objects are often depicted in three different projections simultaneously: the views from the front, the side and above. Apparently, this was not acceptable in artistic (Egyptian) drawing: an object had to be depicted once only (its multiple representation was permissible if scenes occurring at different times were to be depicted). The choice of the sole projection to be shown lay with the artist; it was up to him to decide whether it would be in plan or frontal or from the side. Substituting a single projection for three-fold representation usually entails a loss of information about the object in question, which is why a range of explanatory

conventions is added to the one projection. This is also done in technical drawing where it is always recommended to have as few projections as possible.

Conventional methods of depiction. These are numerous, indeed, so let us review just the four major ones.

Conventional rotation of the planes of projection is used where a single projection (e.g. the view from the side alone) does not provide enough information about an object so that one of its parts has to be shown in another projection.

A relevant example is given in Fig. 1, showing a perspective image and a technical drawing of a stocked anchor. In the latter drawing the stock is "unfolded" in exactly the same way as the shoulders of a human figure in the ancient Egyptian image next to it.
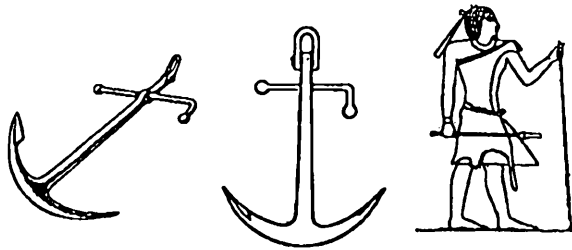

Fig. 1

Consequently, the method of depicting human beings which has drawn so many comments from Egyptologists is fully consistent with the current techniques applied in technical drawing.

A similar device is known to be used in depicting a pond bordered with trees. The pond is shown in plan (it cannot be represented otherwise in a technical drawing) while the trees surrounding the pond are shown from the side. This method survives to this day in tourist maps where the area itself is represented in plan from above while the key sights, such as architectural monuments, are shown from the front.

Obviously, one can find many more examples of the method under review having the same relevance in modern technical drawing and ancient Egyptian art.

Sections. The use of various types of sections in technical drawing is common knowledge. It is also well known that this device was used in ancient Egypt to depict buildings, reveal the contents of baskets, etc.

Displacement. The left-hand section of Fig. 2 shows Ehnaton and his wife "correctly", i.e. in strict conformity with the orthogonal projection method.
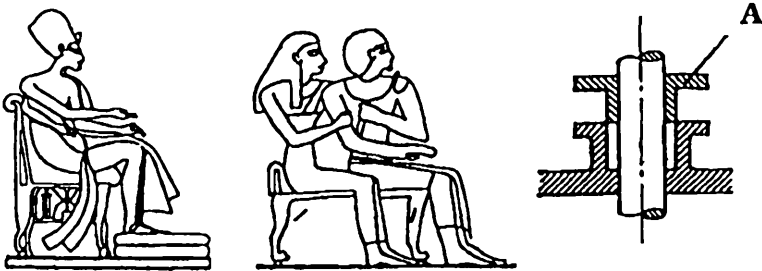
Fig. 2

The couple looks extremely unimpressive because the wife is almost invisible. The same couple is depicted in the middle of the drawing, with the wife's figure conventionally displaced relative to the husband's. Here the wife is clearly visible so that an Egyptian aware of this convention had a good view of both figures while knowing perfectly well that she was seated alongside him. A similar device is used in technical drawing. The right-hand section of the same drawing shows a stuffing box with its plug **A** shifted upwards, as it would never be positioned in a real structure. A present-day engineer aware of this convention would not find it difficult to understand the meaning of the drawing. Here again one can see that the methods used in technical drawing are fully identical to those in ancient Egyptian art.

Scale variation is almost inherent in technical drawing. Under its rules the more important and complicated elements must be shown in larger scale while the inessential and simple ones must be scaled down. A similar phenomenon is to be found in ancient Egyptian art though the reasons for using different scales here are more diverse. One can identify three major reasons for introducing differences in scale here.

1. Increasing the amount of information about the main element (therefore birds sitting on tree branches may be far too large in comparison to the tree - but then every feather is visible).

2. Composition requirements: if a picture shows something occurring in a garden with a pond, then the pond and the trees are shown significantly reduced in relation to the human figures. It would otherwise have been impossible to fit the pond and the trees in the picture surface.

3. Hierarchical considerations: the figures of the gods and the pharaoh would be the largest, those of government officials would be medium-sized and those of ordinary people, the smallest.

Of course, there may be a complex interaction between the above three factors so that the 42 gods who make up the court of law dealing with the souls of the dead in the afterlife may be shown as being very small because it would otherwise have been impossible to fit them in the drawing.

Symbolic imagery. Albeit very important, this feature of ancient Egyptian representation has been largely ignored by Egyptologists. To explain the concept of symbolic convention, let us consider an example from the realm of technical drawing.

Fig.3 shows three projections of a screw. Image A gives the view from the front and Image B, from the side. Under the rules of technical drawing, if many screws are to shown in an assembly drawing they should always be represented according to diagram A, as if from the front, even in drawings giving the side view of a detail. But this is wrong, strictly speaking. Such manner of depiction should therefore be understood not as a correct representation of the screw but as a symbolic indication: "here is a screw". Hence symbolic representation should not be taken literally.
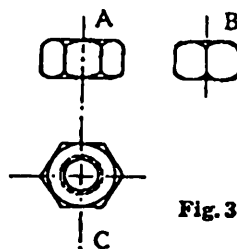

Fig. 3

Indeed, symbolic conventions are used much more extensively in ancient Egyptian art than in technical drawing but their essence is obviously identical. Let us look at a few examples of symbolic conventions in the art of ancient Egypt.

One and the same symbol, viz. a wave-like line, is invariably used in depicting water, even though its surface may actually be still, but this constancy is essential for the symbol to be easily recognizable by everybody. It simply means: "here is water". Likewise, a sandy land surface is represented as a series of standard dots.

In the case of the eyes, they are always shown from the front on a face that is shown form the side. This can be treated as a symbol: "here is an eye". Even more apparent is the symbolic nature of representing the feet of a person walking when both feet are shown from the side of the big toe [which would mean the person having two left (or two right) feet]. Naturally, the Egyptians knew that one of the feet is right and the other is left but they saw the drawing not as a correct representation but as a

symbol: "here are feet". After all, from a symbolic point of view, both feet are identical and so they can be depicted in an identical way. Again it would be appropriate to remember that symbolic conventions should not be understood literally. Likewise, a person could often be shown as having two left or two right hands. This was quite acceptable if everybody was accustomed to the idea of symbolic representation in a painting or a relief.

Symbolism also extended to the representation of collections of objects. When a tray of fruit had to be depicted, for example, an ancient Egyptian artist would show the fruits as only just coming into contact, as in fact they can never lie. Yet the artist had no scruples about that since he was only using symbols to convey this message: "here are fruits".

Symbolism also applied to the depiction of action. Thus the hand of a person holding a heavily laden tray and the hand of one holding a scroll of papyrus were identically represented, and in a position which precluded holding either one or the other. This was simply a standard symbol: "object held with the hands", a symbol which did not at all depend on what was held.

It is easy to add to the list of examples of how broad the use of symbolism is in ancient Egyptian art. As we have shown above, symbols should be "standard" and constant if they are to be easily recognizable. That is one of the reasons why ancient Egyptian art remained virtually unchanged in the course of several millennia. Besides, it would not be amiss to note here that symbolism enhanced the artistic expressiveness of ancient Egyptian paintings (by abandoning "realism") but this is outside the scope of this paper.

A quick comparison between the methods of conveying space on a two-dimensional surface used in ancient Egypt and those used in modern technical drawing reveals them to be fully isomorphous. Modern and ancient Egyptian methods coincide to the minutest detail (for a more extensive discussion of this comparison see [1] and [2]). One cannot help admiring the ancient Egyptians' ability to accomplish that which modern science has achieved centuries later. The foregoing offers conclusive confirmation of the thesis that ancient Egyptians depicted objective space. This is largely explained by the fact that ancient Egyptian art amounted to "artistic technical drawing".

Modern technical drawing emerged in the 18th and 19th centuries and has attained such heights of perfection in the 20th century that it is, in fact, no longer

developing now. This is only natural because to the extent that the limits of what is possible have been reached, any departure can only lead to deterioration. To the extent that ancient Egyptian art has proven to be isomorphous to technical drawing, it is also the ultimate in perfection and its further improvement is impossible. If a present-day artist were asked to solve the same problem as his ancient Egyptian colleague had faced centuries ago, namely, to convey the geometry of objective space, he would not think of anything better than the ancient Egyptian solution. It is therefore pointless to talk of ancient Egyptian art as an "early form". What was early was not the art form but the challenge to the artists, who dealt with it using the most up-to-date methods. In this regard the art of ancient Egypt was far superior to that of Babylon, Assyria or archaic Greece, which also conveyed objective space - but at a fairly primitive level. The ultimate perfection attained by the ancient Egyptian method of depicting space and spatiality as early as in the era of the Old Kingdom rendered its further improvement impossible, thus keeping its principles intact for several millennia.

In this context it would be appropriate to say a few words about the aspective theory developed by Dr Emma Brunner-Traut [3]. She displayed a rare power of observation and ingenuity in creating her aspective theory. Unfortunately, however, she knew nothing about technical drawing and failed to notice, therefore, that everything she had discovered had long since been known to other people who had provided a mathematical basis for it and were using it as successfully as the ancient Egyptians had. Her understanding of aspective as an earlier form than perspective is inaccurate: it can be the other way round. Perspective representation was initially used (by Leonardo da Vinci, for instance) to depict machines and mechanisms but eventually preference was given to the more appropriate aspective method of technical drawing. In fact, the perspective approach preceded the more accurate aspective methodology in Europe in the 16th and 17th centuries. Perspective and aspective are not two different ways of solving the same problem; they are two different ways of solving two different problems (viz. conveying subjective visual perception versus conveying the geometry of objective space). Hence they appear as and when required under different circumstances.

Based on her erroneous idea that aspective is an imperfect early method of conveying space on a two-dimensional surface, Emma Brunner-Traut tried to establish a connection between the ancient Egyptian methods of depiction and children's drawings and even drawings by mental patients. This should not be done; after all, no

one explains technical drawing by reference to the experiences of children and mental patients. Admittedly, there is a certain analogy between children's drawings and ancient Egyptian pictorial representations but this question requires a completely different approach. It is up to psychologists to explain why children prefer to depict objective rather than subjective space. Once this is done, the similarity between children's drawing methods and those used by ancient Egyptian artists or present-day engineers will automatically become comprehensible.

If we go back to the problem of how space and spatiality were depicted in ancient Egypt, we should certainly comment on the flatness of ancient Egyptian representations - an easily explained feature described in numerous art papers. Ancient Egyptian artists sought to convey objective space, as is the case with technical drawings, which are always flat. Objective space does not lend itself to perspective representation. Hence the flatness of ancient Egyptian painting and relief was *a fatal inevitability*, and not an artistic goal or a sign of inadequacy. Fortunately, artists are capable of transforming deplorable inevitability into uniqueness and then using this uniqueness for a creative purpose.

When we stated above that ancient Egyptian art had attained such levels of perfection even during the period of the Old Kingdom that it never changed afterwards, we only meant methods of depiction. It did develop significantly while remaining artistic technical drawing for several millennia and not changing in that sense, and that sense only.

It is common knowledge that originally, in very ancient times, writing and fine arts were so close that they constituted a certain unity. As ancient Egyptian culture developed, however, they became segregated: while writing gradually lost its visually descriptive features and became increasingly more symbolic (hieroglyphs, hieratic and later demotic writing) art went through an opposite process. As time went on, its symbolic sign component kept shrinking while its plastic content became more visible, signalling victory for a sort of "realism". This process was the key factor behind the development of ancient Egyptian art.

Here are just a few examples. When married couples were depicted in the Old Kingdom the husband's primacy was underscored by shifting him in front of his wife; moreover, he would be portrayed blocking her off. In the New Kingdom the husband would still be shown in front of his wife, albeit without blocking her off any more because in earlies times she adopt an impossible pose: sitting to the left of her husband,

she put her left hand on his shoulder. One can see here how the symbolic signs of the husband's primacy became less conspicuous and gave ground to the natural language of the plastic arts.

The same path of development can be traced in the evolution of scenes depicting hunting in an enclosure. In the era of the Old Kingdom the pharaoh would shoot the bow "in general", and the animals in the enclosure would be depicted standing or walking in a calm and well-ordered manner. This was a clear-cut symbolic representation, which in essence was merely the statement that "the pharaoh is hunting animals in an enclosure". In later times the pharaoh or the prince is shown in a dynamic pose; he is aiming at animals that run and fall when struck by the arrows. There is also a clear transition here from pure sign symbolism to the expressive language of the plastic arts.

Similar changes can be seen in the methodology of conveying the human figure. In ancient times feet were represented by their symbols so that a person was shown as having two left or two right feet whereas in later times a person's feet would be depicted in a more "realistic" manner, with just one, and not both of them shown from the side of the big toe. This also applies to other body parts, notably the hands.

Symbolism almost disappears from later images of certain scenes. A case in point is the famous Theban painting showing a group of four female musicians. They are depicted in a variety of free and eye-catching poses, their images being mutually superimposed in an intricate way; one of them is shown as a three-quarter projection. It almost looks like a realistic painting and yet it is a technical drawing: there is a straight horizontal line instead of a floor and there are numerous signs of the use of orthogonal projection.

Some art historians explore such drawings for the beginnings of perspective in a bid to prove that ancient Egyptian art developed "in the right direction". Such statements simply do not hold water for ancient Egyptian art always abided by the rules of orthogonal projection, being, in effect, a kind of technical drawing that could occasionally produce fairly realistic images. The transition from technical drawing methods to perspective methodology was a revolutionary and not an evolutionary phenomenon. It occurred in Greece in the 5th-6th centuries B.C. due to a revolutionary transformation of the entire society which is sometimes referred to as "the Greek miracle".

An analysis of the above examples shows that unlike the artists of the Antiquity, the Middle Ages or modern times, the ancient Egyptian artists conveyed objective and not subjective space. What led them to make what we may regard as a highly unusual choice? One can offer several assumptions here.

To begin with, their choice may have been prompted by the key purpose of Egyptian painting and relief, which consisted in giving objective information (or what was deemed to be objective information) about the pharaoh's activities or depicting those persons, animals or household items that were meant to aid the deceased in the other world. Both purposes called for objectivity instead of the inherent illusory nature of subjective visual perception.

Plausible as these assumptions may be, there must be some other reasons (which could be conventionally described as universal motives) behind an artist's preference for an objective geometry of space at certain stages in the development of human society. For objective space is depicted on archaic Greek vials, for example, though they have nothing to do with glorification of monarchs or the cult of grandees in the afterlife. Here is one possible explanation for their choice.

In pre-historic times man could only live as a member of a group and divided the world into two parts: "We" and everything else, in contradistinction to modern man, who divides the world into the "Ego" and everything else. It was only natural for a collectivist primitive society which would otherwise have never survived. The relevant ethnographic data are well known. What is less known, however, is that the perception of the world in terms of "We" rather than the "Ego" survived in archaic states although their idea of "We" had been reduced to the extended family. This can be seen, for example, from the laws of ancient India where the whole family was held responsible for a crime committed by one of its members. If that person accomplished a feat, however, the same family would be treated as heroes. Similar concepts were reflected in the laws of ancient Mesopotamia and it would be safe to assume that an analysis would reveal their existence in ancient Egypt as well.

If an artist (just as other members of society) thinks of himself in terms of "We" and not his "Ego", then he is bound to depict the world as "We" see it, rather than from the standpoint of his "Ego". But a child sees a table from below and an adult, from above; those who stand nearby perceive it as a large object while those who see it from afar, as a small one. Moreover, the visible shape of the table will vary with the angle of perception. Hence, creating an image of the table that everybody would agree

with is impossible with this approach. The only thing that everybody would accept as being correct is the objective shape of the table and its true size (which obviously does not change with the distance from the viewer). This is why the artist sets himself the task of conveying something common to everybody, i.e. an objective geometry of space and of objects filling it rather than their perceptual (subjective) geometry. As a result, his representation will be consistent with technical drawing (which is authentic in everybody's eyes) and not perspective (which always assumes one viewer).

All this explains why practically all cultures have initially depicted the world around them from what we now see as a "strange" angle. Simply because in the early phases of a society the world is always perceived and depicted from the standpoint of "We" and not the "Ego". The transition to perspective representation occurs with the emergence of the "Ego" feeling. This can be clearly seen from the example of ancient Greece an analysis of which is beyond the remit of this paper. But then the ancient Egyptian method of conveying the world was not just an "early phase" in the progress of art: it was determined by an early phase of social consciousness based on perceiving the world in terms of "We". The ancient Egyptian method of depiction was brought back to life in Europe in the 16th-18th centuries when engineering practice required it for its own purposes. It would be safe to say, therefore, that the highly sophisticated ancient Egyptian method of depiction is "eternal", conventionally speaking, and has been employed as and when required.

Bibliography

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