Sol LeWitt

The two Series «Forms derived from a Cube» and «Pyramids»

Watercolours from 1982 to 1986 and works matching them in other media

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LeWitt has often executed series of works in several media: drawings, watercolours, wall-drawings, wall-paintings, sculptures, prints and books. This goes also for the series of works Forms derived from a Cube and Pyramids — the former produced from 1981 onwards, the latter from 1984. From these series, the watercolours are looked at more closely in the following essay. It is unavoidable, however, not to neglect LeWitt's realisations in other media as he is constantly producing connections between these different manners of realisation.

Forms derived from a Cube, from 1981 onwards

The information Sol LeWitt gives for the construction system of the Forms derived from a Cube\(^1\) are really brief:

![This is the basic cube]

In an isometric display, the side views are shortened to half of the real length and are tilted 45 degrees in relation to the unshortened front and back parts that run parallel to the top and bottom margins of the...
This cavalier perspective is a type of three-dimensional display that contradicts a vanishing point perspective. The front side is drawn in only one viewing axis which in reality you get only in a pure front perspective that does not allow you to see any of the other planes of the cube. In the vanishing point perspective the back part can not be as long as the front side of the cube, as opposed to this isometric perspective shown above, where just this is possible.

Using the cavalier perspective in technical drawing, you usually shorten the length of the sides by half. LeWitt's cube construction is only an approximation to this principle.

LeWitt's construction method enables the beholder to see the basic cube as a unit of flat surfaces derived from a square. The sides of this square have to be divided into three sections. The points marking the sections have to be connected so that the connecting lines form a grid pattern. Into the small squares at the sides of the grid pattern one has to place diagonals; these diagonals should run parallel. Within this unit of flat surfaces one can stimulate the eye to see constructing ideas of various three-dimensional relationships. The length of the unshortened front and back parts is the length of two squares. One gets the length of the shortened side views from the diagonal of one square. This diagonal is a little bit longer than the side of one square. According to the usual rules of technical drawing, the shortened sides of the cube would have the precise length of one square, so that one would get the measures of the side views by doubling their length in the drawing, when actually executing the planned cube. LeWitt's cube construction can not be used in this way.

An alternative to this modified cavalier perspective would be the following axonometry, which is also called pure, unshortened isometry.

Here all sides are unshortened. They are drawn by turning them by an angle of 60 degrees. LeWitt used the axonometry for the three-dimensional display of a variation of Serial Project No. 1 (1966) and for a simply planned display in his series Incomplete Open Cubes (1974). The drawback of the axonometry lies in the fact that cubes displayed in this way can not be understood fully as three-dimensional bodies at first sight. The beholder first has to make use of some abstractions to think his way from the immediately perceivable shape — the hexagon — down to a three-dimensional form, the cube. This is necessary, because the recipient can grasp the pattern in two dimensions, more easily than that of the three-dimensional cube. In the cavalier perspective, this is not the case, despite the fact that it does not follow closely the principle of the vanishing point perspective. The irregular outlines and the missing symmetry...
axis make a more simple three-dimensional pattern plausible.6
In the following lines, I want to describe the connection between the flat surfaces and the three-dimensional aspects contained in the display of the cube selected by LeWitt. These cognitive reconstructable relationships would have been a further reason for the selection of one of the several different types of isometric display. The relationships between the individual planes are the following:

Each plane in the display has dots arranged in a grid pattern. Each plane has an equivalent elsewhere in the cube with the same pattern of dots. The relation between these planes is quite simply that the other plane equivalent to it, takes its place in the cube, when tilted 180 degrees. This does not apply to the square in the middle, except when you see it as a mirrored image of itself tilted 180 degrees or as a plane that consists of two rectangular triangles, one of it being a repetition of the other tilted 180 degrees. LeWitt uses construction lines to derive from one of the basic forms of bodies — the cube — more complicated structures by subtraction. This is quite like some of the things done in technical drawing through certain subtracting construction methods. The derivations are achieved by dividing into halves and quarters the sides of the 'basic cube' and connecting the resulting dividing points by lines. The following lines, connecting corner points of the grid pattern, are ambiguous and can be understood three-dimensionally only by taking into account the context of particular body constructions:

- - - dimensionally ambiguous lines going out from corner points of the grid pattern

Some of the lines that can be connected in more than one way in the three dimensions are losing their ambiguous meaning in the cavalier perspective. LeWitt only constructs the three sides of a body visible from one 'viewing angle'.7 He could draw the lines that are not visible, as well. This, however, would upset the use of colours that have the purpose of denoting planes.8 When one also draws the invisible lines, the arising question is, how one is going to present the planes hidden behind the visible planes? When several planes intersect, one denotes the areas resulting from these intersections, with additional colours, that

would indicate which side intersects the other. But then one would get to a point where the complicated colouring would obscure the form of the body one wants to show in the watercolours. Then the beholder would have to reconstruct these bodies for himself, as is the case in some of LeWitt’s axiometric displays, because a simple three-dimensional pattern is not plausible. LeWitt leaves out any line meant to indicate whether a body is based on a triangle or a square as its basic form. Every body that can be produced along the lines of the watercolours, can be only one out of many alternatives that have three identical sides.

The colours denoting the planes are selected so as to facilitate achieving an immediate three-dimensional effect. The brightest colours mean that the flat marked by it is at the front, a darker colour indicates positions at the top, and two very dark colours are for planes positioned at the sides. With the help of a grid pattern as the underlying planning system with ‘communicative signs’, serving one’s practical purposes, the cavalier perspective is modified into an autonomous drawing system that is independent of any practical purpose. This modified system will allow one to recognize two- and three-dimensional, immediate and constructive ways of reading as a theme in its own right.

All this is done by a generic display of forms taken from the grammar of the ‘basic cube’. These forms are able to provoke different ways of reading. The beholder can create connections between the ‘autonomous signs’ in the drawing and the ‘communicative’ aspect of these signs, by developing, on the one hand, ideas about how to carry out the drawn bodies three-dimensionally in the space, and on the other hand by connecting the ideas with the direct three-dimensional effects of the drawings. The suspense arising between the three-dimensional construction and the illusion of plasticity in the drawings will be discussed below.

In the free-hand sketches diagonal lines are sometimes drawn across two adjacent squares of the grid pattern. Obviously, LeWitt does this only when no flat surface of the constructed body appears at the sides of the cube that are on these squares of the grid pattern. There are even such construction lines that have been crossed out, left out, or not used at all, as well as faulty colouring. Even back in 1981 and 1982, LeWitt used two of the three body constructions in watercolours from the year 1983 that have been done with a ruler on grey background, for producing works in other media. As early as in a series of drawings published in Artforum, and in various Wall-Drawings, the truncated pyramid and the obtuse-angled parallelepipedon are featured. Unlike the watercolours from 1983, none of these variants shows the construction derived from the form of the ‘basic cube’. LeWitt wrote me about the method of using the same line of construction in the watercolours as well as in other media (2/12/1985): «Usually I do the drawings and the watercolours as such — not for use otherwise. I do wall-drawings similar to the drawings or watercolours on paper.» The watercolours we have been talking about so far in this essay, have been constructed by using the same Form derived from a Cube that was used in other media. This being so, it seems logical to think that LeWitt’s statement does not refer to the construction, but to the colours or lines that mark the different sides of the body and the background. In respect of the colours, the watercolours in question differ from older works carried out in other media. From the fact that, in 1984, LeWitt repeated a watercolour from 1983, which had an obtuse-angled parallelepipedon, we can infer that it is important for LeWitt to have different colours for the background, when he paints the same construction with identical colours for the figure in different works. In the repetition of the first watercolour, the dark grey background is changed to a bright grey background. Now the construction lines do not only show the ‘basic cube’, but also the grid pattern on which it is based. It strikes me that in more recent variations of the same body, LeWitt expounds even more precisely the principle guiding
his construction, by adding supporting lines.

Pyramids, from 1984 onwards

The Pyramid drawings feature coloured triangles, that are, in most cases, acute-angled. One or both of the longer sides of a triangle border on sides of other triangles with the same length. Those sides of the triangles that are touching each other, are never the shortest sides of the triangles. By arranging triangles in this way, you get at the top a point, where two of the three sides of each triangle converge respectively from where they are radiating, and below a kind of ‘angular curve’, composed of short sides lined up in different angles. In the examples known to me, the figure thus achieved forms a pattern, standing isolated on a background. The relation of colours, which constitutes the tone of this background is not repeated elsewhere in the triangles. Some of the triangles, especially when they are extremely asymmetrical, may appear in combination with other, viewer asymmetrical triangles, as if they were on an axis rotated derivations of another triangle with a simpler form, seen from the front. According to Rudolf Arnheim, the illusion of the ‘depth effect’, brought about through a perceptual ‘distortion’, is made very evident to the beholder, because their compensation in the third dimensions produces the simplest available patterns. But with triangles this doesn’t function as well as with rectangles. The signs of the drawing may rather lead the recipient to constructions of possible spaces, which give the two-
dimensional forms a function for ‘communicating’ three-dimensional bodies than to a ‘compensation in the third dimensions’.

By using different ‘brightness gradients’ and different ‘gradient[s] of colour’ in different triangles, the colouring may intensify, modify, or weaken the sense of plasticity provoked by the forms. If you read a three-dimensional quality into a ‘pyramid’-drawing, ‘depth effects’ by optical ‘distortions’ and ‘perceptual gradients’ may intensify or alter your constructions on a psychological level.

The added triangles may invoke associations of relief-like creations, like fans, or of bodies, like pyramids, which may allude to something like tents.

When I asked him about the system the watercolours might be based upon, LeWitt gave me the following answer: «The pyramids are done without a system but a series of interrelated triangles.» These relationships between triangles can be deduced from pyramids in the series of works Forms derived from a Cube, just like the relationships between triangles to be seen in the Wall-Drawings presented at the Galleria Mario Pieroni in Rome in 1983, or in a watercolour of the same year. If one would abandon the isometric cube construction shown in the watercolour just mentioned, then such a watercolour could be classified not only as a work belonging to the ‘cubes’, but also to the series of ‘pyramids’ like the ‘Wall-Drawings’ shown in Rome. However, the ways of three-dimensional reading will become more open without the three-dimensional construction based on the ‘basic cube’. The top of the pyramid in the water-
colour mentioned above, lies on the top margin of the flat surface at the back of the 'basic cube'; in the immediate three-dimensional impression without a construction it appears in the middle.\textsuperscript{23}

The Forms derived from a Cube clearly define the position of the figure in the space, but still create impressions inconsistent with the sense of three-dimensional plasticity. When the recipient looks at the Pyramids, he is confronted with the task to overlay the form on display with some cubic or non-cubic construction, no matter, whether or not this construction is consistent with the immediate impression of plasticity in the space, which the beholder gets from it. Looking at LeWitt’s works, the beholder can always establish direct and indirect constructing relationships between the ‘autonomous signs’ and the ‘communicative signs’ in three-dimensional space. The ‘twofold semiotic function’ of signs acting ‘autonomously’ in the work, and virtually ‘communicative’ in the beholder’s reception, can thus be made evident.\textsuperscript{24}

In the Pyramids, as well as in the Forms derived from a Cube, a suspense between the two- and the three-dimensional ways of reading springs to life, interacting with a direct and a constructing way of reading. The beholder can reveal to himself two- and three-dimensional ways of reading the works in an direct or a constructing manner.\textsuperscript{25} I asked LeWitt the question mentioned above, about the underlying system for the Pyramid drawings, because one can clearly see from the drawing done to prepare the Wall-Drawing at the exhibition Process & Konstruktion in Munich last year that LeWitt can also develop the triangles by using ways of construction; like the ones he used in his series Locations of Points / Lines / Forms.\textsuperscript{25} Yet, some artistic decisions have been made here, that cannot be explained by the method of construction. In the Locations series, LeWitt did not give information about measurements, because this concept can be repeated as often as required, on supports of any size.\textsuperscript{26}

In the drawing meant to prepare the works for the Munich exhibition, however, the measurements of the walls, as well as the measurements for the lengths that can not be deduced from the construction method, are given. Thus, this Wall-Drawing can be repeated only on a wall of the same size. LeWitt wrote me about his pyramid sculptures: ‘For pyramids the drawings look like this:

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The dark line is the base. The X is the apex. The height is usually the same as the length & width of the base or half or double. - All pieces are white.’

These pyramids look like models carried out after drawings — a stage in the production process, at which one may solicit the assistance of a technical drawing bureau to work out things between the planning phase of the project and the phase, in which it is put into practice. The flat surfaces of the pyramids might appear in various degrees of brightness, due to light coming in from only one side. One can get an immediate visual impression of the plasticity of the body, because the ‘brightness gradient’ of the planes...
changes from strong to weak and from weak to strong. One can experience the real proportions of the body by going round it. Both observations may share a certain suspense between them, since the immediately visible 'simplest available pattern' does not necessarily give one the real proportions of the body in the space. Sometimes you will even get, in the case of some pyramids, a two-dimensional pattern, if the light meets the object in a special way, particularly when you see it for the very first time.

LeWitt's Working Drawings for the 'pyramids' show that Wall-Drawings and sculptures can be based on certain methods of construction, which in turn can facilitate the intellectual process of finding forms. They are not, however, arranged so neatly as to give us a sort of 'grammar' as consistent as the 'grammar' of the 'basic cube', with the logical relationships established between its planes and its three-dimensional aspects. This suspense between closed and open linear systems is a salient feature of Sol LeWitt's oeuvre: «There are several ways of constructing a work of art. One is by making decisions at each step, another by inventing a system to make decisions.»

LeWitt uses all possibilities of open and closed systems without any aesthetic judgement as a guide to a preference of one of them or of a certain balance between them. This conceptual indifference against aesthetic judgements is a 'blind jump' out of aesthetic conveniences. The surprising results may be very far or very near to such conveniences: LeWitt doesn't calculate how far the 'jump' has to carry him into new regions. So his conceptual indifference to aesthetic judgements is also an indifference to the distinction between the old and the new.

Translated by Michael Müller, revised by the author

(1) Sol LeWitt, on the 13th of January 1986, in a letter to the author. The thin strokes of the sketch reproduced below, have been done by LeWitt with a pencil, and the thick strokes of the Munich felt tip.


(3) As it emerges, for instance, from a watercolour reproduced in the catalogue of the exhibition Aquarelle, Liveckmuseum Düsseldorf, Kassel, 1984 and Six Geometric Figures drawn with india ink washes on the walls of the Giedt, Gent, 1984.


(8) In analogy to this, his 'cube', made of stones covered with gesso (1984), on display at the exhibition Sculpture in the 20th century in Basel, has no top side, because the cube is too high to allow one to see the top side (reproduced, e.g. in S. GASSERT, Zwischen Kunsttourismus und Standortsuche in Kunstforum, 1984, Bd. 73/4, 1984, p. 74/75).

(9) In the second letter (13/1/1986) he wrote, after seeing the photograph I had sent him: «+80/140 seems to be 10/82 anyway it is a date.»


(11) LeWitt gave it the number 140/82. LeWitt marks the drawings with dates. He gives month, (in some cases) day, and year. The unusual signature of this drawing is explained by LeWitt like this: «The 82 would be 1982 but the 140 is a mystery.»