Positional Variations

Position has to do with, first of all, spacing of the planes. If no directional variations are introduced, all the serial planes will be parallel to one another, each following the next successively, with equal spacing between them.

Let us assume that all the planes are squares of the same size. If one plane follows another in a straight manner, then the two vertical edges of the planes trace two parallel straight lines, with a width the same as the breadth of the planes. (Fig. 34)

Spacing between the planes can be made narrow or wide, with different effects. Narrow spacing gives the form a greater feeling of solidity, whereas wide spacing weakens the suggestion of volume. (Fig. 35)

Without changing the spacing between the planes, the position of each plane can be shifted gradually towards one side or back and forth. This causes the volumetric shape to undergo various distortions. (Fig. 36)

Again without changing the spacing between the planes, the position of each plane can be shifted gradually upwards or downwards. This can be easily done if the planes are hung or supported in midair. (Fig. 37)

If the planes are placed on a baseboard, we can reduce the height of the planes to suggest the effect of their gradual sinking-in just by positional variation in a vertical manner. (Fig. 38)

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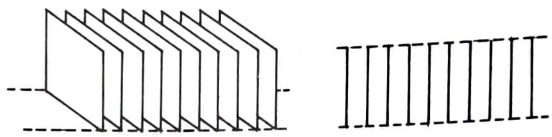

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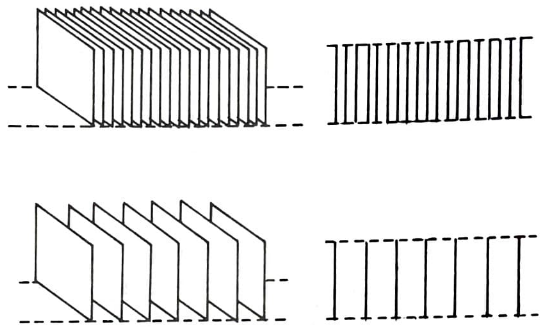

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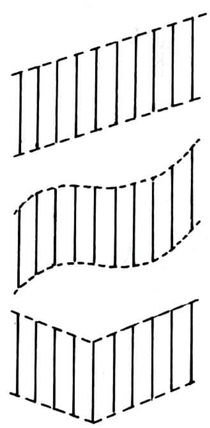

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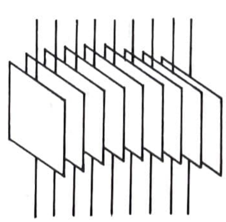

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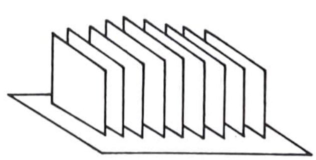

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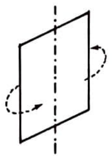
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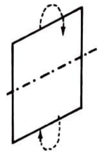
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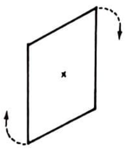

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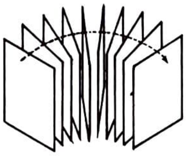

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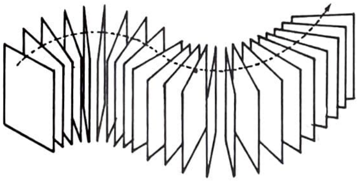

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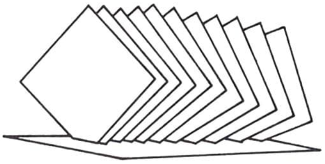

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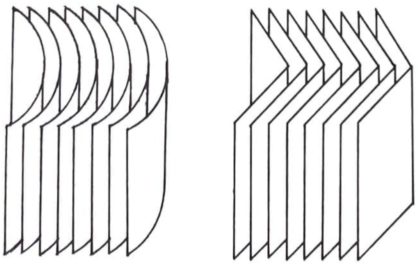


Directional Variations

Direction of the planes can be varied in three different ways:

(a) rotation on a vertical axis; (Fig. 39)

(b) rotation on a horizontal axis; (Fig. 40)

(c) rotation on its own plane. (Fig. 41)

Rotation on a vertical axis requires a diversion of the planes from parallel arrangement. Position is definitely affected, because every directional change simultaneously demands positional change.

The planes in this case can be arranged in radiation, forming a circular shape. (Fig. 42)

Or they can form a shape with curves left and right. (Fig. 43)

Rotation on a horizontal axis cannot be done if the planes are fixed on a horizontal baseboard. If they are fixed on a vertical baseboard, their rotation on a horizontal axis would be essentially the same as the rotation on a vertical axis described above.

Rotation on its own plane means that the corners or edges of each plane are moved from one position to another without affecting the basic direction of the plane itself. This results in a spirally twisted shape. (Fig. 44)

The planes can be physically curled or bent if desired. (Fig. 45)

Construction Techniques

Any kind of sheet material can be used for making serial planes. Acrylic sheets are excellent when a transparent effect is desired. Plywood boards can be used for construction in a very large scale. Most of the models shown in this chapter have been made of thick cardboard, which can be handled easily. The thickness of the cardboard ensures firm adhesion to the baseboard if there is one.

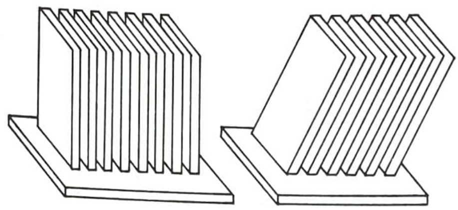
For cardboard construction, adhesives that give a quick, strong bond are the best. The serial planes should stand in a vertical position on the horizontal baseboard for maximum firmness and stability. Tilted planes are possible only when the materials and the bond are both extremely strong, and the joining edge of each plane is precisely bevelled. (Fig. 46)

For reinforcement purposes, additional plane(s) can be used next to the top or side edges of the planes. This is recommended only when those edges of the planes play a rather insignificant role in the final shape of the design. (Fig. 47)

Horizontally arranged serial planes demand a very strong bond if only one vertical board is used for attachment. (Fig. 48)

Normally two or more vertical boards should be used for horizontal serial planes. (Fig. 49)

A vertical supporting core can be used for horizontal serial planes of a free-standing shape if desired. (Fig. 50)



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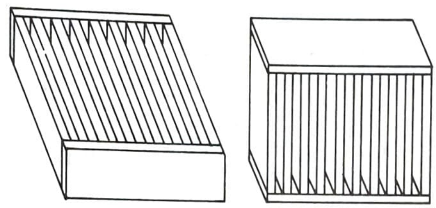

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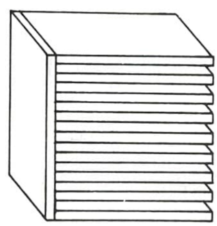

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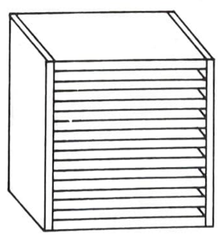

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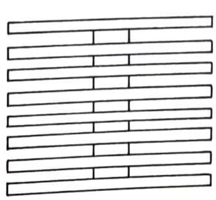

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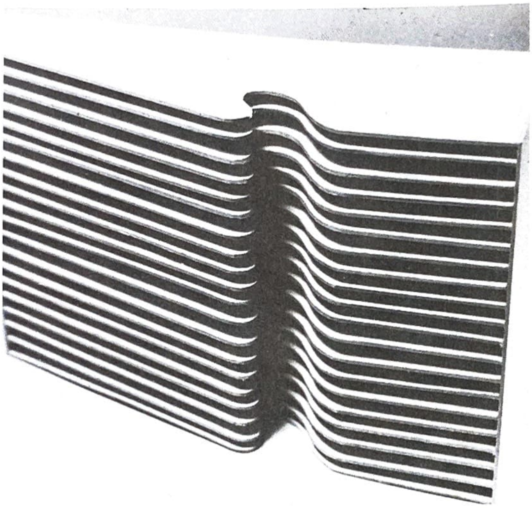

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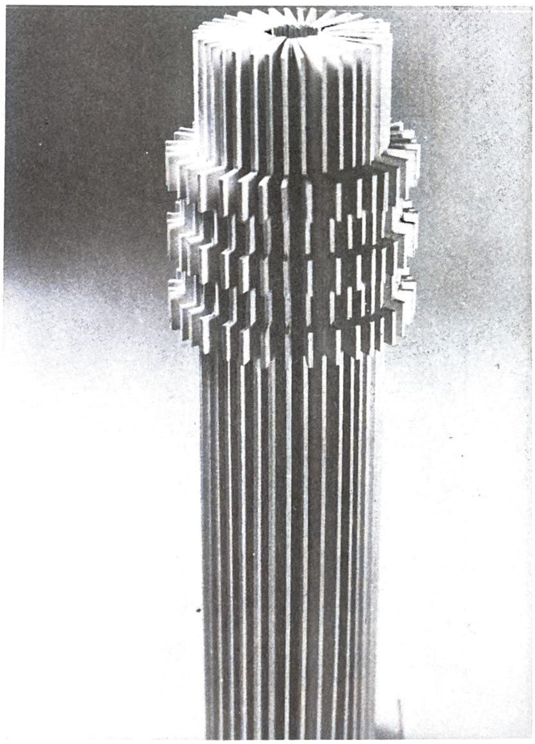

Figures 51 to 66 all illustrate the same design problem in projects by different students.

Figure 51—this is constructed of horizontal serial planes which are repeated both in shape and size. The planes are all parallel to one another with equal spacing in between, and they are anchored to two vertical planes.

Figure 52—here a number of repetitive vertical planes are placed around a common vertical axis. The result is a cylindrical shape.

Figure 53—the arrangement is similar to Figure 52. Here the serial planes increase gradually in height from the foreground to the background. The volumetric feeling of the form is not very strong because the spacing between planes is rather wide along the circumference of the shape.

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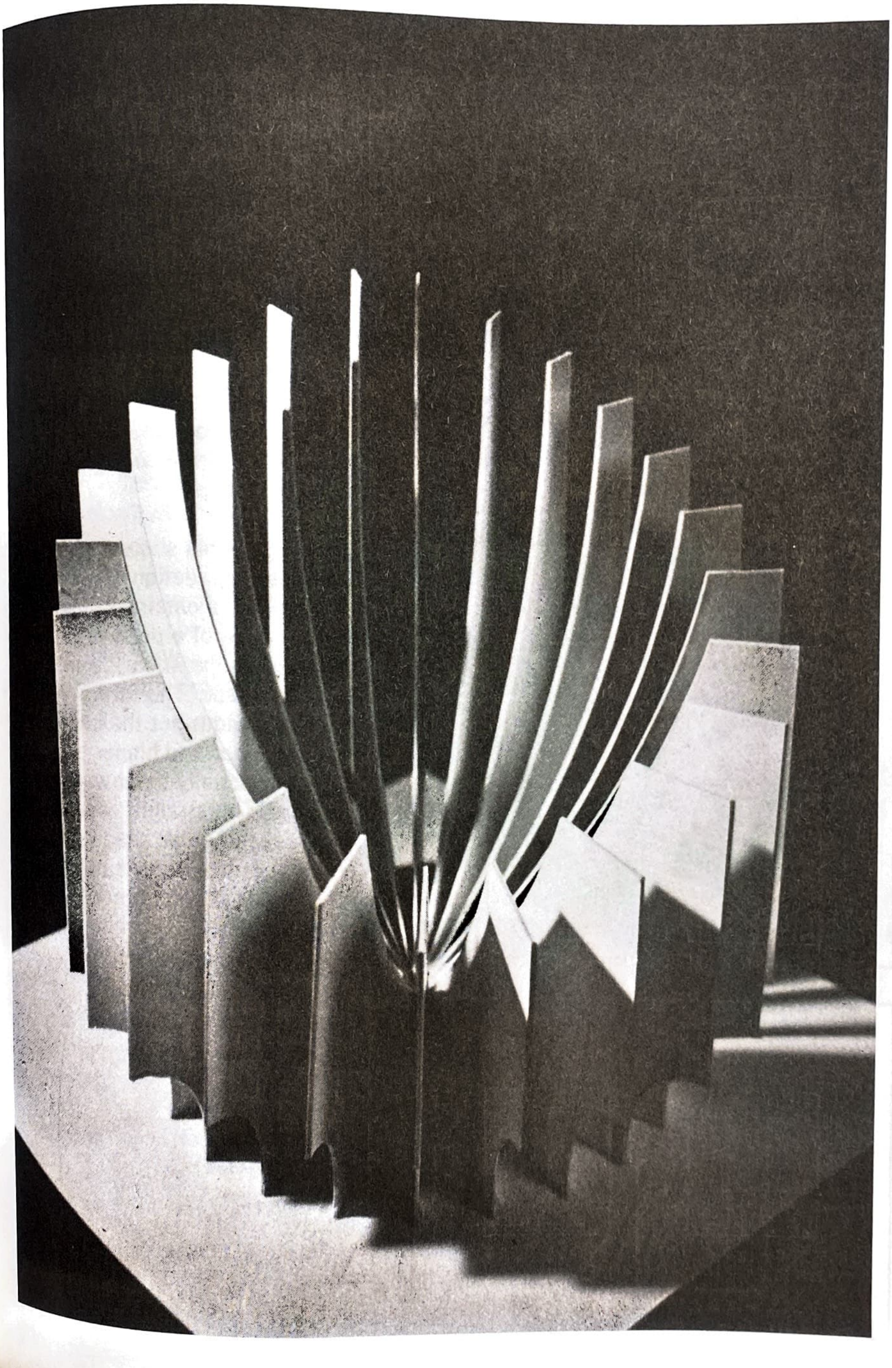

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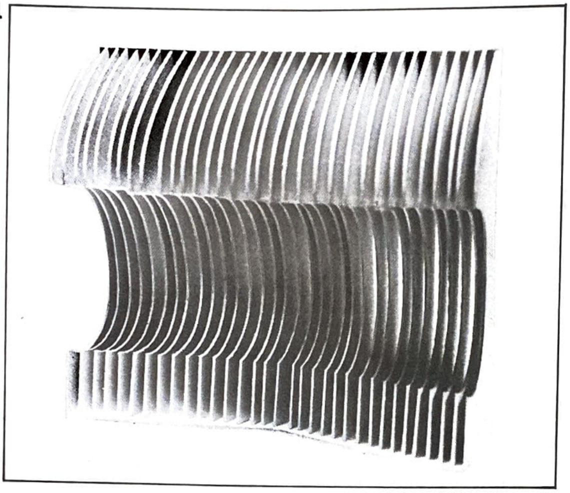

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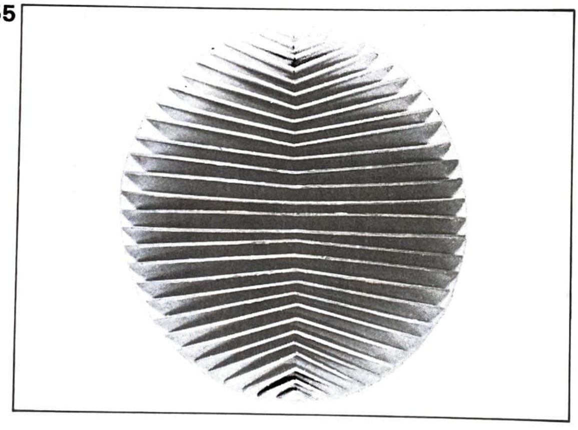

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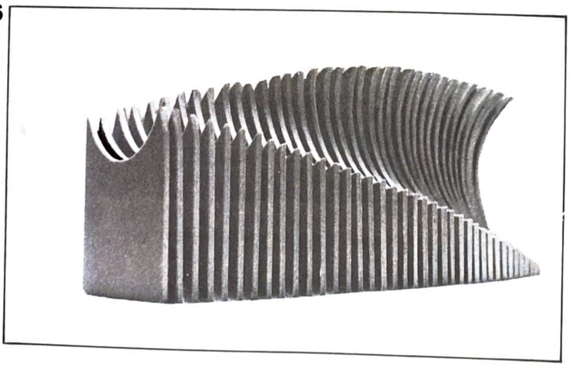


Figure 54—at a glance, it seems that all the serial planes are identical both in shape and size. A closer study reveals that they have a subtle gradation of shape. While the upper part of the structure is straight all across, the lower part subtly bends inward in a V-shape.

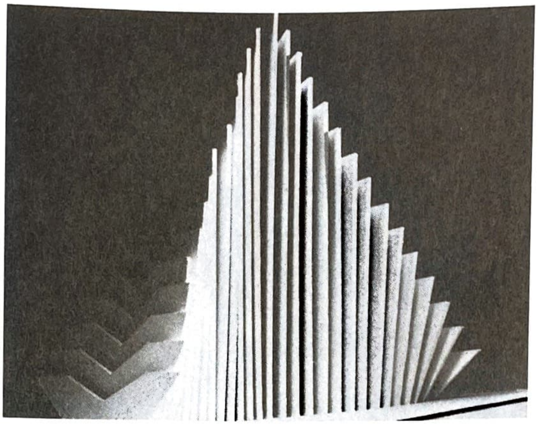
Figure 55—with a straight plane standing in the middle of the structure, all other planes are bent in increasingly sharper angles. The volumetric form suggested here is an emerging spherical shape.

Figure 56—this shows the effective use of gradation of shape. Each plane is obtained by the combination of a positive rectangular shape and a negative circular shape. The former has a constant width but the latter grows bigger and bigger and moves gradually downward and forward. The straight edges of the rectangular shape remain straight at the front but those at the rear change gradually into sweeping curves to echo the negative circular shapes.

Figure 57—this is a triangular structure which is the result of gradation of both shape and size of the serial planes. The short, wide V-shaped planes at the two sides become tall and narrow towards the middle by gradation of size and shape.

Figure 58—circular planes of exactly the same size and shape have been used in this structure. The sinking-in effect of the planes on the backboard is due to positional variation. The two loops which make the general shape very much like the numeral 8 are the result of directional variation.

Figure 59—the use of gradation of shape is quite obvious here, and gives the feeling of planes emerging from or sinking into the baseboard.



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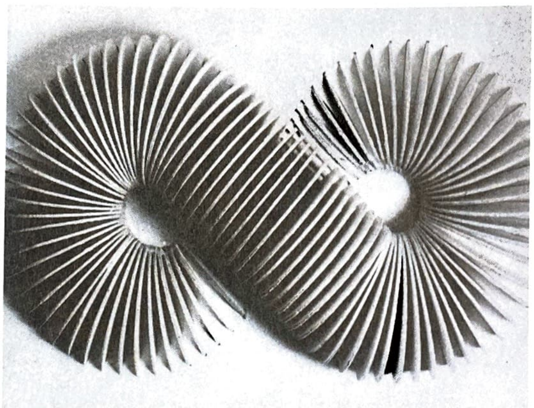

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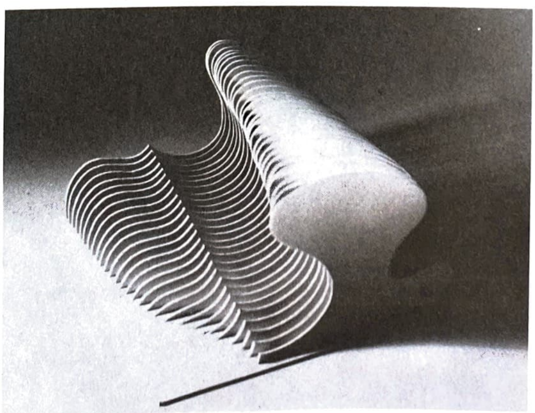

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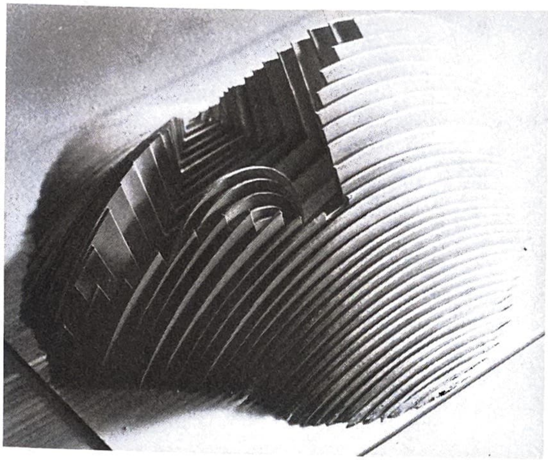

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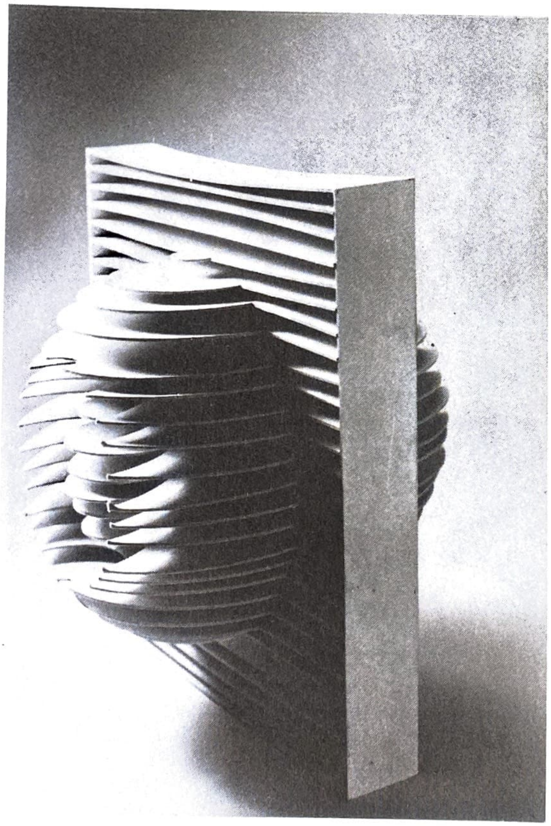
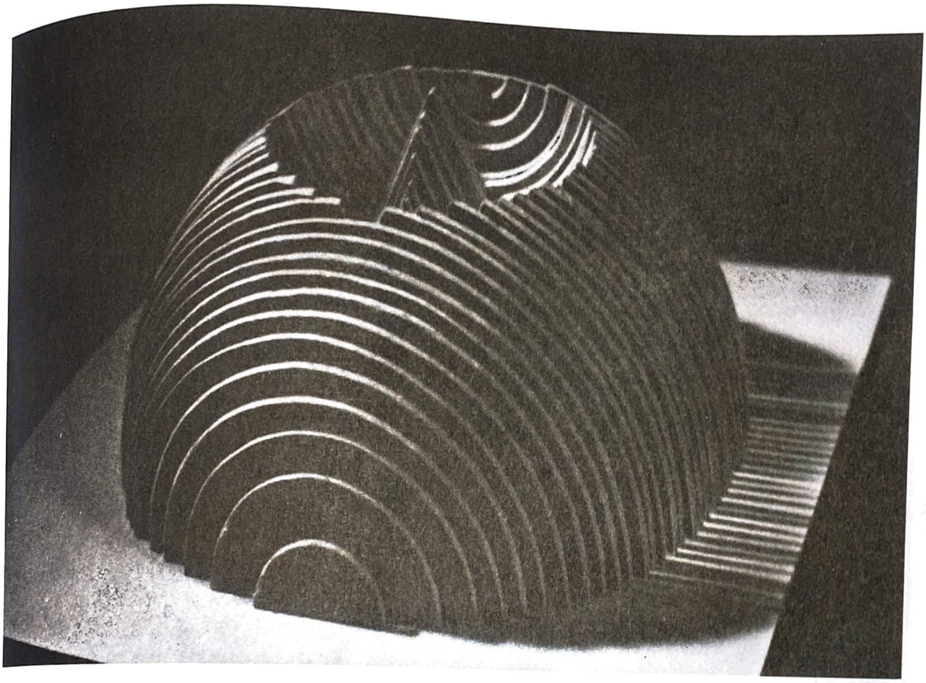


Figure 60—gradation of shape is used here in a rather complicated way. The form rises from the baseboard in high relief, but it splits up in the center to reveal another form within the deep concavity.

Figure 61—this is a free-standing form with a projecting semi-sphere in the front and another in the back. Both semi-spheres have a concave portion, inside of which a smaller semi-sphere is nested. The effect is similar to Figure 60.

Figure 62—the play of concavity and convexity here is the same as in Figure 60.

Figure 63—here the semi-spherical shape has been cut into two parts, and the shape of each part is further modified. A prominent negative shape now becomes the focal point of the design.



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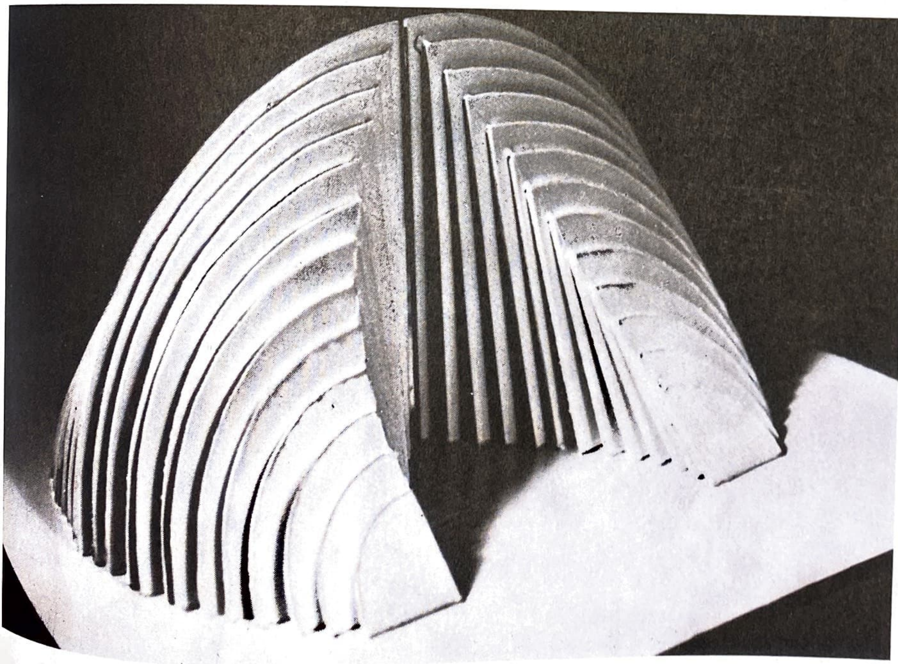

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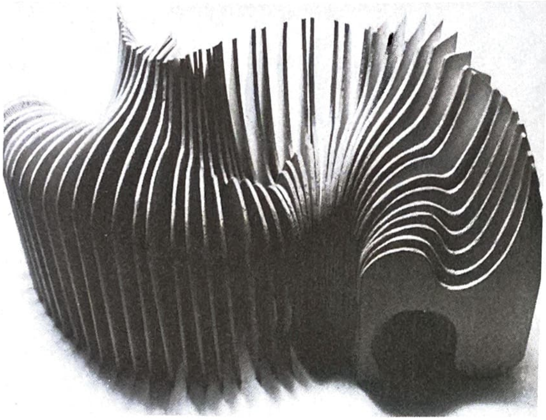

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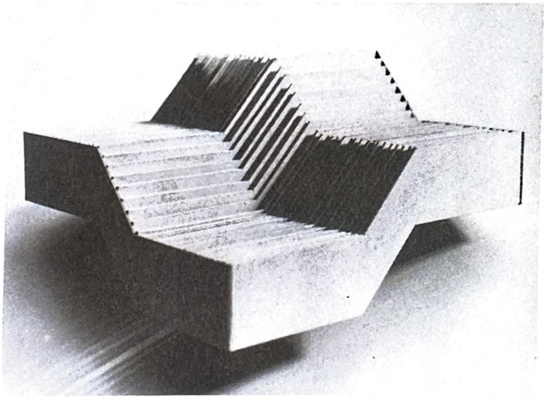

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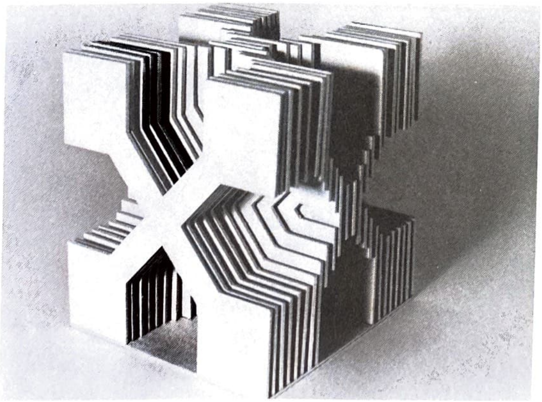

Figure 64—in this form, gradation of shape is used in combination with directional variation. Note the introduction of a negative shape which runs like a tunnel at the lower part of the design.

Figure 65—all the planes in this structure are repetitive in shape and size, but are arranged in a slightly zigzag manner by positional variation. This zigzag arrangement echoes the shapes of the planes themselves. The result is an interesting shape with faceted faces and identical front, rear, left, and right views.

Figure 66—this not only has identical views from four sides, but from top and bottom also. Each of the six views displays the letter X in the same shape and size. To construct this, negative shapes are introduced into square serial planes which are all repetitive in size. Some are repetitive in shape and some are graduated in shape.