2.6 / GOOD SHAPE

When I began looking for living structures, I was surprised to find out how often, mixed with other properties, there was an element that seemed to defy analysis: the works contained elements with the most gorgeous, beautiful, powerful shapes. Sometimes this beauty of shape seemed subtle, complex, beyond analysis. I became aware of a special quality that I began to think of as GOOD SHAPE, but could not very easily explain it, or define it.

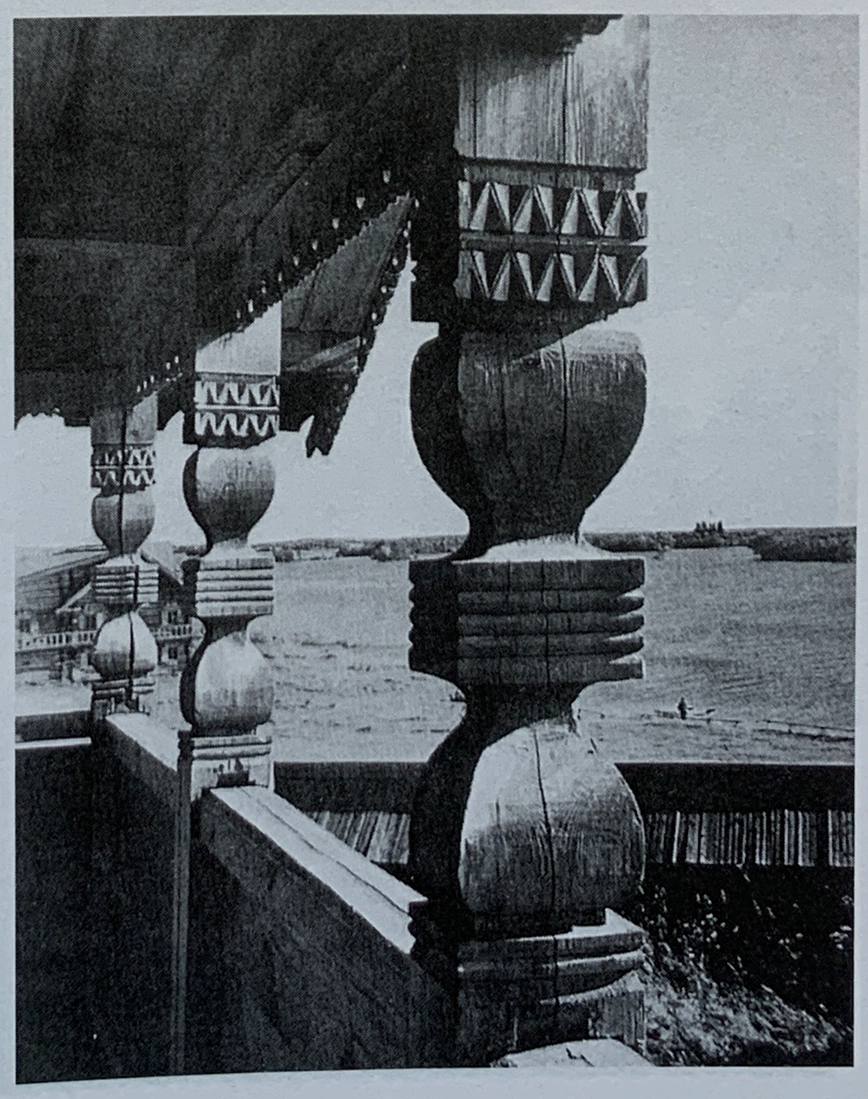
The fan flowers shown on the brocaded velvet below. The carving of the massive wooden columns in Romania, and its lovely forceful shapes. The intense shape of the Japanese shrine (next page). The powerful shapes even of a simply repeating carved ornament like that on the Abbasid stone relief (next page). For a long time I simply collected these things, and noted that they had *good shape*. But what did it mean? What is good shape?

It took me a long time to see that good shape itself is also related to the centers; and that, indeed, a shape we see as good is a shape which is *itself*, as a shape, made up from multiple coherent centers. For example, the beauty of shape in the fan-shaped leaves in the Turkish velvet comes about because of the peculiar way that each individual shape is made from multiple centers.

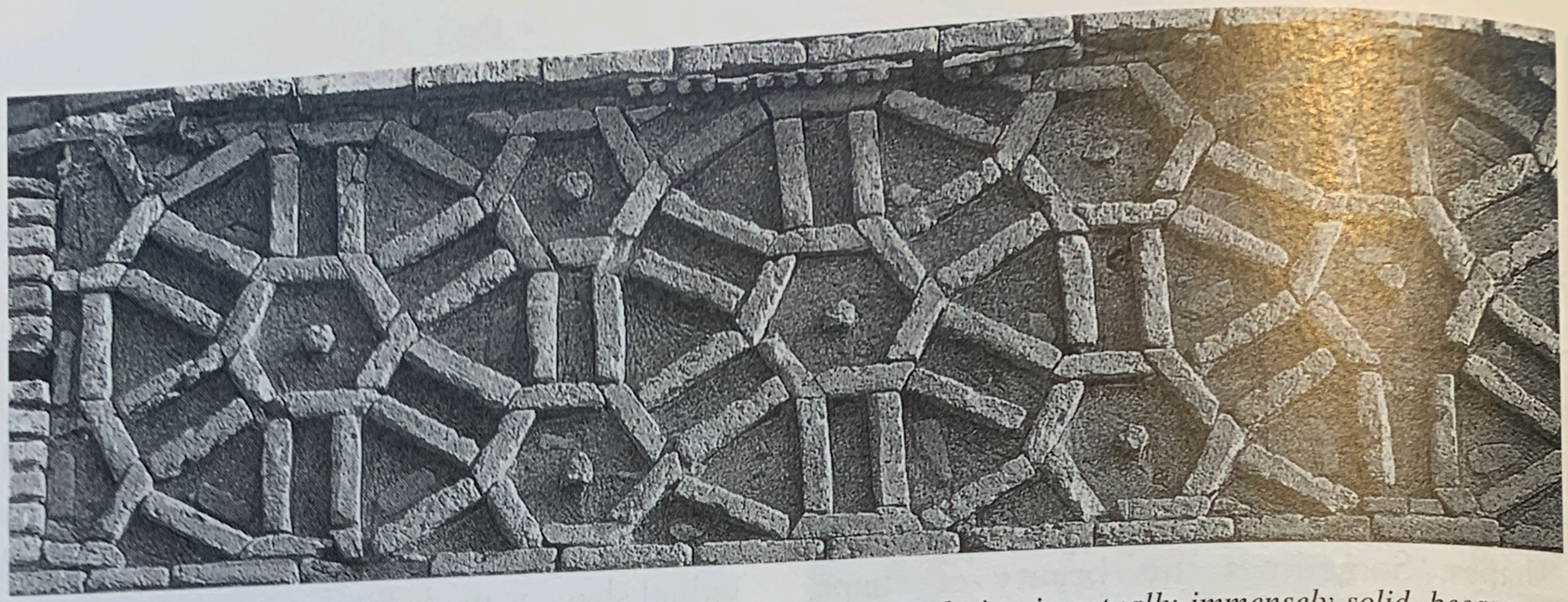
To make the point quite clear, it may be helpful to pick out two objects, one which has very good shape in itself, the other which strongly lacks good shape. On page 181, the Japanese teapot stand we have studied before has beautiful "good shape" within itself. It has centers in every part of its shape, and it is this which makes the shape *good*. In contrast, the futuristic chair has quite appallingly bad shape: none of its components are centers, and it is this which makes the shape *bad*.

What is a "good shape"? What is it made of? It is easiest to understand good shape as a recursive rule. The recursive rule says that the elements of any good shape are always good shapes themselves. Or, we may say this once again in terms of centers. A good shape is a

Good shape in the elements of a figured velvet, 16th-century Turkey



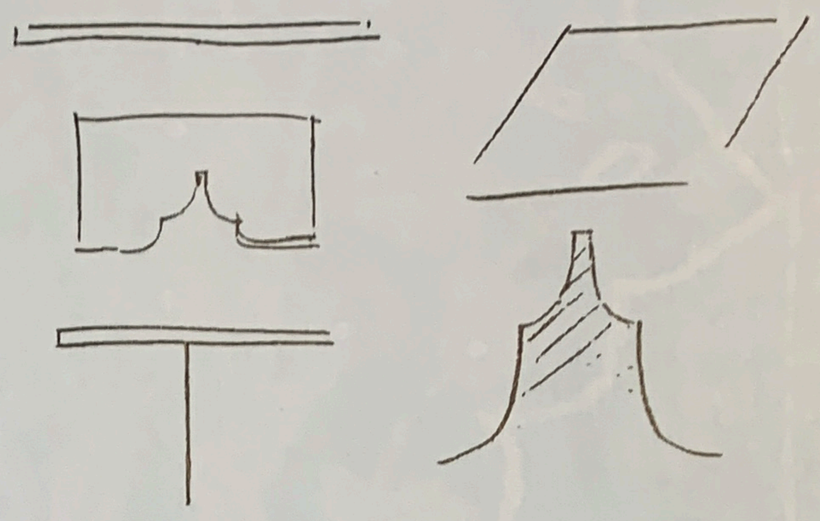
Good shape in a primitive carved column, Romania



Abbasid stone relief: what seems like a rather intricate ''tracery'' design is actually immensely solid, because the shapes—wheels and infill—are made of such simple and solid pieces. The good shape of the ornaments appears in the way that every part, every single part, has positive and definite shape, thus helping the overall organization, and making the large ''wheels'' magnificent in their resulting shape.

Japanese shrine. The shape is so magnificent, it needs no comment.

The beautiful shape of the teapot stand



Elementary centers in the teapot stand form its beautiful shape.

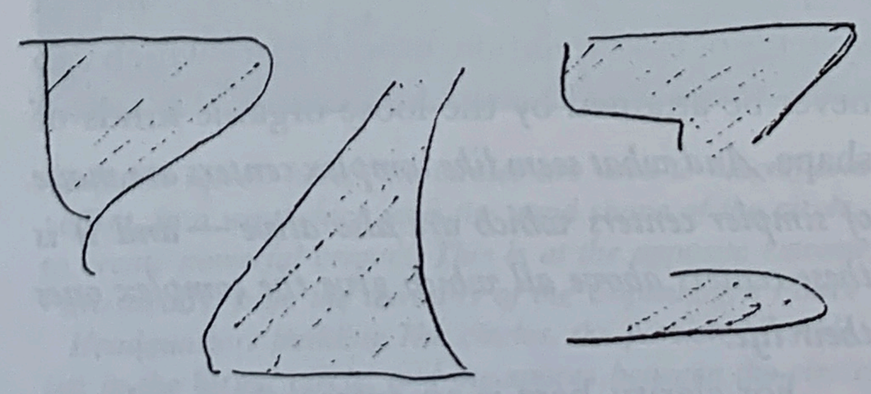
center which is made up of powerful intense centers, which have good shape themselves.

In addition, we note that the simplest and most elementary good shapes are made from elementary figures. Thus the first thing to realize is that in most cases the good shape, no matter how complex, is built up from the simplest elementary figures. The teapot stand can be seen to be built up from the illustrated simple shapes, each of which has good shape. Notice that I include the shape of the positive space under the lip of the teapot stand as one of its component centers.

On the other hand, the amorphous mass of the futuristic chair cannot be understood as being composed of simple elementary shapes at all. If one tries to take it apart, and identify its component shapes, then these shapes are themselves seen to have very bad shape again. In effect, it is not made of centers at all. When space is truly whole, the elements are always made up from shapes which are much more regular in some sense.

Let us start a more detailed understanding by looking at the Persian carpet on the next page. It seems superficially "floral." But on close inspection it turns out to be made up of simpler forms, including triangles, rhombuses, hexagons, arrowheads, pieces of circles, all rather regular — and it is their regularity which allows the formation of so many ambiguous cross-relationships within the form. The shapes of the flowers, leaves, buds, blossoms, stems, are all

Terrible shape in a futuristic chair

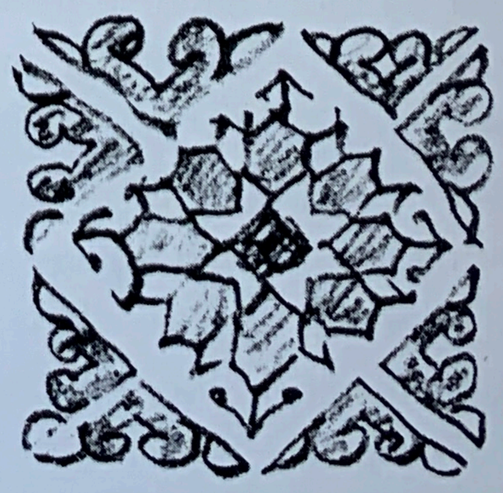


Amorphous figures in the futuristic chair

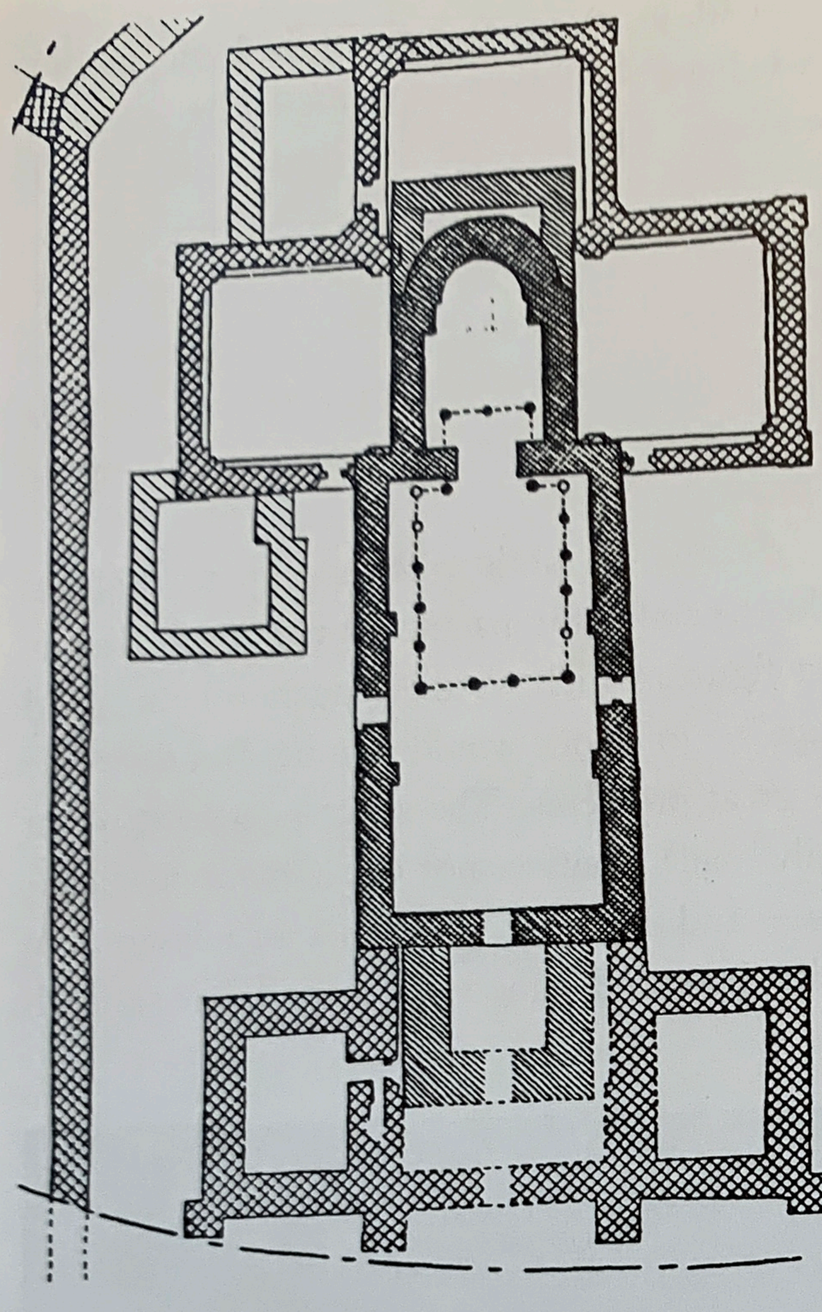
Early Persian carpet: even the individual flowers are made up of good shapes

made of geometrically simple shapes, powerful as bits of local geometry. Here even the flower petals are made of elements that are essentially straight line figures, squares, and triangles, both the colored pieces and the triangles, hexagons, etc., put together in very complex ways to create the illusion of organic shapes. Why is this so important? I believe the regularity of the simple shapes creates a potential for much more complex systems of cross-relationships in space which can never be attained by the loose organic kinds of shape. *And what seem like complex centers are made of simpler centers which are also alive — and it is these centers above all which give the complex ones their life.*

For clarity, here is an extremely simple example, a border ornament from another carpet. Again it is floral-*looking*. Yet on close inspection, it turns out to be made up entirely of diamonds, squares, and triangles, both the colored pieces and the space between. The resulting ornament, as a whole, has good shape. The good shape is an attribute of the whole configuration, not of



Floral carpet element made mainly of rhombs and triangles



Early Christian church: the rooms, spaces, walls, and openings all have good shape, even when looked at in plan. And the whole composition has beautiful shape.

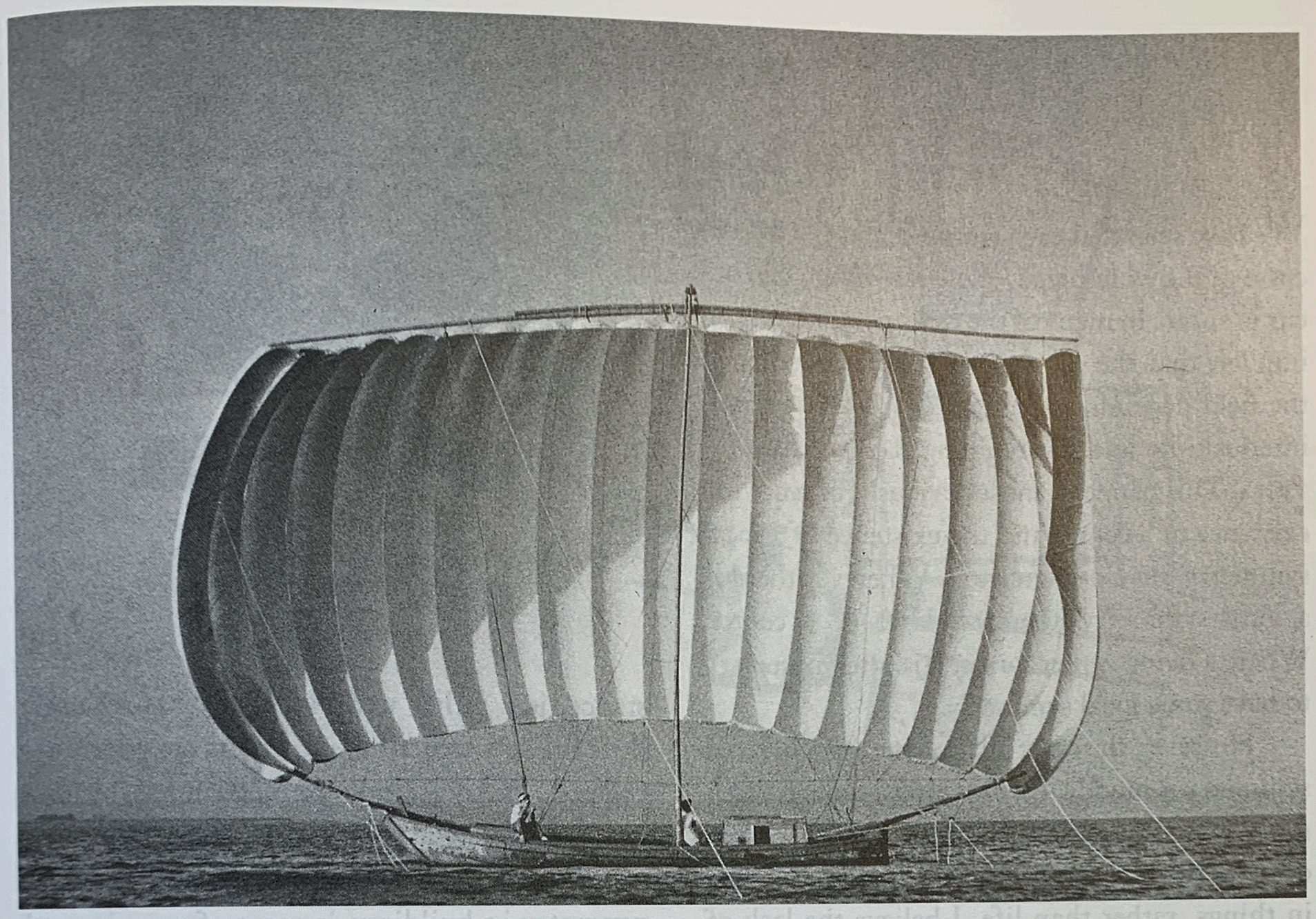
an example in the courtyard of the Copenhagen Police Headquarters building: a ridiculous plan, which is trivial because the space next to the circle is formless, and therefore meaningless. The high degree of sophistication needed to make a circle have good shape is seen in the fabulous Ottoman velvet on page 183, where the two systems of circles are drawn slightly distorted so that the moon shapes, the space between the circles, and the small circles and large circles all work as centers. The pattern is stunning in its power.

Above all, we must remember that the quality of good shape occurs only when the shape itself, as a whole, becomes powerful and extraordinary, when we have good shape by following the principles I have outlined. The ancient classical Greek horse's head, the early Christian church plan, the deeply hewn wooden members in the Romanian log house — these all show good shape in this large, wonderful sense, to the extreme.

The horse especially, with its bulbous eyes, creates an unforgettable shape, hewn as if from three-dimensional living centers. And the early Christian church, almost at the opposite extreme, simple, quiet . . . and yet composed in the same way so that its simple elements together also make an unforgettable shape. How the apse and many squares together, forming locally symmetric pieces in the composition, create all in all something which is matter-of-fact, simple — yet somehow unforgettable, like an ancient haunting melody.

And, perhaps most beautiful of all, this lovely sail from an Egyptian boat has the quality of good shape to an extraordinary degree. We see it and feel it immediately, and we feel the intense and lovely character it has. But — being analytical again — we also see that this complex shape is made up of the furls in the sail, and every one of these — modest, gently curving — is a center in itself. By having good shape, the life of dozens of centers is created. The sail has life because its shape, *as a shape*, is made up of dozens of good centers.

Greek horse: the eyes, the head, each part has its good shape.



Extraordinary beauty of shape caused by the centers in a sail

Although it may seem surprising to someone raised in the mechanist-functionalist tradition, good shape in buildings, rooms, gardens, streets, plays a vital role in the way they *work*. Essentially, what happens is that the thing which works effectively has — must have — more centers in it and, by virtue of having more centers, has better shape. So the good shape is not only making things more beautiful; it also makes them work more profoundly, more effectively.

FUNCTIONAL NOTES

Some of the practical arguments which show why good shape makes things work better. We have seen in the last section, things which are alive have good positive space in them. So in a well-working thing, all the space between the parts has to have good shape.

This special rule is really just part of a more general rule, which says that in a thing which is alive almost every visible part, at every level, has good shape, and is therefore a living center. In the leaf we see the shape itself as made up from centers. In a bridge with good shape, the members play an effective and efficient structural role. In a window with good shape, the arch, header, casements, and jambs all play their roles efficiently and well.

In an amorphous blob-like shape, on the other hand, we cannot really see any centers. Thus the shape is not made of centers in any obvious way, does not induce a field of centers in any clear way, and the beauty of function, the clarity and subtlety of the way it works, will be lessened.

The essence of "good shape," then, is that each part of space is positive and definite. As a result we also tend to see simple good figures within a good shape, and good shapes tend to be made from simple figures. This is the basic rule.

Making a dovetail, we choose its shape in such a way that the pieces of wood on both sides are intense centers, in order to preserve the structural integrity of the members. The good shape that results always has a shape just right for structural strength. In a wall with openings, we choose the best shape for the openings, so that both the openings themselves, and the panels between openings, have simple structural integrity. In APL, PATH SHAPE (p. 589), BUILDING FRONTS (p. 593), COLUMN PLACE (p. 1064), and ROOF CAPS (p. 1084), all show examples. As for the actual space in rooms, several arguments are given in APL to show that the shape of rooms, spaces, and streets, in plan and in section, will always play a vital role in the way they work (E.G., THE SHAPE OF INDOOR SPACE, p. 883).

4.6 / GOOD SHAPE

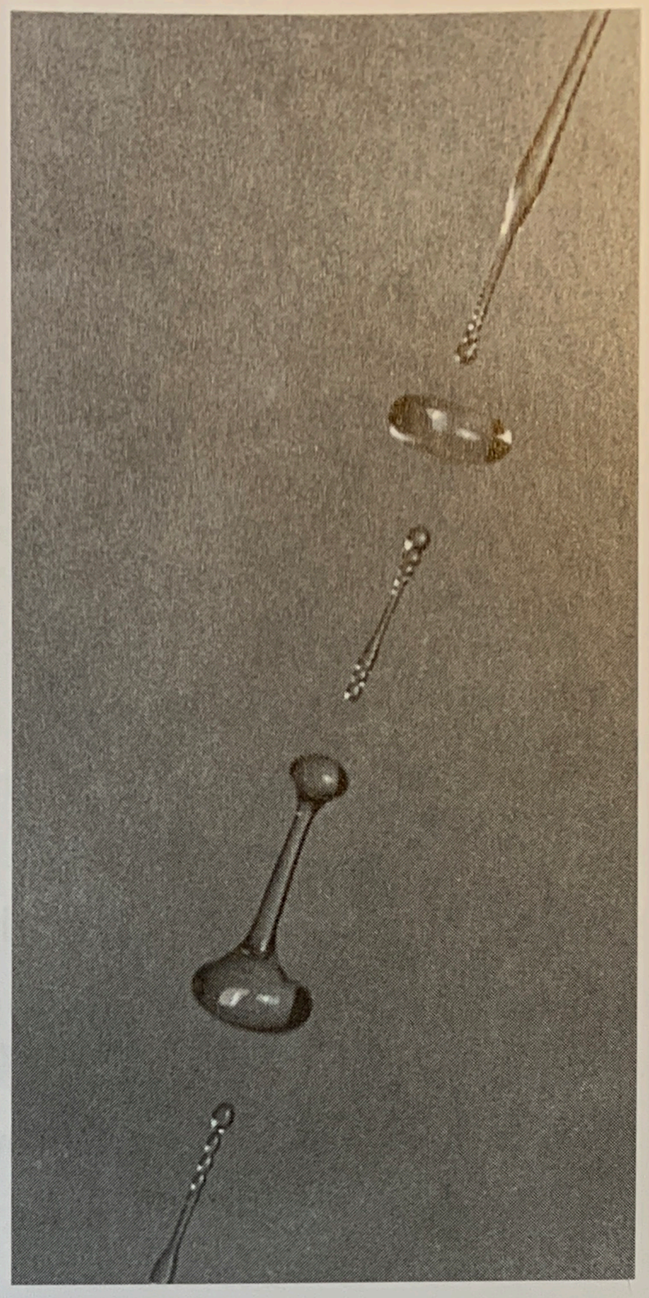
A great many natural systems have a tendency to form closed, beautifully shaped figures: leaves, the curl of a breaking wave, a cowrie shell or a nautilus, a harebell, a bone or a skull, a whirlpool, a volcano, the arch of a waterfall, the hooves of a horse, the outline of a moth or a butterfly, the Chladni figures produced by a violin bow vibrating a steel plate with sand on it — all have natural and beautiful shape.

In order to understand the widespread occurrence of beauty of these shapes in nature, we must remember that a GOOD SHAPE is a geometric figure — often curved — which has in it some major center that is intensified by various minor centers. If we look carefully at the Chladni figure, we notice that the curves of which it is made have a definite and noticeable peculiarity. This comes from the fact that each curve surrounds one center, then surrounds another center on its opposite side, then back again. The particular character of the curve comes from the double system of centers which exists inside the curve formed by the stationary nodes of the vibration. In each case, the fact that an intense major center is surrounded by various intense minor centers is directly connected with the physical behavior of the system. The special shape of the sycamore leaf, with its full curves and reverse-curves at the tips, comes from the relative rates of growth of different parts of the

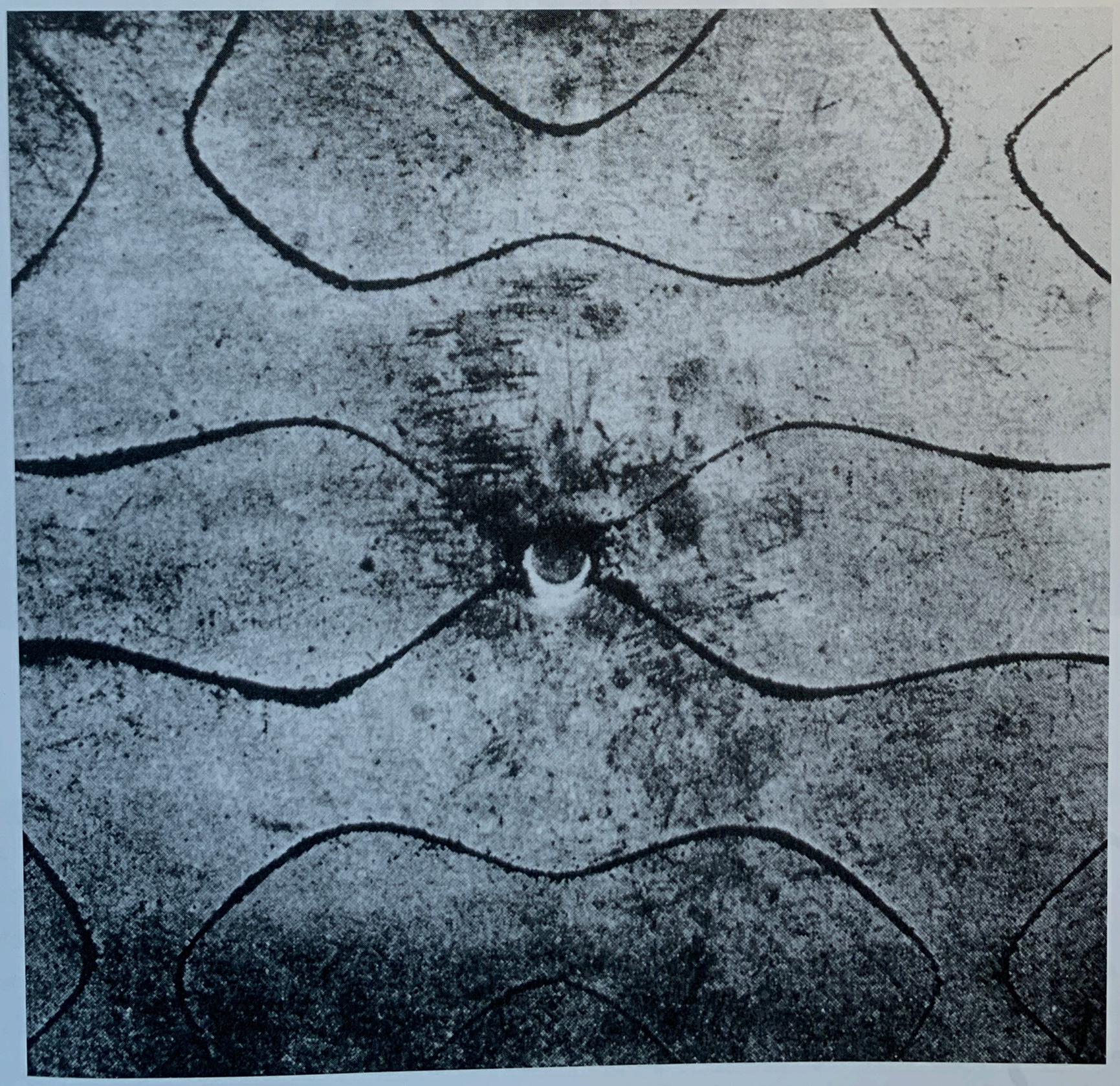
Tulip tree leaf: magnificent shape

perimeter. Again, the good shape arises because each part — the inside of the full curve, and the sharp point of the tip — exists as a center, which is developed very fully in the growth process.[12] In the electron orbitals inside a molecule, for similar reasons, we see similar curved surfaces, with their own three-dimensional version of good shape caused by the interaction of the curves in space.

The appearance of good shape in nature has been noted informally by many writers, notably by D'Arcy Wentworth Thompson.[13] I believe however, that a general explanation of this widespread appearance of good shape in nature has not yet been formulated, chiefly because the concept of good shape has not yet been expressed in precise language. Once again, without the concept of a living center, it is hard to see how this could be formulated precisely.



Water drops



Chladni figures, formed by vibrating the sand on a steel plate with a violin bow