



## 4 / MAKING A COLORED, ORNAMENTED, FLOOR

How does ornament unfold from the situation where it occurs?

Let us consider an example, in depth, to see how the process of getting the ornament from the space works in detail by structure-preserving transformations. The terrazzo floor we made for the main room of the Martinez building shows the extraordinary subtlety of the relationship between ornament and color and geometry. The room is about 16 feet by 24 feet.

This floor was laid at a time when the building was complete, and closed in, and we were working on the raw slab of the main room of the building. At the very outset, I “saw,” in my mind’s eye, that some kind of red and yellow were called for by the building. This feeling originated as a response to the blue-green of the outside, and to the bright white plastered walls inside (see text on page 616). The red and yellow formed light with the blue-green and the white.

As far as pattern goes, my original instinct was for a rather simple checkered pattern; I had a vague idea that big squares would alternate with smaller elements. This again came as a response to the rectangular space, the whole, the positions and shapes of columns where they meet the floor. To find out what kind of pattern would be best for the building, we got hold of thirty or forty long, thin wooden lattice-strips (thin strips of wood, 15–20 feet long, half an inch by one-and-a-half inches). Laying these strips on the slab, to arrange and rearrange different repeating patterns, we could see which patterns arose naturally from the room, which made sense in the room, which were obviously at odds with the room, which ones seemed most subtly related to the room.

The point of what we were doing was, of course, to find which pattern was most structure-preserving to the room. Surprisingly, we found out quite fast that grids which were parallel to the room’s walls did not fit well. No matter whether large or small, they had a jarring quality. Diagonal

patterns, on the other hand, seemed to work well (see diagrams on page 591). This surprising discovery, fine in that particular room, is obviously not a general rule. It is something that was true for *that* floor, in *that* building, with *those* windows, and *those* columns and fireplace.

Having established the diagonal nature of the pattern, we tried to find out what we could about further detail of the pattern. We found that alternation of squares and rectangles was better than a simple checkerboard. And we found that the pattern worked best when the squares were about 16–18” in dimension, and the rectangles were about 5–6” wide.

At this stage, we had a growing, and by now rather specific, idea of the kind of patterns which made sense in the feeling of the room.

Now it was time to identify the colors themselves. We began by painting swatches of color on pieces of paper to find out which color combinations felt most harmonious in that place. It was clear right away that red and yellow, by themselves, were too different from the blue exterior. Some blue was needed to bring the floor together with the outside.

We made a rather good middle red, a very pale yellow, and then tried two kinds of blue — a strong dark blue and a weak blue. The strong blue was the better of the two — more harmonious with the red and yellow. Then we began the crucial experiment to test color proportions. We laid the three colored papers (middle red, pale yellow, strong dark blue) on the floor of the room. Then we started sliding them over each other so that the amounts of each of the three colors which were exposed could vary in size. We kept on rearranging them, leaving different amounts of each color open until we found an arrangement for which the balance of the three colors was just right in the room.

The swatches we were working with were no more than a few inches across. Yet it is im-

portant to record the fact that each time we slightly changed the relative amounts of the three colors, the feeling of the whole, and the feeling of the room, changed completely.

After studying the different possibilities for a long while, it gradually became clear that there needed to be large amounts of red, almost as much but slightly less yellow, and very tiny amounts of blue. In the version we liked best, the exact proportions were these:

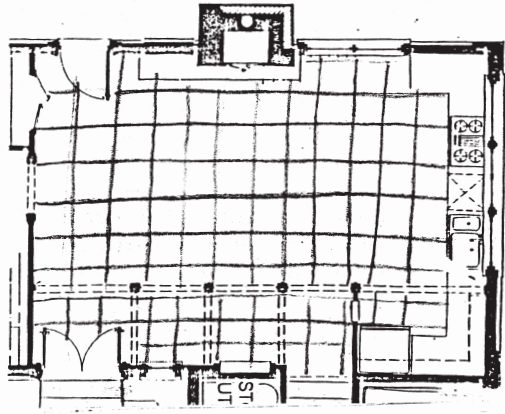
Middle red	57%
Very pale yellow	40%
Rather strong blue	3%

It may be useful to record a strange fact. When I first saw this beautiful color combination, I didn't have the nerve to do it. Eleni Coromvli, who was helping me, felt the same. These three colors in the room, in these combinations, had a sweetness that was almost overwhelming. We felt it might be too "dangerous," too "sweet." Our lack of experience with colored floors made this one seem almost indecent. But gradually I realized that the only thing making it strange was the fact that we weren't used to having floors which were so beautiful.

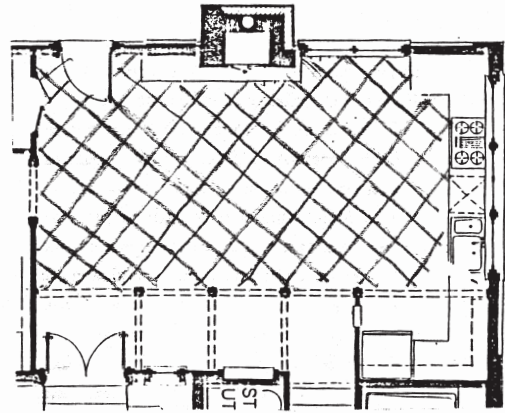
In the end, it was obvious that if we did use these three colors, in these proportions, then the floor would have a freshness, and a beauty, which would delight our eyes every single day—not just be nice or well designed, but a constant source of inspiration, something to draw life from every single time you looked at it.

We tried more subdued and "normal" colors, but they never had any of the wonderful freshness and spring-like quality which this one combination had. So we decided to go ahead. At this stage, we had the color quality of the floor quite clear. The fact that the yellow, active among the 3 colors, was a rather pale almost primrose yellow, was the clue to the subdued but beautiful light the floor gives out. A "thicker," more clogged yellow would have ruined it.

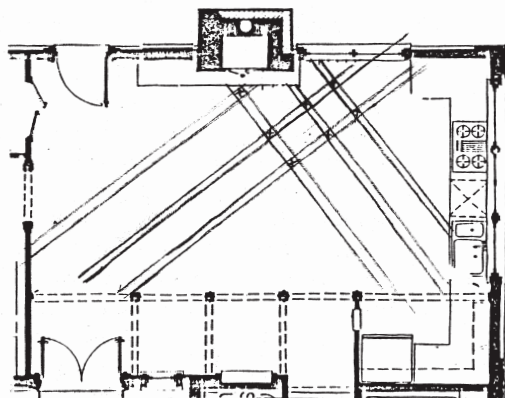
Now we came to a major *geometric* problem. What kind of pattern could be invented which had three colors, in exactly these three proportions, and had a diagonal emphasis? It was not



*Rectangular grid. Does not work very well.*



*Small diagonal grid. Works a little better.*



*Large diagonal grid, alternating with small. This large grid works really well, and was the most structure-preserving grid which Eleni and I could find.*

good enough to have a pattern which had roughly these proportions. My experience showed that once one had discovered something like this combination, it hinged on absolutely correct proportion; even minor changes would destroy the feeling. So I knew we had to find a pattern which followed this proportion with exactness, 57:40:3 — not more, not less.

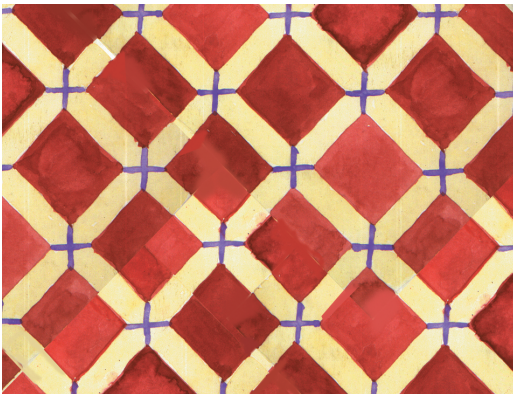
It is not very easy to find a three-color pattern, with these proportions among the three colors. Conventional checkerboard patterns don't have three colors in these proportions. Indeed there was no ready-made pattern that we could use. Instead, we had to invent one. More exactly, it could be said that we had to let the color proportions *generate* a suitable pattern. This again may be understood as a structure-preserving transformation. We had a bit of global

information; the proportions needed to be 57:40:3. Now we had to find a way of obtaining, from that structure, the structure of a repeating diagonal pattern which could extend and enhance that global statistic among the colors.

We tried various possible patterns, some shown on this page. As you can see, only a relatively small number of different types with the exact proportions 57:40:3 can be created. Of the ones we found, it was not difficult to see which one was best in the room. This is shown below.

We then did a fine adjustment on the size of squares, first with sticks, and then by painting full-size mockups on paper and laying them on the floor. The exact size of the final pattern has a 17" square.

Next we began work on the construction itself. We found the correct combinations of pig-



*Best for the room*



*Less successful*



*Perhaps least successful*



*Less successful*



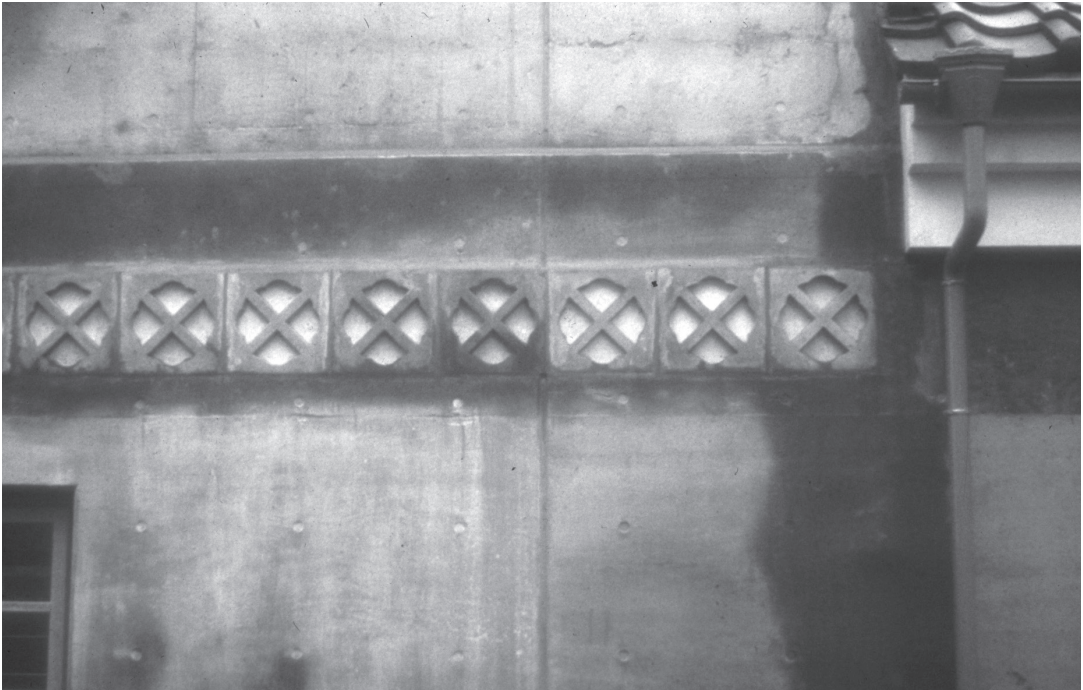


*The finished floor*



*Detail of the finished floor. Christopher Alexander and Eleni Coromvli, 1984.*





*Cast-concrete ornaments in the wall frieze of a classroom at Eishin. Each building has a different ornament. Christopher Alexander and Hajo Neis, 1984.*

ment, marble dust, and marble chips to match the three colors on our painted paper samples — and when we had samples which matched the colors correctly, we went ahead and laid the floor.

In this example, the color and geometry are inseparable. The rough geometry first inspired the color. Then, exact study of the color showed

us a set of crucial proportions which had to be maintained for inner light, and these proportions directly generated the pattern.

We see how the design of the floor, the color, and the geometry all arose as a result of the structure-enhancing transformations in the place where the floor was to be built.



## 5 / OTHER KINDS OF ORNAMENT

The ornamental structure most often comes from the material, and from the way a thing is being made.

In the floors for the Sweet Potatoes clothing factory, I made a series of designs, all out of pine boards that could be cut and fitted with a chop-saw. The only precondition for this series of ornaments was that the client could accept minor inaccuracies in the way the boards met. If they

had to meet perfectly, the process would be very expensive, both in the cutting and fitting — virtually prohibitive. But by getting the clients to agree that minor cracks might occur between the boards and then be filled with beeswax, the range of different floors and designs that could be made was quick and easy — and charming.

The cast concrete ornaments on the classroom buildings of the Eishin campus (above)