

(buildings, biological systems, physical systems) in the service of function — but they are not functional in *origin*. They are pure transformations of space itself, through which the space becomes differentiated, and through which the life of the space is increased.

*Second, as a result of the application of these transformations, the life of the whole is increased.*

I do not mean to imply that these transformations can be applied blindly, in the hope of getting life to occur. They must always be *appro-*

*priate*. They must act in the service of function; they must be undertaken, always, with an eye to local adaptation, and so on. These matters are taken up in later chapters.

But the essential point is this. We do have a system of transformations which are, in principle, capable of nudging a system steadily towards living structure, and these transformations are precisely those transformations which govern the life of the centers themselves — and hence the wholeness (which *is* the system of centers), too.



## 5 / EMERGENCE OF BEAUTIFUL GEOMETRY

To drive the point home, I will give a real example, not only diagrammatic, where we see a beautiful thing emerging, by differentiation, from a sequence of transformations, and where it is clear that it is the transformations that have done the work.

Consider the sequence of transformations, shown on the next page. The diagrams describe the early stages in the evolution of the house plan for the Sanders house, a house we are currently preparing to build in Sonoma County, California. Consider what happens at each step:

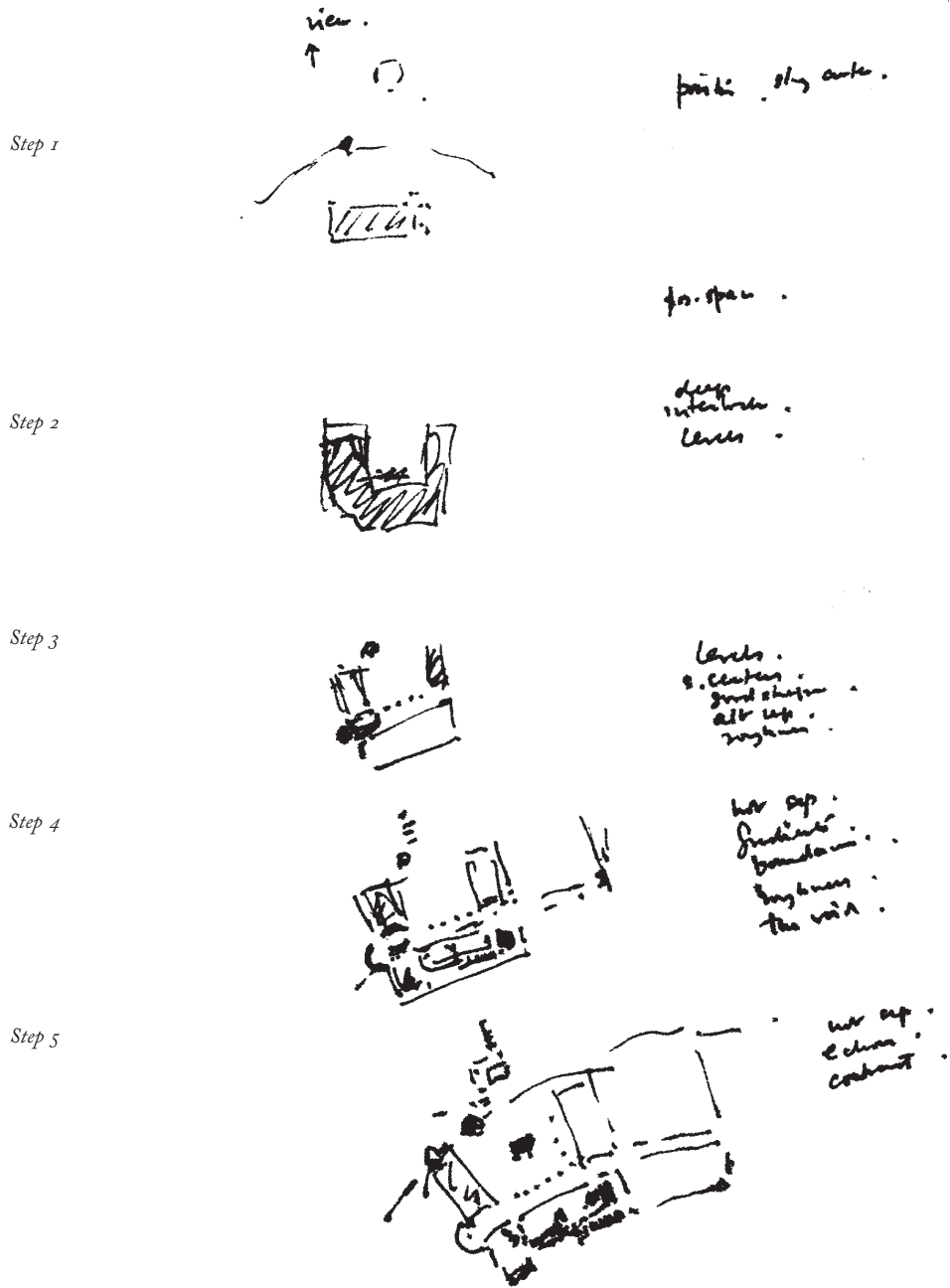
*Step 1 : Location of the House.* A single center is formed. Out of the context, land, view, and nearby buildings, the STRONG-CENTERS transformation sets a position for a house on the edge of the platform in the land, overlooking vineyards below.

*Step 2 : Formation of the Courtyard.* This single center is transformed, now, under the POSITIVE-SPACE, DEEP-INTERLOCK AND NOT-SEPARATENESS transformations. A deep center is formed, a courtyard which looks toward the view, is completed by the house, while the house takes three wings, to make the courtyard. These three transformations establish a connection with the land, reach out into the land, and enlarge it.

*Step 3 : Differentiation of the House Wings.* The previously undifferentiated U-shape is now transformed further. Once again, the primary force of the transformations come from practical considerations — patterns — but the geometric impact arises from the fifteen transformations. In the middle, the ALTERNATING-REPETITION transformation creates a wide porch of square-shaped bays and columns. Each of the three wings is differentiated further: the main room, and largest single center is formed by the LOCAL-SYMMETRY transformation and by the LEVELS-OF-SCALE transformation. And the right hand wing is formed by the BOUNDARY and GRADIENTS transformation. Finally, the entrance, to the left, is formed by the GOOD-SHAPE, DEEP-INTERLOCK, and ECHOES transformations. Throughout, we see the effect of the ROUGHNESS transformation, making rectangles which are as near perfectly rectangular as possible, while yet accommodating to the positive space and to the land, and the angles which they impose.

*Step 4 : Differentiation of the House Interior and Expansion of the Garden.* The central building is now further differentiated by transformations which create the core of the house: the organization of its living area and kitchen. This arises from intensive discussion about function and

THE PROCESS OF CREATING LIFE



Step-wise differentiation of the Sanders house

comfort with the family, expressed in the form of patterns: but the geometry is then produced by the action of the fifteen transformations once again. The organization comes from functional considerations — patterns — but the geometri-

cal impact arises from the fifteen transformations.

Step 5: Further Differentiation of Outlying Areas. The NOT-SEPARATENESS transformation now



*Step 6: The plan of the Sanders house, as it emerges from the previous differentiations through the action of the BOUNDARY transformation, supplemented by the action of LEVELS-OF-SCALE, STRONG-CENTERS, LOCAL-SYMMETRIES and ROUGHNESS transformations. Step 7: The right hand drawing shows the structural plan which emerged from this plan shortly afterwards.*

appears several times, to create outlying centers which differentiate the garden, but which above all create an indivisible relationships between the house and the surrounding land.

*Step 6 : Detailed Differentiation of the Living Room.* The BOUNDARY transformation is very active at the next stage, helping to form coherent space. It shapes the big bow window, the layer of rooms behind the kitchen, the passage and stair behind the fireplace part of the living room, and the overall definition of space and structure which begins firmly to shape the room. Similar effects are visible in the emergence of other rooms visible in the drawing. This action is supplemented by the action of LEVELS OF SCALE, STRONG CENTERS, LOCAL SYMMETRIES in the formation of the alcove window near the bottom of the stair. Throughout the ROUGHNESS transformation acts to make these very strong firmly

shaped centers possible, while respecting the minor irregularities of plan. A plainly visible case appears, for example, in the small lobby to the kitchen inside the main entrance of the house. It has irregular shape to accommodate to external boundary considerations, while nevertheless preserving positive space, local symmetry, and strong centers in the interior of each part of its own space.

*Step 7 : Emerging Structure.* Next, this plan is transformed in such a way as to form a series of coherent structural bays. This is accomplished mainly by the LOCAL SYMMETRIES and LEVELS OF SCALE operators, through which we form individual coherent POSITIVE SPACE from structural elements like walls and columns. As we see, comparing the left and right drawings, this induces a fairly massive transformation in the whole.



## 6 / SUMMARY SO FAR

We see how the coherent geometry which makes the thing a unity, and which gives it beauty appears, step by step, as a result of differentiations caused and modified by the fifteen

transformations. Throughout the process, these transformations essentially created the design.

Ideally, then, when things are going well, each center gradually gets shaped appropriately