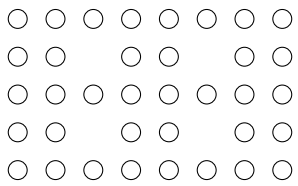
Commentary

Third Study is a series of 100 drawings in two volumes. Each drawing is 16.5 x 11.5 inches, drawn with a 0.20mm pen. The series is itself a continuation of similar drawings, in which a space is filled with a field of adjacent shapes, and rules that determine the shapes are gradually refined. By the end of the first volume, a set of allowable shapes is intuitively defined. During the second volume a new visual element called the patch is introduced, and its usage is developed until the end of the volume. The result of the series is a concept relating field, shape and patch, which can be abstracted from the setting of paper and ink.

The first two studies were completed concurrently and follow the same format of 100 drawings in two volumes, using the same kind of paper and pen. The first study is a repetition of the design for Untitled (2013), which helped to settle on its exact proportions. The second is a grid of 36 mandalas. All three studies follow and gradually refine a set of rules.



Grid for the second study.

1. Field

From the earliest field drawings to the end of the third study, there is a single predominating objective: to express randomness as much as possible, with a field that follows from these axioms:

1.1 The field exists in so far as it is recognized by the viewer.

1.2 The field expands to the limit of the page, so it appears it would otherise extend indefinitely.

1.3 Lines all have the same width.

1.4 Each end of a line conects to another line.

1.5 Lines do not cross.

1.6 The distance between two lines may be no less than their width, except where they meet.

2. Shape

Rules that determine the set of allowable shapes enable them to fit together easily. During assembly, shapes are appended one by one to a continuous growing collection that eventually fills the page. As the edge of the collection extends into the empty space, caverns form between them that need to be filled. Shapes need to be chosen carefully to fit in these caverns, so they don't leave a gap that isn't itself an allowable shape.

Refining the set of allowable shapes reduces the potential for an individual shape to express randomness, in the sense that a digit (0 - 9) has less potential to express randomness than a letter (a - z). A refined set of allowable shapes has fewer elements than an unrefined set, but caverns created with refined shapes are easier to fill. The refined set will actually offer more solutions than the unrefined set when a particular cavern needs to be filled. Having more options to choose from allows for the emergence of patches, which enhance the expression of randomness by the entire field.

The refined set of allowable shapes appears as some family of distorted triangles. The properties of this family are intuitive to the viewer, and may be loosely defined by these axioms:

2.1 The maximum area of a shape is limited in some proportion to the width of the line.

2.2 A shape extends no more than three times its width.

2.3 Every side is at least slightly curved.

2.4 There are three interior angles.

2.5 A shape can have extra interior angles if they give the appearance of a curve.

The proportion of the first axiom is based on the illusion of darkness: an area of shapes appears darker than an area of larger shapes. The value of darkness is zero if the shapes are sufficiently large, in which case it appears no darker than an area of larger shapes. For this reason the smallest shape size to generate zero darkness is the largest allowable shape size.

If the viewer were to compare any two shapes side by side, they could distinguish hundreds of shapes, but in practice the viewer compares many at the same time. In this case one tends to observe the similarities of shapes more readily than their differences. A section of a field in which each shape is visibly distinct from the others is limited to about fifty shapes.

Let A and B be two collections that each exceed fifty shapes. Let each shape be chosen at random from the set of allowable shapes, and let each shape in

A be distinct from each shape in B. Let each collection be open, or without border, in the sense that the viewer recognizes each collection in the context of a continuous field. With these parameters, A and B appear identical to the viewer, because shapes are distinct only if they are compared side by side. The collections are equivalent, because they exist only in so far as they are recognized.

3. Patch

The expression of randomness is inhibited by the vast difference between the area of a shape and the area of the field. If every shape were chosen at random from the set of allowable shapes, the entire field would appear as a consistent texture of relatively similar shapes, like a field of grass. One sufficiently large section appears the same as any other sufficiently large section, and randomness cannot be expressed between things that are the same.

The solution to this problem is to introduce the patch, which is a hybrid of shape and field. The patch is defined by these axioms:

3.1 A patch is a continuous collection of shapes.

3.2 A patch has a border.

3.3 The shapes of a patch are refined by an allowable size range.

Within a patch, the potential for an individual shape to express randomness is again reduced to promote the expression of randomness by the entire field. However, by assigning each patch a particular size range, patches may be distinguished from each other and disrupt the consistent texture of shapes. Some drawings in the second volume experiment with patches characterized by elongation, but this creates caverns, and the consistency of the patch is hard to maintain when filling them. Elongation also tends to constrain orientation.

The size range of a given patch need not be continuous. The viewer can discern a hundred or so distinct sizes, so there are many ways to define a size range. Let us represent size by a number from 1 to 100 where 1 is the smallest and 100 is the largest. Assume some patch allows shape sizes within the set of intervals $\{[10, 20], [80, 90]\}$. If there are as many small shapes as large shapes, the small shapes will occupy far less space than the large shapes. Consequently the number of shapes in proportion to size can also determine the character of a patch.

4. Emergence

All three axioms of the patch can be bypassed owing to the fact that patches exist only in so far as they are recognized.

4.1 Patches within a field can have the same size range. Assume two patches in a field have the same size range and are not adjacent. If they are in proximity to each other, such that the viewer can see them at once, then they appear as a discontinuous patch.

4.2 Let A and B be adjacent patches in a field. Let the size range of A be defined by the interval [20, 60], and let the size range of B be defined by the interval [40, 80]. The intersection of the two size ranges is [40, 60]. Even though the size ranges are distinct, the border may not be recognizable; hence, the border may not exist.

4.3 Let the trivial size range be defined by the interval [1, 100]. Then a patch with the trivial size range is identical to a patch with no size range.

A patch whose size range is similar to the patches adjacent to it is called *subtle*. A patch whose border is not clearly visible is called *vague*.

The partition of a field into patches is not unique. A field could be assembled with some other configuration of patches that the viewer fails to recognize. At the same time, the viewer could interpret the field as some configuration not intended by design. A patch that is recognized by the viewer and is not intended by design is called *emergent*.

Subtle patches naturally emerge in more complex arrangements. A field can be assembled by patches that vary in subtlety and vagueness, so that the patches range between visible and invisible. That a patch could be somewhere in between visible and invisible means the viewer may or may not interpret it as a patch.

5. Examples

2.19 The field is clearly partitioned by patches, many of which have an identifyable border and size range. Patches with a narrow and continous size range are the easiest to identify. Patches with discontinuous size ranges are more vague, and their borders are subject to interpretation. Overall the uniformity of shape size is obvious in most places. In larger patches, shapes show a consistent texture. On the right half, two smaller size ranges are very popular, and each one appears to form a discontinuous patch.

1.45 There is one clearly visible patch of smaller shapes, left of center. There are no other patches intended by design, but more subtle and vague patches could be interpreted. Offering one clearly visible patch invites the viewer to do so.

2.22 These patches are defined by elongation.

2.30 These patches are discontinuous, pairing large and small sizes. The center extending to the left has mostly large shapes, while the right of center has mostly small shapes. The patches are subtle, and especially vague.

2.42 There are many small patches that have clear borders. More patches could potentially emerge. The larger shapes provide contrast and suggest large, vague patches that combine the smaller patches.