

Two Routes to Koch's Quadric Island

a Counterchanged Textile Pattern

© 1999 Betty Lou Whaley

MATH can provide inspiration for the patterning of handwoven textiles but sometimes the results appear like random textures and lack the refinement found in traditional textiles. At first glance the new and fascinating fractals appear to have patterning potential but most are too large for motifs in hand-weaving. However, sifting the fractal sands I netted the small kernel of Koch's Quadric Island¹ (figure 1) and transformed it into a tie-up for patterning a textile.

Mindful of the beautiful counterchanged patterns woven by the ancient Peruvians, I plotted Koch's Island in that fashion on my chart. (figure 2) I made two weaving drafts incorporating this counterchanged repeat. The motifs in the first draft are traditional Bronson Lace (or Mock Leno²), i.e. doubled units with weft-wise floats on a plain-weave ground. The second draft has doubled units with warp-wise floats replacing the plain-weave motifs of the first draft. The draw-in for the second draft (figure 3) is for ten shafts and the structure is Turned Bronson Lace.

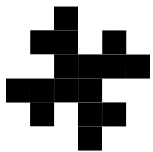


Figure 1

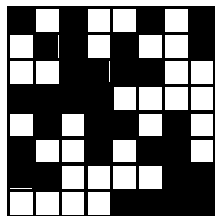


Figure 2

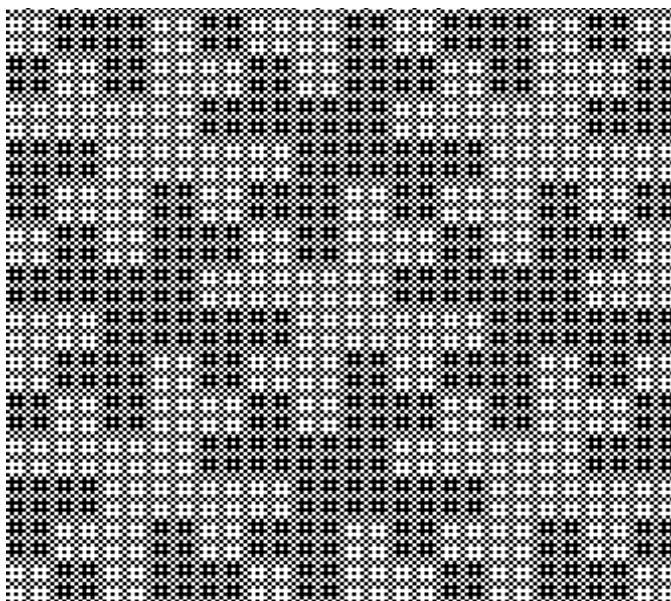


Figure 3

Recently while fishing for inspiration in the navigational log of Ernest B. Berry out of Raleigh, NC² I was astonished to pull up the illustrated description of an identical twin of Koch's Island—arrived at via an entirely different and fascinating route!

The kernel that starts the growth of the twin of Koch's Island is the 2/2 twill tie-up in figure 4. Figure 5 shows the kernel expanded into an 8 X 8 matrix. In figure 6

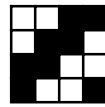


Figure 4

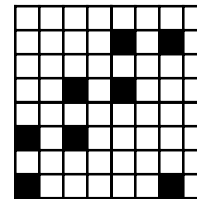


Figure 5

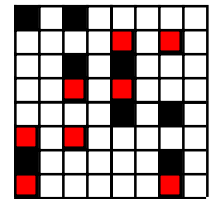


Figure 6

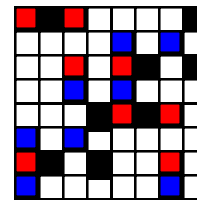


Figure 7

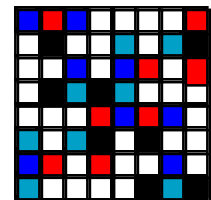


Figure 8

the matrix has been rotated a quarter turn to the right and the same pattern is painted in red. In figure 7 the matrix, again rotated, the pattern is painted in blue. In figure 8, again rotated, the pattern is painted in cyan. Figure 9 shows the completed pattern, all in black, repeated four times, forming a perfectly counterchanged tessellation—Koch's Island revisited!

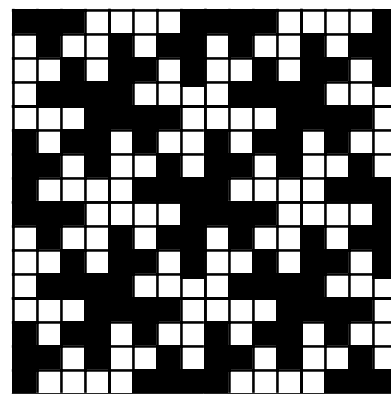


Figure 9

References:

1. Mandelbrot, Benoit. *The Fractal Geometry of Nature*. NY: W.H. Freeman, 1982.
2. Berry, Ernest B. *TEXTILE DESIGNING - PURE AND APPLIED*. NC: School of Textiles, UNC, 1973.