Stewart Coffin Puzzles
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For decades, I gave college level lectures in mathematics, without notes. The sheer logic of the subject drove my remarks rather easily. However, for today’s talk, the sequence seems less obvious, and as I approach age 80, I’ll lean on my notes and read them to you.

First of all, I wish to thank the Emeritus College, Charles Cobb, Bibie Cronwall and Jacob Waterborg for inviting me to talk about the puzzles made by Stewart Coffin. Over forty years ago I saw Coffin’s iconic creation, the Jupiter puzzle, in the office of a math colleague at Hampshire College. Somewhat surprisingly, this is one of the simplest of all his puzzles. About the same time, I heard that acrylic puzzles designed by Coffin were being sold at the Museum of Modern Art’s gift shop. When my mind was more agile, I found these relatively easy to assemble. I laid in a bunch, and our eight year old son Ethan sold them at the Amherst (Massachusetts) farmers’ market. This one is called “Cetus”, and you’ll have a chance to try to take it apart and put it together after my remarks. (“Cetus” is the name of a stellar constellation, and also represents a sea monster in Greek mythology.) Here’s another one, called “Aries”. These puzzles consist of six identical pieces, yet they assemble into beautiful designs.

For now, let’s back up a bit and review Coffin’s odyssey. Born in 1920, he grew up in Amherst, Mass., graduated as an engineer from U. Mass. there, and then worked on the Whirlwind computer project at MIT. An avid outdoorsman and canoeist, he explored the waters of New England and eastern Canada over a period of many decades. Leaving engineering in 1961, he developed the first commercially promoted and patented fiberglass, aluminum and epoxy composite canoe paddle. He was soon also making and selling paddles, canoes and kayaks. In the 1950s, as an instructor in whitewater canoeing with the Appalachian Mountain Club, he met his wife, who was his student. Together, they compiled the first edition of the New England Canoeing Guide. Though his father had fostered an appreciation of nature and the outdoors, his father also sparked an interest in matters geometric by giving him a copy of Hugo Steinhaus’ classic book, _Mathematical Snapshots_. Some time in the 1960s, the fumes from his paddle and boat business permeated a rabbit carcass in his workshop, and when cooked, it had a strange flavor. The family called it “stinky rabbit” and it marked an end to his canoe and paddle business. Having three young daughters, Coffin was also worried about the epoxy fumes arising from his canoe paddle work. He quit that business, and looking around or something to do, he tried his hand in 1970 at making some wooden puzzles. Thus began a career to the pinnacle of which he rose. Stewart Coffin is now recognized as the world's finest designer of polyhedral interlocking puzzles, and he has thought up well over 270 designs. In recent years he has developed “misdirection” [2] type puzzles, such as the problem of packing these tiles into the rectangular enclosure. It’s natural to want right angles to fit into corners, but that is not at all what’s needed to solve this. In fact, it is not possible to fit those tiles so as to have their sides parallel to the sides of the enclosure.

Coffin’s first real puzzle was the Hectix [2], of which this is a wood version. By chance, he was introduced to a fellow not far from his home, who professionally linked developers to companies interested in making and selling games, puzzles, etc. The 3M company got interested in Hectix and was licensed to produce and sell it. They manufactured in plastic some 20,000 of them, but found it too costly to assemble: Union labor commanded good wages. So Coffin offered to have his three daughters
assemble them for four cents apiece. He paid the kids two cents per puzzle. They could turn out two or three a minute, and before long a truck came to take the assembled puzzles back to 3M, which sold them in stores for five dollars each. Coffin recalls that eventually about 100,000 were made and sold. Decades later, the youngest daughter traveled to New Zealand, and visited a hostel. There on the mantle was a Hectix! She astounded the proprietor by claiming that she could solve that puzzle blindfolded. This self-imposed challenge she carried out with ease.

Turning back to wood, one of Coffin’s earliest puzzles is the “Spider Slider”. It’s made of basswood and consists of six identical pieces. The coloring assists its assembly. The puzzle could be regarded as a precursor to the famous Jupiter puzzle, which may be viewed as his first real, wood puzzle. It’s a beautiful structure, and looks complex. Yet it is one of the easiest of all his puzzles to assemble.

Rather more difficult is The Cube, shown here. It is an intricate dissection of a cube into two identical halves and then into four identical quarters.

Next, I’ll describe one of Coffin’s more unusual puzzles, the so-called Three Piece Block. This was done on commission for Citibank, whose publicity agency (Bursten-Mosteller, I believe) wanted a gift puzzle in the form of the Citibank logo at the time. Some of you might recall seeing this in old advertisements in the New York Times. As John Rausch, the premier chronicler of Coffin’s puzzles wrote, “The company wanted a simple puzzle incorporating this pattern for some sort of promotional scheme. So the arrangement of six of the blocks was already determined. All that was required to complete the design was the addition of four more blocks in a sort of triangular pyramid and a judicious choice of glue joints to make it into an interesting interlocking puzzle. The company got what they wanted - except for one thing. It turned out to be anything but simple! Do not be discouraged if you cannot solve it straight away - it has baffled experts!” You’ll get a chance to try your own hand at this puzzle after my remarks. I’ll also have some other of his puzzles for you to try out, such as the following.

Here is a genuinely simple puzzle by Coffin. It’s an old, classic design, called the Star [2]. It’s not too difficult to see how to assemble it, but getting one’s hands to grip the pieces for assembly is another matter entirely.

Another puzzle, simple in appearance, resembles the SOMA cube for those who remember that classic dissection of a cube. It’s the “Half-Hour” puzzle and as the title suggests, is rather more difficult than the SOMA cube. In fact, the Half-Hour puzzle has just one, unique solution, whereas the SOMA cube has 240 different solutions!

Here is a beautiful Coffin design called “Second Stellation”. It fell apart while I was preparing an exhibit for the Linda Hall Library last year, and it took a week or two (off and on) for me to reassemble the thing. At age 78 I was no longer so adept at solving these as I was in the 20th Century!

Beyond being celebrated as the world’s leading designer of interlocking puzzles, Stewart basically opened up the field, which now has many practitioners. He is appreciated for not only sharing his designs and woodworking techniques, he also shares the jigs vital to some of his creations. His book, _Geometric Puzzle Design_, explains how many of his puzzles are constructed. It’s a classic.

You might think advanced mathematics is a skill necessary for design of these ingenious creations. Not so! Geometry, trigonometry, and combinatorial mathematics are as much as he’s used. His main assets have been a gifted imagination, cleverness in design, and psychology. This is a bright and generous individual, and our world is richer for his efforts.