HYPERSEEING

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Cover Photo: Snow sculpture by Dan Schwalbe, Richard and Beth Seeley, and Stan Wagon, based on a David Chamberlain sculpture. Photo, Dan Schwalbe

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Article Submission

For inclusion in Hyperseeing, authors are invited to email articles for the preceding categories to: ***hyperseeing@gmail.com***

Articles should be a maximum of four pages.

COOL JAZZ:
GEOMETRY, MUSIC & SNOW

DAVID CHAMBERLAIN
DAN SCHWALBE
RICHARD AND BETH SEELEY
STAN WAGON, MACALESTER COLLEGE, ST. PAUL, MINNESOTA


Photo: Rich Seeley


Photo: Dan Schwalbe


Photo: Rich Seeley

Geometry, Music & Snow: Cool Jazz at night

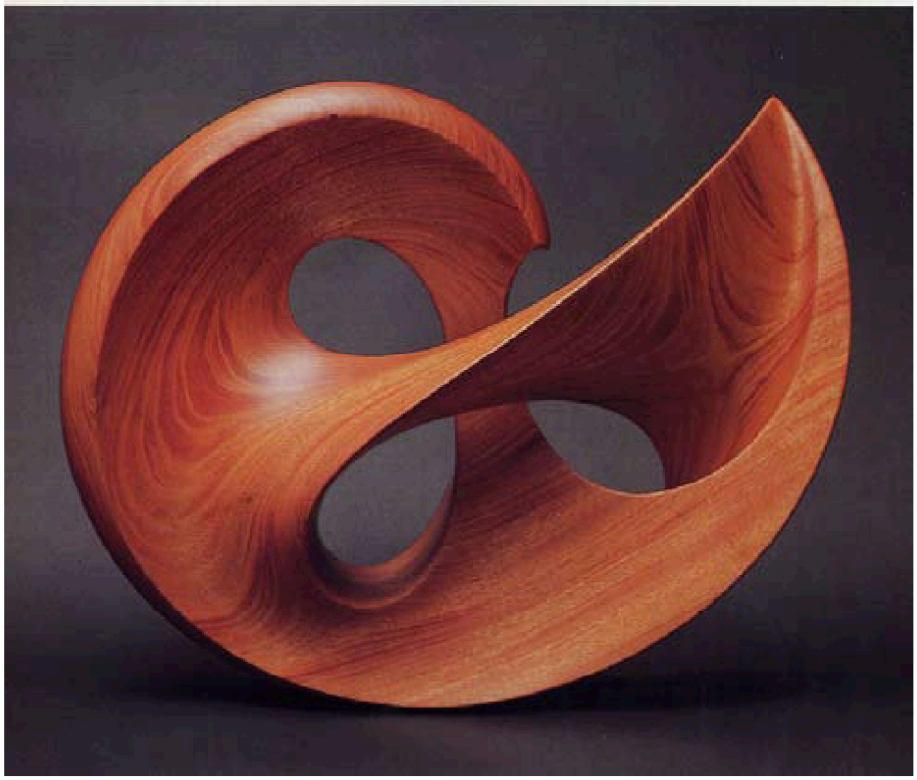
For several years our Minnesota-based team has taken part in the annual snow sculpture competition in Breckenridge, Colorado. The core of the team is Dan Schwalbe and Stan Wagon; over the years they have welcomed sculptors Helaman Ferguson, Robert Longhurst, Bathsheba Grossman, Brent Collins, and Carlo Séquin to the team. For the January 2007 event they asked David Chamberlain to try his hand at this unusual sculpting medium, in the hope that he could modify one of his pieces to suit the scale and the demands of the block that the town provides. David's work is abstract, but with a connection to familiar forms that we thought would appeal to the public and the judges at this event, and also with a connection to geometry, which has been the theme of our team ever since we started in 1999.

David's work is an intriguing overlap of natural organic and geometric forms, each with a serious foundation in the mathematics of form and space. However, his work also represents an attempt to go beyond the formulas and regular physical dictates of dimensional geometry: to stretch that which is produced by the mathematical mind into something newly created, adapted, and influenced by the emotional psyche. Music, he feels, is the obvious analogy: a compositional form based in physical principles that evolves, artfully, into a highly expressive and emotional language.

He admits that his work can be considered a reaction against architecture (a field in which he holds two degrees) in that we find little symmetry and few planes, parallel lines, or right angles — the all-too-predictable elements of geometry. He prefers instead to work more poetically and whimsically, to trust in a personal esthetic of playful proportion, curvilinear surfaces, spiral edges, and transitional forms — to write beyond the score.

The event attracts teams from around the world, in part because of the superb quality of the snow blocks. The 12-foot high blocks are made from snow that is manufactured at the local ski area. This means that the snow is extremely dense: one needs very sharp tools to cut into it (power tools are not allowed). The sculpting teams are well taken care of, with all meals and lodging provided. Once the sculptures are complete, after four-and-a-half days of work, thousands of people walk through the site to view them firsthand.

We felt that one particular piece that David had created in ceramic (a similarly white, tender, and granular medium) would be a perfect



Adagio, a sculpture in mahogany by David Chamberlain

encountering sensual and elegant surfaces in the process, and then returning to its familiar home. This reminded Stan of the theme-and-variation concept, so we used Cool Jazz as the title. Geometrically the shape is a torus derivative, and one of the bounding curves forms a knot variation on the torus. One intriguing aspect is that each of the large spherical bulges on the lower end, as one follows them around, becomes the inside of the opposite bulge. For us, these spherical parts played a large role as anchors for the central loop.

As our team, which included Rich Seeley as sculpting member and Beth Seeley as the fifth member, who can advise and help with snow removal, but cannot sculpt, gathered

basis for a design in snow. He called it Embouchure, and it suggests, among other images, a stylized treble clef. It changes character with varied viewing perspectives: in one direction it is a recognizable musical icon, but from other viewing directions one sees how the upper reach of the shape extends in unexpected, even surprising, ways. In short, it can be viewed as a topological escape from Flatland: as one circles the work one imagines the treble clef visiting the third dimension,

Figure 1. Each team starts with a 20-ton, 12-foot high block of specially made snow. (Photo: Rich Seeley)

in Colorado before the event, we worked on a five-foot high practice block that Stan had built. It used natural snow, which is drier and much more fragile than the dense snow of the large blocks. We got the rough shape formed but, perhaps because we worked too quickly, we did not get the inner loop even close to being right; a slight nudge caused most of the structure to collapse. As in past years, we had learned a valuable lesson about the care needed in visualizing the whole composition, even if we learned little about exactly how strong the final shape was.

Figure 3. Dan examines the marked up interior. We tried white spray paint, but that didn't work! (Photo: Ming Cheung)

Figure 2. The shape emerges. The purple sail is used to shade the sun during midday. (Photo: Rich Seeley)

We started on Tuesday, using our tried-and-true tools of ice-fishing drills and ice saws to cut the 20-ton block down to the rough form right on schedule. On Wednesday night Dan made a critical announcement. Perhaps thinking of previous years when we had made sculpting errors, he noted that, "Our work in the next six hours of sculpting will determine success or failure." His point was that this stage was critical and we would not be able to recover from any error.

We knew that Dan was right, so we spent the first of the six hours, Thursday morning from 7:30 to 8:30, doing absolutely nothing! Instead, we had a spirited discussion of whether we should abandon our plan of a 10-inch high base. We decided the base had to go, since it served no purpose and its elimination would reveal much more of the sculpture. Of course this meant that some aspects of the shape had to change, but David was quite good at visualizing such changes and communicating them to us. Jazz implies improvisation and we did indeed improvise in some large and small ways as the work progressed. Our work in past years was seriously restricted by the symmetry that mathematical shapes often have. This year there was no rigorous symmetry in the design; while the geometry did provide

Figure 4. Cool Jazz and its smaller cousin, made in ceramic. Having a model to work from is very helpful. (Photo: Rich Seeley)

Figure 5. Cool Jazz in the afternoon. (Photo: Stan Wagon)

some restrictions, we could thicken or move various components as we wished, which was challenging, but also liberating.

The carving out — very slowly and carefully — of the correct topology on Thursday and then the smoothing of all curves and surfaces on Friday went well. But the moment of truth was yet to come. We retired for a few hours sleep at 10 p.m. and returned at 4 a.m. on Saturday to do some final polishing before dawn (this is the one night that teams are allowed to work through the night). Our plan was to remove two struts that we had left in place to support the delicate structure while we worked it. The sculpture now looked quite beautiful, but we had to remove the struts. Would it stand, or just collapse in a heap?

In optimistic moods we think that snow of this density is just about as strong as wood in tension or stone under compression. This shape would be relatively stable in those materials, so why not in snow? Yet snow does have some delicacy and we have seen some fatalities over the years — sculptures that collapse within hours of completion. Indeed, this year there was one failure when the home team from Breckenridge balanced a giant snowball on a delicate sine curve. It looked good, but crashed after about six hours as the ribbon was not massive enough to support the weight. And we suffered a fatality of our own in 2003 when "Whirled White Web" fell apart a few minutes after the judges completed their evaluation. We were fortunate, as the work was deemed good enough for second place despite the disintegration.

But from a pessimistic view we had plenty to worry about. We had very little negative curvature (saddle points) in this design, and we believe that negative curvature helps to stabilize a delicate structure. And we had the opinions of other sculptors that our piece would surely stand, but also some who said: "Why risk it? It's beautiful now and it would be such a shame if it just crashed." Our main concern was the weight of the central loop. It was supported nicely by the two anchoring bulges, but there was a lot hanging right in the center. Still, temperatures were nicely low

(the snow a few inches inside the structure varied from 14 to 18 degrees F.), and we wanted to go for it.

At 7 a.m. (the event ends at 10 a.m.) Dan took his ice saw to the first of the two struts, directly under the inner loop. There was no pressure on the saw whatsoever. "That was anticlimactic," he observed. We then spent a half-hour smoothing out the surfaces and prepared for the final cut of the horizontal strut, which tied the loop to the smaller of the two bulges. Stan took the saw to it and after a few strokes there was a loud cracking sound. His heart stopped as he backed away, but yet nothing moved! Switching to a keyhole saw he gently sliced through and still there was no pressure on the saw. Once the cut was complete, it seemed that we were home free. But we waited for a half-hour to see if the small slit would close up. It did not. Great relief! It appears that there was a little tension in our spring, and the release of the horizontal strut caused a micro-adjustment in the mass of snow.

We very carefully continued with our finish work, quitting at 10 a.m. and feeling very pleased. We had sculpted a sophisticated and pleasing form, with clean lines, great white sheets, and a musical message and theme. The large sweeping surfaces look especially good in snow. The town leaves the sculptures up for two weekends, and our piece changed not at all after nine days. Traditional realistic sculpture with fine detail suffers in the sun, as such detail can only lose clarity. This is one reason why we feel that geometric sculpture works very well in this medium.

The five judges liked our work, awarding it second place among the 14 entries. We were pleased, but the real reward is looking at the finished piece, knowing that we stretched ourselves artistically to accomplish in four days something even better than what we had been dreaming of for almost a year. And there is also the excitement of working in three dimensions with a medium that is unique in sculpting.

One of the observers put it best: he has visited our work every year and commented that our mothers must have been scared by a right angle when we were born, as our team seems to have a fear of such things. Basically correct. That is, we start with a perfect cuboid, and try to shape, round, bend, and perforate it so that it exemplifies smooth flow. In short, we like to bend snow into an elegant form, and that means no right angles.

For more information on the sculpture: http://stanwagon.com
For more information on the work of David Chamberlain:
http://chamberlain-studios.com

Figure 6. The band of sculptors after a hard work week. From left: David, Stan, Beth, Rich, and Dan