Symmetry: Culture and Science
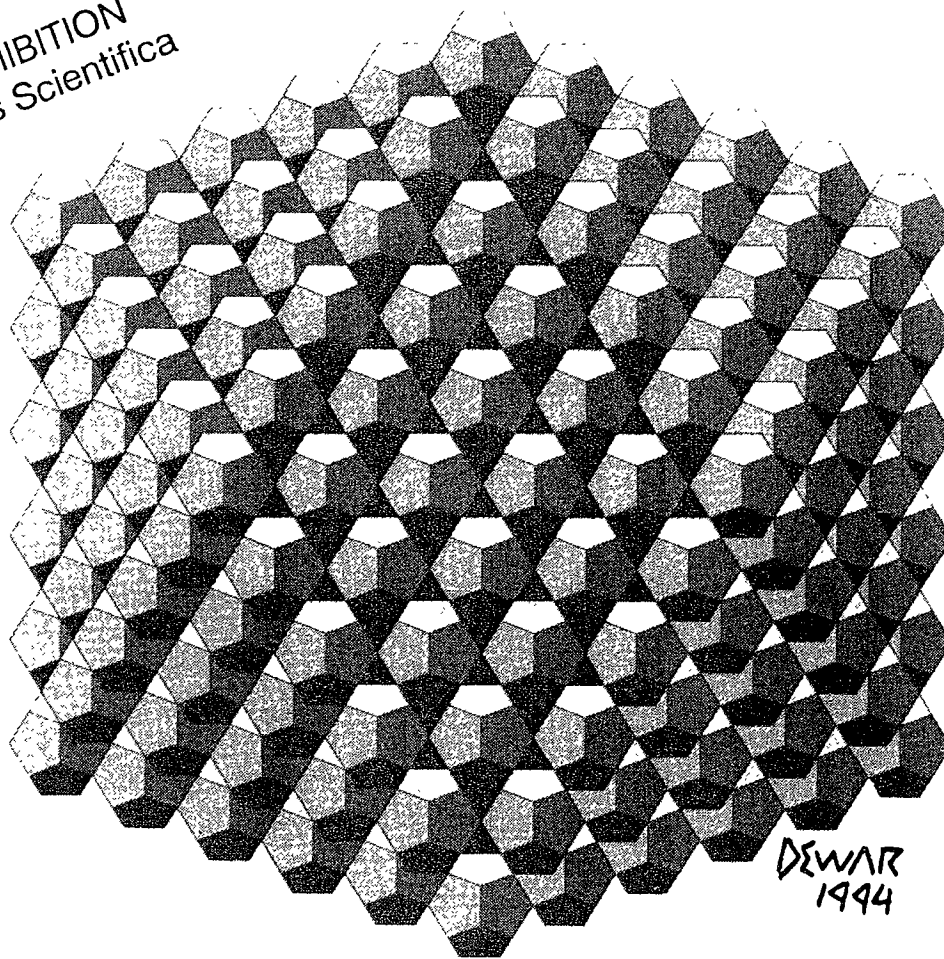
Symmetry:
Natural and Artificial, 4

EXHIBITION
Ars Scientifica

DEWAR
1944

Third Interdisciplinary Symmetry Congress and Exhibition
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Notes on Hexagon of Saddles, 1995

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The hexagonal constellation of saddles in this sculpture is actually Sherk's second minimal surface pulled into a closed loop. See Stewart Dickson's article in the special Visual Mathematics issue of Leonardo (vol. 25, Nos. 3 and 4, 1992) for a Mathematica Graphics 3D rendering of Sherk's surface. This surface is amenable to indefinite linear extension by adding saddle modules, but can only be elastically drawn into a closed loop in even-numbered variants. I tried an articulation of four saddles, but this configuration didn't allow adequate tool clearance for physical execution. The hexagonal articulation proved aesthetically optimal as well as practical (an octahedral one being merely a redundancy of content without qualitative justification).

Closure of the Sherk surface into a loop requires a systematic deformation which can be essentially visualized by imagining a linear set of six contiguous spheres set in motion to form a regular hexagonal pattern in which the first and sixth at the former open ends lose their identity as such when they touch and fall into the serial contiguity of the entire set.

The Sherk surface has four edges paired across its longitudinal axis. These come into precise orientations integral to the hexagonal closure of the surface in my sculpture. One becomes the sinusoidal edge of the window at the center of the piece; and its axial opposite becomes the sinusoidal edge at the sculpture's periphery. The other pair become the level, triangulate edges on either face which are rotated 180 degrees from each other so that as you peer through the piece from face to face a perceptible six-pointed star is formed by their interlacing.

Composing the piece I knew I was aligning saddles in a hexagon. I did not know this was in effect an isomorphic closure of the Sherk surface for it was then unknown to me as such (though I well understood how saddle modules could be indefinitely extended in straight progression having featured manageable sets of them in earlier work).

This sculpture was carved from a sequence of boards laminated after pre-evacuating the interior voids of the hexagonally contiguous spheres mentioned in the second paragraph. For me it not only has the exquisite economy of minimal surface motifs, but no obvious continuum from weaker to stronger perspectives, a shortcoming not easily overcome in my experience of sculpture. Its continuum of coherency varies instead from perspectives of seemingly indecipherable strangeness to others with an appearance of transparent inevitability. It will eventually be available in a limited edition of aluminum casts.

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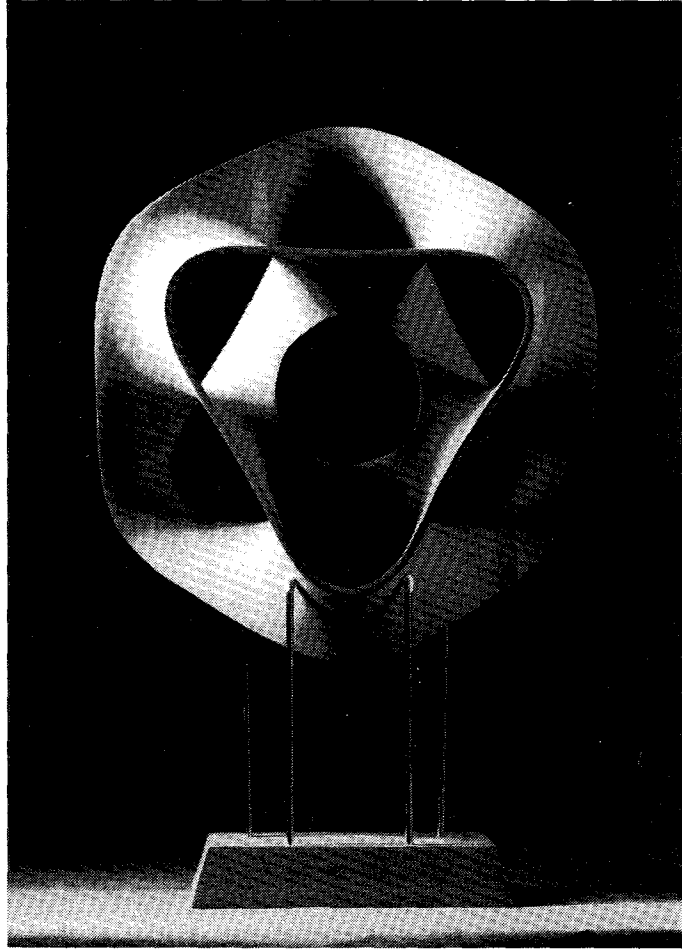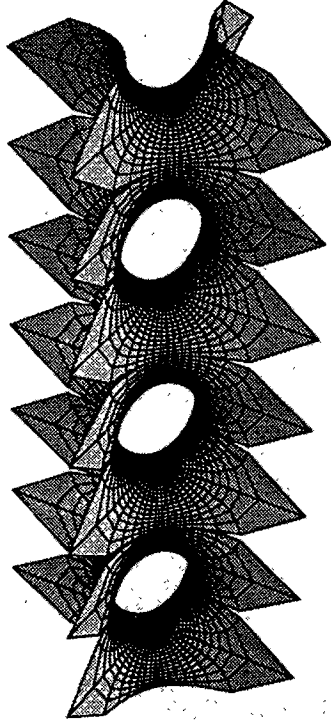
Scherk's second minimal surface. Mathematica Graphics3D[ ] rendering from the global Enneper-Weierstrass form [29].