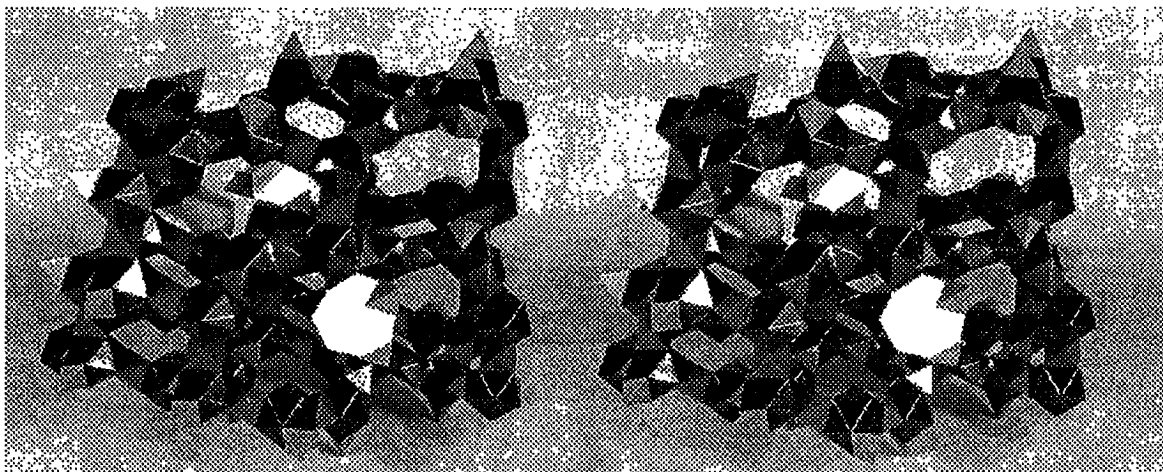


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Sculpture Exhibit

My sculpture, which I made in 1978, is one of a series that I made to investigate crystal structures made of carbon atoms which I hypothesized were shaped like icosahedra. This piece represented an amorphous carbon crystal such as bituminous coal or soft coal which contains volatile hydrocarbons. As a young man growing up in Chicago, where I was born, I had the privilege of stoking the basement furnace with soft coal in the early morning. The coal did not completely burn up and disappear. Rather, a chunk of crystalline carbon was left that was unfondly referred to as a *clinker*, because it had to be removed from the furnace. This sculpture is like a clinker except for the atomic density which is



Amorphous carbon, 1978, Sculpture by Robert E. Dewar, Cross-eyed stereo pair, Structure of Matter series, 26 in. x 30 in. x 33 in., pasteboard and resin, acrylic paint, maquette .

about twice what it should be, but the geometric principles are the same.

I remember being so amazed that I could construct the icosahedron-octahedron-icosahedron bonding scheme from any random face and still find a way to come back to the starting icosahedron in a loop. This is why I have chosen to exhibit this particular piece at the Fourth Interdisciplinary Symmetry Conference because it seems to perfectly fit the theme of Order/Disorder. Although the icosahedra are spatially disordered, the orientation of each icosahedron is the same. Therefore there is five-fold symmetry order in this structure and it is conceivable that it could be observed in an ordinary clinker using x-ray crystallography with a sufficiently short wavelength. Such an observation would be tantamount proof of my hypothesis.

My sculpture has several polyhedron elements which to me represent the following atomic elements:

icosahedron = carbon atom (12 nodes)

octahedron = space

truncated tetrahedron = oxygen atom (16 nodes)

dodecahedron = sulfur atom (32 nodes)

tetrahedron = hydrogen atom (1 node)

As an artist/sculptor I am interested in extending my vision into the invisible world of atoms and molecules. I believe there are simple and beautiful geometric structures which characterize all atoms, and that these structures govern how molecules and crystals are formed. Over the years I have studied scientific writings and textbooks and I have found many ways to support my hypothesis. I hope someday to find the time to collect all of my observations in the form of a book.

Reference:

Dewar, R. E. (1982), Sculptures of Polyhedral Networks based on an Analogy to Crystal Structures Involving Hypothetical Carbon Atoms, *Leonardo*, Vol. 15, No. 2, pp. 96-103, 1982