



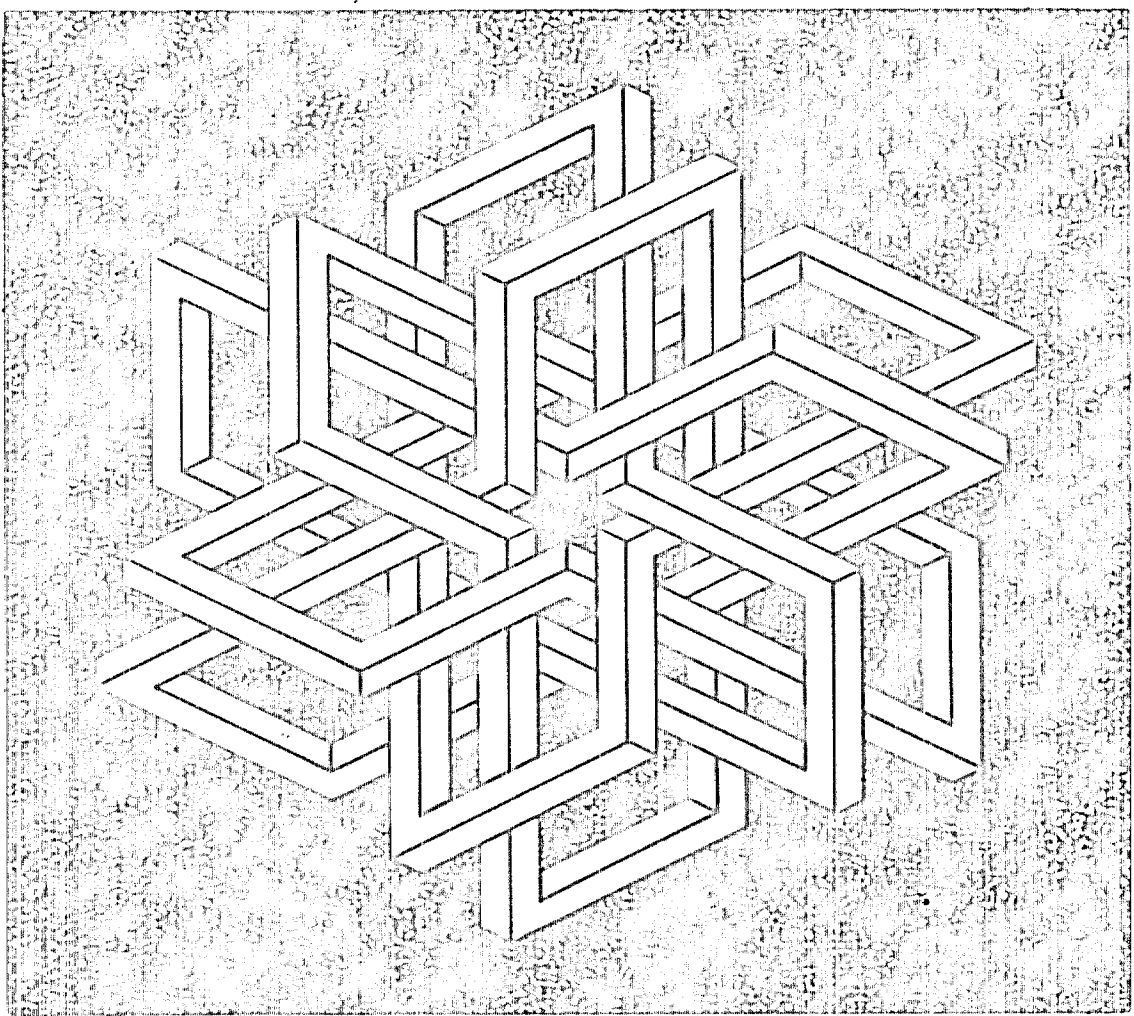
# Symmetry: Culture and Science

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JAPANESE SYMMETRY THROUGH THE EYES OF A VISITOR

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Lest the reader of this Abstract be misled by the title, I know that it is very risky to generalize. Admittedly, this presentation stems from superficial and accidental observations during a recent one-month JSPS Visiting Professorship in Japan, some reading, and a lot of discussions with Japanese friends.

The simplest symmetry considerations of the geometrical kind result in clear-cut yes/no type answers which is certainly not the characteristic Japanese way to respond to questions of any degree of complexity. Many maintain that the Japanese do not like symmetry, and, according to the great late physical chemist Sanichiro Mizushima [1], prefer irregularity to regularity. The Japanese are good friends of Nature and do not want to change it to make any part of it artificially symmetrical. However, the Japanese do appreciate the beauty which comes from symmetry and regularity, if these are natural.

Considerations of the shape of the sugar candy Kompeito are relevant here [2]. Kompeito is roughly spherical with many conspicuous horns. Research into the development of the shape of Kompeito was part of the so-called Terada Physics. The great Tokyo University Professor Torahiko Terada used to discuss familiar, everyday topics with sophisticated means. The final conclusion on Kompeito, which is of Portuguese origin, was that "symmetry involving spherical shape is favored in the West while lack of symmetry is felt more preferable in Japan".

However, even rigorous, geometrical symmetry is quite common in Japan, suffice it to mention its conspicuous appearance in family emblems [3] and company logos. Geometry has played a conspicuous role in the history of Japanese Culture as discussed by Koji Miyazaki [4,5].

There is a great abundance of rich symmetries in Temari patterns [6]. One of the decorations I have come across follows the semiregular polyhedral shape of a truncated icosahedron. I have also observed this shape as a climber in a Fukuoka Kindergarten. These appearances have obviously predated the discovery of the stable  $C_{60}$  molecule, known today as buckminsterfullerene, in the mid-eighties. The first description of such a molecule appeared already in 1970 by Professor E. Osawa in the Japanese chemistry journal Kagaku [7].

Also important, symmetry is much more than just the rigorous, geometrical kind, and its meaning includes harmony and proportion. In this sense the Japanese Garden, among other things, does belong to it too. The Japanese art of arranging flowers, Ikebana, is another case in point.

The presentation will be abundantly illustrated by color slides collected, during my JSPS-sponsored visit, in Honshu, Kyushu, and Hokkaido, including pictures from the Katsura and Shugakuin Imperial Villas in Kyoto.

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