

The illustrations and information contained in this book are only about equilateral triangles and not other triangles like right-angled triangles, isosceles triangles and scalene triangles in all their variations. Whereas a right-angled triangle can have different length sides and hence be different shapes, the equilateral triangle is the most stable form with its fixed structure of three equal sides and three equal angles. Its distinctive structure means we find it in lots of even complex structures and in many mineral and vegetable forms and structures found in nature, ranging from the clover to the oleander. The equilateral triangle is one of the three basic forms, along with the circle and square. A full pattern of equilateral triangles touching on a surface creates a structured field in which endless other combinatorial forms may be constructed, as we can see in many Arab, Chinese, Persian and Japanese decorations. Many styles of decorative art are based around a triangular structure. A triangular (or tetrahedral) structure also gives the overall formal balance to lots of works of pure art. Nowadays, many constructions are based on a triangular structure and the modules deriving from it; we might, for example, mention the modulated constructions designed by Buckminster Fuller and a number of works of architecture by Wright and other young architects or classical constructors. An equilateral triangle can easily be found inside a circle by measuring its radius six times around the circumference and joining its three equidistant points by three lines. An equilateral trian-

gle can be found inside a cube by joining the opposite ends of the three lines meeting at any apex. A cube has a tetrahedron inscribed inside it.

Understanding every aspect and formal-structural possibility of this simple, basic form is a great help to a designer. Due to static reasons, design-construction practicalities and economic factors connected with manufacture, transport and assembly, a modulated construction is now easier to design than the kind of visually striking-pictorial-sculptural construction that used to be built. The most popular structure in these cases is square-based, but it is also the blandest. On the other hand, triangular and tetrahedral structuring often produces more unexpected results, ideal, for example, for designing an exhibition facility which must really stand out in its setting.

In the field of technical-artistic education, experimentation with triangular forms and structures is common practice in design schools. A lot of the illustrations in this book are the result of experiments like this carried out in various schools.

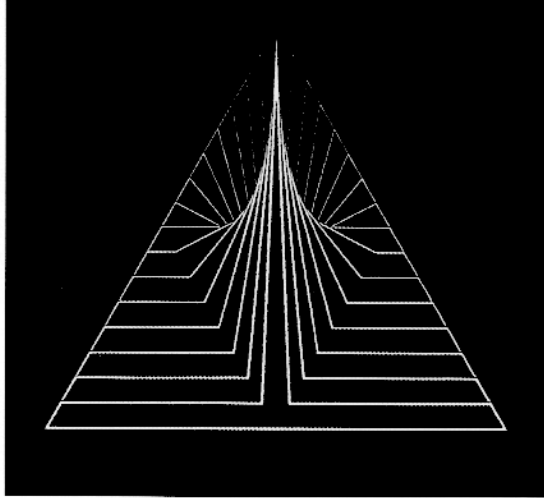
Coherent forms may be constructed in model form, using sheets structured in the form of equilateral triangles, by cutting the sheet along the structural line and folding it according to the angle of the equilateral triangle.

One of the strangest traits of this kind of triangle is that, when drawn over a sphere covering one eighth of the space, it will always be an equilateral triangle with three right angles.

OLD TRADEMARK



One of the very oldest trademarks used for marking ceramic products.



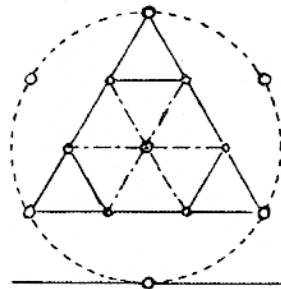
BERTOLIO

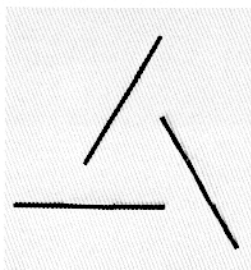
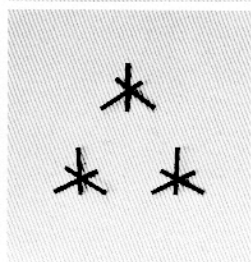
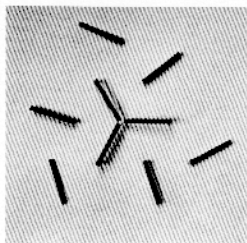
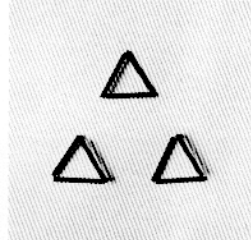
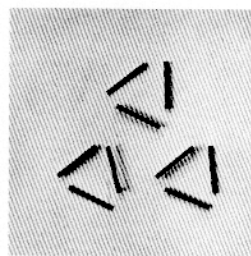
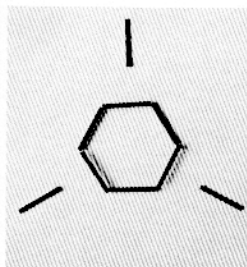
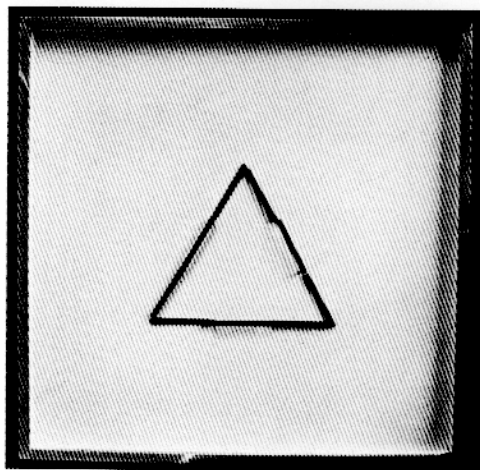
Architecture of a triangle, 1974.

BUDDHA



Statue of Buddha and its harmonious structural scheme.

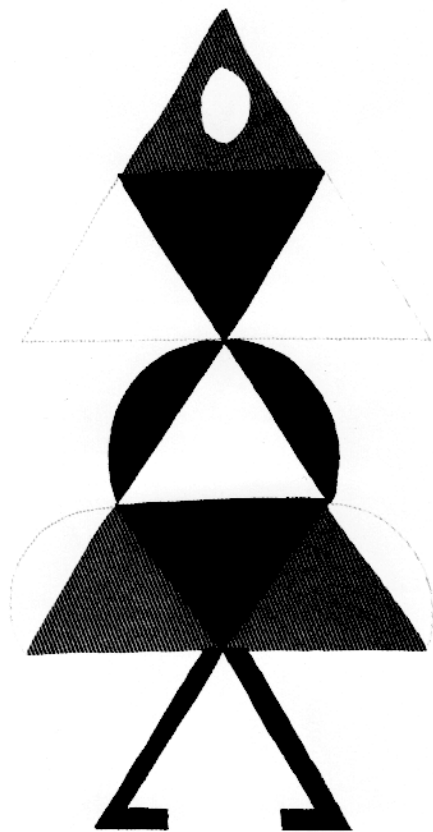




DADDA

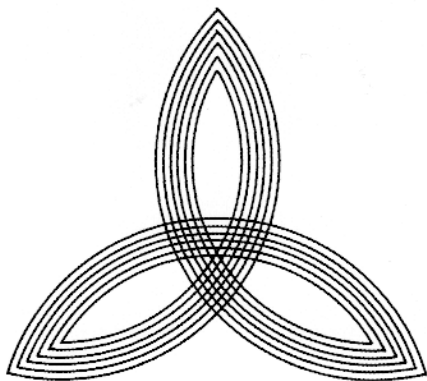
Kinetic work driven by clockwork motors, Dario Dadda, 1972.

The sides of a triangle are divided into nine equal segments and each segment is attached at one of its ends to the pin of the minutes of battery-operated clock movement lasting one year. The segments then rotate with the imperceptible movement of the fingers of the clock and turn the basic starting form into lots of other forms, since each of the nine mechanisms manipulates the positions and times.



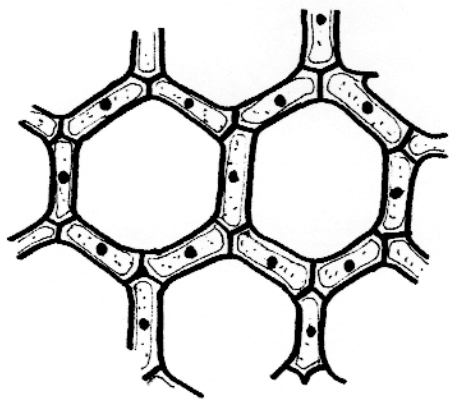
Black and yellow coloured drawing by Sonia Delaunay.

DECORATION



Decorative element drawn with a compass on a triangular base.

HYDRODICTYON



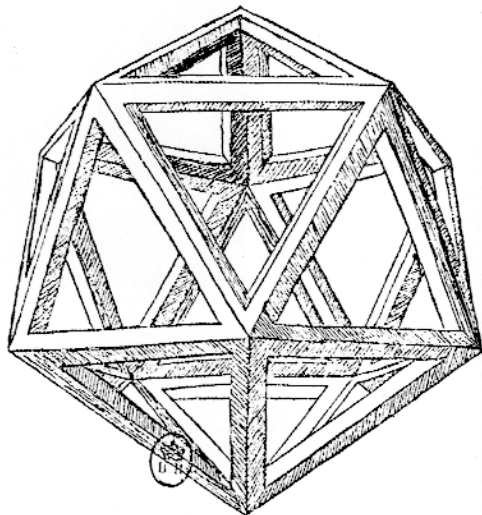
Reticular structure of a *Hydrodictyon reticulatum*.

HITTITES

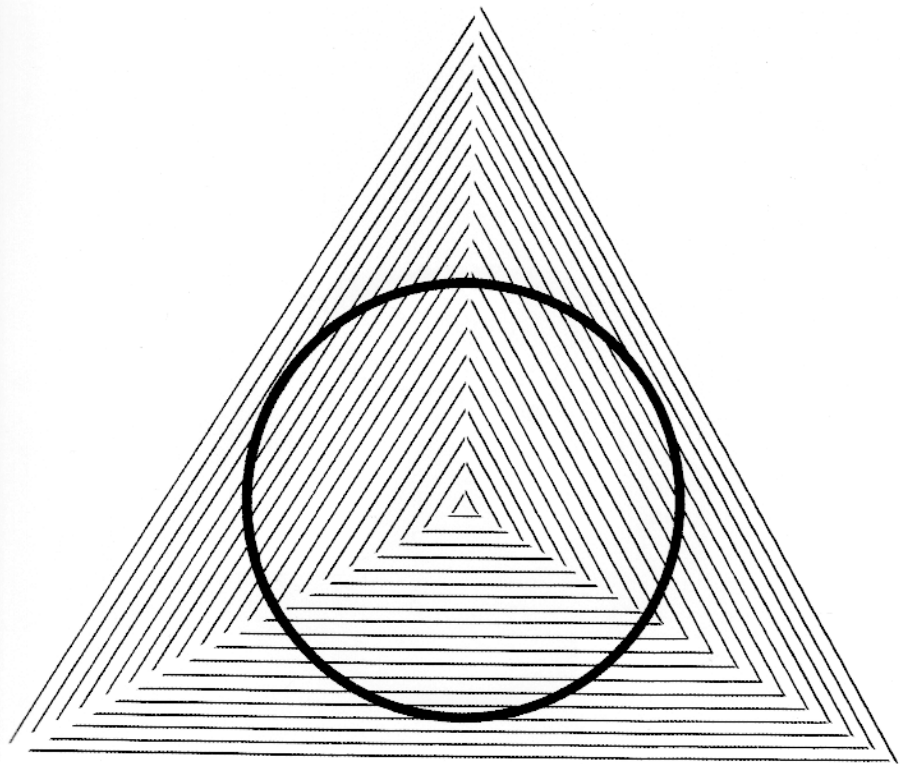


The sign for a city and for a king in Hittite writing.

ICOSAHEDRON



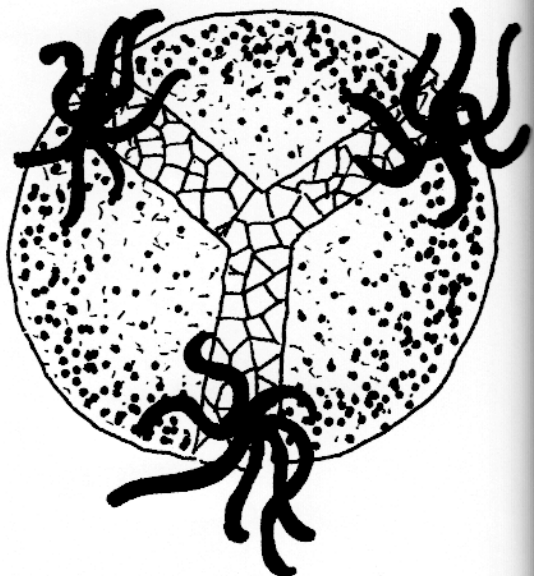
Sculptural form designed by Leonardo.



OPTICAL ILLUSION

A circle drawn on an expanding triangular surface is not perceived as a perfect circle but actually appears to be deformed.

MACROSPORE

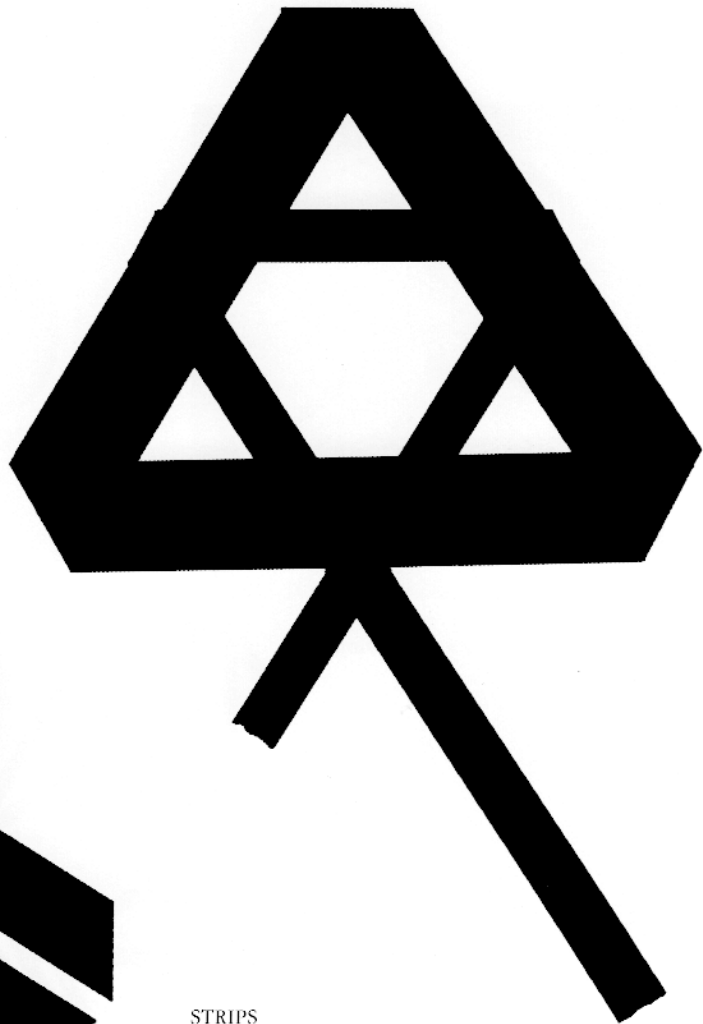


Germinating macrospore.

METEOROLOGY



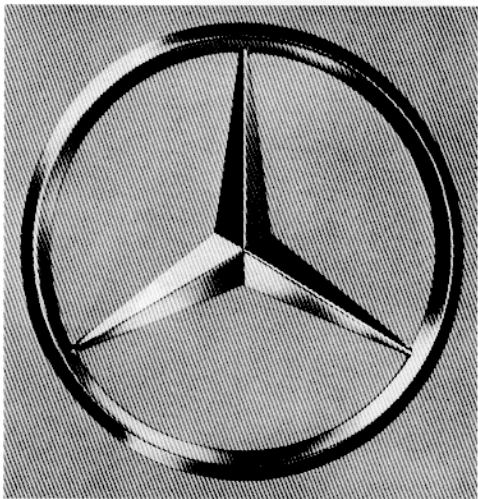
Meteorological symbols standing for: stormy sky, snowstorm, storm, hail.



STRIPS

Decorative patterns made from strips of paper.

MERCEDES

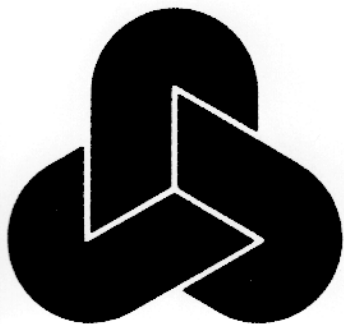


Logo designed by Gottlieb Daimler.

LOGO

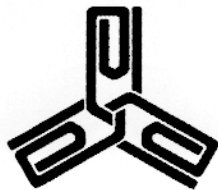
Logo for a car rally organised by Italian Television, designed by Giancarlo Pirelli.





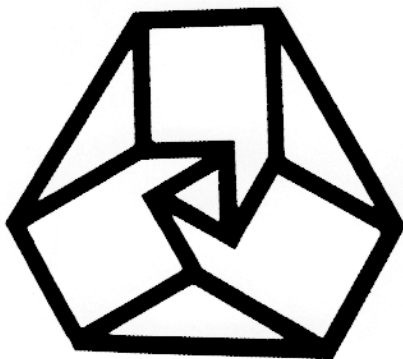
LOGO

Designed by Marcel Wyss.



LOGO

Designed by Eugen and Max Lenz.



LOGO

Designed by Yusaku Kamekura.



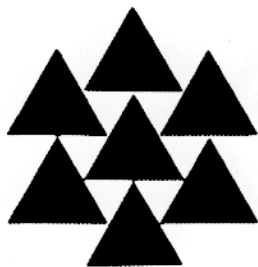
LOGO

Idea for a logo.



LOGO

Idea for a logo.



LOGO

Designed by Russel A. Sandgren.



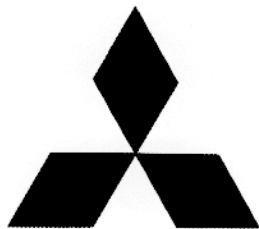
LOGO

Designed by Tom Geismar.



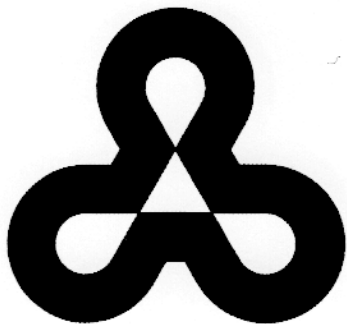
LOGO

Designed by Ilio Negri.



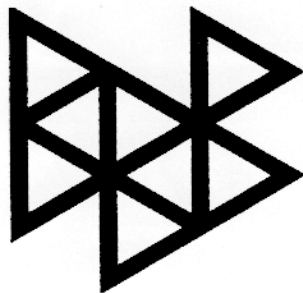
LOGO

Designed by Altes Familienzeichen.



LOGO

Designed by Neukomm and Pinschewer.



LOGO

Designed by Hans Hartmann.

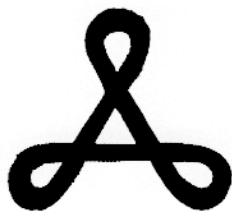


LOGO

Idea for a logo.

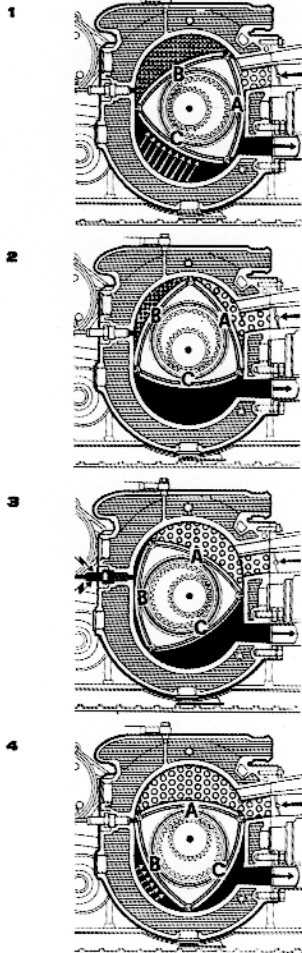
ENGINE

Wankel rotating engine driven by a triangular piston. During the first phase, side A shuts off the discharge and intake ports. B is where compression takes place and C hosts the expansion phase. During the second phase induction begins in A, B completes compression and C starts the discharge. During the third phase A continues the induction, B begins to start up and C continues with the discharge. During the fourth phase induction is completed in A, B starts up the expansion phase, while discharge continues in C.



MESSAGE

Message sign.



INDUCTION



COMPRESSION



WORKING STROKE



EMISSION

NANNUCCI

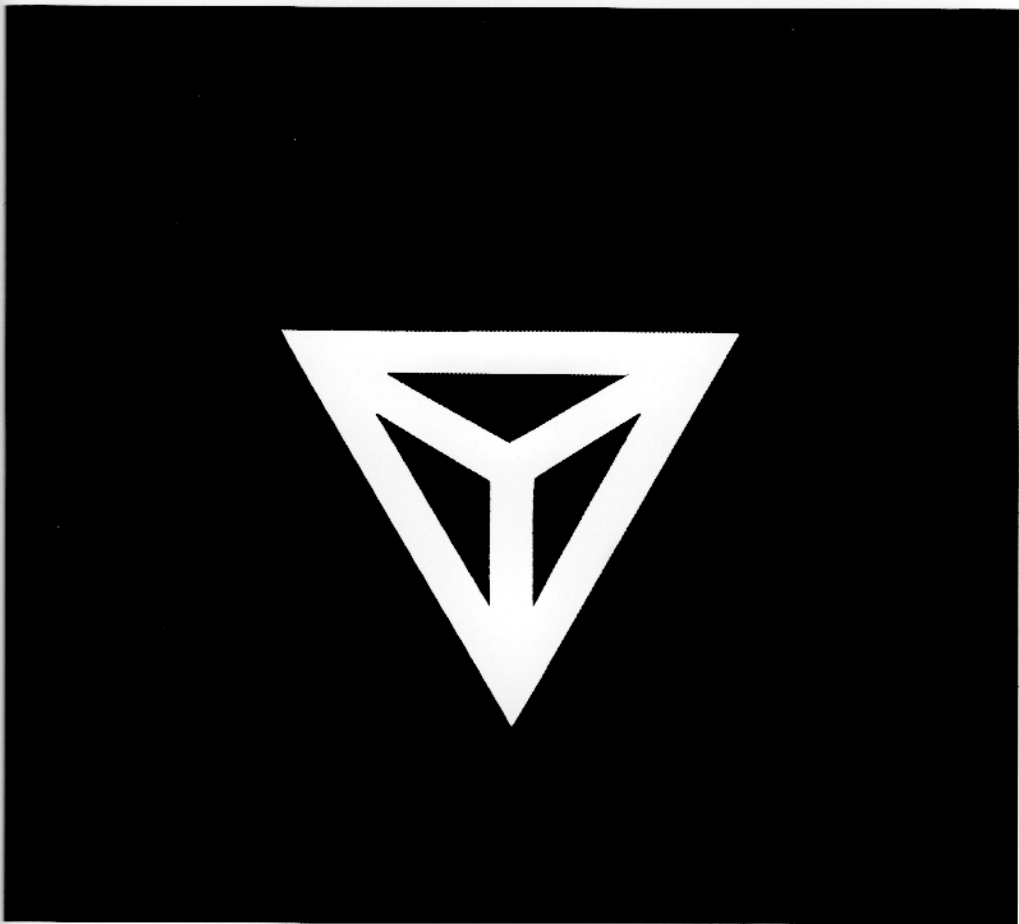


Variation on an equilateral triangle by Maurizio Nannucci, 1970.

ORIGIN



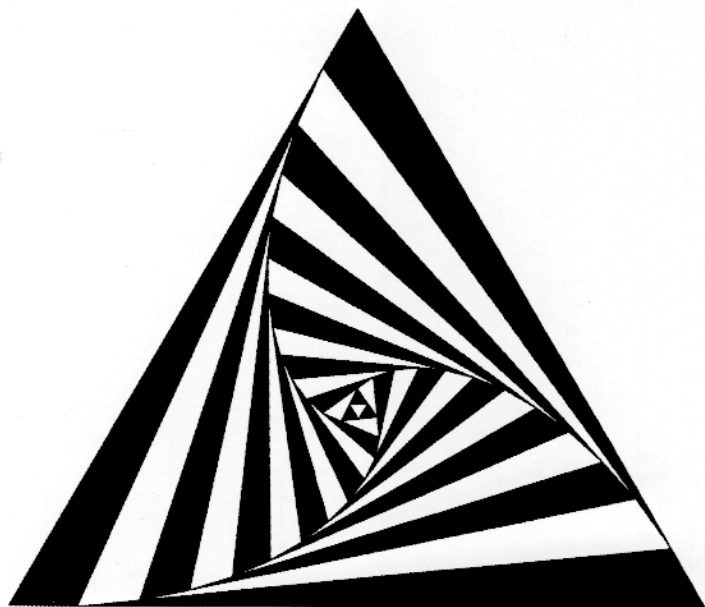
Triangular signs from which the alphabet originates.



DRAGON'S EYE

Ancient oriental symbol.

ROTATION EXPANSION



Rotation and expansion of a triangle, drawing by Franco Grignani.

RUNIC

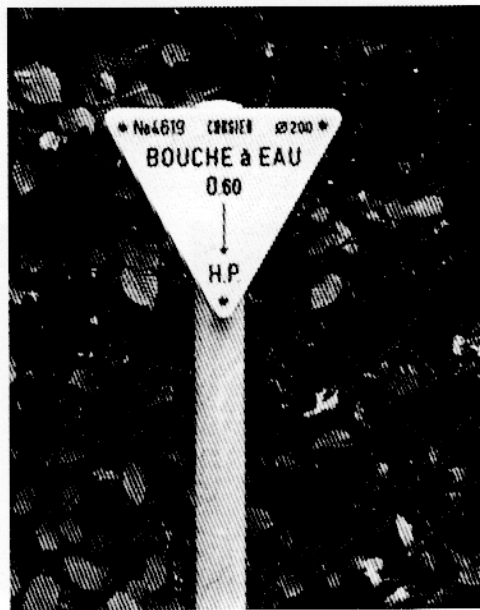


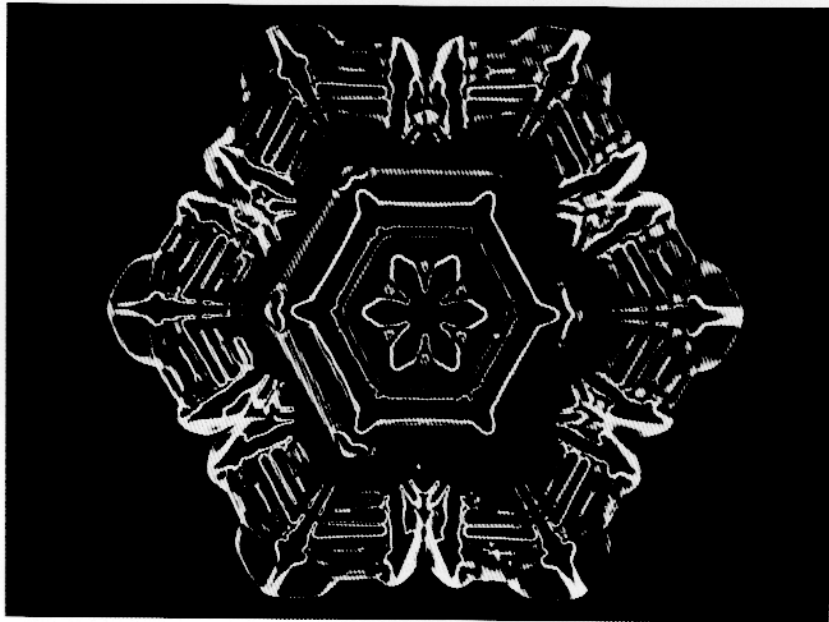
Runic symbols for man, woman, procreation, pregnancy, family, friendship, quarrel, the death of a man and death of a woman.

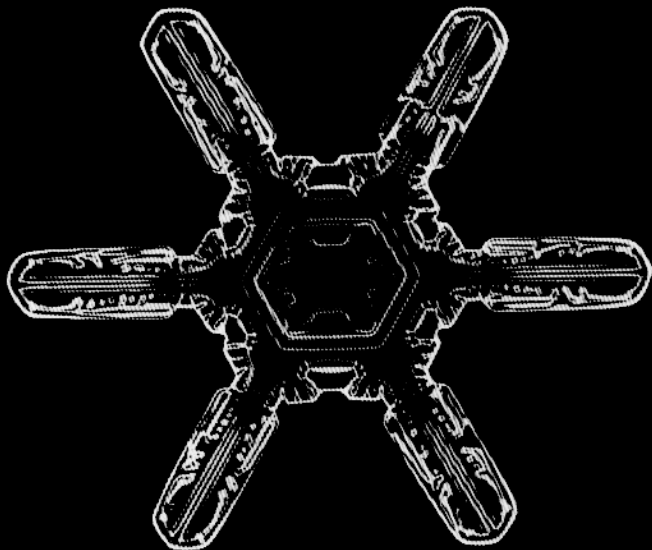


ROAD SIGNS

Signs for a campsite, water supply and school.

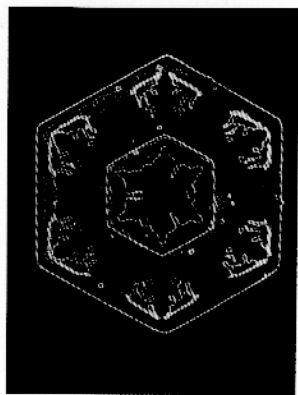


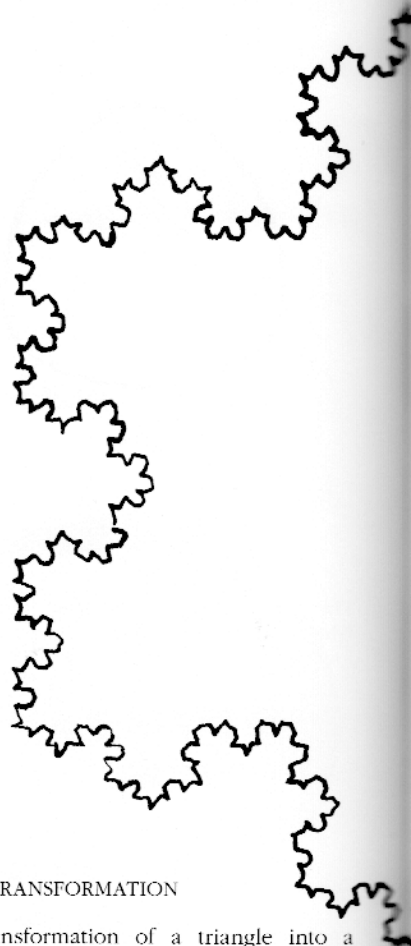
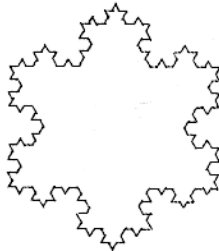
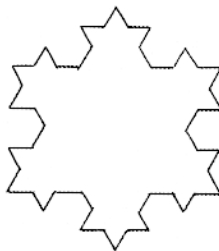
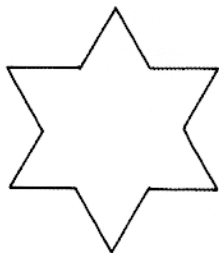
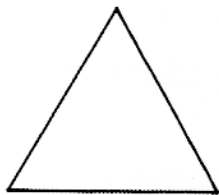




SNOWFLAKES

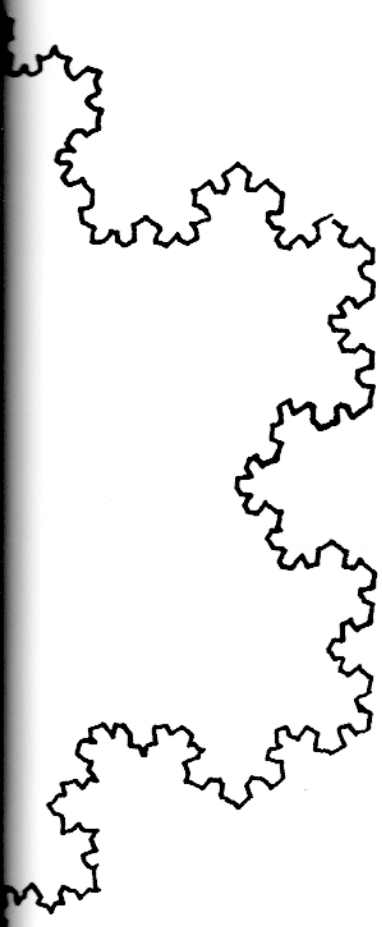
The photographs of snowflakes show how many variations nature creates while keeping strictly within a triangular and hence hexagonal framework.





GRADUAL TRANSFORMATION

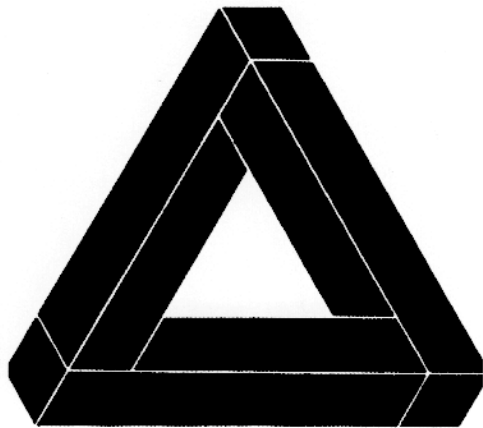
Gradual transformation of a triangle into a snowflake shape, constantly repeating the same operation of dividing up the sides and growing towards the outside of the figure.



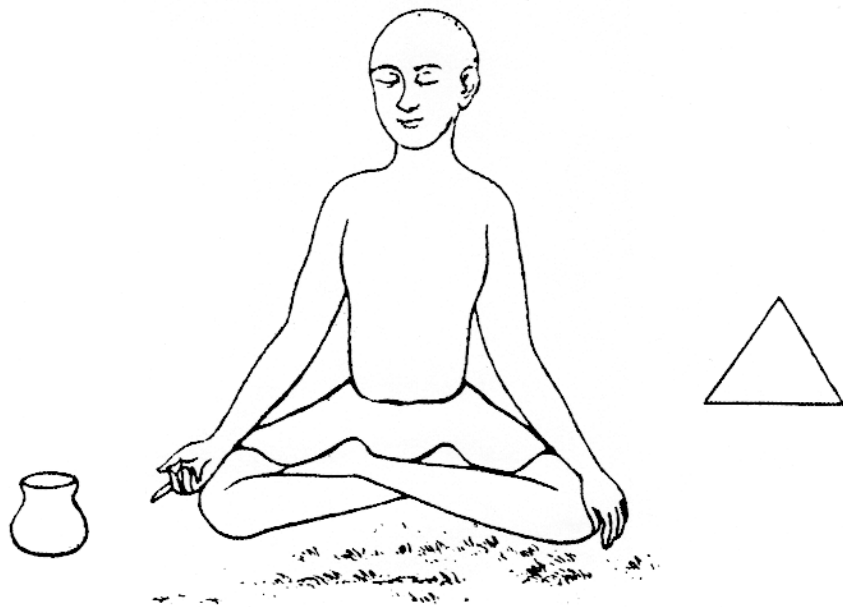
POLAR TRIANGLE

A spherical triangle constructed inside a given spherical triangle, joining together the poles of the various sides (i.e. the point along the side closest to the opposite tip of the triangle).

IMPOSSIBLE TRIANGLE

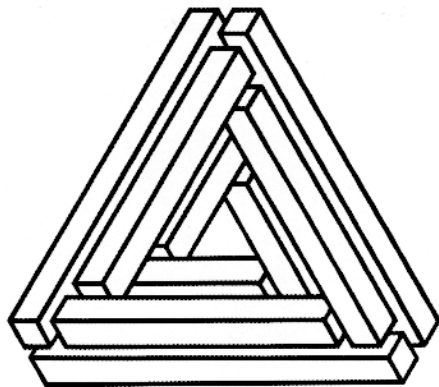


Triangular form which can be described on a plane but is impossible to construct in three dimensions. Invented by L. S. Penrose.

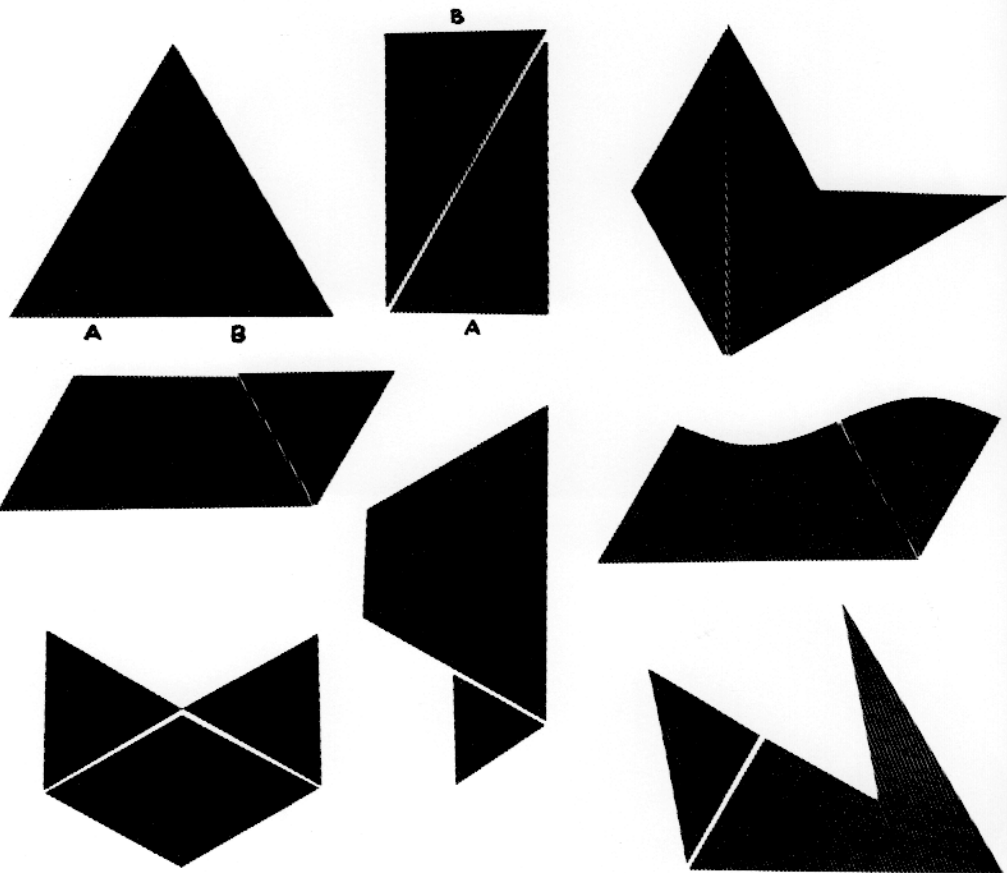


YOGA

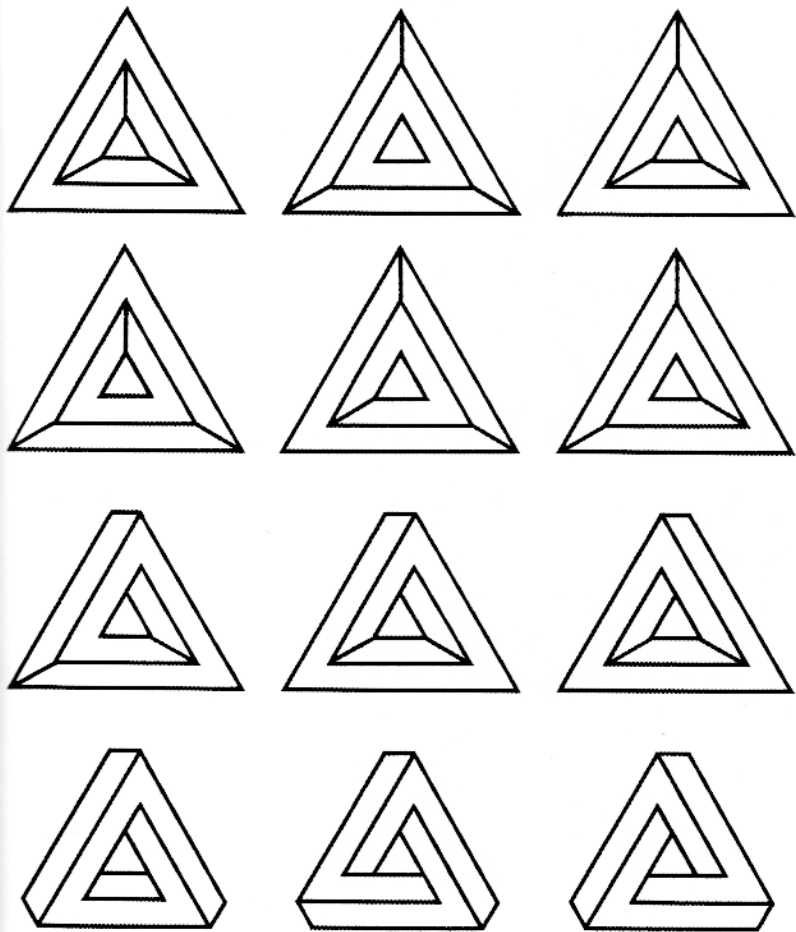
The perfect position tends to create an equilateral triangle shape with your body. This is done as follows: 1 sit on the ground with your legs extended; 2 fold your left leg by placing your foot on the inside of your thigh; 3 fold your right leg and place your foot over your left leg slipping the tip of your foot in the gap between your calf and thigh. Your right heel should be pressing against the pubic bone, both knees should be firmly touching the ground; 4 place the palm of your right hand on your right knee and the palm of your left hand on your left knee; 5 sit up straight but not stiffly keeping your head and back perfectly straight.



EQUAL AREA



Transformation of a triangular surface into other forms with the same area by inventing rules for breaking down and recomposing the figure.



YTURRALDE

Drawings in search of impossible figures.
J. M. Yturralde, 1971.