

## Role of Katachi in Development of Abstract Design

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**Abstract.** In our exhibition we follow a constructional sequence from natural forms, mainly from animal patterns and motions, through their folk art and architectural representations, till some modern abstract art design works. In this gradually increasing abstraction sequence of forms and patterns the essential meaning of KATACHI, the deciphering of the temporal invariance of structure is also reflected.

### 1. Introduction

Recognition of form and pattern connections was always a kind of problem-solving activity since old cultures till today (PRINCE MIKASA TAKAHITO, 1996). Even folk arts contains some interesting arrangements of natural units which prove recognitions of the human abstract intuition. Drawing is the simplest but abstract projection. Which contour express more about the fighting animal? Copying a natural figure onto a woven textile (for example the embroidering) contains many steps of abstraction. Embroidering needs special projection of the originally continuous line drawing to a color and empty network in the pattern (in many folk arts all over the world). The similar problem was the representation of a picture in a mosaic (Byzantian churches).

In order to follow a trend in art history about structure construction we made a sequence of representations to show how some artistic “bridges” arch from natural forms to abstract forms. This gradual approach to higher and higher levels of abstraction, at the same time, connect the works of the authors on our Katachi U Symmetry exhibition (like the beautiful bridges are arching from islands to island and to Honshu and Shikoku in the Seto Inland Sea of Japan).

### 2. Natural Phenomena (Turtle, Serpent, “Dragon”)

Our sequence of gradually increasing level of abstraction is shown on an example we followed: the natural form and pattern (turtle-shield, serpent, “dragon”) → folk art representation (i.e. “dragon” in Japanese art) → religious communal art representation

(church gate serpent-knots as zodiacal path in the Western and Middle Eurasian arts) → mathematical abstract design (computer graphics of complex functions in our age). This sequence of gradually higher abstraction also shows the development of the intuitive human imagination. Higher level of abstraction means higher level and deeper understanding of nature's structural laws (both in analysis and in construction of synthesis).

### 3. Reptiles in Folk Art (Dragon in Japanese Art)

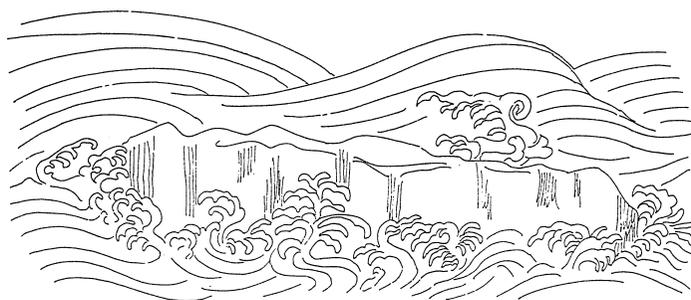
Our sequence example begins at many forms of reptiles (lizards, serpents, turtles). They were favourite animals of the folk art. In Western Eurasia metaphorically reptiles were representatives of the world beneath us and those of darkness, the waters and death. Apart from their human relations, the reptiles have beautiful patterns on their skins, and they exhibit nice spatial motions and spatial curves during their motion. Therefore they helped to recognize many interesting forms, they triggered to draw them on artifacts. We show some Eurasian examples of Japanese, Siberian, Hungarian and Viking arts. In Japanese art many forms of "dragons" can be found from natural mascots to beautiful painted forms. In Siberian art a snakes and frogs life-tree summarizes ancient beliefs about life and death. The Hungarian bottle (Miska-bottle) sketch serpent as a friendly good spirit, like Japanese dragons. In Viking art also the sea dangers are expressed with many forms of dragons (Fig. 1).

### 4. Reptiles and Calendar (Church Gate Serpent Sections of the W. Eurasian Zodiac)

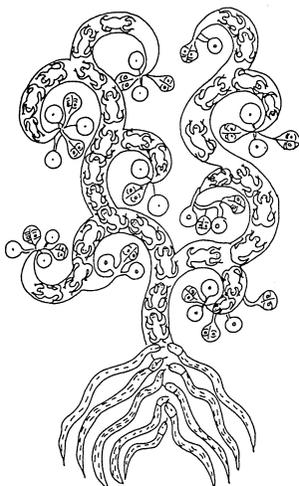
In any cultures using a mythical language in formulation of celestial events serpents represented the pathway of the Sun and some stars (planets) moving on the heavenly stage. In practical calendar serpents were divided by knots. Knots represented sections (months) along the path of the Sun. So the heaven was symbolically represented by the line of the zodiac animated as a serpent with monthly sections of knots. Along the zodiac (we call it today ecliptic, the path of the Sun on the celestial stage) there were remarkable points, where important celestial events could happen. At two points of the zodiac, we call them even today as dragonic points in astronomy, somebody (the serpents), sometimes (during eclipses) had eaten the Sun (or the Moon). From folk art the representation of serpents moved to the religious level of communal arts, where on church gates (entrance to the sacral places) the remarkable zodiacal places were shown to remember. (Aleppo-Haleb, Syria, Egregy, Hungary). Not only the nodes (the arc-ends by dragons) but the essential characteristics of the Sun's path zodiacal motion (the number of sections for months) were emphasized on these architectural ornamentations (Aleppo, Syria, Lund, Sweden). This calendar related sacral role of church gates in Western and Middle Eurasia was common at various religions, and only the number of months may specify them (12 at Christian and many other Eurasian calendars, and 13 in lunar-month calendar of Islamic art, for example Konya, earlier Iconia, Turkey, Fig. 2).

### 5. Reptile Skin Patterns (PATAKI TAMÁS' Art)

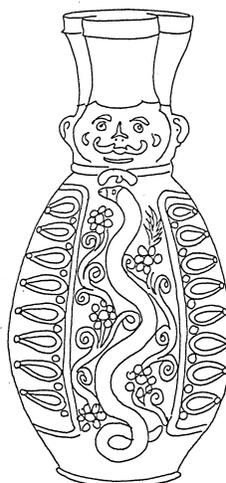
Another field of pattern recognition was the skin structure representation of reptiles.



a.



b.



c.



Sea-dragon from Viking Art, Copenhagen, History Museum, Denmark.

d.



Attila Sword, Hungarian Royal Weapons Collection, Vienna.

e.

Fig. 1. “Dragons” in Eurasian arts: a. Japanese dragons of sea weaves (detail from the painting of HASEGARA TÔHAKU (1539–1610), Tokyo National Museum, drawings of Fig. 1. by BÉRCZI, Sz.), b. Siberian life-tree composed of snakes and frogs, c. Hungarian Miska-bottle with serpent coat adoration (Hungarian Ethnographic Museum, Budapest), d. Viking dragon from North Icy Sea (History Museum, Kopenhagen), e. Old Hungarian art: Attila sword, blood-channel ornament of dragons fight with palmettes (Schatzkammer, Vienna).

In the far Eastern art (China, Japan) serpents represented the good and friendly spirit, coming from natural forces. They were animated in folk dances and the dresses of serpents and dragons were made as large human sized constructions. One of us (PATAKI) focused attention to the turtles. Using their beautiful shield pattern, he developed a modular

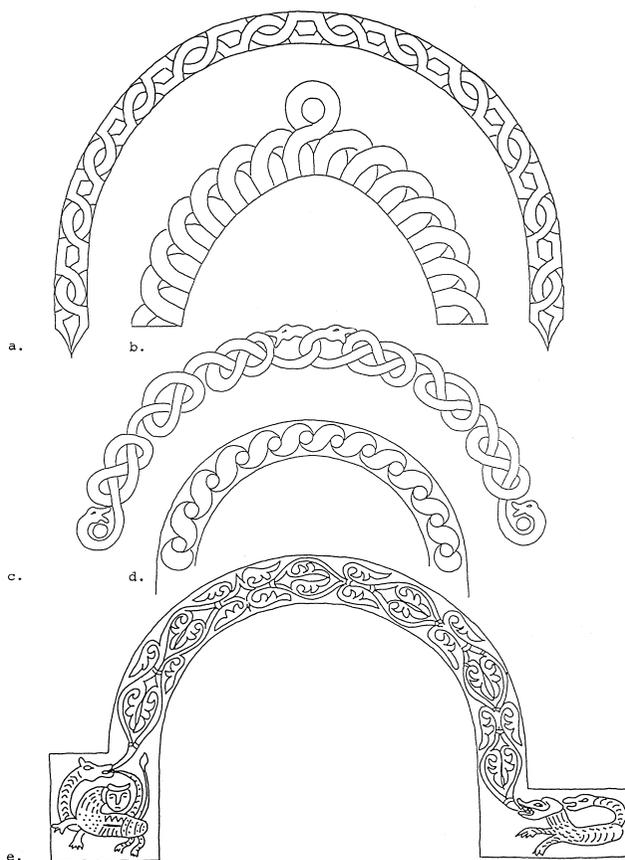


Fig. 2. Western and Middle Eurasian Church gate tympanons: month sections of serpents and “dragonic points” by reptiles at zodiacal-arc-ends. a. Egregy, Hungary (On site church gate drawings of Fig. 2. by BÈRCZI, Sz.), b. Konya (Iconia), Turkey (Islamic calendar has 13 “lunar” months), c. Aleppo (Haleb), Syria, d. Csemeszko

ács, Hungary, e. Lund, (no month correspondence, only sun/moon eating dragons), (Danmark/Sweden).

pavement structure. His tiling art uses small number of individual mosaic elements, for which the fitting (at their edges) is uniform. By continuous side fitting, this small number of different mosaic elements can be built into an almost natural-seeming pattern. The regularity can hardly be recognized because of the rich ornamentation in the individual elements. In his art the tiling units (elements) are not simple. They contain more details from the phenomenon, then we expect from a simple “element”: they are smallest units to combine. Especially in Japanese thinking we can see, (for example in writing) that the elements (the smallest units for combination) need not be very simple, (they must not be irreducible). Therefore the beauty and the natural-seeming is hidden in the richness of the repeated units. In the composites of PATAKI this structural principle is almost Japanese-like (Fig. 3).

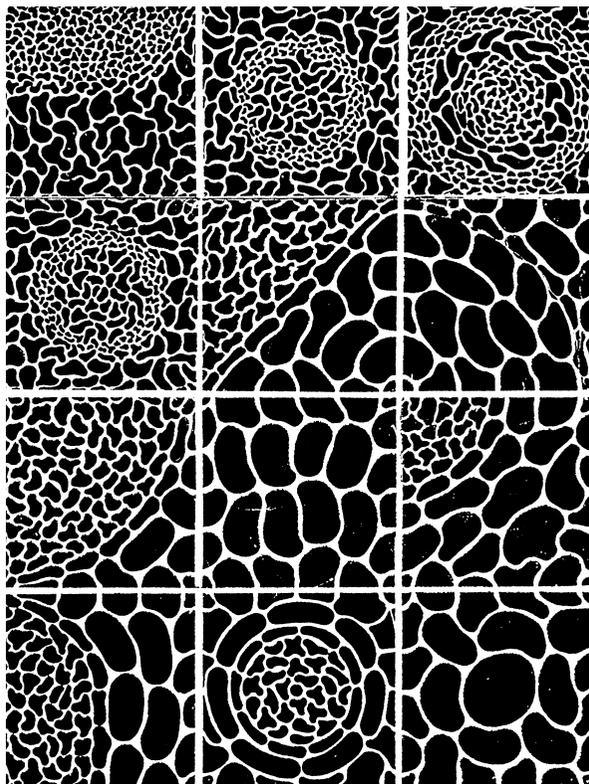


Fig. 3. PATAKI TAMÁS: Turtle shield tiling system (1995). The various large repeating units seem Japanese like in the sense, that in Japan units of structural combinations (i.e. writing) are larger then those in Western Eurasia.

#### 6. Design by Mathematica: Paths and Patterns (KABAI SÁNDOR's Art)

This is the point where we step to the world of computer graphics, the abstract but visually expressed world of mathematics. Curves placed into a coordinate system, geometry of the celestial motions in astronomy, all added important elements to the construction of the modern computer design. Representation of curves of motions and the projected patterns together formed new possibilities for structures as shown in designs of KABAI. From regular and semiregular solid embedding, the alternating weaving and rolling motion-curves of serpents all classic topics appear in the modern life, too. They are present in the invisible molecular world of chains, thorioids, knots and Moebius-bands (BÈRCZI, 1993) in carbon-cahin-chemistry. Design of space-station's free motions (MIURA, 1996) showed that natural forms of cocoon outline surprisingly appears in motions of a spacecraft system. Ancient or actual animal "shadows" in our brain are rediscovered in the modern design. The new forms are old forms but revitalized, and they are the new "animals" of the "technologically-living" world surrounding us today (Fig. 4).



Fig. 4. KABAI SÁNDOR: Ten serpents in harmony (1999).

## 7. Summary

In our paper a sequence of gradually increasing level of abstraction was shown. Examples form natural forms of folk art, through religious and practical communal art representations till mathematical abstract computer graphics illustrated a way how we reached higher and higher levels in the imagination and artistic expression of structures in art.

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