



FORM-STUDIES INSPIRED BY NATURE (POSTER PRESENTATION)

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Abstract:

This paper is particularly aimed to show the process how students solve the problem of creating a new design form. It is a great challenge for them to develop a specific approach in design methods. After their first year's introductory studies of organic objects of nature they research different kind of forms, shapes and structures of fauna. They analyse the rules, systems and processes found in nature and generate new shapes and forms the help of which they can design a functional object for everyday life.

The end-products perform the intended creativity as well as the conscious thinking of the student.

The result of such form-seeking experimental work is that the developing and understanding is significantly easier compared to standard object-oriented design tasks.

Keywords: Design, nature, structure.

1.INTRODUCTION

1.1. Sources of inspirations

Shape is a fundamental element of design. There are three basic types of shapes:

- Natural shapes are shapes that are found in nature (flora and fauna)
- Geometric shapes (squares, circles, triangles, rectangles, diamonds etc.)
- Shapes of man-made items from our visual culture (architecture, regional and global cultural forms, personal forms of artists and designers etc.)

Those who deal with the design can get inspiration from the items listed above. In the syllabus of the second year industrial design students the two month task is to create new design forms inspired by the fauna. They analyse the rules, systems and processes found in nature and generate new shapes and forms the help of which they can design a functional object for everyday life.



Photo 1. Natural shape, geometrical shape, architectural shapes (Foster and Partners, Singapore)



1.2. About the bio-inspired design

Human beings tend to look for answers from nature when they come across technical problems. They are often inspired by animals' traits, or the flora which can result in bionical design. That is why these solutions are also named by scientists as bio-inspired design, which means treating nature itself as a database of solutions that already works. The process of the application of bionic ideas can be done in two ways: one is to apply the character of biology to the idea of product design; the other is the suggestion of 'back to nature' and seeks the related biological elements to solve the problems of designing.

The purpose and needs between the two ideas above are different:

1.2.1. From biological idea to product idea

Bionical design, led by the biological concept, gets initial inspiration from the study, observation and discovery of natural lives, is supplemented with the ideas of bionics and biology, and finally proceeds to the product design stage, guided by biological concepts.

1.2.2. From product idea to biological idea

At the stage of the creative development of the product, one can look for optimal solutions from the nature. By this time, the process of bionical design and the study of natural lives have hopefully helped to answer the question, 'what can be done', and the concept of bionical design has been applied that corresponds with the purpose and idea of the product.

There are several samples in product design, in architecture and in the fields of art for applying the principles of the functions of nature, as a new, contemporary idea:

- architectural solutions (shell- and trussing constructions, etc.)
- tools and appliances (scissors, pincers, velcro etc.)
- principles of location- an position alteration (glider, helicopter, etc.)
- streamline bodies (aeroplane fuselage, submarines, etc.)
- lightweight constructions (sandwich structure building system)
- communications (camera, light, vision, phonograph, oscillation, audition, etc.)
- organising principles, logistics (cell-constructions, mining, etc.)
- fashion industry (garments, hats, accessories, etc.)

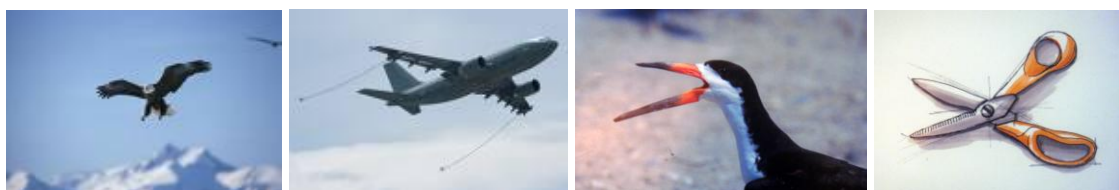


Photo 2. Applying the principles of the functions of nature



Photo 3. Nature inspired fashion

2. ASPECTS OF DESIGN

By having inventions based on inspirations and abstractions from living things an entire new world of life inspired design is possible. The new 3D form should be a hand-held object, like:

- household utensils (cups, knives, mugs etc.)
- bathroom appliances (hair dryer, different plastic bottles etc.)
- stationery (mobiles, mice, pens, staplers, etc.)
- design objects (vases, doorhandles, etc.)
- tools of sports (dumbbells, rackets, etc.)
- toys (matchboxes, baby-furniture, etc.)
- jewellery (rings, bracelets, etc.)

The main aim is to follow the basic idea of the shapes and structures found in nature, learn from it and not copy the actual life-forms. One can implement a function found in nature and transfer technologies into life-forms or just generate new forms by imitating biological structures and shapes.

Forms have to be simplified, without extra decoration in them. Shapes, sizes, weights and surfaces should adapt to the movement and size of the hand.

3. THE PROCESS OF THE DISCURSIVE DESIGN METHOD

3.1. Analysis

Each student choose an animal randomly to avoid the familiarity to their favourites so they can objectively study the behavior, movements and forms of the animal. They collect photos and make natural drawings of bears, snakes, snails, parrots, sharks, penguins, peacocks, crabs, horses, sloths, blue tits etc. and write a description, as well. We analyse the structures, the



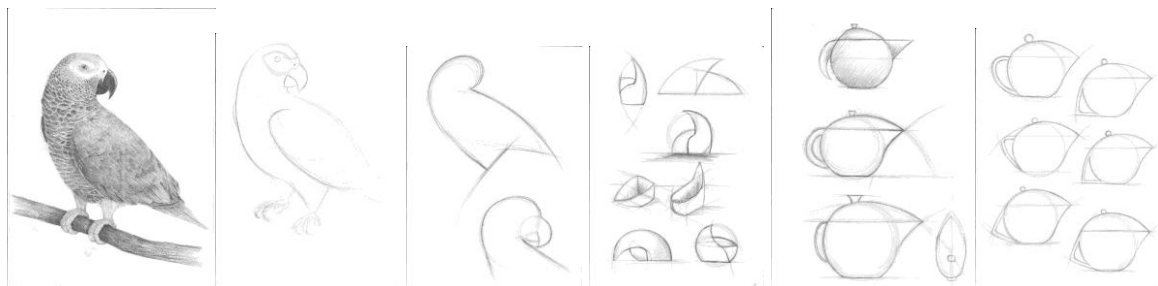
variability, strength and flexibility of these module architectures and the conclusions give solutions for further haphazard functions.



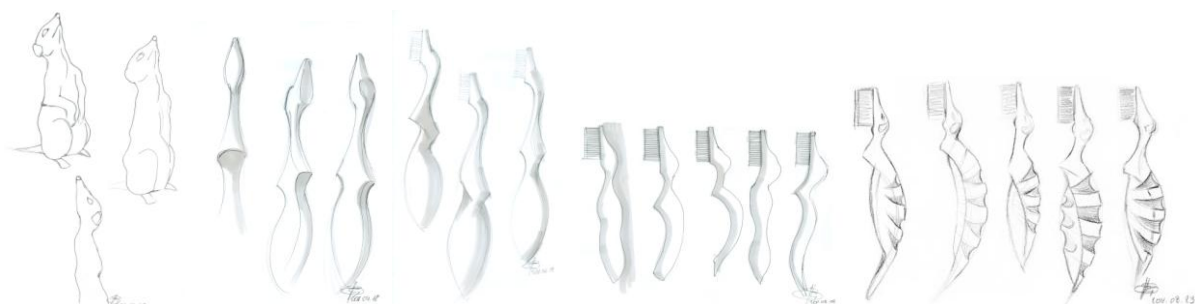
4. Drawings of Diána Ötvös, Vanda Pazsitni, Boglárka Bereczki, Márta Marton, Réka Sztancs

3.2. Inspiration and abstraction

It is a long process from the animal drawings through the form-seeking sketches to the final versions of the product ideas. Students can use with flexible applicability their inspirations and create any kind of unusual forms. Spontaneous sketches turn to a wide range of systematically transformed abstraction. This is a transformation of a product's appearance from the forms that were developed from the environmental adjustment of organisms.



5. Abstraction of a parrot: Nikolett Pál



6. From sketches to product ideas: Boglárka Bereczki

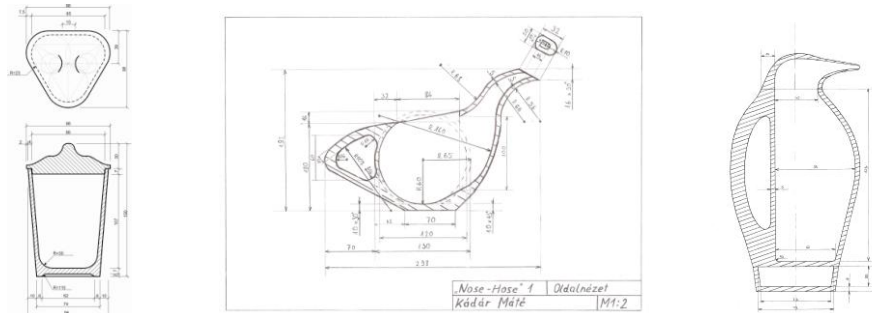


3.3. Modelling and documentation

After choosing the best idea to be developed to a hand-held consumer product students start modelling. All kinds of materials can be used, like paperboard, polifoam, gypsum, plasticine, beeswax, wood, metal, sponge, leather, textile, Corian etc. for creating the mass product. These models will be the basic forms of the original designs the material of which depend on their function. Plastic, ceramic, glass, silver, wood, metal etc. could be the materials of the real products. As the students make all the technical drawings of their products one could even put into production these design ideas. The most skilled students make 3D view of their unique designs which is a perfect possibility to show the colour versions, as well.

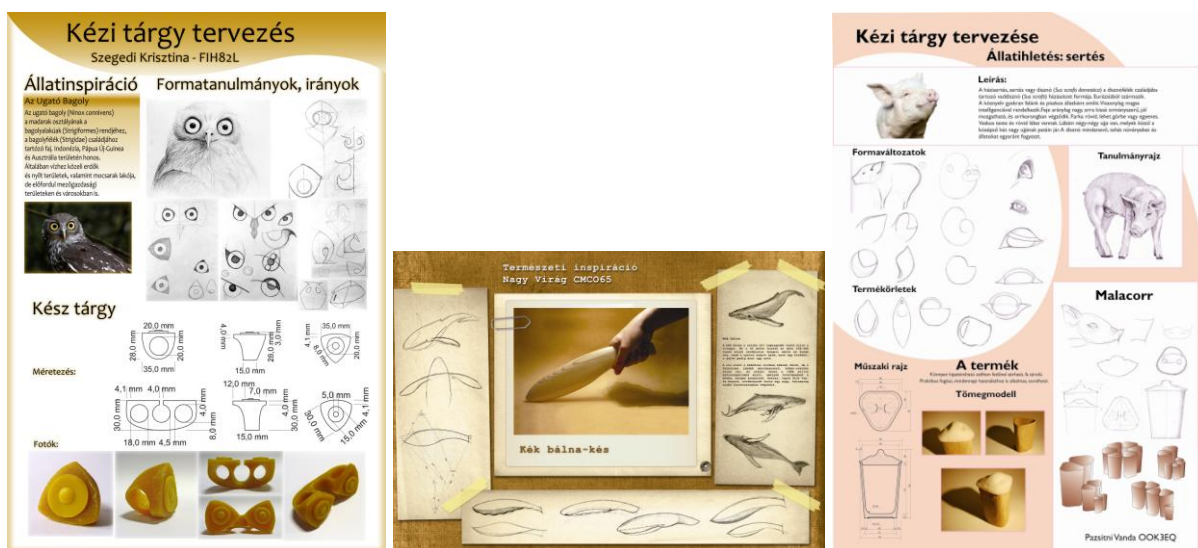


Photo 7. Mass products and 3D models from left to right: István Szilágyi, Boglárka Bereczki, Kitti Macovei, Cecília Tomin, Zsófia Tokodi, Márton Haraszi, Benjámin Hanzel, Nikolett Pál, Fruzsina Kovács.



8. Technical drawings of Vanda Pazsitni, Máté Kádár and Krisztina Lorántfy

The final documentation is a poster which contains all the necessary steps listed above in a well explained meanwhile in a representative mood.



9. Final posters of Krisztina Szegedi, Virág Nagy and Vanda Pazsitni

4.CONCLUSIONS

How to get from the study of nature to a special hand-held product design is not an easy task. It needs well thinking of transformation and abstraction, morphology knowledge, good drawing and computer skills as well as a broad base of using different kind of materials. The end-products in each case perform the intended creativity as well as the conscious thinking of the student. The experimental pieces of students demonstrate that these transformations from different materials needs different solutions.



This is a creative form-seeking process which is a real design problem. All the experiences obtained through these transformations generate new ideas to their future projects. Any kind of other objects for interior design, toys, etc. from nearly all kind of materials could be developed in a similar manner, gaining inspiration from the nature.

The result of such experimental work is that the developing and understanding is significantly easier compared to standard object-oriented design tasks.

5. REFERENCES

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