The structural system of the radial body in nature and to benefit from it in the decorative design

Associ. Prof. Dr. Marwa Ezzat Mostafa
Associate Professor, College of Architecture and Digital Design, Dar Al Uloom University - Saudi Arabia
marwa.ezzat@dau.edu.sa

Research Summary :

Nature is the main source of inspiration for the artist and designer. This organized universe in all its natural phenomena is subject to a systemic adjustment arranged by mathematical standards and laws that are repeated in the natural models in pursuit of balance, harmony and environmental adaptation. These measures and laws are represented in groups of digital systems, and nature has stimulated the emergence of several disciplines such as the radiation system In the natural elements that, as an external system, adapts to the external environment in order to accomplish a specific function without being directed from the outside (by an external force) i.e. self-formation, and from here the research problem was determined in the extent to which the designer's thought can be enriched through the radial formal systems of organisms in Nature in an innovative way enriches the field of design, and the research aims to enrich the designer's thought by extracting the foundations that were formulated by studying the structural system of organisms in nature and the importance of research lies in linking nature with art by studying the external formal structure of the elements in nature and extracting new formulations and designs through radial systems In nature, to create designs that enrich the field of design, and the research assumes the extent of benefit from the structural structural systems of the radial A sale using modern technology, which broadens the designer's perceptions, and the research adopts a descriptive, analytical and experimental approach by tracing the structural foundations of radials in nature to create innovative artistic and design experiments that enrich the field of design and from the results of the research that it is possible to link art and nature through the study of nature, which added experimental approaches according to To study the external structure of radials in nature, the research recommends studying the structural foundations upon which the radiators in nature are based, which serve art as an integrated holistic system that opens the field of design to reach innovation in the field of design.

Introduction:

"Nature is the main source for the designer because it contains an infinite number of design formulas that enrich the artist's thought through lines, spaces, shapes, textures, colors, space and other elements that are characterized by permanent and continuous change and shape, their visual appearance according to what happens in nature of recurring variables, and despite that. These elements undergo various variables, but they are governed by the eternal law of nature of the changing structural system, for all living organisms are governed by the natural law of growth, which is difficult to quantify this law, and it also reflects an integrated and compatible visual system from which the designer and artist deduce to express it with his own vision and the means of performance in his designs inspired by The external nature, "so man by his nature tends to the continuous order, and this brings a kind of comfort to his mind," since his first inception, he has always sought order and arrangement in the various aspects of his life, so he

DOI: 10.21608/jsos.2021.144398

uses his innovative and creative abilities to understand the different relationships of the cosmic phenomena that surround him, as well as He writes the habits of arrangement, classification, and coordination between the assets in the natural elements and then tries to take advantage of it It is difficult for two elements of the same species to be identical, but they may be similar in their external appearance and the designer can be inspired by the difference of these external bodies, and through contemplations of the natural elements can be verified and discovered in the different relationships between them

Key words :
The structural system - rays in nature - decorative designs.

The researcher extends its deep thanks and appreciation to the Deanship of Postgraduate Studies and Scientific Research at Dar Al Uloom University, Riyadh, Kingdom of Saudi Arabia for the material support for this research.

Research problem :
What is the extent of the possibility of enriching the designer's thought through the radial formal systems of objects in nature in an innovative way that enriches the field of design to achieve positive values, thus expanding the perceptions of the decorative designer?
Research objective: The research aims to enrich the designer's thought by extracting the foundations that were formulated through the radial system of organisms in nature and paying attention to studying the external structure of shapes using modern technological means, which broadens the designer's perceptions.
research importance: The importance of the research lies in the link between nature and art by studying the external formal structure of the elements in nature and extracting new formulations and designs through the radial systems in nature to create designs that enrich the field of design

Research hypotheses:
The research assumes the extent of benefiting from the structural structural systems of radial shapes in nature using modern technology and graphic programs, which broadens the perceptions of the decorative designer.

Research boundaries:
The objective limits of the research focus on time limits that are limited to studying the structural foundations of the radials in nature to extract their engineering systems using modern technology An experimental study to develop innovative solutions in the field of decorative design

Research methodology:
the descriptive, analytical and experimental approach by tracing the structural foundations of radials in nature to create innovative artistic and design experiences that enrich the design field in an innovative way.
Search terms: Structural system: It is the reconstruction of the form, the structural system is an attempt to find the appropriate dress for the idea or the emotion of the form, and it is the process of tightening the relationships for this idea, which requires movement by design to the most appropriate and appropriate position.

Radials:

Radials in nature are formal systems and their visual nature is determined by coordinating lines and controlling their movements and external formal directions. Therefore, the lines are what form the structural structure, as the lines of the shape are soft and radially oriented to the depth from the center and it is a spherical shape surrounded by protrusions and filaments in The line is considered a primary and basic means of visual communication as a basis for expression in plastic art. It is an expressive formative element with artistic values in the field of plastic arts. Lines vary in terms of shape to geometric lines and free lines and produce geometric lines using tools Geometry or free lines, "they are irregular and are characterized by spontaneity and through structural formal systems as the lines and movement in it are in radiant directions from the center and the shape has a varied biological nature, so the line has its formal value and its connotations. Spiral, free and radiative

The field of decorative design: decorative design is one of the types of design that uses decorative design formulas in the design, as the decorative design needs balance and rhythm, and as any design begins with the basic elements, which are line, point and color, and needs creativity in art and innovation, and it is an art based on the concept of formation and drafting in a large way Which in turn represents the gathering of the basic elements and geometric shapes to give a shape that contains innovation in the artwork.

First: A Brief About Radiologists in Nature:

"The forms and bodies in nature have varied, which is characterized by the diversity of its factions, bodies and forms. Bodies in nature can be classified into a series of similar groups. Much contemporary artistic research has been interested in searching for the laws of the structural system of the elements in nature, which is based on many areas including the systems. The external structural and formalism in the world of plants, animals, birds, etc., which the artist accepts and serves as his source and source from which he draws his creativity and idea

Second: design features and radial bodies in nature:

"The study of nature is not only the goal, but reaching those systems and laws that spread in the universe is the main goal, and sometimes they are clear, and other times they hide behind the outward appearance of the form and it is not clear from them other than those mutual and compatible aesthetic and artistic formulas that stimulate the creative abilities of the artist and designer, which drives him. To search for these formulas through study, analysis, classification and experimentation in order to identify the structural foundations of design through the levels of artistic creativity in the formulation of these systems, and then try to reformulate them again in a way that satisfies his artistic and aesthetic creativity

Third: the radial mathematical system of plants in nature:

"The importance of studying the laws of nature is due to the fact that different plant models can be divided into more than 335 thousand varieties of plants in the whole world, and the designer cannot overcome the difficulties of identifying all these varieties because each shape can be inspired by an infinite number of different designs. Therefore, the basic and initial lines and general bodies that help the artist and designer arrive at the structural foundations for the elements in nature should be studied.

Fourth: the radial engineering system for marine in nature:

"The radial system is also evident in the marine rays, which are a group of ray-legged Rhizopoda of proto-lakes, most of which are spherical in shape, with false legs of the radial type, and are distinguished by their varied chitinous or siliceous geometry, and they live a free, free, non-parasitic life in fresh water, or in the seas, And it forms an important part of plankton, and it is divided into three different groups with each other of different characteristics, and is the most widespread radial in the seas.

Fifthly: the linear-formal system of radials in nature:

Radials in nature are the formal and kinetic systems of the elements in nature and their visual nature is determined by the coordination of lines and shapes and the control of their radial movements and their external formal directions. Therefore, the radial lines are the ones that form the structural structure, as the lines of the shape are soft and radially oriented to the depth from the center, which implies It is a spherical shape surrounded by radial protrusions and filaments on all sides, resulting in various designs of radial lines

Sixth: The formal design formulation of the radials and their use in the decorative design:

Recent studies have contributed to tracing the geometric radial system and studying the laws of natural elements that came to change the ancient concepts of perception through an analysis of the elements through the invention of optical means and devices such as lenses and electron microscopy and photographic imaging of the most accurate external components of nature in order to facilitate its study and recognition of its construction With more natural elements richer

Pilot study (practical) by graphic software:

- A practical experiment related to the structural system of the radial body in nature is prepared to extract the vocabulary and the structural system and benefit from it in the decorative design according **to the following:**

Extracting design formulas by analyzing the structural systems of designs based on the structural system of the Radial Authority in Nature to extract the vocabulary and the structural system and benefit from it in the decorative design by extracting new formulas and designs by computer to create solutions for new designs in accordance with the laws of the structural system of the Radiators in Nature.

Extracting design formulas by analyzing the structural system of the radial body in nature

- Results:

The study of the radial structural systems of the elements in nature as an integrated holistic system that opens a new field in the field of decorative design.

- Contemporary scientific studies offer new solutions to the design structure of the natural elements (radial systems), which led to an important development in the fields of decorative design.

- There are alternatives to the infinite design solutions through the structural formulas of the radials in nature in which the functional and aesthetic values are achieved in the design.

-Recommendations:

Attention to the structural formal structure of the radials in nature as an integrated holistic system based on design formulas that enrich the two fields of design.

- Opening new horizons and experimental visions that adopt the freedom of creativity in the field of decorative design by investing in the structural and formal systems of the radials in nature.

Conducting more research on the radiation in nature Contemporary theories present new solutions by tracing the structural system of the radiation in nature and including laws of similarity, convergence, repetition and symmetry, and on the basis of which are innovative design formulas.

- References:

-Aniliolias Statthopoulos: "Advanced Simulations in Design Michael Winstock", A-d Morphogenetic Design, Wiley Academy, 2006, p.33.

-Achim Menges: "Instrumental Geometry ", A-D Morphogenetic Design, Wiley Academy, 2005, p.20.

-Akhavan, A.; Samsudin, A.; Akhshani, A. (2011-10-01). "A symmetric image encryption scheme based on combination of nonlinear chaotic maps" Journal of the Franklin Institute.

-Nehmzow, Ulrich; Keith Walker (Dec 2005).

-Hale, N.C.: "Abstraction in Art and Nature", Watson, Gupill, New York, 1980, p.57.

-Malcom, D.C.: "Design, Elements and Principles", Paris, Worcester, 1971, p.98.