

FACTORS OF ESTHETIC PREFERENCE, SPACE AND FORMS

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Abstract. *Why does the the man feel more comfortable in some surroundings than in some other and what is there in the surroundings and in a the man that causes that state of his spirit? It is obvious that one`s reactions to surroundings are reflexive and uncontrolled, yet they happen according to certain patterns. To adjust to his natural surroundings as much as he can, during evolution the the man developed mechanisms (intuitive reactions) that made it possible for him to react to the changes in his environment much faster and more effectively, which was of the key importance for survival. By developing intuitive reactions to surroundings, the the man acquired a special apparatus through which he sees much more in his surroundings than he is aware. Esthetic reactions and esthetic preferences make a part of that apparatus and they have an adaptive role. Thanks to rewarding certain behaviors with comfortable feelings, elements and physical characteristics (compositions, relationships) useful for survival that the man notices in his surrounding have become beautiful to him. Evolutionary psychology, psychology, esthetics and neuroesthetics all research why and how the the man reacts to certain physical characteristics of the surroundings. The goal of this research is to check if the the man notices elements and relations from natural surroundings in architectural space, since evolution “taught” him that he needs them for survival. It also aims to check how the the man reacts to the preferred shapes, relations, and compositions from natural surroundings when they are found in architectural space and to check factors that influence esthetic preferences. Discoveries of esthetic reactions, esthetic preference and evolutionary base of those reactions can be applied in architecture in order to create space and shapes that are customized for the the man.*

Key words: *evolution, intuitive reactions, esthetic preferences, form, natural environment, space*

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1. INTRODUCTION

The questions how the the man estimates beauty and why something is beautiful to the the man, are questions with which philosophy deals, but lately, thanks to technologies and new scientific disciplines that have been made, psychology, evolutionary psychology and neuroaesthetics all research esthetic reactions. There are especially interesting studies and attitudes of evolutionary psychologists about esthetic needs, reactions and preferences, their origin and significance for the the man, as well as neuroaesthetics` discovery about reactions of certain parts of the brain to certain stimuli that are esthetically acceptable (beautiful) to the the man. Evolutionary psychology monitors esthetic needs, esthetic reactions and esthetic preferences as adaptations that have been developed during evolution and that are functioning as means of providing the survival. If we speak about esthetic needs, the term "need" means a lack of something in the organism, by whose satisfaction, normal functioning and survival is made possible. The fact that "beauty" is a need says enough about the significance and function of esthetic reactions and esthetic preferences. In order to provide satisfaction of esthetic needs, esthetic reactions and esthetic preferences are genetically conditioned, inherited from ancestors, and they are occurring according to the intuitive reactions developed during the evolution independently of the the man`s will. It can be stated that esthetic reactions which originate in the satisfaction of esthetic needs are much more significant for the the man than a bare sense of comfort which occurs during perception of the stimuli. The term "stimulus" is used to mark everything (of material or non-material nature) that the the man can perceive with his senses. Because of the function of esthetic reactions and their significance for survival, it is necessary to pay a special attention to reaction to stimuli that originate in nature. They are important to the the man in terms of survival (shelter, natural surrounding). Those are factors that influence esthetic reactions and preferences of the stimuli that he himself has created during cultural development. Psychologists consider that esthetic reactions depend on objective (physical) characteristics of a stimulus. At the beginning of the twentieth century psychologists devoted themselves to the research of subjective experience of an observer which depends on the previous experience, considering that they are more important for esthetic reactions. Evolutionary psychology consolidates the two approaches and believes that the the man`s reactions to a stimulus are conditioned by its physical characteristics due to evolutionary acquired preferences towards the physical characteristics and intuitive reactions to surrounding, which determine the subjective experience. Physical characteristics of a stimulus and reactions which occur during perception of the characteristics are important for esthetic reactions. During the evolution, the the man has been taught to prefer the stimuli of certain physical characteristics. Comfortable emotions occurring during the perception make a part of intuitive reactions to the surrounding and their role is to provide satisfaction of needs and behavior that is useful for survival.

Evolutionary psychology considers that esthetic needs, reactions and preferences have been developed during evolution in order to solve certain adaptive problems and to provide survival to the the man. In this work are used viewpoints and studies of evolutionary psychology to explain esthetic reactions and evolutionary conditioned esthetic preferences towards the surrounding and especially towards shapes and relations from natural surroundings in which the the man dwells and which have provided him with conditions to survive. It was affirmed that the the man has esthetic preferences which he has developed

during evolution towards certain physical characteristics of natural surroundings. While dwelling in natural surroundings, he also develops preferences towards the shapes that he sees. It can be said that esthetic preferences are influenced by certain factors such as genetically acquired preferences, previous experience with stimuli and natural surroundings in which the man dwells. Based on studies of evolutionary psychologists, established genetically conditioned esthetic reactions and preferences, natural surroundings in which the man dwells, and previous experience with stimulus, it is possible to establish physical characteristics of stimuli that the man prefers esthetically. Architects and urbanists can use these while creating architectural space.

1.1. Aims of the research

The man values the space in which he dwells thanks to intuitive reactions that he developed during evolution. He will not value the space as esthetically acceptable and convenient for living if in his surrounding he does not recognize elements towards which he developed preferences, which he was “learned” to recognize during evolution. Based on research of psychology, evolutionary psychology and neuroaesthetic, it is possible to define physical characteristics of a surrounding that the man prefers, good overview of the surrounding, possibility to see but not to be seen, alternative way out, greenery, sun, water, organic forms of curved edges, shapes from the surrounding, especially plants and terrain, pyramidal form, rugged outline of decomposed form. The aim of the work is to check if the man notices previously stated elements and relations from natural surroundings in architectural space and how he reacts to them, to examine preferred shapes, relations and compositions from natural surroundings in architectural space towards which the man has positive reactions, and to examine factors which influence esthetic preferences.

1.2. Methods of the research

In order to define preferred characteristics of the surrounding and then analyze and define preferred shapes, compositions and relations in architectural space, the author used the compilation method of research and poll method. Due to technology development, scientists acquired possibility of observing brain activity while perceiving stimuli and therefore, they could define to which elements in the surroundings the man reacts positively and which shapes and relations in the space he prefers. There was a research in psychology, evolutionary psychology and neuroaesthetic. It encompassed the man's needs, reactions to a surrounding and mechanisms according to which the reactions are manifested. It made it possible to affirm characteristics of the surroundings, shapes and relations in natural surrounding that the man prefers. Based on the research and defined preferences toward the surrounding, the author of the text designed and conducted a poll in order to test how respondents react to similar characteristics in architectural space. The questions within the poll were designed in a way to test respondents' reactions to preferred shapes and relations in architectural space, to test if they notice them, and how they react to them. One pair of photographs depicted objects with surrounding that is strongly expressing preferred elements, while another pair of photographs depicted less expressed elements. In each question, the respondents were asked to decide in which of the object they would like to live. This poll included one hundred respondents.

2. ESTHETIC NEEDS AND REACTIONS AS ADAPTATIONS THAT MAKE SURVIVAL POSSIBLE

By development of intuitive reactions to surrounding during evolution and mental and anatomic adaptations, the man has acquired the capability to estimate physical characteristics of surrounding, whether they are beneficial or not for life and survival, and to react accordingly. Some of the intuitive reactions which have been developed in order to enable survival to the man are also esthetic reactions to stimuli. All changes done on the man's body and brain that have been happening during evolution, happened in order to enable the man's survival and species continuation. Evolutionary psychologists consider that human brain has not evolved less than his body. (Kardum 2004) As a result of adaptation to surrounding, intuitive reactions developed in both brain and body, which regulated the man's reactions to surrounding. Also, the man developed special parts of brain that are in charge of esthetic reactions and thanks to them, the man has survived. Psychological processes, as well as anatomic structures and physiological mechanisms made survival and reproduction easier to our ancestors, so the intuitive reactions within our brains are equally products of evolutionary processes as our bodies are. Brain of a newborn baby is a set of reprogrammed, abundant in content and specialized mental modules which evolved, similarly as our bodily organs did, due to successfully solving certain adaptation problems. (Kardum 2004) Thanks to the technological achievement and possibility of scanning a brain with magnetic resonance, and monitoring brain activities during observation of stimuli, a new science was developed. It studies parts of brain which react to a certain stimulus, and it is called Neuroaesthetic. Today, it is assuredly known which parts of brain are active depending on a type of stimulus and how brain and body react to stimulus. The very fact that the man had to develop organs that make possible for him such complex reactions to surrounding, and a special part in the brain which is in charge of esthetic reactions to stimuli, confirms how important they are for the survival. Kaplan says that esthetic is not a reflection of caprice people achieve, but it is, as it seems, a guide for the human behavior which has far reaching consequences. (Kaplan 1987) Therefore, esthetic reactions to stimulus have been developed during evolution, they are genetically conditioned and are processed autonomously, independently of the man's will. As studies showed, other living beings also possess similar mechanisms according to which they react to stimuli, because of the need to provide survival. Because of intuitive reactions that developed during evolution, intrinsic to every human, it is possible to determine regularities in esthetic reactions to certain types of stimuli and their characteristics. Determined preferred characteristics of stimuli say a lot about esthetic preferences of the man and his tendencies toward certain forms, elements, and compositions in surrounding. This can be very useful to architects while creating living space.

2.1. Biological base of esthetic reactions

Thanks to neuroaesthetic, nowadays scientists can assuredly know which part of the human brain is active when a person observes something that is "beautiful" that evokes pleasant emotions within them. Nancy Etcoff defined beauty as "something" that activates the center for comfort in the brain. Stimuli that activate the center for comfort in the brain are beautiful, according to her. (Atcoff 1999, Atcoff et al 2001, Zeki 2011) There is a logical question to be asked: Who decides and based on what, which part of the brain will be active? How does the brain make a selection of stimuli and direct them into a certain part of the brain which is in charge of arrangement of that type of stimuli? It is

obvious that this process takes place autonomously, without any influence of consciousness. This capability was acquired by brain during evolution. In our subconsciousness we genetically received experiences from our ancestors. As stated above in the research of scientists from Max Planck Institute, when the man reacts to stimuli from the surrounding, a higher activity of the brain is noticed prior to the the man becoming aware that his body reacts to surrounding. That proves that the reactions to stimuli from the surrounding and esthetic reactions take place according to a determined mechanism and without a possibility of controlling these reactions by the aware part of brain. (Haynes 2007) Based on previously stated facts it can be concluded that esthetic reactions are genetically conditioned and that there is a regularity in people's reactions to certain types of stimuli because of their same base and function, biological changes and development of the man's organs during evolution. Therefore, it is possible to determine genetically conditioned and developed preferences toward surrounding, its certain forms, colors and compositions. It is important to emphasize that esthetic reactions do not depend solely on genetically conditioned preferences that have been inherited, but also on conditions of environment in which the man lives and previous affective reactions to stimulus.

2.2. Evolution and esthetic reactions

Scientists have been studying the issue of existence of universal beauty and the phenomenon of natural beauty which affects people equally, regardless of era, age, education, tradition and ethnicity. What is so special in nature and in the man that makes nature so unique? The human brain was developed in an organic and biocentric surrounding and therefore, it is completely normal that even today people have the need for ancient surrounding. It would be a miracle if all characteristics learned during evolution, were erased during several thousand years of civilization. (Markus 2005) It was noticed that psychiatric patients in hospitals reacted positively to photographs showing natural surrounding and that all recorded attacks on the photographs were on those of impressionists' photographs. (Urlich 1986) Kardum says that evolutionary psychology negates the presumptions about the human mind as of general-purpose machine for solving problems. He considers that millions of years of evolution have been connected to specific challenges of surrounding. By natural selection process, that led to development of specific cognitive mechanisms. Therefore, evolutionary psychology does not consider the human brain to be a mechanism of general purpose upon which culture should impress a certain content through learning processes. Evolutionary psychology considers that emotions and psychological processes are adaptations that started by the process of evolution during natural selection because they made survival and reproduction easier in our ancestor's environment. (Kardum 2004) Esthetic needs and esthetic reactions have not been developed during evolution only for the man to be able to estimate if something is beautiful or not. Their purpose and function are much more important for the man than a bare feeling of satisfaction. The fact that a special part of the brain that is in charge of esthetic reactions was developed implicates their significance for survival when solving adaptation problems. During evolution, thanks to esthetic reactions and needs, the man has developed preferences towards some stimuli that is important for survival. At the same time, evolution has made him acquire a capability of adjusting to the environment in which he lives. Therefore, two things are important: beside evolutionary acquired esthetic preferences, the man, thanks to adaptive function of esthetic needs and reactions, develops preferences towards the environment in which he lives, and the preferred forms found in the environment become the themes of his creating.

3. FACTORS WHICH INFLUENCE ESTHETIC PREFERENCES

Based on previous observations it can be stated that following factors influence esthetic reactions and preferences:

- evolutionary acquired preferences toward certain physical characteristics of stimulus,
- previous affective experience with the stimulus and the context in which it is perceived,
- forms and shapes from natural surroundings in which the man dwells

3.1 Influence of evolution on esthetic preferences

The simplest example of esthetic preference, its function and importance is esthetic preference of the opposite sex. If the man did not prefer the opposite sex, he would not survive. Such intuitive reactions were not developed solely in the man, but also in animals, so we have an example that during choosing its partner, a swallow chooses one who has more symmetric tail. Zebras choose those with more regular design. German biologist Joseph Reichholf considers that sensory functions and information processes function similarly in humans and animals. (Reichholf) It can be said that animals possess intuitive esthetic reactions and preferences which have been developed during evolution, so this can be another proof that we cannot discuss a phenomenon that is learned during socialization, because animals are not capable of learning such things, nor is it a completely individual process which depends on an individual, depending on physiological attitudes and subjective factors. Therefore, it is a phenomenon that is consciously controlled but it happens according to previously estimated mechanisms developed during evolution, both autonomously and subconsciously.

3.1.1. *Previous exposure to stimulus and esthetic preferences*

The man and animals react to stimuli very similarly due to genetic bases of the reactions. Studies of psychologists on effects of previous exposure to a stimulus showed that a repeated exposure to a stimulus causes an increase of esthetic preference and positive affective reaction to the stimulus, both in humans and animals. The term stimulus is used to mark an observed object. (Janković 2010, see Zajonc 1968, 1980, Borstein 1989) The fact that the man and animals react very similarly to stimuli indicates two important things:

1. Genetic base of esthetic reactions and preferences. They have been developed during evolution and they are not learned but genetically inherited,
2. While dwelling in a certain surrounding and during his adjustment to it, the man develops preferences toward shapes in the surrounding.

Every man has certain knowledge and experience. A group of authors researched their influence on perceiving a stimulus, its evaluation, esthetic impression and emotions that are evoked consequently. They concluded that firstly, stimuli need to be integrated in the existing knowledge. That enables classification, which is in a reciprocal relation to so-called cognitive overpowering. It is pivotal in evaluation of an artistic piece, from which esthetic judgment and esthetic impressions are drawn. (Janković 2010 see Leder, Belke, Oeberst, Augustin 2004) If we cannot integrate a certain stimulus into an existing knowledge, we will not be able to classify and position it in relation to already existing structures which make evaluation possible to us. Therefore, there will not be cognitive overpowering over the stimulus, which will consequently affect esthetic impression and

emotions following it. (Janković 2010) It is needed to recall Wilson who says that a human brain has never been an empty board, and human nature is not a written part of the board, but it exists as an inherited rule of mental development. (Wilson 1984) So, the man uses knowledge that he genetically inherited in order to value some deed of nature or man-made deed, according to intuitive esthetic reactions which he has also developed during evolution, thanks to the development of brain and its parts functioning as esthetic reactions.

It is possible to state that the man prefers certain shapes and compositions since he has long been meeting them in nature and he was born with inborn knowledge of them. That is why integration, classification and positive evaluation of the shapes and composition that he notices in surroundings are certain and they lead to a very positive esthetic impression and to positive emotions. Since the man long dwelt in natural surroundings, he developed esthetic preferences toward forms and shapes from the surrounding, which are inherited genetically. Beside genetically acquired preferences, esthetic reactions depend on the surrounding due to the development of the preferences toward the surrounding while dwelling in it. That is also an adaptation made during evolution, which is explained by the effect of the previous exposure. The explanation can be found in studies done by Etcoff, Gerhard and Orians. The psychologist Nancy Etcoff from the Harvard University experimentally affirmed that during observation of esthetically attractive photographs of men and women, the same part of the brain in charge of regulation of sense of pleasure is activated in each person and the reaction is more intense if they have previously seen the photographs. The marks that the participants in the experiment gave to certain photographs equaled the level of activation of pleasure center, and photographs marked more positively were followed by a more intensive reaction of the center. A similar research was done by a psychologist Ashley Gearhardt from the Yale University, who did a research on craving for things which cause pleasure, that is, food. She came to a conclusion that, during time brain has been learned so well that the cravings occur faster and faster and the man does not crave for food but for the emotions that occur during its consuming. (Gerhardt 2008) Identical conclusions were drawn by a team from the Harvard University, led by Nancy Etcoff, questioning people who used narcotics. They noticed that narcotics affect the pleasure center the same way as in the case of esthetically acceptable people. (Etcoff et al 2001)

3.1.2. Development of preferences influenced by reward system

Orians discusses rewards and pleasurable feelings, as intuitive reactions which ensured that certain activities that are very important for the man to be genetically represented enough in generations to be. He says that diet and sexual intimacy are greatly rewarded and that there is no need for detailed examination to find out that those activities that are not rewarded would not be represented enough in next generations. (Orians 1992) The same argument is true when choosing a habitat. The worse the habitat, the less ancestors would survive and reproduce. (Orians 1980) Therefore, there is a pleasure center in brain which is in charge of extremely pleasurable feelings to stimuli that are positively graded due to genetic base and adjustment to the surrounding. The brain center for pleasure can be activated by various triggers and the result is always the same: very pleasurable feelings in people, followed by physiological changes in a body. Those feelings are memorable which is why people want to repeat them. When choosing a habitat and shelter, the man has evolutionarily developed a capability to subconsciously use the pleasure center which is activated during esthetic reactions to surrounding and it remembers pleasurable feelings which the man tends to repeat. In this way,

the man acquired ability to use genetically acquired preferences toward surrounding, ability to adapt and to develop esthetic preferences towards the surrounding beneficial for survival, which relates to adaptive function of esthetic needs and reactions.



Fig 1 Source: http://www.wikiwand.com/en/Scots_pine



Fig 2 Source: <https://opusteno.rs/slike/2012-07/najvisa-planina-jugozapadne-srbije-15073/planina-golija-srbija-11.html>

During the research, when respondents were asked to choose the surroundings they prefer, of two pictures with very similar natural surroundings, 95% of them chose picture number 2 which shows surroundings with a thicker tree top. The author of the text interviewed shepherds who were nomads on lowlands in winter and they said that they were looking for as thick forest as possible because they were warmer in such surroundings during night. The majority of participants have never spent a night in nature nor have they had the shepherds' experience, but due to the intuitive reactions and knowledge acquired during evolution which is genetically conveyed, they chose the surrounding that is more beneficial for survival. That represents a good example of influence of evolution on esthetic preferences. Evolution sets things in a way that, thanks to intuitive reactions and development of esthetic preferences, participants liked the forest in picture 2 because it gives conditions more beneficial for survival. That is the function of esthetic reactions and preferences developed during evolution.

3.1.3. *Subjective and objective factors of esthetic preference*

Searching for an answer to the question which factors influence the man's estimation whether something is beautiful, scientists dealt with objective and subjective characteristics of esthetic reaction and preference. Some of them came to a conclusion that it is physical characteristics of an observed object (stimulus) that influence preferences, and others that esthetic reactions and preferences depend only on subjective mechanisms of the observer and the way he experiences the object (stimulus) he observes. Philosophers think that beauty is not a trait of things around us, but the subject himself and his soul's powers (Steiner 1997), while Fehner is the founder of experimental research on stimulus characteristics and esthetic preference testing. Fehner and his followers started at the point that objective, physical traits of stimulus are in the essence of esthetic preference, and for a long time (the 19th and 20th century) many scientists accepted this thesis and did researches on the psychical traits of stimuli and their influence on esthetic preference. However, at the

end of the 20th century attention was drawn to subjective factors of esthetic preference. Those are subjective mechanisms which are basically esthetic preferences. They deal with the way the observer reacts to what he sees and the starting point is the thesis that esthetic preference does not depend on objective traits of stimulus, by itself, but on the way in which the traits are experienced by an observer. (Janković 2010) Steven and Rachel Kaplan developed a model of environmental preferences which takes into consideration psychological influences of an individual that influence the outcome of esthetic judgment. (Orians 1986, see Kaplan and Kaplan 1983) Therefore, there are two approaches in history of esthetic reactions study:

- objective, that tends to define physical characteristics of a stimulus that the man values positively and
- subjective, that tends to define subjective psychological factors which influence esthetic reactions, esthetic valuing of objective characteristics of the stimulus and outcome of esthetic preferences.

Lately, by observing esthetic reactions as adaptations to surrounding developed during evolution, evolutionary psychology consolidates two approaches, affirming physical characteristics of surrounding to which the man reacts and psychological mechanisms developed during evolution, which are in the base of those subjective reactions. In other words, evolutionary psychologists tend to explain the connection between objective physical characteristics of stimuli (objects) and subjective impression and esthetic evaluation of stimuli by an observer which is occurring on a subconscious level according to intuitive reactions to surrounding that were developed during evolution.

3.2. Previous affective experience with stimuli and the context in which stimuli are perceived as a factor of preference

An important factor which influences esthetic preference is a previous experience with stimuli and the context in which the stimulus (object) is perceived. Reacting subconsciously and autonomously to the stimulus observed, there are intuitive reactions to surrounding and adequate emotions, so the human body experiences physiological changes which the man feels and remembers. When he sees the same or a similar object in a different context, he will recall the emotions which first appeared and, regardless of change of the context, if the initial experience with that object was negative, he will perceive it negatively due to the negative context in which he perceived it first and tied his emotions for the event. An example of how the context in which the object is previously perceived influences esthetic preference is a poll. Preferences of people of different age to apartmental facilities were tested. The object in figure 3 got very contrary comments and reactions. While some participants perceived the object as a house from horror movies, others perceived it as a fairytale house. So, depending on the context in which the participants perceived a similar object with which they connected the shape of the given object, they reacted in a following way: adults saw a house from a horror movie, and perceived that kind of shape in a very negative context which evoked negative emotions, so they marked the object negatively.



Fig 3 <https://www.houzz.com/photos/traditional-exterior-traditional-exterior-birmingham-phvw-vp~851929>



Fig 4 <http://www.montazneidrvenekuce.info/vijesti/drvene-kuce-honka-kvaliteta-i-ekologija/107>

A five-year old child who has not watched horror movies saw the roof of the object like “sea” and reacted positively, in a similar way like other participants who did not perceive this shape of a house in a negative context.

In the same poll the object in figure 4 was shown. According to comments (warm, domestic, family, chimney, natural, peace) and preferences, majority of the participants who remember some earlier days, architecture and way of life, perceived the object in a way that they related it to objects they perceived in a different context, very positive. They were recalling their childhood because the shape of the house reminded them of houses from that period, so the esthetic reactions to this object were very positive. So, a context in which the stimulus is perceived affects emotions and, at the same time, esthetic reactions and preference of an observer. Evoked emotions depend on a context in which the stimulus is perceived, they are memorized and by perception of a similar stimulus, the man will recall the memorized emotions. If some stimulus is perceived in a positive context, some positive emotions will be evoked that will connect to the stimulus and positive esthetic reactions. Later, if stimulus similar to the previous one in a certain context is perceived and is related to certain emotions, the man will recall those emotions and react esthetically positive to the stimulus. House in picture 3 does not differ much from most of the houses and it is not intimidating, but the context in which some people perceived a similar object, of which this house reminded them, is very negative and intimidating, which resulted in negative emotions and esthetic reactions. The fact that the previous experience with stimuli (objects) and context in which the man dwelt and perceived certain forms influence his esthetic reactions is of a great importance for architects when creating living space.

3.3. Natural surroundings` influence on preferences

Many studies show that natural surroundings influence esthetic preferences and that the man prefers shapes, forms and relations he sees in a surroundings in which he dwells. With his research, Orians founds the theory of savannah in which he explains the relation of the man to his surroundings. He says that the man prefers surrounding that is considered to have been the surrounding in which he originated, region of East African savannah. Even though the tested group had not lived in savannah, they reacted very positively to the pictures of the savannah, which leads us to a conclusion that the man

genetically conveys esthetic preferences to his descendants. (Orians 1975) Those are genetically conditioned esthetic preferences of natural surroundings. Another important influence of the natural surrounding is that it influences development of preferences during dwelling in it. Studies have shown that children react more affectively to pictures of the African savannah than adults. It is considered to be a consequence of adults having spent more time in new surroundings than children, so they developed esthetic preferences toward the surroundings in which they live. Therefore, the man has genetic preferences toward natural surroundings but, thanks to mental and anatomic adaptations, he acquired capability to develop preference to shapes and forms he sees in the surroundings in which he dwells.

3.3.1. Adaptation to surroundings and preference development

The explanation for the phenomenon of development of the preferences towards forms from natural surroundings is possible to find in the studies of psychologists and evolutionary psychologists. First, we need to start from the phenomenon of previous exposure. Many scientists have dealt with the phenomenon and there have already been discussions about the studies of Nancy Etcoff during which she noticed that people react more positively to photographs of the opposite sex if they have seen them before. (Etcoff 1999) Janković says that repeated exposure to a stimulus causes more positive reactions to the stimulus. (Janković 2010) Previous exposure to the stimulus causes an increase of esthetic preferences and more positive affective reaction to the stimulus. The more the stimulus is known, the more beautiful and pleasurable it will be, estimated by an observer. Duration of exposure to the stimulus influences the process of making esthetic judgment. (Ognjenović 1980, 1986, 1991 Lazić 1988, Graovac 1989) From the previously mentioned studies it can be concluded that previous experience with an object and familiarity with the object influence esthetic reactions and the man's preferences. The more the man dwells in surroundings in which he perceives certain objects, shapes and forms, the more acceptable they will be for him. Lesser preference of unknown objects has an adaptive function and serves to protect organisms, by leading to reduction of interaction with unknown objects, until they are proven not to be dangerous for the organism. (Hil 1978) Janković defines the concept of esthetic preferences as an intensity of our esthetic experience with an object. (Janković 2010) In other words, a man will esthetically prefer objects with which he has greater intensity of esthetic experience so it happens that a man, while dwelling in natural surroundings, develops esthetic preferences toward surroundings, shapes and forms that he sees in nature. Therefore, there are some examples when construction builders built after shapes of plant species. The pillars in Egypt were built in the shape of old papyrus and lotus, or in Greece, the Corinth pillar with capital was built in the shape of acanthus. The builders used forms and shapes from the surroundings which they were familiar with and toward which they developed esthetic preferences. They could not use plant shapes from another region because they were unfamiliar to them.

3.3.2. Influence of preferences toward natural surroundings on architecture

An example of development of esthetic preferences toward natural surroundings in which the man lives is also the Dinaric log. The connection between shape of the Dinaric log and natural surroundings was noticed and described by Jovan Cvijić. He that the house is in harmony with its surroundings, looks and vegetational clothes of the region. (Cvijić 1922) Cvijić noticed the connection between the shape of the Dinaric log and

vegetation and the connection between the shape of the log and the region it was built in. Free-standing tree tops of conifer have the shape of equilateral triangle. The roof of the Dinaric log has the identical shape. Psychologists affirmed that the main predictors of esthetic preferences in natural surroundings are plant species. Especially tree tops and terrain (Gabr 2005) which Cvijić noticed and stated by observing the Dinaric log in its surroundings. So, the main predictors of the man's esthetic preferences are plants and terrain. The man prefers shapes and forms he sees in plants in natural surroundings in which he lives and forms of the terrain, compositions and relations that exist in his surroundings. Shapes of plants and terrains can serve to builders to estimate esthetic preferences of users of the space, but at the same time, they influence the esthetic preferences of constructors and their creations because constructors tend to build preferred forms into their work.

4. CONCLUSION

Esthetic reactions and preferences have adaptive function. They are developed in order to secure survival. They are influenced by physical characteristics of stimuli and subjective impression of an observer which is conditioned by evolutionary development, previous experience of the man with the same or similar stimulus and surroundings in which the man dwells, which respondents showed in the poll. The poll showed that the man subconsciously reacts to architectural space in the same way that he reacts to natural surroundings. He notices its characteristics that enable conditions that are more suitable for dwelling, and he does it unconsciously. In addition, the poll showed that previous experience with certain space and forms, the context in which an observer noticed them and emotions that were arisen during observation influence the observer's reactions and preferences. Beside generally known factors which influence creating of space, such as social-economic, natural, cultural and technological factors, another very important factor when creating space is the psychological factor. The psychological factor is represented by reaction of the man to surroundings according to patterns and intuitive reactions developed during evolution and preferences developed during dwelling in the surroundings. The man possesses inborn preferences toward space. That provides security and conditions needed for survival. He is taught to recognize them in surroundings, but at the same time, thanks to development of mental and anatomic adaptations and due to the need of as good adjustment as possible, he acquired the ability to memorize previous experiences with objects and space, and to develop preferences of the surroundings in which he dwells. Because of evolutionary base of reactions to surroundings and based on factors which influence esthetic preferences, it is possible to estimate physical characteristics of the surroundings that the man prefers. With studies, psychologists affirmed that the man, due to his security and esthetic needs, prefers a good overview of the surroundings, dismantled space that provides shelters, possibility to see and not to be seen, greenery, sun, wind, organic forms of curved edges, shapes of the surroundings, especially of plants and terrains. It is obvious that the man prefers shapes and elements of natural surroundings with which he has had previous positive experience, which he knew well and which were important for his survival. He values if the space is esthetically acceptable or not based on whether the mentioned elements are present.

Psychological research defined physical characteristics of surroundings towards which the man has positive reactions. Therefore, photographs given in the poll depicted architectural space containing elements of natural surroundings, shapes and relations that the man prefers in natural surroundings. The poll showed that respondents had positive reactions to a good overview of surroundings, possibility to see and not to be seen, alternative way-out, decomposed space that offers refuge, greenery, sun, water, organic forms of curved edges, plant and terrain shapes from the surroundings, pyramidal forms, rugged outline and decomposed shape of objects. It can be stated that research and assumptions on surroundings preferences that were defined based on research of evolutionary psychology, psychology and neuroaesthetic, can be applied in architectural space. Respondents recognized the characteristics in architectural space and they reacted positively which led them to choose space with expressed physical characteristics. Evolution taught them to recognize those characteristics in surroundings, so they said that they would choose that kind of space for living instead of space that does not have the mentioned characteristics.

Esthetic preference factors, preferred shapes, relations and compositions from the surroundings that the man notices and prefers in architectural space can be useful for architects and urbanists. When architects and urbanists are familiar with evolutionary conditioned esthetic reactions (influence of previous experience to esthetic reactions and influence of natural surroundings, plant shapes and terrain morphology) they are able to use it when creating architectural space. In this way, they will create space that is customized for the man.

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FAKTORI ESTETSKIH PREFERENCIJA PROSTORA I FORMI

Zašto se čovek u nekom okruženju prijatnije oseća i šta je to u okruženju i u čoveku što izaziva takvo stanje duha? Očigledno je da su čovekove reakcije na okruženje refleksne i nekontrolisane ali se dešavaju po određenim obrascima. Da bi se što bolje prilagodio prirodnom okruženju čovek je tokom evolucije razvio mehanizme koji su mu omogućili da puno brže i efikasnije reaguje na promene u svojoj okolini što je bilo od ključnog značaja za opstanak. Bilo kakva aktivnost u prirodnom ili izgrađenom okruženju ne može da prođe bez aktiviranja tih mehanizama. Razvojem mehanizama reakcija na okruženje čovek je stekao poseban aparat kroz koji vidi puno više u okruženju nego što je svestan. Estetske reakcije i estetske preferencije su deo tog aparata i imaju adaptivnu ulogu. Zahvaljujući nagrađivanju ugodnim osećanjima određenih ponašanja, elemenata, fizičkih karakteristika okruženja (kompozicija, odnosa) korisnih za opstanak koje čovek opaža u okruženju, čoveku su vremenom postali lepi. Evolucionarna psihologija, psihologija, estetika, neuroestetika se bave istraživanjima kako i zašto čovek reaguje na određene fizičke karakteristike okruženja. Cilj rada jeste proveriti da li čovek u arhitektonskom prostoru zapaža elemente i odnose iz prirodnog okruženja jer je evolucijom "naučen" da su mu potrebni za opstanak. Proveriti kako reaguje na preferirane oblike, odnose i kompozicije iz prirodnog okruženja u arhitektonskom prostoru, kao i faktore koji utiču na estetske preferencije. Saznanja o estetskim reakcijama, estetskim preferencijama i evolucionoj osnovi tih reakcija se mogu primeniti u arhitekturi s ciljem kreiranja prostora i oblika u prostoru po meri čoveka.

Ključne reči: evolucija, mehanizmi reakcija, estetske preferencije, forma, prirodno okruženje, prostor