

## PSYCHOLOGICAL THINKING IN ARCHITECTURAL THEORY TILL 1960

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### Summary

A general model of experienceable physical environment is adopted. It consists of physical environment /S/, observer's experience /P/ and evaluation /U/. Subjective interpretations of these parameters as opposed to objective ones are regarded as early manifestations of psychological thinking, before psychology appeared as science. It is argued that the parameters are becoming subject of interest of environmental studies consecutively over time. General division in four periods of historical development of the studies is proposed. Three of the periods are analysed.

### 1. Introduction

#### 1.1. Subject of the study

The study has a theoretical framework of a general model of experienceable physical environment. This has been developed basing on studies of Thiel /1970/, Kleyff /1976/, Canter /1977/, Hesselgren /1977/ and Lenartowicz /1978/. The model consists of the following parameters:

- physical environment. This is understood as structure /S/ of the built environment, i.e. its substance, shape and size, which together constitute stimulus in a perceptual event.
- observer's experience. Personality participating in the physical environment undergoes a multilevel perceptual experience. The perception is a reflexion of objective properties /P/ of the environment, of its ability to influence man.
- evaluation. Objective properties /P/ of the environment are subjectively evaluated. Kleyff calls it utility /U/ or subjective properties, the ability of the environment to provide for particular needs. In other words, evaluation is the degree to which the environment is able to change an unsatisfied user into a satisfied one, to help him to achieve his objectives.

Because of the participating personality the above model is of interest not only for architectural theory but also for psychology.

The aim of the present study is to draw up an inventory of psychological interpretations of architectural phenomena and to systematize lines of psychological thinking concerned with architecture.

## 1.2. Psychology in the interpretation of physical environment

As a travestition of the statement by H. Ebbinghaus from 1908 that psychology has a long past but a short history, one says that architectural psychology has no history but only a past.

Nevertheless, clear-cut stages in the development of psychological thinking in architecture can be distinguished. These periods, as it seems, can be referred to the particular mentioned parameters of the experienceable physical environment.

Thus, primarily man was interested with stimulus itself, i.e. structure /S/ of the environment. Analysis of the structure was the first task he was setting for himself in considering the environment. The ancients were discussing only one of the structural features, namely shape, its proportions in regard of its beauty.

At first beauty was being explained objectively.

Objective interpretations of art and architectural phenomena assumes the existence of some stable, unchangeable canons and principles. Such an approach dominated in theory of art since the antiquity until the end of the 17th century. Contrary interpretation, subjective one, emerged much later, though for some time both interpretations existed in paralel /Tatarkiewicz 1967, 1968/.

Subjective interpretation is based on the assumption that the man is so built that some forms please him and he calls them beautiful.

It is in the subjective interpretation of aesthetical predilections that the beginnings of psychological approach in architecture can be found.

Subjective interpretations became widespread in the 18th century and since then predominated theory of art.

The parameter of objective properties /P/, i.e. perception becomes the subject of interest. The study of perception is continued today. The establishment of psychology as science marks a qualitative change in the second half of the 19th century.

The decline of modernism in the end of the 1950ties, failures of architectural design manifested in negative evaluations of the built environment and its rejection by users have brought a strong need for research of users' needs, utility /U/ and environmental evaluation.

There is a turning point in the development of psychological thinking in architecture around 1960. Quantitative and qualitative changes in research take place. The term "architectural psychology" appears in language. An explosion of environmental studies is a response to the general need. Attempts are being made to give premises for design to enable creation of built structures that would comply with the demands of utility and be positively evaluated by the users.

The proposed periodization complies to a certain degree with the shifts in the philosophy of science which Goodall /1965/ classifies as first, second and third science. First science - Greek, a science of axioms

conforms with the period of objective interpretations of the structure of the built environment. Second science - Renaissance, is a science of observation, hypotheses and experiment. These methods have been applied in psychology since the 18th century and are used in architectural psychology today. Third science - science of systems and processes is what architectural psychology is in transition to become.

2. General chronology

2.1. First period/ from the Antiquity to the end of the 17th century/  
 Elements of psychological formulations can be found in the ancient philosophy. Regarding architecture, however, objective formulations predominated at that time. Common subject was the structure /S/. Nevertheless, architects took notice of the perception of their buildings. Roman architect and engineer Marcus V i t r u v i u s Pollio /"De architectura libri decem", 1st century BC/ quoted the refinements practised already in classical Greek architecture in order to correct optical illusions. These were: change of the space between the exterior columns, upward curvature of the stylobate, inward inclination of columns, entasis of the column shaft etc.

Subjective understanding of beauty can be found in the writings of early church father B a s i l the Great from Cesarea /4th century AD/, Giordano B r u n o /16th century/ and René D e s c a r t e s. The latter wrote among others about the necessity of an optimal stimulative complexity /"Compendium musicae", 1650/.

Of importance is a treatise on optics written by Arab scientist I b n a l - H a i t h a m /11th century/ which marks the beginning of experimental psychology. His work was further developed by W i t e l o /13th century/ the first Polish scientist to win an international fame /fig. 1/. Witelo was ahead of his time and can be regarded as a predecessor of modern psychology.

Fig. 1  
 Witelo, "Perspective",  
 title page of the  
 3rd printed  
 edition, Basel 1572

VITELLONIS THEOPHILATI  
 PRAGIENSIS OPTICAE LIBRI DECEM  
 In hunc usque modum ab hunc, et sic sub hunc usque modum  
 quibus inter se, et hunc, et hunc.  
 A  
 FREDERICO RIEMER.



Fig. 2  
 Claude Perrault  
 /1613-1688/

that could have been repeated in laboratory. Psychological experiments were also carried in the USA by Williams J a m e s . Elementary processes of psychic life were studied by Herman H e l m h o l z , Wilhelm W u n d t and Ernst H. W e b e r. Gustav Th. F e c h n e r was the first to put up the problem of evaluation in psychology /"Vorschule der Aesthetik", 1876/, though he was wrong to believe in the possibility of statistical and laboratory finding of real beauty. The 20th century introduced to psychology and aesthetics new thoughts concerning the structure of psychic life. The opposition against the assumptions of classical psychology led to the appearance of a new trend - Gestalt psychology. This trend proved to be much more fertile for architectural theory and theory of art.

Psychology of work, called psychotechnics by W. Stern in 1903, ergonomics, industrial psychology etc., has certain common elements with architectural psychology. Hugo M u e n s t e r b e r g treated psychotechnics as practical application of psychology in different domains of culture and life. As regards aesthetical experience Muensterberg was a supporter of isolation theory. This theory assumed that insolation of the contemplated object is the first condition of an aesthetical experience. /"Principles of Art Education", 1905/.

After World War II some notions as well as methods and research techniques which entered later the inventory of architectural psychology have been elaborated /Lee, 1979/, among them:

- questionnaire interviewing technique,
- adjectival rating scales /Semantic Differential/,
- cognitive mapping,
- Repertory Grid Technique.

### 2.3.2. Architectural theory

A range of architectural theories was set up in the 19th century. They were more numerous than ever but only some of them included psychological elements.

Rudolf A d a m y was the first more important theoretician of architecture to advocate explicitly subjective understanding of creation and reception of art /"Die Architektur als Kunst", Hannover 1881/.

Theodor F. V i s c h e r /"Das Schoene und Kunst", Stuttgart 1898/ was adherent of the theory of empathy in architecture. This theory of active nature of aesthetical experience was further developed by Theodor L i p p s /"Aesthetik", Hamburg 1903-1906/.

Swiss art historian Heinrich W o e l f f l i n /fig. 3/ puts together the two notions: architecture and psychology /"Prolegomena zu einer Psychologie der Architektur", 1886. In: "Kleine Schriften", Basel 1946/. This is not yet "Architekturpsychologie" and only "eine Psychologie der Architektur", but the title is promising more than gives the contents. Woelfflin defines the task of the future architectural psychology. According

to him it should describe and explain psychic sensations which architecture and its means are able to produce. He does not notice the necessity of psychological research for design.

Fig. 3  
Heinrich Wölfflin  
/1864-1945/



Fig. 4  
Juliusz Zórawski  
/1898-1967/

Wölfflin's dissertation was based on the psychological research of Wundt. Later developments of Gestalt psychology gave material for other studies in architectural theory. Polish architect Juliusz Zórawski wrote in the preface to his thesis /"On the structure of architectural form", 1943. Published: Warszawa 1962/: "...a book by Paul Guillaume "La psychologie de la forme" published in 1937 fell into my hands. I was reading it substituting its considerations by architectural contents. This was an interesting play: psychological principles of the book were referring to architecture, the examples seemed to be architectural. Points and lines from the described experiments were for me houses or windows in Renaissance elevations...". This seemingly pioneering work did not find a wider response as psychology was banned in Poland during the Stalinist period. It only could be published in 1962 when other more advanced works were already existing.

Ten years after Zórawski his central idea was picked up independently by Rudolf Arnheim /"Art and Visual Perception", 1954/. From the same year dates the dissertation of Sven Hesselgren /"Arkitekturens Uttrycksmedel", unpublished doctoral thesis, 1954/ developed in his later works /"The Language of Architecture", Lund 1967. "Man's Perception of Man-Made Environment", Lund 1975/. Hesselgren does not only apply results of psychological research to architecture but finally himself carries out psychological experiments related to perception in architecture.

### 2.3.3. History, practice and criticism

Subjective explaining of architectural phenomena was continued independently from developments of scientific psychology and without concern to the aesthetical theories of the period.

Vienna architect Camillo Sitte started a line of studies of perception of existing towns in which he saw potential for design practice /"Der Staedtebau nach seinen kuentlerischen Grundsætzen", Wien 1889/. /Fig. 5/.

Fig. 5  
 Camillo Sitte,  
 "Der Staedtebau...",  
 manuscript page

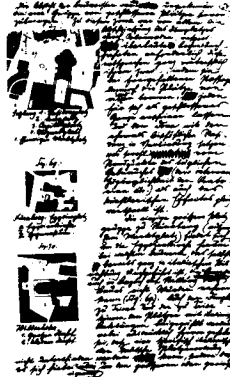
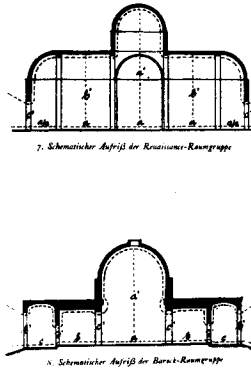


Fig. 6  
 Renaissance and  
 Baroque space concept  
 /after Brinckmann,  
 1922/



His ideas influenced Albert E. B r i n c k m a n n /"Platz und Monument", Berlin 1908/. In his other book /"Plastik und Raum", Muenchen 1922/ Brinckmann discusses coexistence of sculpture and architecture in different styles and draws probably for the first time "space bubble envelopes" /fig. 6/. Sitte and Brinckmann were followed by G. S t r e n g e l l /"Staden som Konstverk", Stockholm 1922/. Their ideas, questions of beauty and perception of urban space fell into oblivion for a long time.

This was due to the ideas of rejection of decoration /A. Loos/ and functionalism set up by Le Corbusier. The latter stated that "all people have the same organism, the same functions. All people have the same needs" /"Vers une architecture", Paris 1923/.

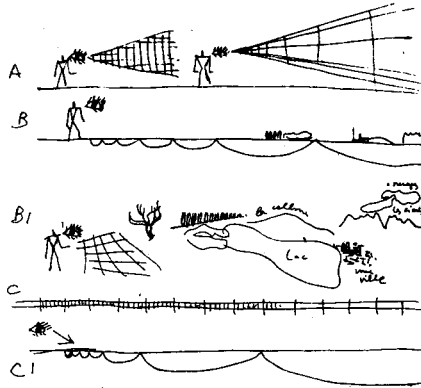
Such an argument as well as other slogan-like simplifications as "house is a machine to live in" were never based on scientific research. Architects are hardly to be blamed for this state of knowledge. Social sciences were not able to help design in solving of the growing difficult problems of the period, though, psychology and sociology were soon to show that the needs of man are differentiated and changing in time.

Necessity of psychological research in architecture and the need of cooperation between architects, sociologists and psychologists was seen by Hannes M e y e r, Bauhaus director /1928-1930/, who replaced W. Gropius on this post. Short period of Meyer's activity did not allow him to achieve any meaningful result. His merit remains in an intensification of students' sensibility to social problems.

It is worth mentioning that Le C o r b u s i e r took into account the psychological principle of Weber-Fechner Law when creating his unique system of proportion and scale /"Modulor", Boulogne s/Seine 1950//fig. 7/.

Fig. 7

Space seen in logarithmic rather than arithmetic scale /Weber-Fechner Law/ /after Le Corbusier, 1950/

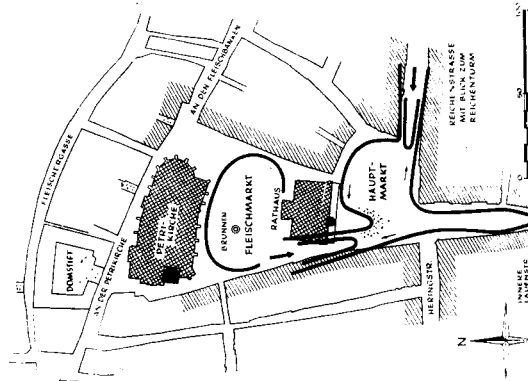


The line of thought started by Sitte has found a creative continuator after years in the person of Wolfgang R a u d a, who studied perception of urban space in old towns. /"Raumprobleme im europaeischen Staedtebau", Muenchen 1956. "Leebdige staedtebauliche Raumbildung", Berlin 1957/ /Fig. 8/ The work of Paul Z u c k e r /"Town and Square", New York 1959/ belongs to the same stream.

One should mention the names of art critic Bruno Z e v i and architectural writer Steen E. R a s s m u s s e n. Their writings are rare positive examples of texts about architecture.

Fig. 8

Space form manifestation, Bautzen /after Rauda 1957/



The rest of architectural critics is loaded with academism and archeological approach. It is backward in comparison to the criticism of art. Architectural aesthetics treats the problems in a narrow way, makes no reference to the contemporary philosophical and psychological thought and is vague in its theoretical basis.

#### 2.4. Fourth period /from 1960 till today/

This period is not included in the present paper. It has to be studied separately for its richness and complexity. 1960 is regarded as a turning

point in the development of architectural theory based on psychological research. The early 1960ties bring a particular intensification of psychological research and the birth of architectural psychology in two streams:

- important work of Kevin Lynch /"The image of the City", Cambridge Mass. 1960/, a book that was followed by a whole avalanche of studies concerning the perception of urban and architectural spaces,
- explosion of psychological research of environment which can be measured by the series of conferences starting from the historic Conference of Architectural Psychology and Psychiatry in Salt Lake City /1961/ where the term "architectural psychology" was used for the first time. Similar importance can be attached to the Annual Conference of the British Psychological Society in Reading /1963/.

It seems that systematic and processual methods should be characteristic for this period and that the study of environmental evaluation, called here utility /U/ will be the qualifying mark of the next stage of development of environmental studies in psychology.

### 3. Conclusion

Environmental studies are almost as old as architecture. Not all of them, however, do have psychological characteristics. The stream of psychological thought concerned with the experienceable physical environment of man is growing steadily through the ages till today. It seems that the argument as described at the beginning of the paper relating to the changes in interest of environmental psychological research, has been demonstrated in a sufficient degree.

### 4. Bibliography

- CANTER, D. /1977/. "The Psychology of Place." Architectural Press, London.
- GOODALL, M.C. /1965/. "Science and the Politician". Schenkman. Cambridge, Mass.
- HESSELGREN, S. /1977/. "Triangular Model of the Visual Perception of Artefacts". Unpublished paper presented to SEP Meeting, Warszawa, May the 23rd.
- KLEYFF, Z. /1976/. "Praxiological Analysis of Design Activity". In: Design Methods and Theories, Journal of the DMG and DRS, Vol. 10, No. 2, April-June.
- LEE, S.-A. /1979/. "Architectural Psychology: an Introduction". Paper in: Gasparski W. /et al//eds./ "Zagadnienia psychologii projektowania". PAN, Warszawa.
- LENARTOWICZ, K. /1978/. "On Space in Architecture". Unpublished doctoral thesis /in Polish/, Technical University of Kraków. See also: Architectural Psychology Newsletter, Vol. IX, No. 3, September 1979.
- TATARKIEWICZ, W. /1967/. "A History of Aesthetics". /In Polish/ Ossolineum, Wrocław.



- TATARKIEWICZ, W. /1968/. "A History of Philosophy". /In Polish/  
PWN, Warszawz.
- THIEL, Ph. /1970/. "Notes on the Description, Scaling, Notation, and  
Scoring of Some Perceptual and Cognitive Attributes of the  
Physical Environment". In: Proshansky H.M. /et al//eds./  
"Environmental Psychology". Holt, Rinehart and Winston, New York.

The author attempts to systematize the lines of the development.

## PENSAMENT PSICOLOGIC EN LA TEORIA ARQUITECTONICA FINS EL 1960

### Resum

Les interpretacions estètiques del fenomen artístic poden ser objectives (tenint en compte l'existència de regles estables i cànons invariables) o subjectives (tenint en compte que l'home està fet d'una manera que algunes formes li complauen i les anomena belles). Abans que es fes servir el terme de psicologia "arquitectònica" i "ambiental" i abans que la investigació intensiva i multidireccional comencés a la psicologia, es troben elements de pensament psicològic a l'estètica com interpretacions subjectives de l'art.

Aquestes interpretacions varen començar a prevaler sobre les objectives durant el segle XVII.

### Cronologia General

En el desenvolupament històric de la psicologia ambiental es poden distinguir dos períodes principals:

- 1) a partir del principi del pensament psicològic fins a inicis dels anys 60,
- 2) a partir de 1960 fins ara.

El començament dels 60 es considera com un punt de partença, marcat per un cantó per "La Imatge de la Ciutat" de Lynch (1960), al qual va seguir una extensa literatura sobre la percepció dels edificis i les ciutats, i per l'altre, la puixant investigació en la psicologia que es va manifestar, per exemple, amb una sèrie de conferències nacionals i internacionals.

### Principals representants

Les primeres reflexions psicològiques es poden trobar a les obres de l'arquitecte Perrault (1683), Dubos (1719), Home (1762) i Burke (1756). Arquitectes escriptors, així com també historiadors i teòrics portaven a efecte l'estudi de percepció d'edificis i ciutats. "L'Art de construir ciutats" de Sitte (1889) és aquí una fita important. A Sitte el van seguir Brinckmann (1912), Strengell (1922) i Howard (1898). Woelfflin (1886) juxtaposa la noció de psicologia i arquitectura ("Prolegomena zu einer Psychologie der Architektur"). Hi ha un trencament característic en aquest camp d'interès a causa de les idees funcionalistes del modernisme a l'arquitectura entre 1920 i 1950.

Excepcions rares són els escrits de Rasmussen (1934, 1949) i Zórawsky (1943). Aquest va adoptar els principis de la psicologia de la Gestalt en la seva teoria arquitectònica.

Arnheim (1954) i Hesslegren (1954) varen seguir d'una manera independent el mateix camí.

La línia de percepció de Sitte de l'anàlisi de la ciutat va ser continuada per Rauda (1956), (1957) i Zucker (1959).

Aquest estudi presenta un perfil del pensament psicològic relacionat amb

el medi ambient. L'autor intenta sistematitzar les línies de desenvolupament.

## PENSAMIENTO PSICOLOGICO EN LA TEORIA ARQUITECTONIA HASTA 1960

### Resumen

#### La Psicología en la interpretación de las artes.

Las interpretaciones estéticas del fenómeno artístico pueden ser objetivas, (teniendo en cuenta la existencia de reglas estables y cánones invariables, o subjetivas (teniendo en cuenta que el hombre está hecho de tal manera que algunas formas le complacen y las llama hermosas.)

Antes de que se usara el término psicología "arquitectónica" y "ambiental" y antes de la investigación intensiva y multidireccional en psicología empezara, se encuentran elementos del pensamiento psicológico en la estética como interpretaciones subjetivas del arte. Estas interpretaciones empezaron a prevalecer sobre las objetivas durante el siglo XVII.

#### Cronología General

En el desarrollo histórico de la psicología ambiental se pueden distinguir dos periodos principales:

- 1) a partir del principio del pensamiento psicológico hasta principio de los años 60,
- 2) desde 1960 hasta ahora.

El principio de los 60 se considera como un punto de partida, marcado por un lado por "La Imagen de la Ciudad" (1960) de Lynch, a lo que siguió una extensa literatura sobre la percepción de los edificios y de las ciudades, y por el otro, la creciente investigación en psicología que se manifestó, por ejemplo, con una serie de conferencias nacionales e internacionales.

#### Principales representantes

Las primeras reflexiones psicológicas se pueden encontrar en las obras del arquitecto Perrault (1683), Dubos (1719), Home (1762) y Burke (1756). Arquitectos escritores, al igual que historiadores y teóricos llevaron a cabo el estudio de percepción de edificios y ciudades. "El Arte de construir ciudades" de Sitte (1889) es aquí un hito. A Sitte le siguieron Brinckmann (1912), Strengell (1922) y Howard (1898); Woelfflin (1886) yuxtapone la noción de psicología y arquitectura ("Prolegomena zu einer Psychologie der Architektur"). Hay una rotura característica en este campo de interés a causa de las ideas funcionalistas del modernismo en la arquitectura entre 1920 y 1950.

Raras excepciones son los escritos de Rasmussen (1934, 1949) y Zórawsky (1943). Este adoptó los principios de la psicología de la Gestalt en su teoría arquitectónica. Y Arnheim (1954) y Hesselgren (1954) siguieron de manera independiente el mismo camino.

La línea de percepción de Sitte del análisis de la ciudad fue continuada por Rauda (1956, 1957) y Zucker (1959).

El objetivo de este estudio es presentar un perfil del pensamiento psicológico relacionado con el medio ambiente. El autor intenta sistematizar las líneas de desarrollo.