ANALYTICAL SPACE THEORIES
AND GYULA HAJNÓCZI’S SPATIOLOGY

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Gyula Hajnóczi’s scientific career is characterized by the intertwined cultivation of ancient architectural history of the Antiquity, architectural theory, and the preservation of monuments of the Antique world. From the late 1960s onwards, the need to develop a new theory of architecture became more and more pronounced in his researches, which was completed in the 1980s with the creation of the analytical space theory called Spatiology. This paper aims to analyse his complex analytical research methodology in the international research context. Hajnóczi’s research method of analysing the architectural space includes also the socially and psychologically determined factors of spatial perception. According to his analytical theory, the constructive-initiative medium can initiate spatial relations called vallum and intervallum, and by referring their quantitative survey, the definition of spatial qualities can be interpreted in relation to building, man and space in a wholistic approach. Architectural creation is theoretically approached in this duality, from the point of view of quantitative and qualitative characteristics. Hajnóczi’s work is little known internationally, however, by comparing and analysing it with the researches of his contemporaries, it can play an important role in the international research context. It is considered as one of the relevant theoretical architectural achievements in Hungary in the second half of the 20th century.

Keywords: Gyula Hajnóczi, theory of architecture, Spatiology, analytical theory of space

INTRODUCTION

In the thematic richness of Gyula Hajnóczi’s scientific career three disciplines appear of exceptional interest which are inseparably combined into a whole oeuvre: the history of architecture of Antiquity, architectural theory, and the preservation of architectural monuments of Roman Pannonia. In my approach I would like to grasp from this rich oeuvre the importance of his researches in the field of architectural theory, also highlighting its architectural history context (Fig. 1).

The framework and symbolic milestones of theoretical research are set out in the textbook of “History of Architecture – Antiquity” published in 1967 and in his dissertations: in 1966 for the degree Candidate of Technical Sciences with the disserta-

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THE NEW TEXTBOOK OF THE HISTORY OF ARCHITECTURE OF ANTIQUITY WITH A NEW THEORETICAL BACKGROUND

The unfolding of Hajnóczi’s architectural work can be traced back to the sixties. By placing Hajnóczi’s intellectual legacy in a broader context, we can grasp one of the most valuable strands of architecture theory researches in Hungary in the decades before the change of regime, which is also of outstanding significance in architectural thinking in East Central Europe. In a study by M. Simon written in connection to two theoretical writings of Hajnóczi, she accurately drew the position and novelty of his research on the form of architecture, also interpreting it in an international context. The theoretical clarification of modern architecture in the 1960s, following the work of Giedion, Zevi, Blake, Banham and others, was just the opposite approach to the Marxist ideology of Hungarian architecture, which, following Máthé Major’s theoretical approach, provided a theoretically grounded answer operating with the dichotomy of content and form to the problem of architectural space.


It is obvious that in the then Department of History of Architecture lead by Máté Major, the Marxist-oriented writing of architectural history was decisive, yet, Gyula Hajnóczi’s new textbook on the architecture of Antiquity used an approach in which contemporary economic, social, cultural conditions, building materials and structures, architectural technology appeared in a balanced presentation against style analysis or the one-sided validation of societal relations in a Marxist ideological context (Fig. 2).

Although Major himself wrote a thorough architectural history discussed in three volumes on a purely Marxist ideological basis, in his open-minded departmental workshop it was possible to apply a different theoretical approach to this main trend, which allowed the department to be a progressive workshop for Hungarian architectural and theoretical research. This atmosphere is characterized by a footnote written to one of the basic theoretical texts of the great contemporary, Zoltán Szentkirályi, with which Major allowed to publish the study in his academic journal: “We present this study not only because of its positive qualities … and its interest, but also because we consider it to be one-sided in its approach, and therefore to be discussed. It would be good if those colleagues dealing with the theory of architecture and art would comment on it... “.6

In Hajnóczi’s studies on the history and theory of architecture, a new approach raised many important and system-related issues concerning the question of how the periods discussed affected later historic eras. In this context, he not only examined the influence of the Eastern world on Ancient Rome, but also built on the conceptual basis according to which the ancient Western world tangibly articulated the legacy from which Europe was born. In its interpretation, Classical also means European, even if later history has nuanced and coloured this fundamental idea. Moreover, building on all this, this conceptual base later led to a change in his historical-theoretical approach of architecture, according to which Hajnóczi characterized the architectural processes from the Early Modern Age until the beginning of the 20th century with the concept of Memorism.7

The theoretical basis of his textbook was determined by his university doctoral (dr. univ.) dissertation (Spatial Forms and Spatial Connections in Ancient Roman Architecture, 1961). The theme of his dissertation for the title of Candidate of Technical Sciences exploring the development of spatial approach of Antiquity indicates that the subject matter of his study is increasingly turning to spatial theory. The approach to space formation that can be read from the matrix of spatial forms and spatial relations has now become the subject of his research not only in relation to the architecture of Antiquity, but also in the whole spectrum of historical architecture. Here the work discussing the architectural history of Antiquity and the problem of the theoretical anatomization of the architectural space meet.

A peculiar grimace of fate is that his candidate’s dissertation, although having a signed contract with a publisher, could not be published in book form – it is not possible to reconstruct whether for his non-Marxist approach or for other reasons.

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Later, however, the publication became possible in the form of a journal article, and this may have been a symbolic event in the history of the Faculty of Architecture of BME: the faculty’s scientific periodical started with his research results published as a full-length article titled *Space and Ideas* (Fig. 3).  

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**Figure 3.** Hajnóczy, Gy.: Types of spatial connection in Roman architecture (Source: Hajnóczy, Gy.: *Space and Ideas*. *Periodica Polytechnica Architecture* 12 (1968) 2. 1–99 – here Plate XI. p. 93

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A NEW THEORY OF SPACE IN HUNGARY
IN THE 1980S – SPATIOLOGY

His candidate’s dissertation is the antecedent of his academic DSc dissertation *Prolegomena for the Objective Evaluation of Architectural Creation – The Analytical Theory of Architectural Space*, which is one of the highlights of the entire oeuvre. This work later matured into a book published by Akadémiai Kiadó under the title *Vallum and Intervallum* first in German, then in Hungarian. The events of the career of the professor just outlined, including the space theory research that has developed since the 1960s, are of special value to the writings of architectural theory in Central and Eastern Europe.

According to *Prolegomena*, the particularity of the architectural creative process is the relationship between mass and space, their dual alignment to each other, as characterized by a contemporary Hungarian architectural theoretician, Zoltán Szentkirályi: space as the antinomy of mass and mass as the antinomy of space. In the interpretation of the relationship between mass and space, quantitative analysis refers to the mass-like, structurally defined *vallum* and *intervallum* is determined by

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the so-called “constructive-initiative medium”, and the aim of qualitative spatial analysis is to explore the process of examining and analysing the subjective acceptance of space (Fig. 4a–b). All this complex entanglement of mass and space is characterized by the spatial relations and proportions that can be described by the rules of geometry, that traces the architectural spatial analysis – in Hajnóczi’s words – back to a quasi-two-bit or black-and-white basic relationship. The architectural space bounded by various architectural elements – foundation, floor, walls, ceiling, or even a row of pillars, vaults, glass walls – and with its material properties, size, shape, proportions, decorations and lighting characterize not only the architecture of Antiquity, but also the architectural culture of millennia in general.

Architectural creation is theoretically approached in this duality, from the point of view of quantitative and qualitative characteristics. He analysed the structural medium of space – the structure-lead history of architecture – with the rules of geometry, while the qualitative characteristics were disaggregated into spatial types, moreover, taking into account the rules of human perception and also the field of psychology.

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Figure 5. Spatial relations of a closed and loosely built-up part of a settlement

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12 In Hungarian: konstruktív-iniciatív közeg.
he laid down the theoretical foundations of Spatiology – the methodology and discipline elaborated by his researches. In addition to the internal spatial relations, the external spaces delimited by architectural ensembles are also dealt with in the study, which makes urban environments also become part of the issues of spatial creation – we can learn more about its practical adaptability from Péter Hajnóczí’s doctoral research (Fig. 5).14

The quantitative and qualitative numeric analysis and interpretation of space theory – that is the spatiological evolution – in relation to the main periods of architec-

Figure 6. Ronchamp – qualitative and quantitative spatial analysis following the methods of Spatiology (From: Hajnóczí, Gy.: Épület- és településkarakerológia [Building and Settlement Characterology]. OTKA Research Report in Print, BME Sokszorosító, Budapest [1991.] p. 275)

tural history was elaborated by involving some key monuments of the periods. This analysis appears to be a heroic work – note that at that time the digital technology available to everyone today was not yet at hand, but these directions – the use of digital tools and the interpretation of virtual space – make his theory relevant today and methodologically much easier to apply (Fig. 6).\footnote{Mezős, T.: A térmennyiség számítógépes megállapításának módja [The Determination of the Amount of Space by Computer]. In Hajnóczi, Gy. (ed.): Appendix – a 283. számú OTKA kutatás (1988–1991) zárójelentése. [Appendix – Final Report of OTKA Research No. 283 (1988–1991)] [Printed manuscript] [1991.] II. rész [Part Two], pp. 19–21.}

**SPATIOLOGY AND ITS THEORY CONTEXT**

As outlined above, Hajnóczi’s studies of space theory began in the 1960s and by 1978 became a consistent theory with the *Prolegomena*, resulting in the scientific methodology of analysing the architectural space called Spatiology. After the elaboration of *Prolegomena*, in the course of the research project (supported by OTKA, the Hungarian National Research Fund)\footnote{Hajnóczi, Julius Gy. (témavezető): Épület- és településkarakterológia. OTKA kutatás, 283. sz. 1988–1991. [Hajnóczi J. Gy. (lead researcher): Building and Settlement Characterology – Research project supported by OTKA (=the National Scientific Research Fund) No. 283. 1988–1991.]} for the development of Spatiology to practical applicability, and by the progress in the publication in book format Hajnóczi could determine a critical reference to the space researches carried out by Herbert Muck, a professor at the Akademie der Bildenden Künste in Vienna.\footnote{Muck, Herbert: *Der Raum. Baugefüge, Bild und Lebenswelt* [The Space. Structure, Image and Living Environment]. Akademie der Bildenden Künste Institut für Sakrale Kunst, Wien 1986.} This provided an opportunity for Hajnóczi to place the foundations of the *Prolegomena* into a critical context by referring to the human dimensions and social relations of architecture.

Looking at his references it appears obvious that, contrary to Muck’s interpretation, Hajnóczi’s position is much more complex, including the socially and psychologically determined factors of spatial perception. According to Hajnóczi’s Spatiological method, or, in other terms, according to his analytical theory of space, a constructive-initiative medium initiates spatial relations, including external and internal aspects, and based on this ability, the definition of spatial qualities can be interpreted in relation to man and space. The quantitative analysis of these spatial quality categories leads to the establishment of spatial characterology.

Spatiology can be paralleled with, or more precisely, it can precede the architectural research processes in the field of architectural theory in international context, which have highlighted only one aspect from the sub-areas covered by Hajnóczi’s complex analytical methodology. Such a parallel initiative is, for example, the method of analysis based on visual exploration and perception of space, the spatial description with “isovists”, according to Tandy’s theory (1967)\footnote{Tandy, C. R. V.: The Isovist method of Landscape Survey. In H. C. Murray (ed.): *Symposium. Methods of Landscape Analysis*. Landscape Research Group, London 1967. 9–10.}. Michael L. Benedikt
(1979) later introduced analytical measurement methods for qualitative spatial and environmental representations based on isovists. This process greatly contributed to the practical applicability of the method based on visual space analysis. Tandy and Benedikt’s method marked the main direction of analytical spatial studies in Western architectural culture, which later expanded to include spatial perception-centric and other disciplines, among others also graph theory to its methodology, leading then with the proliferation of digital techniques to the development of analytical methods that could be performed with a computer. At the same time, the essential difference between the application of isovists and Hajnóczi’s theory is that while isovist theory considers only the visual revelation – and thus excludes the subject-defined social determinism of space – Hajnóczi’s theory aims at the complexity of spatial analysis: in addition to multifaceted and precisely defined quantitative characteristics, it includes the immanent attitude to the intellectual history approach, spatial psychology, the designer’s and recipient’s aspects, as well as the possible social dimensions of spatial quality, completed with an analysis focusing on the historic development of architectural spaces. He argues that architectural environment is an “objectified form of human behaviour” that should be interpreted not only in relation to the building and space, but also in relation to man and space.

Miloutine Borissavlievitch’s comparative critical study of architectural theories (1926) was one of the thought reference works for the conceptual basis of Spatiology, for its geometric proportion analysis, and for the development of a comprehensive and critical history of architectural theory. However, an essential difference is that Borissavlievitch forced the application of perspective according to independent principles in the critical evaluation of all theories, thus resulting in a reduced approach.

The relevance of Hajnóczi’s theory is indicated by the fact that the need to use analytical architectural theory was articulated in several ways at the end of the 20th century. The need for renewal in the field of humanities is represented by the theoretical work of Jon Lang (1988), who attempts to formulate normative design theory based on, among other things, the results of research in behavioural science.

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CONCLUSION

This brief overview highlights the extent to how Gyula Hajnóczi’s theory of architecture with its theoretical basis and methodology may appear as a considerable chapter in the European architectural culture of the second half of the 20th century and is still relevant today. It is not so well known, perhaps because of the kind of in-depth focusing integrated character and understanding of the extremely complex structure of space theory that is not so easy to apply in a simplicist form. The other reason is that although it was published in German, and then in Hungarian, it remained quite limited to the international readership, the English edition is still waiting for completion. Its effect can basically be traced in Hungarian theory writing.

In addition to his space theory, he also wanted to process an outline of another intellectual challenge, the history of architectural theory from Antiquity to the 20th century. The book would have been the textbook of the subject History of Architecture Theory, that is also taught today in architecture education at BME, and he had actively worked on the manuscript until his death in 1996. The first part of the work – which presents the history of theory from Antiquity to the end of the Renaissance – was published in this periodical, the reconstruction of the second part from manuscript fragments can be an important task for Hungarian architecture theory researchers for the future.

Gyula Hajnóczi’s intellectual legacy is present in the teaching of architecture, his books are in use, and his theory is known to interested students. If university architecture education were to have a properly equipped spatial theory research laboratory, Spatiology might play an essential role in this initiative. Hajnóczi’s theory would be worthy of this: the comprehensive approach developed from the study of the spatial view of the architecture of Antiquity should be considered as one of the relevant Hungarian architectural and intellectual achievements of the second half of the 20th century.
térészlelés társadalmi és pszichológiai meghatározott tényezőit is. Analitikai elmélete szerint a konstruktív-initiatív közeg határozza meg a vallum és intervallum fogalmakkal meghatározott térfolyamatokat, majd ennek a kvantitatív elemzése alapján a térfolyam minőségek meghatározása az épület, az ember és a tér vonatkozásában komplex módon értelmezhető. Az építészeti alkotás elméletileg ebben a kettőségből nagyadó meg, kvantitatív és kvalitatív jellemzőivel. Hajnóczi munkássága nemzetközi kevésbé ismert, azonban kortársainak kutatásaival összehasonlítva és elemezve fontos szerepet játszhat a nemzetközi kutatásokkal párhuzamba állítva. Műve a 20. század második felében hazánk egyik releváns elméleti építészeti eredményeének számít.

Kulcsszavak: Hajnóczi Gyula, építészetielmélet, Spaciológia, analitikus térelmélet

ANALYTISCHE RAUMTHEORIEN UND GYULA HAJNÓCZIS
„SPACIOLOGIE“

Zusammenfassung


Schlüsselwörter: Gyula Hajnóczi, Architekturtheorie, Raumkunde, analytische Raumtheorie

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