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HUMANIZATION OF A CONTEMPORARY HOSPITAL – RETURN TO TRADITION AND TO HOLISTIC CONCEPT OF TREATMENT?

HUMANIZACJA WSPÓŁCZESNEGO SZPITALA – POWRÓT DO TRADYCJI I HOLISTYCZNEJ KONCEPCJI LECZENIA?

Abstract

The article is a reflection on the quality of the architecture of a modern hospital, which, following a long period marked by the supremacy of medical technology and patient safety, is now an indicator of contemporary cultural and aesthetic values. The objective of the article is to determine how the therapeutic significance of architecture is integrated into the modern design of hospitals. Selected concepts of solutions in hospital facilities have been referenced, emphasizing the role of natural environment in them, especially in the latest concept of shaping the therapeutic environment. This phenomenon can be viewed both as a reminiscence of the ancient holistic concept of health, in which nature affects the course of the treatment process as well as a set of solutions aimed at building a brand name of a facility and implementing the highest standards for the improvement of treatment quality. The presented conclusions are based on a literature study involving the research on the impact of the elements of therapeutic environment, as well as on a comparative case study, demonstrating how to implement natural elements into the hospital space.

Keywords: hospital architecture, therapeutic environment, design in terms of patients' needs, sustainable construction, the role of nature in the design process of hospitals

Streszczenie

Artykuł jest refleksją nad jakością architektury współczesnego szpitala, który po długim okresie dominującej roli technologii medycznej i bezpieczeństwa pacjentów jest obecnie wykładnikiem współczesnych wartości kulturowych i estetycznych. Celem artykułu jest określenie, w jaki sposób terapeutyczne znaczenie architektury wplata się we współczesne projektowanie szpitali. Przywołano wybrane koncepcje rozwiązań w obiektach szpitalnych, podkreślając w nich rolę natury, zwłaszcza w najnowszej koncepcji kształtowania środowiska terapeutycznego. Na zjawisko to spojrzeć można zarówno jak na reminescencję starożytnej holistycznej koncepcji zdrowia, w której natura wpływa na przebieg procesu leczenia oraz jak na rozwiązania ukierunkowane na budowanie marki obiektu i realizację najwyższych standardów w podążaniu za podniesieniem jakości leczenia. Prezentowane wnioski bazują na studium literaturowym dotyczącym badań wpływu elementów środowiska terapeutycznego, jak i na komparatywnym studium przypadku, wskazującym sposoby implementacji elementów przyrodniczych w przestrzeni szpitala.

Słowa kluczowe: architektura szpitala, środowisko terapeutyczne, projektowanie pod kątem potrzeb pacjenta, zrównoważone budownictwo, rola natury w projektowaniu szpitali

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1. INTRODUCTION

The values comprised in contemporary architecture emphasize, among other things, the social dimension of shaping space: architecture, which is the stage of our everyday life, should support rather than divide, restore rather than consume and inspire rather than enslave[2]. With regard to the architecture of hospitals, it is the supportive environment of people which plays a crucial role at times of special psychophysical sensitivity. Architecture in this context becomes an inherent component of the treatment process, which has been confirmed by numerous studies in environmental psychology (Roger S. Ulrich, A. J. Owens, G. Golden). The hospitalization process has been analyzed in them from a holistic perspective which allows to identify the components of the anthropogenic and natural environments that support patients and their relatives in the treatment process. On the one hand, it is unquestionably the result of the superior role of patients' comfort as one of the most important groups of stakeholders in the hospital, as well as the effect of increasing awareness of the impact exerted by the physical environment on people (*patient-centered design*). Simultaneously, the quality of hospital facilities is now also expressed through the concern for people in terms of the quality of the environment in which we live and implement sustainable solutions in six categories: site planning, water use reduction, use of energy, materials and construction practices, community[3]. Therefore, the objective of the article is to specify contemporary tendencies in the design of hospitals with the use of therapeutic significance of architecture and nature.

Undeniably, modern technological development has contributed to ignoring the impact of physical environment on man, lowering the awareness involving man's impact on well-being and health, as well as weakening the relationship between man and nature. In the distant past, man lived in symbiosis with nature, using its resources while respecting its rights. It was also reflected in the holistic concept of treatment, which used the elements of nature, religion, healthy nutrition and art to maintain the balance of mind and body. Yet, we can put forward a thesis that nowadays defining the quality of the hospital is done by searching for innovative solutions that return to those traditions and concepts.

The investigated subject is the result of the author's research and reflection on the behavioral dimension of hospital space, earlier – mainly through the perspective of components found in hospital environment used for the adaptation of older patients, which in turn led to the questions: **How is the therapeutic significance of architecture woven into modern hospital design? What are the ways to restore human homeostasis in the anthropogenic environment and what traditions do they originate from?** To find the answers, literature studies were carried out, indicating the importance of the main components of the therapeutic environment and providing a basis for a comparative case study of selected hospital facilities. In effect, the role of the natural environment in shaping the therapeutic environment and, consequently, its importance for the creation of hospital architecture, socially responsible and integrated with the environment was specified.

[2] Guenther R., Vittori G., *Sustainable healthcare architecture*, John Wiley & Sons, New Jersey 2013, pp. 3–11.
[3] *Ibid*em.

2. HOSPITAL BEFORE AND TODAY: SELECTED CONCEPTS OF TREATMENT AND THEIR IMPACT ON THE SOLUTIONS OF HOSPITAL FACILITIES

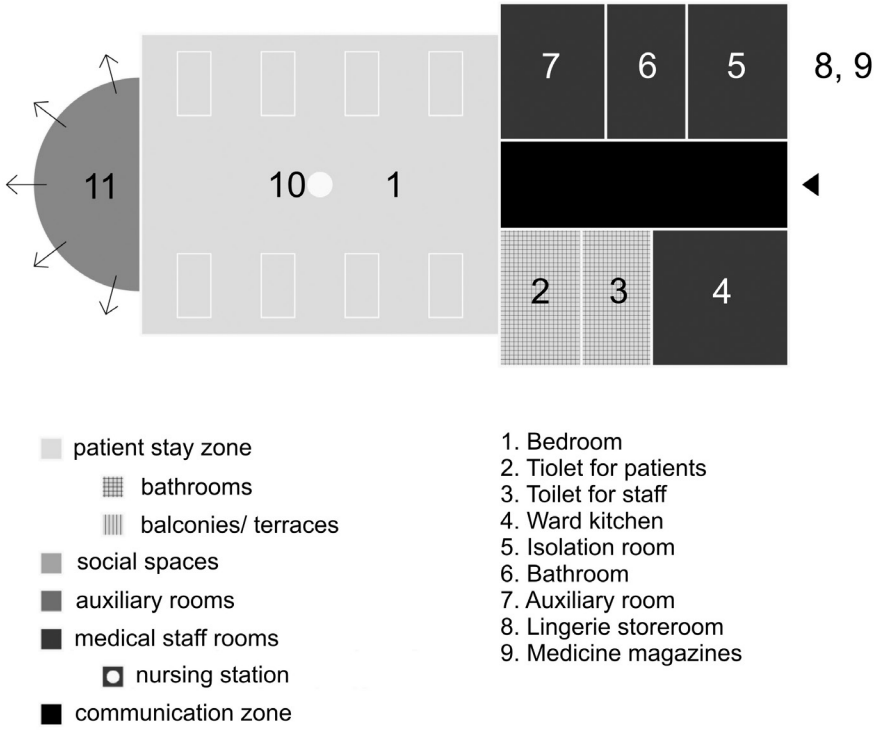
The basic premises underlying the shaping process of healthcare facilities as a rule used to comprise the state of knowledge and medical technology as well as the concepts of care for the sick in terms of faith, knowledge and healthcare. Human strive for harmony resulted directly from the desire to recreate the universal order of nature, which was reflected in the concepts of shaping forms and their meaning for healthcare facilities. The permanence of this accepted wisdom among many archaic cultures ensured the access to traditions as the most reliable source of full knowledge which could be taken advantage of. For most of these cultures, the belief in the existence of a hidden order, that is, principles representing unity in the world and the bipolar nature of reality, gave rise to the introduction of these concepts into the building material[4].

In ancient times, the treatment process referred to the concept which combined illness with the ethical and sacral side of life, which later initiated health resort treatment. For example, ancient healing in Greece was associated with the cult of Asclepius, combining rituals with body purification and diet. This purpose was served by elevated sacral centers created by temple buildings, stadiums or arcades having the function of hospitals, as well as reception and sleeping rooms, or rooms for treatments and baths. The symbolism of water as a source of purification and rebirth intertwined with the cult of Asclepius played an important role in the treatment[5]. Additionally, in the past, health states and diseases were also referenced to the rhythms and cycles of nature, which were a source of meditation and provided therapeutic means, e.g. in the form of baths or herbal decoctions. However, later achievements of the Hippocratic school diverted the treatment to other, more rational thinking paths, desacralizing the causes of disease, basing the treatment on the gathered experiences and introducing the principles of hygiene and proper nutrition.

Later concepts of treatment, and in consequence the forms of collective treatment were associated with the existing political system and religious worldview (medieval hospitals as shelters under the auspices of the Church). The achievements of the turn of the 18th and 19th centuries in the field of medical knowledge (including classification of medical units, introduction of asepsis) resulted in the separation of hospital wards and the subsequent introduction of aseptic conditions for surgical procedures (separated surgical rooms in 1882)[6]. At the same time, it was the period when the ideas of the British nurse Florence Nightingale provided a new line of thought about the architecture of hospital, about the rise of hygiene and efficiency of nursing care. In her book, Notes on Hospitals (1863), she pointed out the most important factors in improving sanitary conditions in hospitals[7]. These

[4] Drapella-Hermansdorfer A., *Idea jedności w architekturze*, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 1998, p. 42.
[5] Pasek Z. (ed.), *Miejsca święte – leksykon*, Znak, Kraków 1997.
[6] Tomanek M., *Technologia medyczna w projektowaniu obiektów szpitalnych*, Śląsk, Katowice 2015, pp. 21–26.
[7] Verderber S., *Innovations in hospital architecture*, Routledge Taylor & Francis Group, New York 2010, pp. 20–24.

include: adequately low density of patients in hospital wards, appropriate air circulation, daylight illumination of patients' rooms, hygiene of sanitary facilities and in kitchens as well as good social conditions for nurses (Ill. 1). The second half of the nineteenth century was the period in which hospital premises were most often shaped as dispersed pavilion buildings (among other things due to the development of medical knowledge and individual specializations, or discoveries in the field of bacteriology as well as to prevent nosocomial infections)[8].



Ill. 1. Plan of a hospital ward according to F. Nightingale's recommendations
Source: the study of A. Szewczenko acc. [6]

The relations between medicine and the natural world have a centuries-old tradition. However, the breakthrough development of civilization towards knowledge, technology and industrialization, and later towards information technology, has significantly increased the gap between the treatment process and its natural roots, seeing in the achievements of modern medicine a new way to solve health problems of the society. The architecture of hospital facilities, mainly that from the second half of the 20th century, was subject only to the rules guaranteeing the smoothness of medical processes and the efficiency of med-

[8] Tomanek M., *op. cit*.

ical technology. However, the increasing awareness of human alienation from the natural environment and the growing consequences of the subjective treatment of nature enforced a retreat from the anthropocentrism and technocentric architecture. A new perception of nature reflected in hospital facilities of the 21st century assumes that the course of a treatment process should be in unison with the natural environment, especially in view of the tasks implementing the principle of sustainable design.

3. HEALING ENVIRONMENT AS A CONTEMPORARY CONCEPT FOR SHAPING HOSPITAL SPACE

The contemporary concept of shaping hospital facilities advocates primarily a holistic approach to patient treatment and the use of various elements of the therapeutic environment (healing environment) to treat the mind, body and spirit, which underlines the patient's respect and dignity, thereby the whole facility helps support patients in their difficult life situations. The basic components that make up the therapeutic environment comprise: air quality, thermal comfort, noise reduction, level of privacy, access to daylight and artificial light, connection with the natural world, conditions for isolation in severe disease states, visual stimulation for convalescents[9]. In line with the theories defining human interactions with the environment, which have matured in the last three decades, the theoretical perspective pointing to stressogenic stimuli and the level of adaptation has become a key issue for the research on the quality of hospital buildings. Eliminating stress, maintaining the control level and patients' comfort had become the leitmotif in the design process of therapeutic environment, which was reflected in the theory of supporting environment (Supportive Design Theory: a theory designed by Roger Ulrich 1991). It assumed the coexistence of three basic components of the hospital therapeutic environment: a sense of control, social support and positive distractors in the physical environment. It should be noted that in parallel with the biopsychosocial treatment model, in which environmental factors should strengthen the physical, social and mental health of the individual, the definition of beneficial environmental factors results from the knowledge collected on the basis of data. Evidence-Based Design as the most commonly used research method investigating the quality of hospital facilities is focused on the identification of environmental factors that have a measurable, empirically confirmed impact on patients' health. In effect of research studies conducted with this method, a broader definition of the components of the therapeutic environment has been developed, comprising such elements as: access to the elements of nature, positive diversion, access to social support, providing the possibility of choice (ensuring patient control over the environment), elimination of stressogenic environmental stimuli[10]. They expand the necessary scope of indispensable elements in the design process of hospital facilities.

[9] McCullough C. (ed.), *Evidence-Based Design for Healthcare Facilities*, Sigma ThetaTau International, Indinapols 2010, pp. 45–47.
[10] *Ibidem.*

Elements of therapeutic environment	Importance for health and symbolism
Elements of nature:	
water	**in the past**: water as a cosmic element, the matrix of all existence, well-spring of life and vitality, symbolism of purification, **today**: spa waters as a basis for spa treatment, element of aesthetic importance, adjuvant as a soothing agent,
plant life	**in the past:** the healing value of herbs, healing with essential oils, the symbolism of the tree of life as a source of healing power, **today:** healing effects of herbs as an adjuvant therapy (phytotherapy), the natural world as one of the key elements of the therapeutic environment, principally in psychotherapy, mainly due to the polisensoric effect[11], combined with climatic conditions, spa treatment was launched,
air	**in the past:** healing importance of air quality with respect to meditative and relaxation techniques, **today:** mechanical and electrical stimuli (wind action, changes of pressure or ionization of air) important in the treatment of the nervous system, indoor air quality as an important factor of treatment quality; healing conditions in view of climate conditions,
natural light	**in the past:** primordial power, source of life and the symbol of infinity and divinity, whereby light played an important role in religious rites, **today:** documented improvement of metabolism, stimulation of hemato-poietic mechanisms, increase of body's immunity, stimulating influence on endocrine glands, deallergizing and anti-rickets action,
Elements of culture:[12]	
level of privacy	essential for reducing the patient's stress level, regulating environmental factors and ensuring a sense of security; enabling the individual to choose how to participate in processes occurring in the hospital environment,
socially oriented space	influence on the deinstitutionalization of the hospital space, very important for the well-being of patients by building the social climate of the hospital, facilitating contacts with the family or with other patients,
information channels	treating the healthcare facility as a set of environmental factors: medical, spatial, organizational ones – allowing for the influence of information in the patient-hospital relationship on maintaining the patient's control level; lowering the stress level by providing information about hospital space and adjusting the structure of information transfer.

4. SPECIAL DIMENSION OF THE THERAPEUTIC ENVIRONMENT: NATURE DISCOVERED ANEW. CONTEMPORARY ROLE OF NATURE IN HOSPITAL FACILITIES

In the mid-1980s, the research in the field of environmental psychology conducted by Ulrich (1984) demonstrated that the improvement in treatment efficiency in the hospital space was

[11] e.g. Attention Restoration Theory – ART, developed by Rachel and Stephen Kaplan, acc. Shackell A., Walter R., *Greenspace design for health and wellbeing*, Forestry Commission, Edinburgh 2012, pp. 3–5.

[12] selected elements of healing environment according to the identified components by B. Dellinger. McCullough C. (ed.), *op. cit.*, p. 47.

closely related to nature. The research carried out by the Evidence-based Design method reinforced that belief, and now the introduction of available therapeutic gardens and greenery in social spaces, the introduction of aquatic elements (aquariums, fountains) and the opening of green rooms has become a routine approach in many contemporary projects. Nonetheless, there is no explicit language of patterns facilitating the introduction of these elements to a design process which would yield measurable indicators of a successful development of therapeutic environment. This requires that the designer should have a thorough knowledge of issues related to environmental psychology. There are available recommendations for shaping the hospital environment (e.g. the recommendations of the British Ministry of Health – NHS Health Building Notes), indicating specific solutions in shaping the therapeutic environment, yet to obtain the proper character of the facility, we need to employ expanded design competences.

The concept of "biophilia", introduced in the early 1980s by the American biologist Edward O. Wilson, emphasized the tendency of people to relate to nature and other forms of life, due to fact that man had been in constant connection with nature for over 90% of their existence on Earth, and hence, genetically, human instinct responds positively to the contact with nature. Further research by Stephen R. Kellert and Judith Heerwagen in 2005 expanded the definition of biophilia onto the area of the built environment, including hospitals, at all levels of its designing process – from organizational issues to the selection of materials. The strategy of using the biophilia in hospital facilities assumes considering the environmental features of the location, the natural morphology of forms, the concepts of managing light and space in the facility, connections with the identity of place (place-based relationships) and creating relationships between man and nature[13]. And hence, the next premise arises for using nature in the holistic process of restoring homeostasis in the human organism.

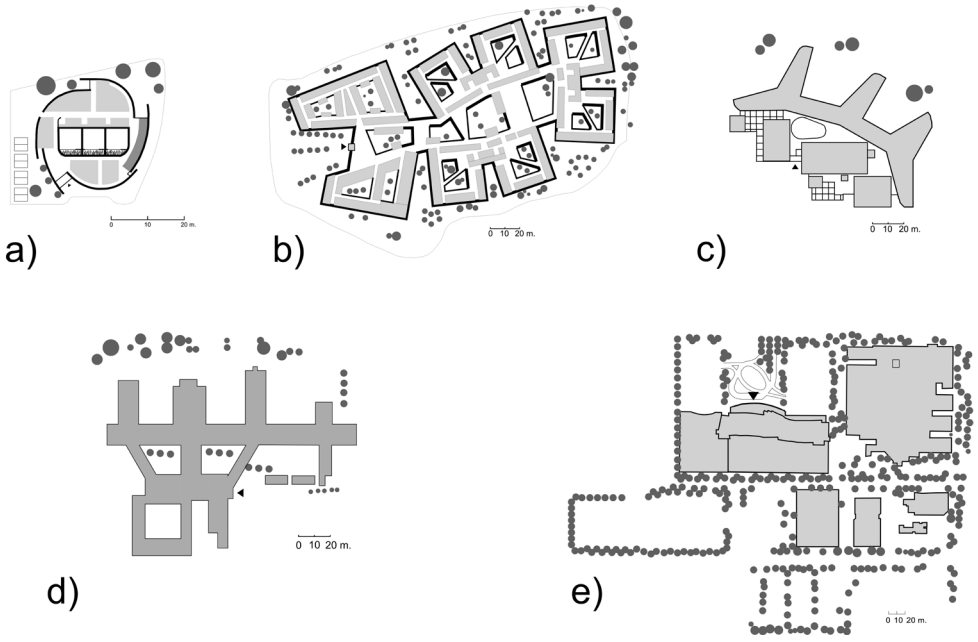
Concurrently with the discourse in the field of environmental psychology in the area of public health initiatives, there are also many other activities undertaken towards sustainable architecture of hospitals and the highest possible quality of hospitals. Apart from obvious measures undertaken to reduce energy consumption in the facilities and to limit negative impact on the natural environment, other tools have been developed to identify key solutions in sustainable construction. As regards the criteria specified in the certification system BREEAM for Health, such categories as health and well being are taken into account, and in the system Living Building Challenge – access to green areas. The criteria involving the availability and visibility of greenery for patients are also a part of the British quality assessment tool of hospitals – AEDET.

The concept of easing stress or anxiety of patients associated with the treatment process through the maximum use of natural light and the views offered by nature is the leitmotif of many modern hospital facilities. As a rule, this interpenetration of matter, being the product of man and nature, is expressed by the fragmentation of the body of a building; its polymorphism can be reflecting the diversity of the natural environment. At the same time, this formal approach enhances the availability of sunlight and greenery. Representative examples which are subject to analysis have been realized in the last twenty years, presenting an excellent level of unity between architecture and nature. By reason of the character of the discussed issues, the choice of examples was dictated by the criterion of bimorphism, i.e. the degree of mutual adaptation of the facility and the nature. The second criterion involved the relationship between the area of the patient's zone and the natural environment (Ill. 2):

[13] Guenther R., Vittori G., *Sustainable healthcare architecture*, John Wiley & Sons, New Jersey 2013, p. 68.

- health center: Kraemer Radiation Oncology Centre at Anaheim California, USA (designed by Yazdani Studio of Cannon Design, realisation in 2015),
- psychiatric hospital at Vejle, Denmark (designed by Arkitema Architects, implemented in 2017),
- hospital in Deventer, the Netherlands (designed by Dutch Health Architects, realisation in 2008),
- Midpark Hospital, Dumfries, the Scotland (designed by Architecture and Design Scotland, A+DS, realisation in 2012),
- Arizona's Phoenix Children's Hospital, Phoenix, USA (designed by HKS Arch, realisation in 2011).

A repeatedly applied interpenetration of two realities – anthropogenic and natural – is a symptomatic feature in the above examples. The transparency of partitions or envelopes, the introduction of open-plan perspectives (as in the hospital in Vejle), or the poetic character of form (e.g. in the case of the Anaheim radiotherapy center) is woven into a creative search for symbolism related to nature, aiming to evoke the context of nature in the architecture and to return to the primal values. The healing effect of natural elements is most often obtained thanks to the maximum opening onto the internal atria, which make up green centers of particular segments, or the centers of the entire facility. At the same time, they constitute a semi-private recreation space for patients and they create specific microecosystems, which facilitates personal relation with nature.



Ill. 2. Maximum opening on natural environment in representative examples of hospitals: a) health center: Kraemer Radiation Oncology Centre at Anaheim California, b) psychiatric hospital at Vejle, c) hospital in Deventer, d) Midpark Hospital, Dumphries, e) Arizona's Phoenix Children's Hospital, Phoenix. (by A. Szewczenko)

Most of the above facilities have been awarded for the development of an environment which supports treatment and patient care, for the reduction of stress experienced by patients and their families, and for the environment focused on experiencing nature (e.g. the LEED Gold certificate).

An exceptional influence of the hospital space has been reported with respect to patients with mental disorders (e.g. dementia syndromes) for whom the incorporation of natural elements into healthcare facilities means not only outdoor activity, but also an orienting factor, giving the space the character of *a place*, whereby it assumes the aura of homeliness and security. Inner green courtyards are used:

- to support physical activity within internal therapeutic gardens, and thus limiting forceful methods applied to calm patients down,
- to ensure comfort for patients and staff thanks to the maximum use of daylight in the building and its therapeutic properties.

Also in Poland we can find progressively more realizations of hospitals, whereof space is filled with natural elements serving the comfort of patients. Such assumptions had been followed at the Swissmed hospital in Gdańsk (2003), the Radiotherapy Center in Kalisz, (designed by Archibud, implementation in 2014 – Ill. 3) and in the recent reconstruction of the building F of the hospital in Międzylesie (2018).

Ill. 3. View of the inner patio in the Radiotherapy Center in Kalisz. Design by A. Malicka. Photo by Archibud (the photo is from the archives of the Archibud office, courtesy of Ms. A. Malicka)

5. CONCLUSION

In the era of broadened awareness of the concept of health as a holistic process, which is a condition ensuring physical and psychosocial well-being, the form and functionality of hospital facilities are naturally following these changes. Rooted in the tradition of many cultures and biologically conditioned, the relationship between man and nature has been undergoing new interpretation in the contemporary architecture. Using the knowledge and effects of scientific research, we are more and more consciously shaping the built environment of hospital facilities, endowing it with the character of a place conducive to convalescence and supporting the healing process. Thanks to the developed research methods, which verify the effects of the applied architectural solutions and the role of the introduced natural elements, these activities may adopt more measurable, deterministic, and not only intuitive character. The process is taking place through authorial realizations, which seek innovative solutions involving the relationship between the building, the user and the nature. At the same time it is in unison with the development process of new functionalities and a new dimension of hospital architecture. Indisputably, after a long period marked by advocating technocentric solutions and the domination of medical technology, the implementation of natural elements in the hospital space is not deprived of the servile role of architecture, but undoubtedly in this type of thinking we can find the reminiscence of the old concept of treatment in harmony with nature.

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