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Determining the degree of degradation of a historical and architectural object: Assessment Scale

T Yu Bystrova^{1,2}

¹Theory and History of Architecture Laboratory, UralNIIproject, 50a, Lenina St., Ekaterinburg 620075, Russia

²Chair of Culturology and Design, Ural Federal University, 19, Mira St., Ekaterinburg 620002, Russia

E-mail: taby27@yandex.ru

Abstract: The author's definition of the degradation of a historical and architectural object is derived in the article, taking into account the change in the paradigm of working with heritage and strengthening the humanitarian component in it. The degradation of a historical and architectural object is interpreted as the loss of its function and meaning for the people and the territory on which this object is located, caused by an underestimation of its value and socio-economic and cultural potential. Understanding the subjective components of degradation leads to the conclusion about the possibility of specialists' working with public opinion, and involving residents in project activities. Examples of the work of architects with degrading architectural objects are shown. The criteria for evaluating such objects that help to make reasoned professional decisions on working with objects of historical and architectural heritage are derived.

1. Introduction

At the beginning of the 21st century, the outlook on the development of cities is changing dramatically, since with the aging of industrial buildings and housing stock, the activity on rehabilitation, revaluation, updating of historical and architectural objects, not only passported ones, takes an increasingly important place [1-11], while the construction of new objects is far from always being appropriate in environmental terms [12-15]. Previously, this process did not reach such scale, since the cities themselves were smaller, the factors of destruction of buildings (primarily, fires and wars) showed themselves very intensively, and the economic effect of operating historical objects was underestimated. As the Mexican researcher A. Amine notes correctly, '... recently, a growing concern about historical centers can be fixed; the attitude is changing, since historical centers were thought of as purely cultural objects, now they are considered as objects that are economically advantageous' [4].

The transition from 'point' work with conserved and protected objects to more systemic, complex projects leads to an increase in its scale. At the same time, its humanitarian component is being strengthened, which requires an understanding of the unique features and 'spirit' of an object in relation to its location, people's way of life, the identity of its territory, etc. Attracting specialists of various profiles to this complex work is necessary. Besides, it makes it difficult to assess the state of historical and architectural objects at the pre-design stage, especially when determining the boundaries of professional 'interference' in the architectural form, although there are more than 20 methods for



assessing the state of objects [16-29]. What needs to be left unchanged, what to change or redesign, how to relate to a valuable but significantly destroyed building (and how residents will relate to it) – these issues cannot be resolved without understanding the degree of degradation of a historical and architectural object. This article is devoted to the definition of degradation criteria and the possible actions associated with it.

2. Methodology

We emphasize that we designate any buildings as historical and architectural objects without ranking them by architectural, artistic or other significance. A synthesis of publications on the topic reveals three main methods used by specialists. This is *an interdisciplinary approach*, justifying the involvement of theoretical material in the humanities, theory and practice of development and urbanism, implemented in [4,26,30-38]. *The semiotic approach* used by [17,33] allows us to develop a classification of the degrees of degradation of objects and complexes of historical and architectural heritage, taking into account the attitude of residents, investors, and tourists. *The morphological analysis* in the spirit of [2,19,30], which treats form as an information-symbolic system, allows us to propose mechanisms for the rehabilitation of objects and complexes of historical and architectural heritage of small cities as a system-forming component and ‘growth point’ of these cities, responsible for their integrity, development and identity.

We leave aside a rather large block of works of a natural scientific kind, treating degradation as a purely physical process, considering this understanding insufficient for the architectural process [5]. On the contrary, the inclusion of the value attitude of residents and specialists to heritage objects [23] proposed in the work requires an additional study using opinion polls [9]. An interesting statement is the question of the relationship between a homogeneous and image-based city landscape with the degradation of the architectural environment in its cultural dimension [20]. The consequence of the rejection of the diversity of architectural objects and proper work with them is the loss of identity.

In general, due to the low degree of elaboration of the problem, the work is based on the intersection of two levels of scientific data, that is, empirical, taken from the practices of protecting and updating objects of historical and architectural heritage, and theoretical, obtained from various sources of analytical, reference and encyclopaedic, and design nature. A similar kind of methodology is implemented in [6,32], and is productive in developing a similar theme in Russian conditions.

3. Results

By comparing with the interpretations of degradation by representatives of other disciplines, the concept of ‘degradation of an architectural object’ is defined taking into account the latest trends in working with historical and architectural objects (from point design to environmental one; from conservation to actualization).

The ways of architects working with degrading historical and architectural objects are derived.

The criteria for assessing degrading objects, which together give a peculiar ‘profile’ of potential changes in a historical and architectural object, are defined and compiled into a model.

4. Discussion

4.1. Degradation as a concept of the theory of architecture

In domestic sources, the word ‘degradation’ is sometimes used without its conceptualization, as part of a general description of the state of historical objects. In one of the thematic dictionaries on restoration, published in 1984, there is no such term; everything is limited to the list of technologies [1].

The concept of ‘degradation’ as applied to cultural heritage was introduced by the UN Convention for the Safeguarding of the *Intangible* Cultural Heritage of October 17, 2003 (emphasis added – T. B.). The context is related to the statement of global social transformations, on the one hand, and the lack of financial resources, on the other: ‘... recognizing that the processes of globalization and social

transformations, creating conditions for the resumption of a dialogue between communities, are, at the same time, like the phenomenon of intolerance, the sources of the serious threat of degradation, extinction and destruction that hangs over the intangible cultural heritage, in particular, as a result of a lack of funds to protect such heritage...’ When it comes to architecture, this term, as a rule, is used only by representatives of scientific knowledge to show the damage caused by water, wind and other natural causes, both natural and man-made [13,14], often at the case study level, with the indirect presence of theory.

Nevertheless, we consider it possible to introduce this concept into the professional vocabulary of specialists in the protection and updating of historical and architectural heritage, introducing into it a number of completely new meanings, possible in connection with changes in the design and management paradigm – first of all, we are talking about the *attitude* of residents and administrative workers to what they consider to be ‘worthy’ of degradation, that is, taking into account *subjective factors* that were not taken into account in the ‘classical’ approach. Similar actions have already been taken regarding what since the 1990s began to be called ‘cultural landscapes’ [27]. Even an ordinary building, which is not protected by anyone, can be old, but not degraded if it is adequately cared for and included in the system of daily activities of the inhabitants. In the future, through the efforts of specialists, it can return to the urban fabric and sociocultural processes.

The word ‘degradation’ came to Russia during the time of Peter the Great and originally meant ‘demotion’, ‘reduction in military rank’. It is in this sense of the decline in social status – and not just the deterioration of physical characteristics – that we use it as part of this work. From a chemical point of view, degradation is the destruction of the old structure and the formation of a new one (in a similar sense it is used by restorers and art historians [21,35]). This gives rise to the use of systematic [6] and structural approaches in working with architectural historical objects. Finally, the expression ‘land degradation’ means processes associated with a decrease in soil fertility. In relation to our questions, this means that the object, as it were, ‘does not give’ the cultural baggage that is present in it to its surroundings.

Hence, *the degradation of a historical and architectural object can be defined as the loss of its function and meaning for the people and the territory where this object is located, caused by an underestimation of its value and socio-economic and cultural potential*. Accordingly, we shall call *rehabilitation* the finding and updating of a new function (or a number of functions) of a historical and architectural object, *taking into account its typology* [5], on the one hand, and the urgent needs of the place and its inhabitants, on the other.

4.2. Degradation and destruction

To further clarify the concept, we use the development of M. E. Krogus, who presented the typology of destructions [16]. Despite the fact that the author speaks of reliance on technical documentation, the first stage of the destruction of a historical and architectural object is also associated with the loss of the owner, a change in attitude towards the object. M. E. Krogus defines four successive stages of destruction but does not fix them in the text of his work with sufficient clarity, therefore, we shall single them out of the text of his work:

1. the initial stage of destruction, damage to the bearing and load-bearing structures is not visible – care of the owner, lack of a ‘master’ eye, turning the building or part of it into the abandoned one (Figure 1).
2. the destruction of the interior, the gradual formation of foci of destruction. ‘This stage is a threshold, after the transition of which it becomes impossible to restore the building, preserving the details and features of its former daily functioning,’ notes the author [16] (Figure 2).
3. mass destruction of a structure – the destruction of various elements and parts, which can be intense.
4. the final stage when the building cannot be restored. The author notes the universality of his approach because of his reliance on physical laws: ‘A similar sequence of stages of destruction, in fact, a model for the development of the destruction process and its formalized description are

considered in the work "Micromechanics of Destruction and the Kinetic Concept of the Strength of Solids. Prediction of Destruction, Non-Destructive Testing of Strength".



Figure 1. The house of the plant manager N. A. Tunev, now the post office. Interior with traces of old alterations. Bilimbay. 2020. Photograph taken by the author.



Figure 2. Building in the style of constructivism. Student building № 1 UrFU, ex. VTUZ-gorodok. Arch.: K. T. Babykin, A. V. Gorshkov, A. P. Utkin, A. V. Katz. 1930s. Ekaterinburg. Photo: D. Zidirova. 2017. The junction between the new and old parts of the building is the place where the original object was destroyed and the new one was adjusted due to the impossibility of restoration.

One can add another state of the object to this list of criteria, in which it can be recognized as valuable – or not recognized at all. This is a ruined state [7,12].

These processes are an integral part of the broader process of degradation, but do not exhaust it. It is necessary to add processes that occur with complexes and territories to the primary classification (Figure 3). The stages will be the same, can occur synchronously, but have a different scale.



Figure 3. ‘White House’, Kyshtym. 1757. Poss. arch. M. P. Malakhov. An object of cultural heritage of federal significance. A striking example of the abandoned territory of the complex of factory buildings, provoking and enhancing the degradation of architecture. Photograph taken by the author. 2019.

4.3. Degradation and ruining

We have already noted that these terms are not synonymous and lie, as it were, in parallel planes. In modern conditions, it is not so much the fixation of the preservation (more precisely, the lack of preservation) of the object that matters [10], but the understanding of its potential, including in connection with the processes taking place in the surrounding area.

Thus, in the dissertation of P.D. Bush on the integration of ruined historical objects into a new context, a detailed analysis of the value of ruins and the types of historical-architectural and historical-cultural work with them is carried out. In particular, the author talks about historical and scientific; functional; historical and memorial; aesthetic and artistic; material value of the ruins [7].

In 2003, B. Sokolov, following Th. Whately and G. Simmel, notes that the word ‘ruin’ is used not only for an architectural structure, but for an object ‘once significant’ [34], without mentioning any quantitative characteristics or criteria, but emphasizing the power of associations caused by the object. With all the validity of his position, this formulation makes it difficult to understand the boundaries of working with the ruin in the rehabilitation of historical and architectural objects, especially since he mainly focuses on the aesthetics of the ruins during the period of Romanticism in Europe and in the art of romanticist trends in Russia, citing examples from fiction.

As if continuing his remarks, P. D. Bush mentions four basic ways of working with ruins, the knowledge of which can be useful in determining ways of rehabilitation of degraded historical and architectural objects. These are the following: strengthening the ruins (exaggeration); preservation of the existing state (apparently, if the experts consider this sufficient, since this is the work of specialists – T. B.); museum exhibits ‘in situ’; ‘reintegration’ of the image of the ruins [7]. In the latter case, being the most distant from modern restoration practices, special work is needed on the semantics of the project. At the same time, we will stipulate the possibility of the existence of an absolutely unaesthetic ruin, precisely in the case of its complete abandonment and complete loss of urban fabric (Figure 4). A positive example of working with a partially ruined building and aesthetizing the ruins is shown in Figure 5.

The following statement can be formulated: the ruin in the ‘existing state’ is *an abandoned degraded architectural object*, practically not falling under the current rehabilitation activities, but having a certain aesthetic and semantic potential as an element of new architectural objects or spaces (Figure 6).



Figure 4. The Art Nouveau building in ruin. Year of construction approx. 1905. Vyborg. Photograph taken by the author. 2019.



Figure 5. House. Mrizi, Albania. 2018. Arch.: Plisatelier architectural bureau. Source: <https://www.instagram.com/plisatelier/>.

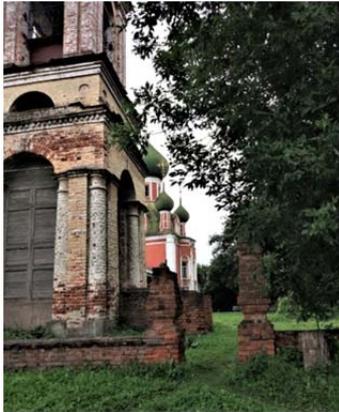


Figure 6. Church of St. Alexander Nevsky. Pereslavl-Zalessky. 2019. Photograph taken by the author. An example of a ruined object that has potential both within the complex of which it is a part and for the city as a whole.

4.4. Value as a necessary category in the work to overcome the degradation of an object

In the history of architecture there were two opposing positions well-known to experts regarding the protection of architectural monuments – those of E. Viollet-le-Duc (1814–1879), on the one hand, and J. Ruskin (1819–1900) and W. Morris (1834–1896), on the other. Today they are referred to as interventionism and anti-interventionism. According to E. Viollet-le-Duc, preservation and restoration of an architectural monument recognized as such presuppose its return to an almost perfect initial state and maintenance in this state. J. Ruskin is extremely negative about the restoration, focusing on the processuality of architecture. Such a ‘dynamic’ interpretation is in many respects close to modern approaches, however, sharing it, it is simply impossible to qualify any building as degrading.

The Austrian art historian A. Riegl (1858–1905), who introduced the concept of ‘an architectural monument’, differentiated in it the division into ‘value of memory’ and ‘modern value’ [31], relevant for this topic. Representing the concept of ‘degradation’ in his terms, we can say that underestimation or loss of the value of memory, together with the lack of modern value and / or knowledge of ways to acquire it, leads to degradation.

The aforesaid introduces the concept of ‘value’ into scientific practice, which assumes a subjective reaction of people to an object and not reducible to a set of purely physical indicators [22,25,32,36].

Value is a concept that has a long history, but has entered into general theoretical usage relatively recently, and has a variety of interpretations. At first glance, it seems almost transparent to ordinary consciousness. In fact, the transition to value discourse entails significant consequences in the attitudes of the researcher or designer. According to I. Kant, a person who evaluates something with the help of the ‘reflecting’ ability of judgment experiences a feeling of pleasure or displeasure, correlating the individual (information about the object) not with the notion already known to them, but with the one they have yet to find. For this, the possibilities of reason and mind that European rationalism is so proud of are not enough. In the future, for F. Nietzsche, evaluation is the most important mode of human life: a person *refers* to everything that is around him, and, thereby, learns themselves better. In assessment, it is not so much subjectivity that is important as the independence of its implementation. Using the concept of ‘value’, including in the theory of architecture, we are moving away from opposing a person to what he evaluates, which is important for changing the attitude of specialists and citizens to heritage.

The Encyclopedia of World Problems and Human Potential, UIA [13] refers to the environmental degradation of urban areas, which also includes the destruction of historical sites. It is noted that it occurs both due to the changing needs and social structure of cities, and due to underestimation of the heritage potential. In other words, the *socio-economic* and *subjective-evaluative* causes of the degradation of historical and architectural objects are highlighted.

The criteria for the value of an object of historical and architectural heritage can also serve as criteria for assessing the degradation of an object if they are absent. This is, first of all, authenticity; historical value; external values; added values. Nowadays, undoubtedly, the value of an object in the context of ecology is added to them.

4.5. *The environmental significance of the rehabilitation of degrading historical and architectural objects*

This significance is due to the very fact of their existence, which is little understood in Russian-language sources. M. Maria and her co-authors note the following: ‘The idea that low-energy buildings respect the environment and that by constructing more buildings of this type we will fulfill the promises made at the Rio de Janeiro summit, to reduce CO₂ emissions in 2005 to 25% of the level that existed in 1990 is, of course, mere absurdity. A new building never saves energy, it rather generates new energy needs, and urbanization is basically anti-environmental in relation to the new (used – T. B.) land [18]. We must be aware that the glorification of new construction, even the most ‘green’, is dictated by a specific economic structure and its needs, and is not a cultural constant. Novelty is a modern landmark that remains significant today, but, above all, for the economy, and not for nature or culture.

Gradually, authoritative public organizations confirm with their decisions the course towards the use of the existing fund. For example, starting from the 2012 London Olympics, the International Olympic Committee takes into account proposals for temporary and renovated buildings among applicants for the Games and opposes megaprojects involving the construction of a large number of new facilities.

Unfortunately, these steps are not completely consistent. For example, they do not take into account buildings, groups of buildings or city districts that cannot be cataloged as historical or being of particular interest to the heritage, even if the architectural qualities that make them easily transformable and adaptable to new types of use are clearly visible in them (adaptive reuse). Experts emphasize that it is these buildings that should be included in new special protection and conservation plans as a basic strategy for saving energy and resources.

The foregoing leads to the question of assessing the degrees of degradation. The most important criteria here are *particularly the functional-semantic* parameters of historical and architectural objects.

4.6. *Classification of the degrees of degradation of historical and architectural objects according to its reasons*

To make responsible decisions in a complex dynamic urban environment, it is necessary to derive comprehensive criteria for assessing degrading historical and architectural objects. In this, we agree with the author from Mexico, who notes: ‘Although it may seem obvious to emphasize the importance of research in any design, application and evaluation practice to preserve the material heritage, we must remember that we cannot intervene in a certain area if we do not have knowledge on more or less accurate and complex characteristics, weaknesses or strengths, so that we can ... decide how to take corrective actions, take measures to restore and preserve and where it is necessary to strengthen earlier existing trends, services or practices’ [5]. Accordingly, in the future, these scientifically based criteria, without which it is impossible to diagnose the state of a historical and architectural object, may be accompanied by a recommended list of possible rehabilitation actions. Such a list should be more or less varied, but it necessarily contains technologies, techniques, formats of real – and not formal – rehabilitation of objects (Table 1).

We should immediately mention the almost categorical rejection of *decorativism* as an approach that leaves ‘fragments of antiquity’ devoid of any functional content. Even if initially they have aesthetic and artistic value (P.D. Bush), without proper supervision or context, they instantly become objects of vandalism and – economically – cause losses.

In order to avoid the identity of the concepts of ‘destruction’ and ‘degradation’, in the light of all the aforementioned, an assessment of the degradation of a historical and architectural object must be carried out taking into account *its causes*. Just a visual assessment or a full-scale fixation is not enough.

Since all the data have different scopes and different measurement scales, it is most convenient to record and show the degree of degradation with a radar chart. Five scales are set on it according to the components of degradation derived above. Evaluation is carried out with mandatory consideration of

the typology of an object. The ‘profile’ of a particular historical and architectural object arises as a result of recording the entire complex of data: a ‘small’ in volume profile indicates a very poor condition and low potential of the object, both material and evaluative (by the population and the state). Going ahead with the performance of one or more axes helps to understand the strengths of the object and suggests the nature of possible projects. As a result, the radar chart, fixing the state of a historical and architectural object, may look as follows (Figure 7).

Table 1. Comprehensive grading criteria of the degree of degradation of a historical and architectural object.

Degree of physical destruction	Loss of function in relation to a city or territory	Loss of function in relation to owner or user	Treatment of local population to facility or complex	State support or lack of it
Destruction is not visible	The beginning of a break in ties with the actual life of a territory, a sense of anachronism of an object; may be accompanied by the unsystematic change of several functions in a row, including without taking into account the typology of an object	Abandoned by the owners or not supported by them	A positive assessment and understanding of the potential of an object. Willingness to physically help in the conservation or restoration of an object. Initiation of a rehabilitation project	Architectural monument status
Destruction of the internal decoration, the gradual formation of foci of destruction	The growing anachronism, the loss of part of the socio-economic, symbolic, aesthetic and artistic functions in relation to the territory	The possibility of vandalism accelerating degradation	Willingness to help specialists in their rehabilitation project	Inclusion in the protected area [11]
Mass destruction of the building	Lack of functions in the socio-economic life of the territory		Media support, readiness for information activity in relation to an object	
Final stage, the impossibility of recovery	Minimal presence of aesthetic, artistic or symbolic function		Neutral attitude, abstract knowledge about the value of an object	Grant support of city administrations, NGOs, ANOs
Ruin	All functions lost	Erased from practice and memory	Negative assessment, complete ignorance, unwillingness of the population to recognize the value of the object, probable intentional or unintentional vandalism	Lack of funding

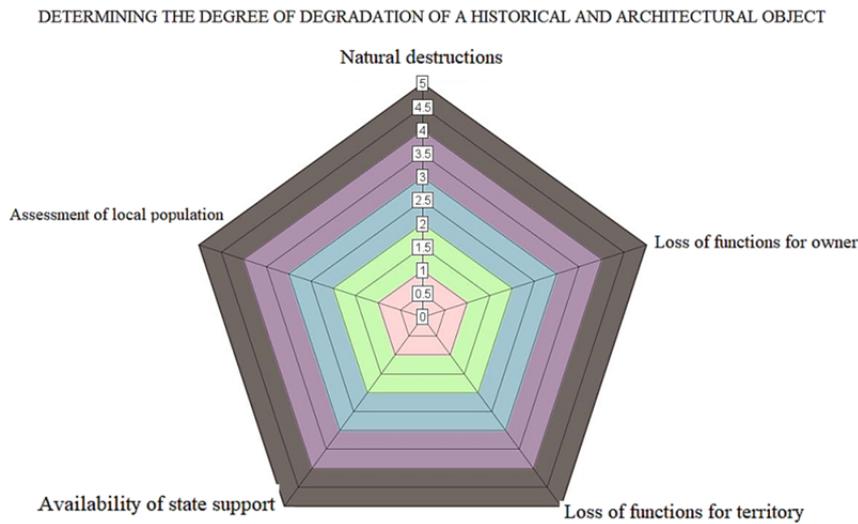


Figure 7. Radar chart sets an algorithm for assessing the degradation of a historical and architectural object. Author: T. Yu. Bystrova.

5. Conclusion

The introduction of the concept of ‘degradation of a historical and architectural object’ is necessary in the context of a change in the attitude of specialists and the public towards historical heritage. The ranking of buildings on any basis and the protection of individual objects become burdensome for the budget of the territory. The same, unrelated to the history and ‘spirit’ of the place, redevelopment proposals for the demolition or creation of ‘art spaces’ have exhausted their uniformity and, in fact, represent one of the protracted paths of degradation. The prospects for industrial areas can often be associated not so much with tourism as with the re-profiling of local production.

Thus, in the city of Bolzano in Northern Italy there was an industrial zone, which was especially active during the fascist dictatorship of Mussolini. It includes an aluminum plant built in 1938, and a number of other heavy industry enterprises. After the closure of the plant in the 1990s the provincial administration acquired a 50-hectare site in this area. In 2004, four inactive workshop buildings received the status of historical monuments, and then the provincial administration held a competition for their re-functionalization. The architect Claudio Lucchin and Architetti Associati set up a technology park on the site, with more than 60 enterprises operating today [24].

Using the building technologies traditional for the region and focusing on working with authentic materials, the authors of the project modernized the factory buildings, making them suitable for production activities in the new conditions. The historicism of the approach was based on an understanding of the style advantages of buildings in the first third of the 20th century. New elements do not hide themselves. They are often painted in dark colors, contrasting with white surfaces and volumes of the original buildings. With the preservation of certain types of (currently inactive) equipment and the general structural basis of the building, they are certified according to environmental standards. In one of the former transformer stations there are laboratories and offices. The former water tower today has become a reservoir for the water used to cool and heat the complex. The entire industrial territory works today, transmitting the industrial rational ‘spirit of the place’ and the spirit of the time of its creation. The contribution of the project to the culture of the region is connected with this. At the same time, the creators of the technopark abandoned the original idea of the museum, replacing it with innovative sites.

This example suggests the need to continue to develop a scale of degrees of degradation. At the next stage, in the assessment of architectural processes, it is necessary to introduce a record of population occupations, preserving the mentality and ‘spirit’ of the territory instead of indulging one-day plots that do not fully take into account the cultural consequences of overcoming degradation.

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