

ASSESSING THE VALUES OF HERITAGE IN SV SYSTEM: the Method and Examples of Use



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Lublin University of Technology

Lublin 2018

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ISBN 978-83-7947-290-1

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PUBLISHER:

Lublin University of Technology

Nadbystrzycka 38D, 20-618 Lublin

PRINTED BY:

Drukarnia Alf-Graf

Abramowicka 6, 20-442 Lublin

This monograph has been published as part of the project entitled:

Smart Values – Scientific modern analysis of research topic; Values and valuation as the key factors in the protection, conservation and future modern utilization of the heritage – collaborative research of European cultural heritage.

The project is co-financed by National Science Centre; Grant no.:

DEC-2013/11/Z/HS2/00001 (UMO-2013/10/Z/HS2/00804)

Special thanks to:

Barbara Olejarz – Head of Ignacy Łukasiewicz Museum of Oil and Gas Industry in Bóbrka

Maria Badeńska-Stapp – Municipal Historic Preservation Officer in Żyrardów

Maciej Szymczyk, Ph.D. – Head of the Museum of Papermaking in Duszniki-Zdrój

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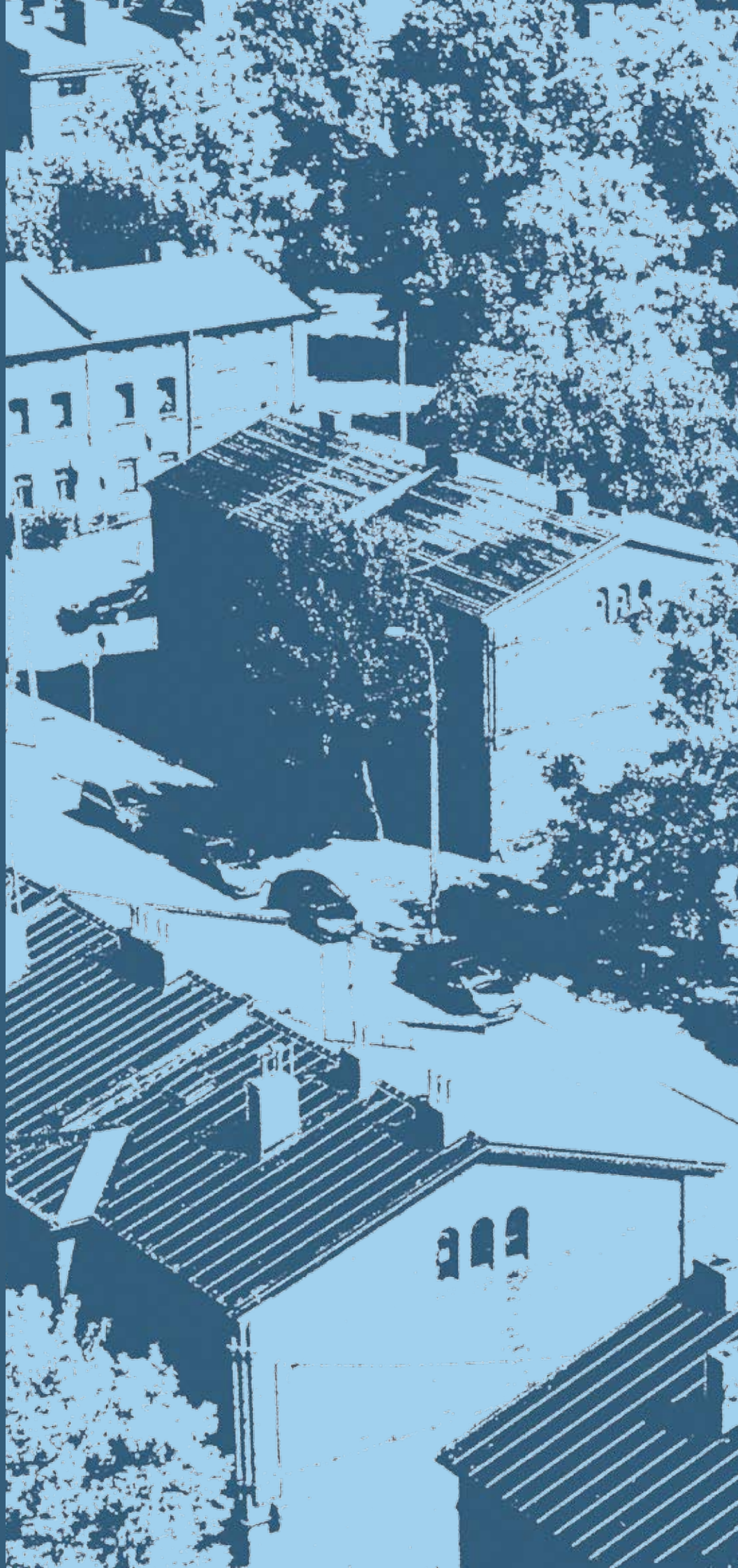


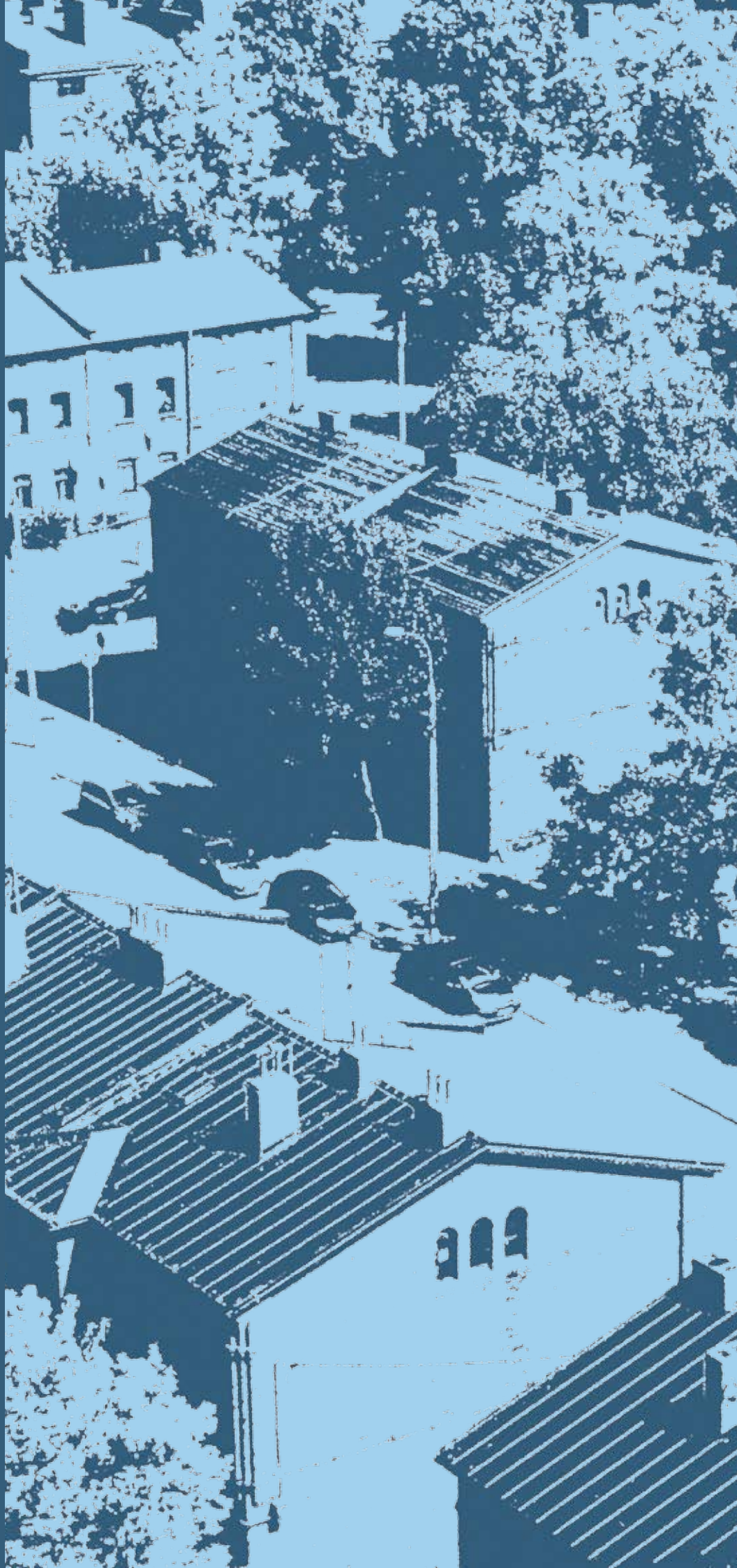
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INTRODUCTION



DETERMINANTS, ASSUMPTIONS, HERITAGE VALUE ASSESSMENT WITH SMART VALUE METHODOLOGY

1. Determinants of heritage value assessment

Heritage value assessment is a fundamental issue concerning conservation science and heritology. Prior to developing a protection plan and schedule of conservation works for a historic monument or site, it is particularly important to assess its values. This issue, however, has not been addressed appropriately yet – no heritage value assessment standards have been developed and implemented. It is therefore of great need to devise a heritage value assessment method. This article not only explains what the Smart Value system is—a heritage value analysis and assessment methodology—but also explores examples of its application.

What should be, however, discussed before the Smart Value system (SV) is presented, are heritage value assessment determinants—the specific nature of heritage protection in particular. This nature is what makes assessment of heritage values difficult and restricts the scope of the analysis itself.

On top of that, it needs to be emphasised that heritage protection and preservation are not independent disciplines. Although it is independent monument preservation, protection and conservation specialists and heritologists who define historic monuments and sites, establish preservation principles and determine heritage protection forms, theories they formulate and actions they undertake are affected by external determinants, i.e. culture, economy, politics, society, religious beliefs, technical conditions, globalisation, conflicts, tourist traffic, media, etc.

As most of these factors—i.e. the ones which determine human activities—are inconstant, it is necessary to modify assumptions, objectives and methods applied in disciplines within which practical aspects are dealt with. With regard to heritage protection, the expert-developed protection system needs to be adapted to current conditions. For this reason, heritage protection should involve an ongoing dialogue between monument preservation specialists (historic preservation theory) and the society.

When the society fails to understand recommendations submitted by historic preservation experts, it is impossible to protect historic monuments and sites.

It was in the 21st century when it was observed that external determinants directly affect the heritage protection system. In a number of disciplines, changes which have been taking place in the last few decades are more radical and sudden than they used to be in the past. Consequently, heritage protection of the 21st century must be different from its twentieth-century predecessor. Practically, each and every element being a part of heritology and conservation science undergo extensive changes, which can be summarized as follows:

First and foremost, historic monuments and sites are understood in a different way. The term ‘heritage’ (the record of historic monuments and sites is a small part of the record of heritage assets) replaced the much narrower, traditional term ‘historic monument/site’ understood as both a document of historical significance and a work of art. A historic monument or site used to be an element of the past, whereas heritage is an element of the present. Additionally, as it used to be of objective nature, specialists could provide it with objective description. Heritage, however, is of subjective nature – it depends on subject’s decision and, hence, is limited in terms of objective description. As the record of historic monuments and sites was determined by criteria defined by specialists, it used to be very specific and limited. The record of heritage is unlimited – it depends on decisions made by a number of subjects changing over time. It is even impossible to define qualities characterizing heritage – there are no limits on age, typology, material, artistic, and functional aspects. Each tangible and intangible asset created in the past can be considered a heritage asset. Consequently, the record of heritage assets is extensive and it is often impossible to assess their different values.

Second, the objectives of monument protection are different. Traditionally, heritage protection aimed at preserving historic monuments and sites in possibly most authentic condition. This approach followed from acknowledging

that a historic monument or site is the evidence of the past—individually created work of art. Acknowledging that a monument or site is of outstanding value provided sound reasons for listing the asset as a protected property. According this status translated into preservation of the asset's value, which was the priority in defining different forms of use. As a historic monument or site perceived in this way does not belong to contemporary generations, monument preservation specialists should make sure that the assets they are responsible for are handed down in the possibly most authentic condition. The principal objective of historic preservation was protection of historic monuments and sites; although it is desired that these assets are used and visited, the forms of use need to be in line with protection guidelines. These priorities resulted in historic preservation specialists—professionals in monument protection—playing a decisive role in defining the form of preservation. Therefore, the main reason behind monument protection was to preserve their values of great historical significance.

Third, the forms of monument protection and the principles underlying it were also changed. Universal character of the rules governing historic preservation was typical of the traditional approach to monument protection. Prohibited—e.g. purist restoration, reconstruction, and rebuilding—and permitted—e.g. conservation, anastylosis—actions were defined.¹ These rules should be applicable to all historic monuments and sites, no matter their value or context. Nowadays, however, a different approach to historic monuments and sites is favoured; historically significant assets are no longer considered of equal value and, therefore, conservation and historic preservation actions are no longer of universal nature. There are different forms of handling heritage, which depend not only on its value but also current circumstances. In extreme cases, it is even permitted to rebuild the entire building but its facade. Additionally, understanding the requirement of authenticity—which was a major feature of the traditional monument preservation—was changed along with the principles underlying historic preservation. Formerly, however, satisfaction of the requirement of authenticity was understood as meeting all its requirements, not only the selected ones — just like it is provided in the currently binding Nara Document on Authenticity.² As the

forms of historic preservation and the rules governing it are very diverse, there is a sound reason behind defining values of historical significance in analytical way — it allows for planning and supervising historic preservation works.

Fourth, conditions for protection of historic monuments and sites have also changed. It has already been discussed how external determinants influence not only the idea but also the entire system of heritage protection. This paragraph is intended to attract attention to important changes in the way national monument protection systems function. Traditional systems functioned in relatively strong states, authorities of which declared responsibility for the condition of historic monuments and sites. It was therefore inevitable that extending the scope of the heritage record resulted in limiting the financial resources available for protection of heritage assets and, on top of that, waiving rules governing their maintenance. In general, these phenomena result in weakening not only historic preservation offices' position in relations with other stakeholders but also the entire monument supervision system. In these circumstances, as documents concerning heritage value assessment support arguments for heritage protection, it is of utmost importance to produce them.

It must be emphasised that the said changes are dynamic in nature. This means that they involve ongoing, mutually dependent processes. Therefore, as heritage protection is continuously transforming, what is being updated is not only the way how heritage is understood but also the aims to be achieved and methods to be applied in heritage protection. This results in far-reaching consequences, for historic preservation theory in particular.

In heritage protection, historic preservation theory set out rules governing protection of historic monuments and sites and, hence, it was the point of reference for practical actions. It was provided in 'doctrinal documents', which the international historic preservation milieu widely considered as a set of normative guidelines. Traditional historic preservation theory was a universal collection of principles applicable to the entire record of historic monuments and sites. These rules were provided in several doctrinal texts.³

At present, historic preservation theory can no longer be pro-

¹ In Venice Charter (1964), considered a fundamental document in traditional historic preservation, a list of permitted and prohibited actions in historic monuments and sites is provided – Conservation Officer's Handbook, International Standards in Cultural Heritage Protection, PKN ICOMOS, Warsaw 2015, pp. 39-42

² Contemporary understanding of the requirements of authenticity and integrity was set forth in 1994 in Nara Document on Authenticity This interpretation was also accepted in UNESCO World Heritage System and implemented to

„Operational Guidelines for the Implementation of the World Heritage Convention” (II.E Integrity and/or authenticity).

³ Manifesto adopted by Society for the Protection of Ancient Buildings is regarded as the first doctrinal text outlining the approach to protection of historic monuments and sites. This British anti-restoration manifesto contained rules for handling heritage assets. These principles were being applied for the next hundred years and were developed in the most well-known documents, i.e. The Athens Charter (1931) and the Venice Charter (1964).

vided as a universal collection of principles. As it can no longer be of static nature, it is even difficult to define its current shape. Contemporary historic preservation theory is therefore provided in a considerable number of doctrinal texts, which, however, can be applied in certain cases only. Contemporary doctrinal texts—and, hence, also historic preservation theory—concern either smaller records of heritage assets having common features or, even isolated historic monuments or sites located in certain regions or countries.⁴

In general, there is an increasing tendency towards avoiding explicit, uncompromising guidelines in all texts which contain rules governing heritage protection. What is gaining in popularity is liberal approach, according to which historic preservation should be adapted to local conditions. Therefore, instead of being a list of normative instructions, contemporary historic preservation theory is a programme including recommendations and guidelines. As the role that stakeholders play in protection of historic monuments and sites is growing in importance, the process in question can be both put at risk and provided with new opportunities. It is therefore worth emphasising that in these circumstances, the role of historic preservation officers is rising in importance and the tasks falling within their scope of duties have become more complex and responsible.

Contemporary determinants and historic preservation theory stemming from them are heading towards a greater diversity of the forms of handling historic monuments and sites. Protection of historic monuments and sites is becoming an increasingly individual process. This means that each time when historic preservation officers approach a monument or site, they are obliged to define its importance, assess its value, choose appropriate protection measures, define the scope of possible use in certain circumstances, and select the right protection form (the form in which it can be preserved). Consequently, the scope of works which can be carried out in historic monuments and sites is very wide – from strict preservation which involves preservation of the form and elements of historical importance, to upgrading and adaptation works, to reconstruction, and to style emulation in modern properties.

Due to contemporary determinants, it is therefore well-justified and inevitable for the historic preservation theory to be increasingly fragmented. It is impossible to go back

to universal normative solutions. This does not, however, mean that the historic preservation theory is diminishing in importance. It should still be the point of reference for preservation practice. System-based protection of heritage requires programme and normative foundations provided by the historic preservation theory.

There are serious dangers arising from the fact that the theory is relative and fragmented. Historic preservation specialists can be trapped in voluntarism and subjectivism, which may result in adopting opportunistic attitudes. Therefore, the profession in question may become less trustworthy and important. The society, i.e. authorities as well as owners and users of historic monuments and sites, may start to think that monuments and sites can be freely converted, transformed, and adapted to meet different needs, standards and tastes. This state of affairs poses threat to maintenance of historic monuments and preservation of their value in particular.

As it is necessary to permit different types of works in properties and sites of great historical significance—which may, at the same time, affect their form and elements of historical importance—protection of their values becomes an issue of key importance. According to the traditional definition of the term ‘historic monument/site’, values of properties having this status were considered in a comprehensive manner. When a historic monument or site was treated as a piece of evidence of the past and an isolated work of art, there was no need to analyse connections between its value and physical form. Being a tangible entity, a historic monument or site conveyed certain values and was subject to protection as this entity (form and elements of historical importance). It was therefore unnecessary to analyse each role that each element of the property or site played in ‘conveying’ these values.

Currently, works affecting the form and elements of historical significance are permitted and the circumstances have changed. It has become necessary to define connections between values and physical carriers of a historic monument or site. This provides foundations for defining the scope of works to be carried out in a historic monument or site (forms of protection) and determining the impact these actions may exert. Each time, before choosing protection measures to be adopted in a historic monument or site, a historic preservation specialist should analyse values of the property in terms of their tangible carriers, i.e. elements of the property. Therefore, methodology of this analysis becomes the most important issue to be explored within the contemporary historic preservation theory.⁵

⁴ Doctrinal texts fall into three categories: documents including general ideas and a plan for protecting and using historic monuments and sites; texts containing methods applicable to certain typology groups of historic monuments and sites; texts in which scopes of certain works carried out in historic monuments and sites are defined; texts containing methods applicable to historic monuments and sites in certain regions. See, e.g.: *Vademecum Konserwatora Zabytków*, PKN ICOMOS, Lublin University of Technology, Warsaw, 2015; B.Szmygin, “Formal Analysis of Doctrinal Texts in Heritage Protection,” *Conservation and Preservation. Interaction between Theory and Practice*, Edizioni Polistampa, Firenze 2010, pp. 95–106.

⁵ The process of extending the spectrum of values carried by heritage takes place all over the world – see, e.g.: Robert E. Stipe, “Where Do We Go from Here,” *A Richer Heritage. Historic Preservation in the Twenty-First Century*, ed. Robert. E. Stipe, The University of North Carolina Press 2003, pp. 451–493

Development of historic preservation theory should aim at devising methods for analysing heritage values. As of yet, no such methods have been worked out and no common historic preservation practice has been implemented.⁶ Instead of value analysis, value description of un-ordered, system-based nature was applied. This description, however, fails to provide objective foundations for planning and assessing the form of preserving a historic monument or site. Fragmentation of historic preservation theory is continued in other doctrinal texts, yet it does not rule out common elements. Methodology of assessing values of historic monuments and sites, being independent of the type of a monument/site, conditions in which the assessment is carried out, and the list of values being assessed, can be regarded as one of these common elements.

Determination of functions which monument value assessment methodology should serve should be the starting point for developing this methodology. Looking at heritage protection from wider perspective confirms that any works carried out in historic monuments and sites are based on determination of values. These stages, when described, provide recommendations for monument value assessment methodology.

1. Determination of values underlies identification of a monument or site – tangible and intangible features are considered the basis for according the status of a historic monument or site. In the past, this process used to be less complex than it is nowadays – what reflected a value was, for instance, the age of a property, the style in which it was designed, or the designer him/herself. At present, as the spectrum of values of great historical significance is more subjective in nature, its scope is much broader and, at the same time, less universal. Therefore, value assessment methodologies need to be more complex and consist of several stages. On the other hand, however, the need for their application increases.
2. Value assessment underlies the diversity of historic monuments and sites in the traditional historic preservation approach, only properties and sites of the highest value were considered historic monuments and sites. Additionally, it was assumed that all objects being accorded this status are equally valuable. This had always been a utopian assumption and, consequently, no methods for differentiating monuments and sites were developed. Obviously, historic monuments and sites were noticed to be of different value, yet historic preservation methods were never formally

diversified.⁷ As the record of historic monuments and sites is constantly expanding and the properties are becoming increasingly diverse, the forms of protection need to be diversified as well. Therefore, categorisation and classification of historic monuments and sites is a common practice which should be preceded and underlain by value assessment.⁸ Moreover, as classification of certain properties and sites depends on value assessment—which is based on comparing all elements of the record—it should encompass the entire record of heritage being identified.

3. Protection measures are selected upon assessment of the value of a historic monument or site. At present, historic monuments and sites are frequently transformed in their tangible form. Therefore, as already mentioned, there is a strong need for conducting an analysis which would connect values of a monument or site with their tangible carriers. The scope and possible impact of transformations of a monument or site should be underlain by determining the said relations. Forms of historic preservation measures are selected in accordance with value analysis. Furthermore, assessment of values and selection of their tangible carriers provide foundation not only for monitoring a historic monument or site but also for analysing potential threats.⁹ Monitoring the condition of a historic monument or site and analysing threats it may be potentially exposed to should be a vital and necessary protection measure. Monitoring should be based on measurable indicators, which should be determined in accordance with values of a monument or site and their tangible

⁶ Heritage value assessment methods are presented in *How to Assess Built Heritage? Assumptions, Methodologies, Examples of Heritage Assessment Systems*, B.Szymgin (ed.), ISC Theophil, Del Bianco Fundatione, Lublin University of Technology, Florence-Lublin, 2015.

⁷ Moreover, as the record was of small size, there was no need to diversify monuments and sites. For instance, under the first monument protection act—British Ancient Monuments Act—only 68 properties and sites were protected – John Earl, *Building Conservation Philosophy*, Donhead Publishing, United Kingdom 2010, p. 150.

⁸ Both categories are applied in contemporary heritage protection systems. However, these two types of organizing monuments and sites need to be clearly separated from each other: whereas categorisation organizes the record of monuments and sites into typology groups having similar features, classification organizes them according to their value – see: *Klasyfikacja i kategoryzacja w systemie ochrony zabytków*, Polish National Committee ICOMOS, Royal Baths Museum in Warsaw, Lublin University of Technology, Warsaw, 2016.

⁹ In the UNESCO World Heritage protection system, which is of highest importance and value in terms of the methodology being applied, impact assessment is implemented, i.e. analysis of potential effects that specific factors or actions may exert on a heritage property or site (Heritage Impact Assessment). In order to conduct these analyses, value of a property and value carriers need to be determined in the first place.

carriers. Therefore, it is certain that the form of protection measures, the scope of works to be conducted—including upgrading and adaptation works—as well as monitoring are contingent upon value assessment.¹⁰

4. Determining the value of a historic monument or site is essential in the monument protection system and—in particular—in the support it is provided by its stakeholders. It is possible to protect historic monuments and sites only when the protection itself is accepted by the society and the government. In democratic societies based on market economy, heritage protection needs to be in line with these conditions.¹¹ This translates into the monument protection being successful and effective only when it is accepted by stakeholders – administrative regulations themselves fail to satisfy this requirement.¹² This requirement, in fact, means to define and present heritage values in appropriate way.

Furthermore, it must be remembered that the values of great historical significance must be high enough in order to 'win' in the struggle between values, which takes place in the contemporary societies. Only the right presentation of a value of a historic monument or site can provide sound reasons behind its preservation and protection. In practice, this translates into maintaining the public protection system (legislation, authorities, financing, supervision), which means limiting ownership right to a monument or site as well as the rights to their use and adaptation. Therefore, the awareness of how heritage is valuable must be felt in public space.

5. Assessing the value of a historic monument or site—understood as determining and popularizing different values that a property of great historical signifi-

cance has—prevents historic monuments and sites from being treated as commodities. In the market economy, it is not unusual that all features and values come down to a value of a commodity. It is either that the importance of other values is diminished or the values themselves are considered to come down to monetary values. This, however, changes the nature of the property, service, and action itself.

When the nature of a property shifts, several disadvantages occur, for instance from the perspective of non-market value of a property. Other values, the intangible ones in particular, decrease in importance (or, in other words, 'value'). The market values are more obvious, universal, and can be translated into money. When a historic monument or site is treated as a commodity, less time is needed to evaluate whether the reasons behind carrying out preservation or adaptation works are valid and convincing. Profitability criterion helps indicate which solutions are the fastest, cheapest, and of poorer quality.

As it is somewhat natural to commodify a historic monument or site, this process may lead to severe and harmful consequences. In the struggle between stakeholders representing diverse values, it is market values that are predominant. This happens, in particular, when a historic monument or site represents a great potential of market values – location, form, extension and development capacity. Therefore, it is crucial to reveal other values.

The aforementioned aspects prove that it is essential to assess values of a monument or site in each stage of handling a property of historical importance. For this reason, heritage value assessment methodology should become important element of the historic preservation theory. This confirms that in the 21st century, monument protection—and shifting the paradigm of this discipline—requires a well-developed value assessment methodology.

2. Assessing values of the record of historic monuments and sites – assumptions

Determining heritage values requires comprehensive analysis of properties to be assessed. Analysis and description of a historic monument or site are different activities, yet frequently confused with one another. Description of a historic monument or site includes, in particular, a list of historical facts or events related to the subject property and a description of its tangible elements. The description is provided in form of a survey – technical activities carried out in line with specific standards and procedures.¹³

¹⁰ The problem of preserving the value of a historic monument or site after it had been particularly affected by works aiming to adapt it to a new use is discussed in the following publication: *Ochrona wartości zabytku w procesie adaptacji*, PKN ICOMOS, Lublin University of Technology. Museum in Wilanów, Warsaw 2015.

¹¹ For the very first time, stakeholders were involved in determining heritage values and its protection forms in doctrinal texts in Australian Burra Charter – see art. 5 Values, art.6 Burra Charter Process, art.12 Participation, art. 25 Interpretation.

¹² Recommendations concerning society's participation in heritage protection are provided in a great number of heritage preservation documents. The Faro Convention on the Value of Cultural Heritage for Society of 2005 is the most important document pertaining to the issue in question in Europe. In the Preamble, it is written that there is a strong "need to involve everyone in society in the ongoing process of defining and managing cultural heritage;" and that "every person has a right to engage with the cultural heritage of their choice, while respecting the rights and freedoms of others."

¹³ There is a considerable number of standards and instructions providing guidance on how to conduct building surveys, also in historic monuments and sites. Furthermore, norms for surveying properties of great historical significance

It is more complex and difficult to analyse a property of great historical value. Nevertheless, analysis of certain aspects important to heritage was also developed, e.g. architectural studies or assessment of technical condition. These actions were also provided with certain standards¹⁴. However, comprehensive analysis of heritage values has not been provided with any standards yet.

In order to develop monument value assessment methodology, certain restrictive assumptions—which result from the specific nature of heritage and the context in which it is placed—need to be made. Assumptions which provide determinants and needs of the value assessment system can include:

1. The record of heritage assets and the record of historic monuments and sites are separate entities.

The record of heritage assets—formerly referred to as the record of cultural properties—and the record of historic monuments and sites must be treated separately.¹⁵ This distinction is crucial for the monument protection system – from legal, formal, theoretical, and financial perspectives.

The status of assets considered as heritage (which have no status of a historic monument or site) does not have to be formalized, i.e. a property does not have to be in-

scribed in any formal list or entered into any formal register or record, for instance register of monuments and sites, record of monuments and sites, a list of architectural properties of the 20th century, etc. The status of assets considered historic monuments or sites should be formally confirmed, e.g. in a register or list.

The range of heritage assets is extensive and it includes all assets that remain from past generations and that demonstrate markedly different values, meanings, features, and information. Heritage assets are of subjective nature – they require no formal assessment. Protection of these assets can take multiple forms; they can be protected within various systems, even the ones that are created by individual persons.

The record of historic monuments and sites is the most valuable element of the heritage record. Formally authorised historic preservation bodies make decisions on according a heritage asset the status of a historic monument or site. The scope of their rights is defined in legislative documents. Historic monuments and sites represent meanings, values, features, and information that, if preserved, would benefit the society as a whole. The formal and obligatory assessment of a historic monument or site should be aimed at proving that the property being analysed represents these meanings and values. It should also prove that properties considered historic monuments or sites are important achievements of the past generations; the assessment should be up-to-date when looked at by future generations.

Hence, the protection of historic monuments and sites is formal and obligatory. It should be offered within an organised global system under which restrictions, limitations, and various opportunities of public support (state and local government) are provided.

2. Comparative assessment (relative) of values of historic monuments and sites (within specific criteria and record).

Basing on the analysis of a heritage record it is possible to organize a record of historic monuments and sites protected within a formal protection system. Analysis and assessment of a heritage record—which aims at organizing a record of historic monuments and sites—must be of comparative nature, irrespective of autotelic values. Values are assessed within a record of historic monuments and sites – value assessment assumptions pertain to this particular record only.

In order to carry out a comparative analysis and an assessment of a heritage record/record of historic monuments and sites, it is necessary to define two elements: assessment scale and assessment criteria.

Assessment scales can be either spatial (territorial) or temporal or typological.

ce were also developed – see, e.g. J.Uścińowicz, “Standardy dokumentacji konserwatorskiej obiektów architektury drewnianej jako podstawa monitoringu i zarządzania” in *Dokumentacja i monitoring w zarządzaniu obiektami budownictwa drewnianego w Muzeum Rolnictwa im. Ks. Krzysztofa Kluka w Ciechanowcu oraz Muzeum Ryfylke, Muzeum Rolnictwa im.ks. Krzysztofa Kluka*, 2016, pp. 43-67.

¹⁴ A great number of standards pertaining to technical aspects of dealing with heritage was developed, e.g.: PN-EN 16096:2013-02: Conservation of cultural properties – Condition survey and report of built cultural heritage; PN-EN 16883:2017-07 – Conservation of cultural heritage – Guidelines on Improving Energy Efficiency in Properties of Outstanding Historical Value; PN-EN 16853:2017-06 – Conservation of cultural heritage – Conservation process – Decision making, planning, implementing; PN-EN 16085:2013-02 – Conservation of cultural properties – Sampling Methods in Historic Monuments and Sites – General Principles; PN-EN 15898:2011 – Conservation of cultural properties – General terms and definitions in conservation of cultural properties.

¹⁵ Making clear and precise distinction between these two terms, i.e. ‘historic monument or site’ and ‘heritage’ (formerly functioning as ‘historic monument or site’ and ‘cultural property’) is crucial to allow the monument protection system to function properly and efficiently. See, e.g.: Jan Pruszyński, “Zabytek – pamiątka czy dobro kultury?” in *Ochrona Zabytków*, vol. 3, 1993, pp. 261–264; Bogusław Szmygin, “Zabytek – pamiątka czy dobro kultury? Uwagi o niedoskonałości pojęcia” in *Ochrona Zabytków*, vol. 1, 1995, pp. 104–108; Jan Pruszyński, “A jednak pamiątka” in *Ochrona zabytków*, vol. 1, 1995, pp. 109–113.

The range of the assessment criteria can involve various aspects, e.g. age, author, style, size, material. Assessment criteria can also include intangible features, e.g. links to an event, historic figures, impact the property exerts, and uniqueness.

In order to benchmark historic monuments and sites according to more than one criterion, it would be necessary to establish their hierarchy, i.e. define benchmarking scale (create hierarchy of importance).

Defining the hierarchy of values is of arbitrary nature – it must not be defined in the course of monument analysis – it results from including external determinants.

Analysis and assessment of universal values of a single historic monument or site is of relative (comparative) nature, it concerns only certain features (criteria) and it functions only within a specifically defined record (scale). In light of these restrictions, it is of objectifying nature.

Analysis and assessment of a historic monument/a record of monuments and sites should be conducted as one of procedures (it is necessary to develop them) – it is a condition which assessments must satisfy for their objectivity. Assessing values within a specific record of historic monuments and sites involves establishing a procedure under which a specific scale is ranked and specific criterion/criteria are established.

3. Opportunity to assess tangible quality of a historic monument or site.

A historic monument or site, i.e. an entire asset, together with its elements, is a tangible 'carrier' for carrying values, features, meanings, and information. Values/meanings playing crucial role in according the status of a historic monument or site to a property should be also decisive in selecting the right form of protection.

Values of a historic monument or site which are determined as a result of comparative value analysis can be ascribed 'value attributes', i.e. elements and features of a property or site which 'personify' these values.¹⁶ Each attribute can have its tangible carriers. Value attributes are of both tangible and intangible nature, whereas the carriers are of tangible nature only (it is necessary to stress the difference between the attributes and their carriers).

It is possible to define to what extent features of a specific historic monument or site—due to its current material condition (technical condition and adaptations)—represent values that were used as basis for according the property the status of a historic monument or site.

Analysis of a property of great historical importance should also assess whether the value attributes—which were used as basis for according the property the status of a historic monument or site—satisfy the requirements of authenticity and integrity.

When an attribute (element or feature) of a specific value of a historic monument or site is real, it means it is authentic (in the broad sense of the Nara document). On the other hand, when an attribute (an element or a feature) is complete (within the meaning of Operational Guidelines), it means it is integral.¹⁷

A value attribute may be identical to the tangible carrier, although it is not a rule.

4. Scope of assessment of values of historic monuments and sites.

Each value assessment process involves application of certain criteria – even though they are often chosen at random. There is a vast array of criteria to be potentially chosen – it depends on an individual making the choice as well as local determinants.

The criteria represent different areas, although—most frequently—they are of economic, functional, aesthetic, product, technical, artistic, political, symbolical, and historical nature.

It is stakeholders who select value assessment criteria to be applied. Different stakeholders can apply different criteria when assessing values of the same asset.

Within the historic preservation system, value assessment of historic monuments and sites should be limited to selected criteria, which can be evaluated within this system (assessment is conducted by professionals specialising in this specific system).

Monument value assessment carried out by a historic preservation specialist should be based on criteria according to which an asset is considered as being of great historical value. Only these criteria can be objectified in the process of historic preservation value assessment (due to competences demonstrated by a heritology expert).

Values and criteria which allow for according a property the status of a historic monument or site could be referred to as 'objectified values of a monument or site'.

Universal values of historic monuments and sites are also assessed within numerous non-historic preservation systems used for assessing values. This means that value assessment analyses are conducted by stakeholders who are not

¹⁶ The concept of value attributes and their carriers is discussed in Wyjątkowa uniwersalna wartość a monitoring dóbr światowego dziedzictwa, PKN ICOMOS, National Heritage Board of Poland, Warsaw 2011 – publication concerning analysis methodology and assessment of values in UNESCO World Heritage system.

¹⁷ All properties nominated for inscription on the World Heritage List shall satisfy the conditions of integrity. Explanation of the term 'integrity' is provided in Operational Guidelines, art. 97-95.

historic preservation specialists and who base their evaluation studies on non-historic preservation criteria. In practice, historic preservation specialists need to compete against each other for important positions not only in the hierarchy of stakeholders but also in the hierarchy of other criteria.

The monument protection system is needed because it secures the position of historic preservation specialists in the existing hierarchies. In order to accept that values of historical importance are of considerable importance, both requirements must be satisfied – in practice, monument protection would not be successful otherwise.

5. Applying procedures of assessing values of historic monuments and sites.

Assessment of values of historic monuments and sites should be included in procedures and documents which concern conservation works and the process of according an asset the status of a historic monument or site.

Defining the scale, criteria, and value attributes applied in assessing values of historic monuments and sites should be included in the procedure in question. Moreover, identifying the said elements should be documented.

Obviously, monument protection is of individual nature – it must not be limited to following certain procedures but—at some stages, e.g. value assessment, evaluation of documents, etc.—it needs to be arranged in the right order while being in line with these procedures.

In order to determine the scope and form of protection of a historic monument or site objectively (for historic preservation specialists) as well as to provide sound reasons behind the need for and the form of protecting it (for the society), it is necessary to assess not only values of a historic monument or site (comparative, identifying value attributes) but also its quality (authenticity and integrity of value attributes).

Objectified values of a historic monument or site justify the reason why the public monument protection system should function (legislation, authorities, financing, supervision), even though it translates into limited ownership right to a monument or site as well as limited rights to its use and adaptation.

Therefore, objectified value of a historic monument or site should be demonstrated publicly.

Assumptions underlying the system for assessing universal values of historic monuments and sites

The aforementioned determinants and assumptions pertaining to heritage value assessment provide framework for defining opportunities for developing methodology allowing for conducting analyses in which monument values are assessed. In order to develop this methodology, it is necessary to make assumptions concerning values which can fall within the scope of the value assessment system.

Obviously, as historic monuments and sites express a great number of different values, there are sound reasons behind establishing the great variety of systems. However, a vast array of values attributed to properties of outstanding historical value and the subjective nature of these assets result in the systems being incomplete (it is not possible to consider them as classification groups). Consequently, it should not be assumed in the monument value assessment methodologies that they will encompass the entire spectrum of values accorded to historic monuments and sites. Therefore, as it is necessary to narrow the analysis down to certain values—which can be objectified in specific circumstances—values can be grouped into three different categories.

The first category comprises values pertaining to features—i.e. qualities—of a historic monument or site being a work of construction engineering, architecture, urban planning, and spatial development.

The second category includes values pertaining to the past use and importance of a historic monument – in its entire lifetime.

The third category comprises values pertaining to the present use of a property of great historical importance – both as a commercial or residential property and as a historic monument or site having been accorded new meanings and connotations.

Whereas the very first two categories include values which classify a historic monument as a property created by past generations, the third category comprises all values of contemporary origin—even though they are predominantly based on the first two ones. As both the first and the second category are of different nature, they represent different values and, hence, had to be separated – the first one is based on the tangible substance and the form of a historic monument or site, whereas the second one is of intangible nature. The third category includes both tangible and intangible values.

All categories of values can co-exist with each other and be used in the same properties of great historical importance. Obviously, determining and accepting values depends on different groups of stakeholders. In practice, every stakeholder determines different sets of values and attaches them with a certain status in the hierarchy of importance. Determining a common set of values—and their hierarchy—is difficult and even, in majority of cases, impossible.

It is not possible to solve the said problem by means of axiology. In order to decide on the methods to be applied to handle a historic monument or site properly, the conflict of values needs to be settled. In practice, this requires either recognizing certain values as superior or arriving at suitable compromise. The issue is resolved by granting stakeholder groups certain decision-making rights – they have the right to choose leading values.

With regard to historic monuments and sites, the problem of choosing values which would determine the choice of methods for handling these properties and sites is solved through appointing historic preservation bodies. Under the provisions of law, representatives of these bodies are entitled to make decisions on according properties the status of historic monuments or sites and choose the right form of protection¹⁸. These deliberations result in the values and their hierarchies being on privileged position. Monument protection systems—usually established by state government bodies—are used to support and implement sets of values which are of utmost importance for historic monuments and sites—the values which determine whether a property can be considered a historic monument or site.

However, maintenance form of only a small number of monuments and sites of the most outstanding value can be subject to protection of values of historical significance. Most historic monuments and sites need to be protected and maintained in accordance with the third category of values. This is in line with the contemporary approach to heritage protection, according to which this obligation must be met by historic preservation bodies as well. It is, however, difficult to achieve this objective – not only because of frequently different values but also narrow range of skills and formal competencies demonstrated by historic preservation officers.

Although historic preservation bodies share responsibility for the contemporary use of historic monuments and sites, they should still focus on protection of values which determine the importance and status of these properties. This means that monument protection programme should be aimed, in particular, at values classified under the first and second categories. These values represent historic monument and sites regarded as historical evidence. The most important function which a historic monument or site serves—both at present and in the future—is to be regarded as a piece of historical evidence. For this reason, historical preservation-based analysis of values attributed to historic monuments and sites should include, for instance, values incorporated in the first and second category.

Value assessment involves juxtaposing selected properties/elements/qualities according to certain criteria. Property assessment involves comparing the property it-

self to a reference record of properties. In practice, however, the assessment is not of analytical but rather intuitive, subconscious, unordered, and fragmentary nature. The value assessment process becomes a single value assessment act, which is founded on regular patterns based on multi-layer and non-verified experiences.

It does not, however, mean that mechanisms which provide basis for value assessment are invalid. These mechanisms—also known as patterns—can be analysed and should be applied when the value assessment process should be objectified, rational, and should result in drawing useful conclusions. This is what is needed in monument protection.

Therefore, value assessment process in monument protection could be narrowed down to juxtaposing selected assets/elements/qualities with a certain context, which could be referred to as a 'reference group'. This process should be carried out in assessment of values falling under category one and two.¹⁹ In the first group, the analysis pertains to values based on both tangible elements of historical significance and the form of a historic monument or site. In the second group however, it concerns values based on property's past use and importance—which should also have certain tangible carriers.

What still needs to be established is the name of the suggested method of assessing values of historic monuments and sites. As the recommended process is complex and of peculiar nature, such names as 'Smart Value Assessment Method/Methodology/System' can be applied.

In general, in light of the definitions provided by the *Uniwersalny Słownik Języka Polskiego* (Universal Dictionary of Polish Language) and *Wielki Słownik Poprawnej Polszczyzny* (The Great Dictionary of Correct Polish), the meaning of the words method and methodology is similar. According to USJP, method is a conscious way of handling something which is aimed at achieving a specific objective. According to WSPP, methodology is the science of methods applied in scientific research and of effective ways of learning their cognitive value (definition 1). When considering the differences between these two definitions, it can be assumed that the term methodology is much broader. It can be therefore considered a better choice when referring to assessment of values of a SV historic monument or site, which involves analysing a number of qualities and elements by applying a variety

¹⁸ In the Polish monument protection system, a decision on according a property the status of a historic monument or site is made by a local government body which is entitled to issue regulations in local zoning plan as well as establish cultural parks. These are two out of four fundamental forms of monument protection set forth in art. 7, of the act of 23 July 2003 on the protection and guardianship of monuments and sites (Polish Journal of Laws of 17 September 2003). In practice, however, these actions are consulted with historic preservation bodies as well.

¹⁹ Obviously, assessment of values classified under the third category is similar, even though the methodological correctness of this process—its analytical nature—does not need to be the subject of historic preservation activities. In the third group, different comparison methods are applied, e.g. economic (declared preference method) and social (quantitative and qualitative methods) values are used.

of detailed methods. It must be, however, remembered that it is not a science of value assessment methods.

Consequently, it is also needed to verify whether it is possible to apply the term system. The Dictionary of Polish Language provides several definitions of the term system, which can describe the process of heritage value assessment, referred to as SV – a set of elements of a specific structure and being a logically ordered unit (understanding 1); an ordered set of statements and views on which a theory is founded (understanding 4); a certain way of carrying out an activity or a principle behind organization of something (understanding 5). As each of the aforementioned definitions can be considered as encompassing the SV process, the term SV system is accepted as well.

When the dictionary-based definitions of the terms method, methodology, and system are juxtaposed, it is not possible to explicitly confirm which one is the most accurate. Good reasons behind applying either of them can be found. Given the complex nature of the value assessment process, i.e. diversity of the qualities and elements being analysed, the number of value assessment stages, the amount of information, and the great number of entities conducting the assessment, it seems to be most reasonable to apply the term system. Therefore, the name system for assessing values of SV historic monuments and sites has been adopted.

To summarize the aforementioned determinants, the following aspects defining the system for assessing values of SV historic monuments and sites can be listed:

1. The system for assessing values of SV historic monuments and sites is used to assess the value of tangible assets, e.g. buildings, groups of buildings, spatial layouts, cultural landscapes.
2. A historic monument value of which is assessed within the SV system is considered a tangible historical evidence; what is assessed are the qualities/elements of the monument or site, their authenticity, and integrity.²⁰

In historic monuments and sites regarded as pieces of 'tangible historical evidence', authenticity and integrity are of considerable importance in comprehensive assessment. If these requirements are not satisfied, the value of a historic monument or site being analysed is lower.

3. Value assessment conducted within the SV system includes, for instance, qualities/elements which

qualify historic monuments and sites under the category of tangible assets (the first category of values) as well as values pertaining to the past use and importance of the property being analysed (the second category of values) – these values can be objectively determined by heritology experts.

Contemporary tangible and intangible values falling under the third category of values and stemming from different meanings and connotations, e.g. economic, use-related, political, cultural, religious, symbolic, can be subject to—in limited scope—value assessment conducted within the SV system.

Narrowing the scope of values subject to value assessment conducted within the SV system results from the fact that it is impossible for values to be objectively attached with a certain status in the hierarchy of importance—in particular with reference to values which cannot be effectively determined because of heritology experts' gaps in certain skills and qualifications.

4. Value assessment conducted within the SV system involves comparison of qualities/elements/meanings of a historic monument or site being analysed within a certain reference group. What is assessed are qualities which make a historic monument or site stand out in a selected reference group.

Comparing certain qualities within specific reference groups allows for adopting the right (objectifying) comparative scale.

5. Assessments of historic monuments and sites should not be limited to value assessments carried out in the SV system (due to the limited scope of the values being analysed – assumption no. 3).

As value assessment comprising other values may either complement or totally change the result of value assessment of a historic monument or site, it should be conducted after a property of great historical significance is analysed within the SV system.

6. Value assessment conducted within the SV system should provide basis for the most important actions taken within the monument protection system – determining the record of historic monuments and sites as well as protection forms for specific properties of great historical significance.
7. Value assessment conducted within the SV system should provide information on which a comprehensive protection and use concept would be developed, e.g. listing elements to be protected, forms of maintenance, scope of conservation works, possible works which may affect elements of historical importance.

The information gathered in SV analyses should be used for developing a Monument/Site Management

²⁰ Qualities of tangible assets include such elements as architectural form, material, colours, design, author, date of creation, use. With regard to groups of buildings and landscapes, such factors as spatial layout, dominants, panoramas, surface, and green areas can be also taken into account.

Plan (with regard to properties of the most outstanding historical value, e.g. World Heritage assets or a Polish Listed Monument, developing guidelines for the Management Plan—stage two, levels 3 and 4—should be a part of the value assessment process).

4. Value assessment system – SV historic monuments and sites

Several types of actions are needed for the monument protection system to function, e.g. determining the record, defining the scope of protection, planning conservation works, justifying the need for the care and guardianship of monuments and sites. These actions are of varied nature. Some of them require the entire value of a historic monument or site to be determined, e.g. value assessment aimed to determine whether a property or site should be accorded the status of historic monument or site. Other actions, however, require determination of relations between values and their tangible carriers, e.g. assessment aimed to define the scope of intended works which may have an impact on a historic monument or site. Consequently, the assessment process should result in acquiring a great amount of information – depending on the diverse needs of the protection system.

The distinctive nature of actions undertaken within the monument protection system is taken into account in the SV value assessment system. There are two stages in the process of assessing values of historic monuments and sites by applying the SV method.²¹

Stage 1. Determining the value of a historic monument or site – determining the value of a property in a comprehensive manner, excluding protection recommendations.

Stage 2 Analysing values of a historic monument or site – assessment of values of a property of historical significance through determining value attributes – the objective is to determine protection methods to be applied and the scope of intended works.

Stage one in monument value assessment – comprehensive determination of values of a historic monument or site

In the process of determining the total value of a historic monument or site, the property being analysed is compared to other properties in the reference record of historic monuments and sites. Value assessment, i.e. comparison of values, can be conducted only according to certain criteria. Therefore, in order to carry out the comparison process, specific criteria—which will be used

for assessment purposes—need to be established (mechanism applied in the UNESCO World Heritage system).²²

As assessment of values of historic monuments and sites is always conducted within a certain record of properties of great historical significance, this analysis is of relative nature.

In order to conduct value assessment, reference groups and sets of qualities (criteria) used in the comparison process need to be established.

Qualities being compared are considered values, whereby properties being attributed these values are considered valuable.

Valorisation of a historic monument or site is conducted in several stages. This results from the fact that the criteria for assessing values of a selected monument or site have to be selected individually, much like the reference groups themselves. These actions must be taken in a certain order.

Valorisation levels falling within the scope of Stage One: Description and analysis of the property aimed to select attributes of the reference group.

Indicating the right reference group to provide comparative context.

Determining value assessment criteria (verifying property's qualities to be used as basis for value assessment – this is achieved through comparing qualities of a historic monument or site to qualities provided in the selected reference group).

Assessing values—in light of the selected criteria—with reference to the reference group

In order to assess values within the SV system, it is necessary to determine a reference group. A reference group consists of historic monuments and sites to which qualities and values of other properties of great historical significance are compared in order to conduct value assessment (comparative context). Reference groups can be determined according to different criteria, e.g. typology, territory, time of creation. A reference group can be based on one or several criteria; it is most common to found a reference group on typology, territory, and chronology.²³

²¹ Stage one provides foundations for carrying out actions in heritology—science dealing with comprehensive analysis of historic monuments and sites. Stage two of the value assessment process provides information used in conservation science, which deals with maintaining historic monuments and sites in good condition.

²² The value assessment method applied in the World Heritage system was a role model for developing the method used in assessing values of properties nominated for inscription on the list of Polish listed monuments.

²³ Most often, historic monuments and sites are compared to properties being used for the same or similar purposes, e.g. castles, churches, tenement houses. It is very common to introduce additional criteria which allow for narrowing the scope of reference groups, e.g. castles in Poland (territory), masonry castles (material), Medieval castles (period of creation). Narrowing the scope of reference groups allows for determining criteria which help increase the level of objectivity of comparison analysis conducted within the specific reference group.

Values of a historic monument or site can be compared to values falling under the scope of one or several reference groups.

In the contemporary monument protection systems, reference groups are not defined in the usual manner – no comparative analysis is conducted²⁴. As no reference group is indicated, value assessment of a historic monument or site is based on the ‘default’ reference group. The default reference group usually encompasses a non-defined record of historic monuments and sites (both the entire record and its qualities are not indicated), which covers properties of great historical significance situated on a territory falling under jurisdiction of a historic preservation office conducting the assessment (country, region, city).

As the value assessment process greatly depends on defining the right reference group, it requires certain skills and qualifications for its successful implementation, i.e. knowledge of the right record of historic monuments and sites as well as the qualities they have.

In order to determine the right reference group, it is necessary to indicate criteria for identifying elements which are within this group. The criteria allow for defining the right reference group – the greater the number of elements (historic monuments and sites) falling within the scope of the certain group is identified, the more detailed and reliable the value assessment can be. Only in exceptional circumstances it is possible—and necessary—to identify all elements on which the reference group is based; This means that value assessment of historic monuments and sites is based exclusively on already identified historic monuments and sites falling under the scope of the reference group.

An example of the comparative analysis based on properties of this kind is assessment of assets nominated for inscription on the UNESCO World Heritage List. What is determined under the procedure being adopted, is a reference group which consists of historic monuments and sites falling under the scope of the same typology group

as the property being assessed.²⁵ What is also determined is an area where historic monuments and sites included in the reference group are located. The scale must not be smaller than a region (the area must be larger than the country) and, preferably, should cover the entire world (maximum scale).

The specific nature of value assessment analyses conducted in the World Heritage system results in nomination assessments being carried out by members of ICOMOS International Scientific Committees specializing in certain typology groups.

Also in World Heritage documents, heritage is divided into several categories. For certain categories of historic monuments and sites, ‘thematic studies’ were undertaken in order to provide a context for their evaluations. These studies provide analyses of reference groups covering certain types of properties.

Reference groups should be indicated together with determining criteria, which provide foundations for evaluating/comparing the property to other properties falling under the scope of the group.

Predominantly, criteria are based on material description of a property and its qualities perceived in the context of the entire reference group. Therefore, the criteria may include, e.g. age, impact, size, quality, innovation, creator, etc.

Each reference group has certain qualities on the basis of which the criteria are established. They are laid down individually – it is possible, to certain extent, to use criteria applied in the World Heritage system²⁶.

Criteria should not only be established. They should be also provided with guidelines on how to measure them – measurable criteria are optimal since they provide better opportunities for objective evaluation.

Evaluation of a historic monument or site which is based on two and more criteria, should be provided with evaluation scale showing hierarchy of importance of these criteria and how they affect each other. In most cases, as

²⁴ In the Polish monument protection system, properties nominated for inscription on the list of Polish Listed Monuments are assessed in comparative analysis, which is aimed at determining the value of a property which makes it stand out from other properties of outstanding historical significance located across the country. This analysis is conducted according to criteria applied to Polish Listed Monuments. In certain decisions on listing a property on the register of historic monuments and sites, one can notice justification reasons which can be regarded as fragmentary comparative analyses. As the scope of these actions, however, is pretty narrow, it can be claimed that it is uncommon to conduct comparative analyses in the Polish monument protection systems.

²⁵ Categories of properties (typology groups) used in the process of inscribing properties in UNESCO List are provided in Operational Guidelines (ANNEX III – GUIDELINES ON THE INSCRIPTION OF SPECIFIC TYPES OF PROPERTIES ON THE WORLD HERITAGE LIST). In order to evaluate a property to be inscribed in the List, the property’s qualities need to be compared within the right typology group.

²⁶ There are six criteria applied in the World Heritage System used to evaluate cultural assets. They concern the way in which physical qualities of assets are perceived in a certain record of historic monuments and sites, rather than the specific qualities themselves (art. 77 of Operational Guidelines).

there are no objectifying measures, it is difficult to satisfy this condition, e.g. when comparing the age of a property to its formal qualities.

It is widely accepted that examination of authenticity of a property (the form and elements of historical significance accumulated over time and the condition in which they are preserved) as well as integrity (completeness) of its qualities/elements should not be considered a criterion. The assessment of authenticity and integrity of qualities/elements of a historic monument or site (Assumption 2) is another stage in the evaluation process.

Additionally, it must be emphasized that the criteria used for determining a reference group must not be mistaken with criteria used for evaluating historic monuments and sites within a reference group – these are two separate categories, which in some cases may be similar or even overlap.

Valorisation carried out at stage one results in the value of a historic monument or site being comprehensively assessed in the context of the specific record – because of the criteria being adopted. Simultaneously, this evaluation, once performed, allows for conducting comprehensive valorisation of the record, which is, in this case, the reference group.

The simpler the evaluation criterion is applied, the easier it becomes to conduct the valorisation process; The size of a heritage record to be evaluated is proportional to the complexity of the evaluation criterion.

One of the simplest criteria is, for instance, the age of a property. As it is relatively easy to apply this criterion, it has become most commonly applied criterion in valorisation of the entire record of historic monuments and sites (even when not divided into typology groups). In a great number of countries, this criterion is used as the basis for inscribing a property the status of a historic monument or site.

However, the main disadvantage of the simple criteria is the fact that they are extraordinarily general – when adopted, they fail to provide recommendations for a protection method to be applied (stage two of the value assessment process)

Therefore, in order to acquire information on the methods to be applied to protect a property of great historical significance, more evaluation criteria need to be adopted. This, at the same time, results in narrowing the scope of the record of historic monuments and sites being evaluated (it narrows the scope of the reference group). Information on protection methods to be applied (intended works which may have an impact on a historic monument) can be acquired through conducting analysis at stage two of the value assessment process.

Stage two in monument value assessment – analysis of values accorded to a historic monument or site (properties of great historical significance as value carriers)

The second stage of value assessment involves indication of elements and qualities which are attributes of values accorded to the historic monument or site being evaluated (determined in stage one).

Analysis of a historic monument or site conducted as part of stage two is therefore aimed at determining value attributes. Attributes are of tangible or intangible nature.

In this type of analysis, it is not required to compare the subject property being studied to any other properties, i.e. no comparison to a reference group is required.

Value attributes are determined in order to indicate elements being critical for preserving the total value of a historic monument or site. It is assumed that the elements constituting a historic monument or site are unequal in value since each element expresses a different level of importance for the property's value, which was defined in stage one.

When intended works which may have an impact on a historic monument and affect its elements of great historical significance are planned, it is necessary to analyse the values of the subject property to be affected as well as determine their attributes. In this case, it is necessary to indicate elements falling under protection. This is a basis for choosing the right protection method and determining the use of a historic monument or site.

Valorisation levels falling within the scope of stage two:²⁷

1. Determining value attributes (defined in stage one)
2. Determining tangible carriers of the value attributes
3. Defining the scope of intended works which may have an impact on a historic monument or site
4. Developing guidelines on the scope of monument protection

Attributes are the qualities or elements of a historic monument or site which are of key importance for values which played the decisive role in listing a property or site. The value attribute can be of tangible nature—if it is an element of a historic monument or site—or intangible nature—if it pertains to a quality of a property or site. When a quality of a monument or site, which is considered a value attribute, is of tangible nature, it is an

²⁷ In terms of merit, “Defining the scope of works which may have an impact on a historic monument or site” (item 3) and “Developing guidelines on the scope of protection” (item 4) do not fall within the scope of the value assessment process. These levels, however, are the part of the value assessment process, in accordance with the Assumption (no. 6 and 7).

'attribute carrier'. It may occur that a tangible element of a historic monument or site is an attribute of value being the property or the site itself and, simultaneously, carries the attribute of value being a quality it makes tangible. For instance, log frame or half-timbered structure of a wooden building is both an element of a historic property and a quality making the subject property stand out from other wooden properties of great historical significance.

Each value of a historic monument or site can be represented by one or several attributes; the same attribute can represent different values. Tangible attributes can be evaluated from the perspectives of authenticity and integrity.

Value attribute carriers are tangible elements expressing attributes of values of a historic monument or site. A tangible attribute and its carrier can be, at the same time, identical. Value attribute carriers, much like the attributes themselves, can be evaluated in terms of satisfying the requirements of integrity and authenticity.

5. SUMMARY

The aim of the SV system being discussed is to make objective, system-based value assessment of historic monuments and sites possible. The aim of assessing values in the SV system is to reveal values of a historic monument or site treated as a piece of historical evidence analysed by qualified heritologists. This type of value assessment should counterbalance a monument value being relativ-

ized in the course of a value assessment conducted by other stakeholders.

Connecting values to their tangible attributes is an important part of the SV system. This results in determining indicators which allow for monitoring a historic monument or site.

Value assessment is not the aim itself. It should provide foundation for selecting the right protection methods and defining the scope of use of a specific monument or site. Protection methods and the scope of use of a property or site of great historical value should be provided in a Management Plan – a document which should be a standard in protection of historic monuments and sites. Information collected in the SV value assessment process allow for devising a Management Plan. Management Plan should complement value assessment conducted in the SV system; the value assessment process should be considered a part of the Management Plan.

Value assessment conducted within the SV system is a recommendation which should be applied in practice. For this reason, value assessment of three selected historic sites was conducted: Paper mill in Duszniki (17th century); Crude oil mine in Bóbrka (19th century); a group of industrial and residential buildings in Żyrardów (19th century). The historic sites being subject to value assessment represent three typology groups of heritage. This allows for verifying the SV system comprehensively in practice. Furthermore, the Management Plan for the paper mill premises in Duszniki—based on SV value assessment—is provided in a separate publication.

ANALYSIS OF THE VALUE OF THE CRUDE OIL MINE IN BÓBRKA



DESCRIPTION OF THE ASSET



DESCRIPTION OF THE ASSET

1.1 Historical characteristics of the asset

1.1.1 Historical context of crude oil extraction¹

Petroleum has been known around the world for many millennia. Its presence was recorded on different continents in the form of spills occurring on the surface of the ground, as well as reservoirs and watercourses; it was extracted from shallow pits or rock crevices. In ancient times, it was already used for various purposes: medicinal, construction, lighting, for embalming bodies or in the art of war (the so-called Greek Fire). Oil and bitumen resources were used, among others, by the Babylonians and Assyrians in the Euphrates and Tigris river basins. They used the tarry substance, i.a., for sealing the hulls of ships or for bonding bricks in construction. Its properties were also known to the indigenous peoples in America, who used it to seal canoes, impregnate clothes and as a medicinal agent.¹

Mentions of bitumen occurred already in the ancient times – in the works of Aristotle, Herodotus or Tacitus. A Roman historian, Pliny the Elder, wrote about the treatment of various diseases and ailments with bitumen. In the Middle Ages, Marco Polo described deposits of natural asphalt found in today's Baku in Caucasus. Many of such references and descriptions of bitumen have also been preserved in the writings of scholars from different countries in the contemporary period.

Crude oil, commonly called rock oil, was also found in the Carpathians (along their north rim) and already during the Middle Ages, a variety of its uses was noted – as a means of preservation, medicinal agent or for lighting (flaring) purposes. The first mention of Polish oil appears in Jan Długosz's works, then in a few records from the 16th century, concerning its medicinal properties. One of the oldest mentions concerning the presence of oil in the Gorlice area comes from 1530, when Seweryn Boner, searching for gold in the village of Ropa, stumbled upon oil that flooded his mine. Descriptions of ways to obtain crude oil, e.g., in the vicinity of Drohobych, survived from the 17th century.

Such historical mentions (based on unpreserved source documents) on occurrence and use of crude oil appear also with regard to the Krosno region where Bóbrka is located. The information concerns, i.a., the privilege that Krosno had in the 16th century with regard to lighting the town with rock oil. According to quoted monastery files, Krosno took oil for lighting from sources in Węglówka.² The sources of crude oil and natural gas in the vicinity of Krosno were also known and described in the 17th and 18th centuries.³ The information pertains, i.a., to Iwonicz, Głowienka, Turaszówka,

¹ The chapter has been developed based on published materials with particular reference to J. J. Cząstka, *Dzieje przemysłu naftowego w krośnieńskim* ("The History of the Oil Industry in the Krosno Voivodeship"), /in:/ *Krosno. Studia z dziejów miasta i regionu* ("Krosno. Studies on the History of the Town and the Region"), Vol. II, Krakow 1973, keyword: ropa naftowa (crude oil) /in:/ Nowa encyklopedia powszechna PWN ("The New PWN Encyclopaedia"), Vol. 5, Warsaw 1996, pp. 567-568, website: <http://www.nafta-polska.pl/historia-naftownictwa/pierwsze-wzmianki/>; *Bóbrka Naftowe Dziedzictwo* ("Bóbrka – the Oil Heritage"), pp. 14-15

² Such information is given by J. J. Cząstka in *Dzieje przemysłu naftowego...*, p. 5, by referring i.a. to the following studies: C. Engle, H. von Höfer, *Das Erdöl*, III B, *Die Technologie des Erdöls und seiner Produkte*, Leipzig 1911 and T. Mikucki, *Nafta w Polsce do połowy XIX wieku* ("Paraffin in Poland to the Mid-19th Century"), "Przegląd Naftowy", XIII, Lviv 1938, no. 17, pp. 461-469

³ These are the works of Albert Tylkowski *Physica curiosa*, issued in 1682, in Oliwa, and of Gabriel Rzączyński, *Historia naturalis curiosa Regni Poloniae*, published in Sandomierz in 1721.



Fig. 1 The so-called Greek Fire, source: https://pl.wikipedia.org/wiki/Ogie%C5%84_grecki

Potok. In these works, their authors describe the existence of bitumen, asphalt and petroleum (referred to as liquid bitumen) and their use, among others, by local peasants for lubrication of their carts' axles. Some works dealing with the research, exploitation and properties of oil come from the 18th century. For instance, worth mentioning are the works of Gabriel Rzączyński – he listed particular towns located in what is now Subcarpathia in the context of oil acquisition (e.g., Iwonicz, Ropienka, Węglówka, etc.). In the work of Gabriel Rzączyński, there is also an interesting reference to attempts made as early as in the 18th century, to purify the oil, as well as distil it. Numerous sources of rock oil, the way it was used, and even the specifications of its commercial value Stanisław Staszic also described in his work *O ziemiorodztwie Karpatów i innych gór i równin Polski* ("On the Resources of the Land of the Carpathian Mountains and Other Mountains and Plains of Poland").

What's also interesting, is that in Lemkivshchyna, in the second half of the 19th century, an extensive exploitation of natural oil spills took place and production of lubricant for cart axles from that oil. So-called "maziarze z Łosia" ("slurry-makers from Łos") travelled the markets of Galicia, the neighbouring provinces of the Monarchy, the Kingdom of Poland and the distant Russian governorates (i.a. the territories of today's: Slovakia, Hungary, Austria, Lithuania, Latvia, Ukraine, Russia, Croatia).⁴

⁴ M. Brylak-Zataska, *Maziarska wieś Łosie*, Wrocław – Cracow 1983

However, only in the middle of the nineteenth century emerged the appropriate organisational, economic and technological conditions that allowed for the development of Galician oil mining and industrial oil extraction. The mid-nineteenth century is considered to be the time when, both in the territory of Galicia and the Austro-Hungarian monarchy, as well as in other European and North American countries, pre-industrial oil mines have entered the stage of industrial economy. The second half of the 19th and the beginning of the twentieth century was a time of extraordinary development of the Galician oil industry – of mining and drilling techniques and methods of oil exploitation as well as the processing industry. Exploration and extraction works were carried out during this period in the area of Galicia in *the broad Carpathian range, from Kosmacz in the east to Nowy Sącz in the west*⁵.

Ignacy Łukasiewicz is considered in Poland a pioneer of the oil industry. In 1852, he distilled crude oil and obtained paraffin, in 1853 invented the paraffin lamp, in 1854 co-founded the world's first crude oil mine in Bóbrka and built the first oil well, and in 1856, he founded the first distillery in Ulaszowice. However, in the world, the beginning of the oil industry is most often associated with the drilling of the first oil well in the US, in Titusville, Pennsylvania in 1859. In Bóbrka, the mine was established a few years earlier, but the method of auger drilling was used here in 1861, and it may have an impact on Titusville's precedence.

⁵ T. Wais, *Likwidacja kopanek...*, p. 18

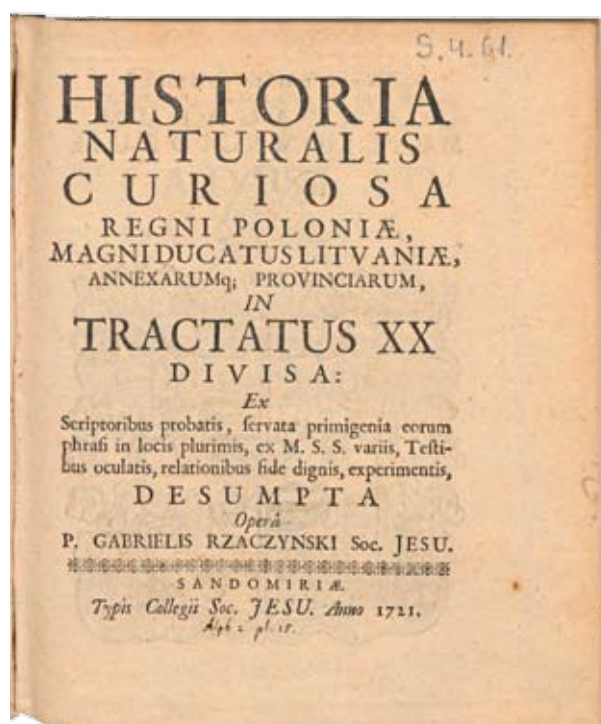


Fig. 2 The work of Gabriel Rzączyński *Historia naturalis curiosa Regni Poloniae*, source: <http://www.starodruki.ihuw.pl/stWeb/single/73/>

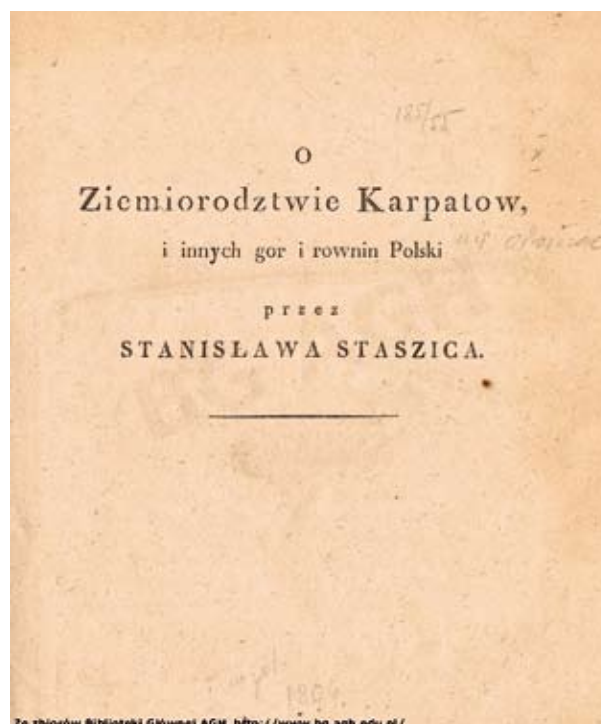


Fig. 3 The work of Stanisław Staszic *O ziemiordztwie Karpatów i innych gór i równin Polski*, source: <http://winntbg.bg.agh.edu.pl/skrypty3/0431/>



Fig. 4 Oil extraction from natural spills, source: <http://www.nafta-polska.pl/historia-naftownictwa/od-polski-si%C4%99-zacz%C4%99%C5%82o/>

1.1.2 An outline of the history of the mine and the open-air museum

HISTORICAL OVERVIEW OF THE MINE

The history of the mine in Bóbrka is part of the creation and development of the Galician and world oil industry in the second half of the nineteenth century. Oil industry historians have undisputedly recognised it as the most important oil mining centre in Galicia. The beginning of the oil mine in Bóbrka dates back to the

In 1854, in addition to digging a ditch in the place of abundant rock oil spills (as crude oil was called in the 19th century), called “Wrzanka” (or “Wrzonka”) in Bóbrka, drilling of wells called “kopanki” – cellars (or “szyby kopane” – dug-out shafts) began. The first cased well – “Wojciech” – was dug in 1855.⁶ During the first years of exploration and drilling, the mine in

ZAŁOŻYCIELE KOPALNI ROPY NAFTOWEJ W BÓBRCE

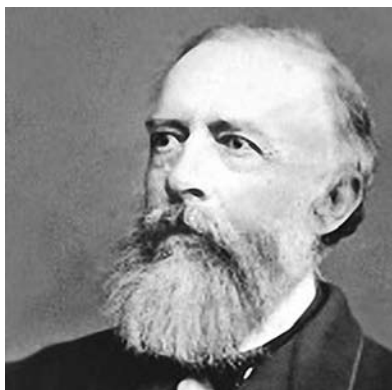


Fig. 5 Tytus Trzeciecki, Source: <http://oc.mik.krakow.pl/pionierzy/trzecielski/>



Fig. 6 Ignacy Łukasiewicz, source: <http://www.poland.us/strona-13,6767,0;ignacy-lukasiewicz.html>

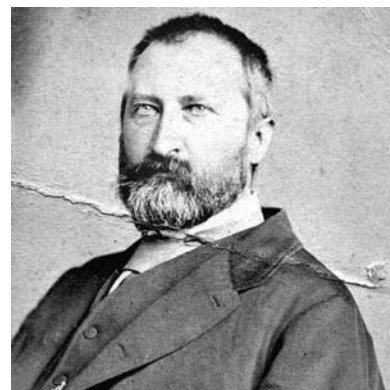


Fig. 7 Karol Klobassa-Zrencki, source: <http://oc.mik.krakow.pl/pionierzy/klobassa/>

mid-nineteenth century, when the exploration works on an industrial scale began in the woods near Bóbrka. At the exploration site, natural oil spills have been occurring for a long time, and the oil has been used by local residents. However, the first systematic mining works began in 1854 and this date is considered the beginning of the mine and the industrial exploitation of oil in Bóbrka. This initiative was the result of the cooperation of Tytus Trzeciecki, a landowner and initiator of the venture, Ignacy Łukasiewicz – a pharmacist, inventor of the paraffin lamp and the later director of the mine, and Karol Klobassa-Zrencki, the owner of Bóbrka. It should be emphasized that the creation of the mine would not have been possible without the involvement of Ignacy Łukasiewicz, a magister (MSc) of pharmacy, a later industrialist who, through long-term laboratory experiences at the Lviv and Gorlice pharmacies, distilled from crude oil the world's first oil distillate – paraffin, used for paraffin lamps. 31 July 1853, the day when the paraffin lamp illuminated the hospital in Lviv, is considered the symbolic beginning of the Polish (and, sometimes, the world) oil industry.

In 1854, Łukasiewicz was invited by Tytus Trzeciecki to Bóbrka, where natural oil spills have been present. With the consent of the owner of the area, Karol Klobassa, he began the first mining works.

Bóbrka did not produce a lot of oil, nor did it bring any profit. It was decided to expand the exploration area to “the entire forest”. Despite failures in exploitation of oil in Bóbrka, Łukasiewicz and Trzeciecki decided to set up a distillery, built in 1856 in Ulaszowice (now a district of Jasło), in the estate of Franciszek Trzeciecki (brother of Tytus). Łukasiewicz then settled in Jasło and only casually supervised the mine in Bóbrka. From the source materials (including Łukasiewicz's own account) it is known that this was a difficult time for the mine – it still did not make any profit, and in addition, probably in 1860, the Ulaszowice distillery burned down. A number of professional difficulties and family problems led to Łukasiewicz's intention to withdraw from the activities carried out in Galicia (including conducting the mine in Bóbrka) and leave for the Kingdom of Poland. He changed his mind under the influence of Trzeciecki and new circumstances that occurred in the mine in Bóbrka, where in the “Wojciech” cellar, after piercing a sandstone layer with a drill, a larger amount of oil appeared. Bóbrka turned out to be an oil-bearing terrain. In 1861, Trzeciecki, Łukasiewicz and Klobassa officially incorporated an oil company.

⁶ P. Franaszek, *Myśl techniczna...*, p. 53

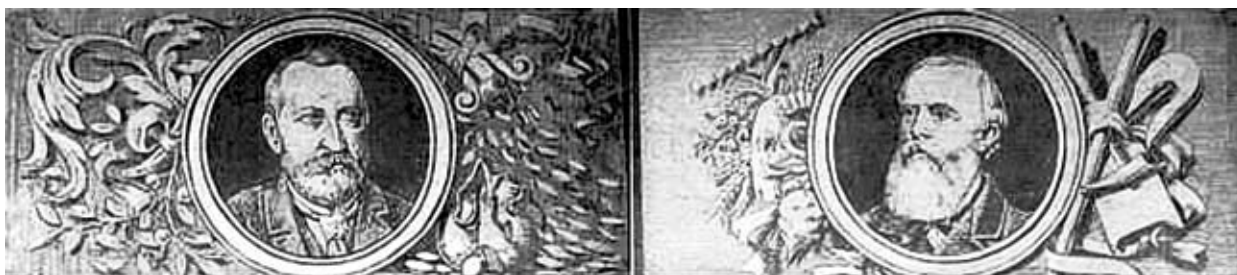


Fig. 8 Sgraffiti depicting Trzeciecki and Klobassa on the building of Towarzystwo Zaliczkowe in Krosno, Source: <http://www.eioba.pl/a/1n4c/kopalnia-w-bobrze>



Fig. 9 A sgraffito depicting Łukasiewicz on the building of Towarzystwo Zaliczkowe (the Prefinance Society) in Krosno, Source: http://www.zrecin.vgh.pl/print.php?type=N&item_id=924

The contract was not written down or formally validated, but it is known that it was concluded for a period of 10 years, so that Klobassa gave the oil, Trzeciecki gave the funds, and Łukasiewicz gave the work⁷.

Since then, the mine has developed and modernised very quickly and intensively. Great influence on the profitability and further development of the mine can be attributed to the "Małgorzata" well, dug in 1862.⁸

The owners enjoyed the profits⁹, but they also did not stop investing in the mine.

In the second half of the nineteenth century, there was a very rapid development of the mine – continuous modernisation of the mining methods, the emergence of new, more numerous oil wells all increased the amount of raw material obtained, bringing the owners of the company large profits. The area of the mine

⁷ W. Anczyc, *Ignacy Łukasiewicz*, "Kłasy" 1882, no. 875

⁸ P. Franaszek, *Myśl techniczna...*, p. 53

⁹ According to S. Bartosiewicz in 1861, the profits of the company until 1871 (the year it was dissolved) amounted to 1.5 million guilders.



Fig. 10 Oil mine in Bóbrka, /in:/ Władysław Bełza, Iwonicz i jego okolice ("Iwonicz and its surroundings"), 1885

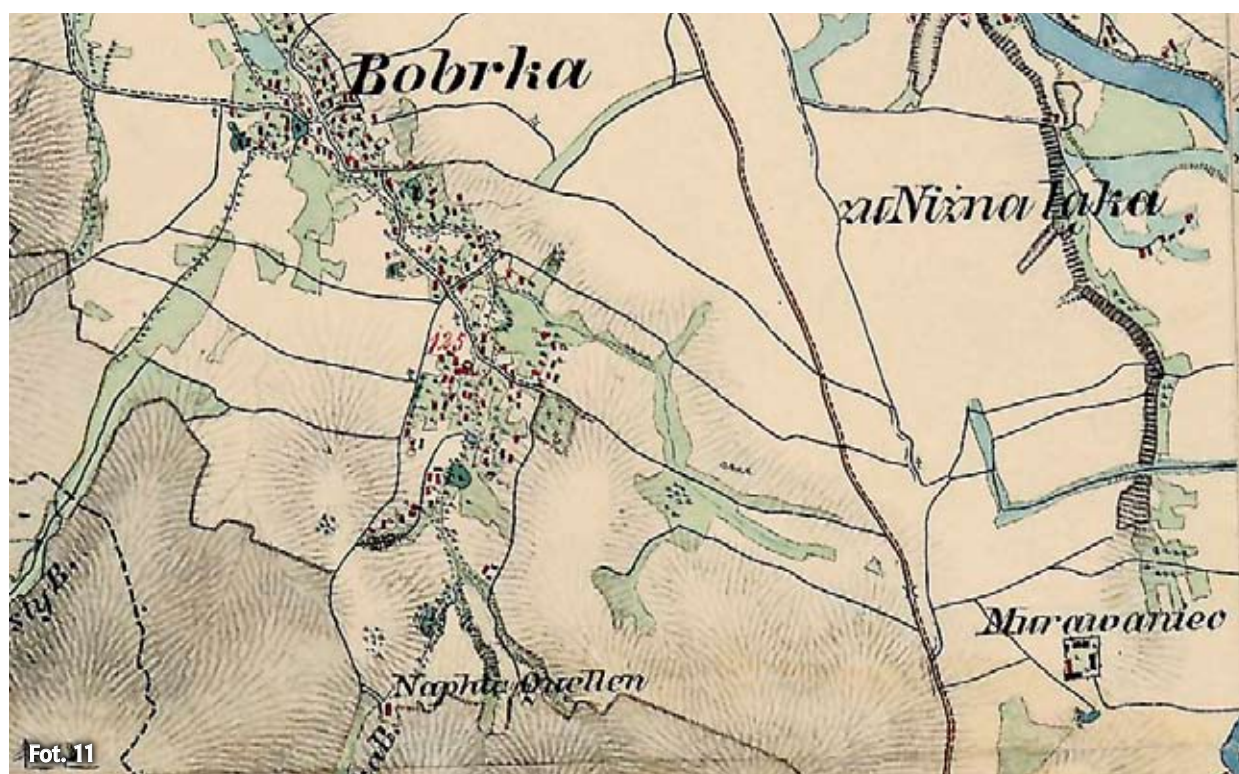
underwent rapid changes at that time – alongside new mining sites, new infrastructure – necessary to manage the mine and the increasingly active company – as well as state-of-the-art drilling equipment appeared.

I. Łukasiewicz, aware of the significance of technological progress, undertook as a director of the mine a number of activities which resulted modernisation of the mine on an extraordinary – in Galicia at that time – scale. Łukasiewicz employed people – counsels, specialists, researchers – whose knowledge and skills contributed to the great development of the enterprise. Among people working in the mine in Bóbrka were figures inseparable from the history of the oil industry and the technical changes in oil mining. These included, among others: Henryk Walter, Albert Fauck, William Schütte, Juliusz Noth, Adolf Jabłoński, and many others.

Probably in 1868, Łukasiewicz, a few years before the expiration of the contract with Trzecieski and Klobassa, withdrew from the company, but remained a director of the mine. In 1870, also Trzecieski resigned from the company, and employed to work in Bóbrka was Adolf Jabłoński – a pharmacist who, along with Wiktor Klobassa (son of Karol) went, at the cost of the mine, to the United States, where he studied and learned about

the functioning of the American oil industry. After his return in 1873, he became the technical manager of the mine in Bóbrka, and Łukasiewicz still held the position of the head director. At that time, Jabłoński actually managed the mine, as Łukasiewicz focused on his refinery in Chorkówka, and his directorial role at that time was rather formal. After Łukasiewicz's death in 1882, Jabłoński became the director of the mine. He held this function until 1887. A. Jabłoński made the mine's history as the next innovator of tools and devices. From the United States, he brought modern drilling tools (drills, hermetic cladding pipes), improved the process of sealing off water using the so-called Jabłoński's bell, built in accordance with his own design. He is considered one of the best oil industry practitioners and theorists in Galicia.¹⁰ The mine's scale and rapid development of the day is confirmed, i.a., by the preserved "Plan kopalni Bóbrka" ("Plan of the Bóbrka Mine"), drawn up in 1879 by Adolf

¹⁰ A. Jabłoński is also the author of the book *Kopalnictwo Nafty* ("Petroleum Mining"), in which he described mining methods from digging wells, through the then well-known drilling systems, methods of extracting oil, as well as descriptions of drilling equipment and tools designs.



- Fig. 11** Österreichisches Staatsarchiv, Wien, Historical Maps of the Habsburg Empire, The Second Military Survey (1806- 1869), Source: <http://mapire.eu/en/map/secondsurvey/?bbox=2411351.7717515696%2C6379838.086218091%2C2420524.215145791%2C6384104.227859257>
- Fig. 12** Österreichisches Staatsarchiv, Wien, Historical Maps of the Habsburg Empire, The Second Military Survey (1806- 1869), Source: <http://mapire.eu/en/map/secondsurvey/?bbox=2411351.7717515696%2C6379838.086218091%2C2420524.215145791%2C6384104.227859257>
- Fig. 13** Österreichisches Staatsarchiv, Wien, Historical Maps of the Habsburg Empire, The Third Military Survey (1869-1887), Source: http://mapire.eu/en/map/hkf_75e/?bbox=2411351.7717515696%2C6379838.086218091%2C2420524.215145791%2C6384104.227859257
- Fig. 14** Österreichisches Staatsarchiv, Wien, Historical Maps of the Habsburg Empire, The Third Military Survey (1869-1887), Source: http://mapire.eu/en/map/hkf_75e/?bbox=2411351.7717515696%2C6379838.086218091%2C2420524.215145791%2C6384104.227859257

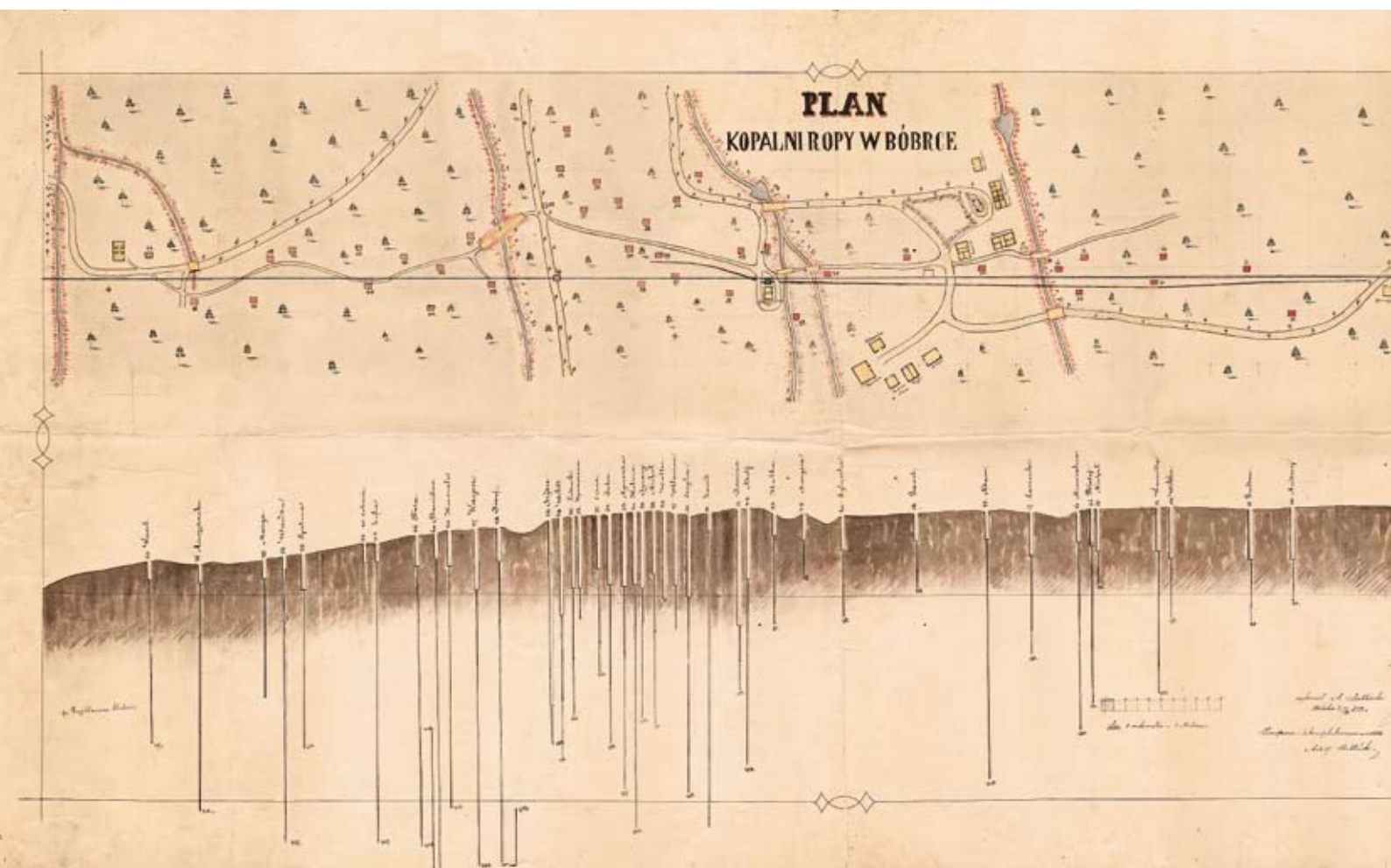


Fig. 15 Adolf Jabłoński, "Plan kopalni Bóbrka", 1879, in the collections of Muzeum Przemysłu Naftowego i Gazowniczego w Bóbrce (the Memorial Museum of the Oil and Gas Industry in Bóbrka)

Jabłoński. The plan presents the mine investment and the cross sections of 50 cellars.

Apart from the cellars, the plan includes also buildings with different functions, some of which survived to this day. These are (in chronological order): the mine forge from the year of creation of the mine – 1854, the administration building, the so-called Ignacy Łukasiewicz House from 1864, the machine shop from 1864, the boiler room equipped with a steam boiler from 1867, the obelisk commemorating the founding of the mine, funded by I. Łukasiewicz in 1872. In 1883, the number of the so-called "szyby produktywne" (productive shafts) increased to 61.¹¹

In 1886, after the death of Karol Klobassa, the mine was owned by his sons, Wiktor and Stanisław, and Helena – Klobassa's widow. Almost at the same time, after the death of Adolf Jabłoński, in 1887, the management

and directorship were taken over by Zenon Suszycki. He was another director that contributed to the further development and modernisation of the mine. It was him who introduced the Canadian drilling method in Bóbrka, which resulted in multi-fold increase of income of the company. In addition, *as one of the first, he implements the method of sealing off water using hermetic plunge pipes. He is building the first pipeline to the train station in Krosno, to which oil from Bóbrka, Wietrzno and Równe is transported.*¹²

¹¹ P. Franaszek, *Myśl techniczna...*, p. 53

¹² Bóbrka Naftowe Dziedzictwo ("Bóbrka – The Oil Heritage"), edited by J. Sozański, work of authors: J. Sozański, S. Kondera, J. Sożyński, R. Wolwicz, J. Zuzak, Krosno 1996, p. 42 Zenon Suszycki, a mining engineer educated in the Higher Mining School in Paris (MINES ParisTech), January Uprising participant, in addition to directing the mine in Bóbrka in the years 1887-1893, he founded, in the premises of the mine in Ropiarka near Dukla, a professional drilling school under the name: Praktyczna Szkoła Wiercenia Kanadyjskiego ("the Practical School of Canadian Drilling").

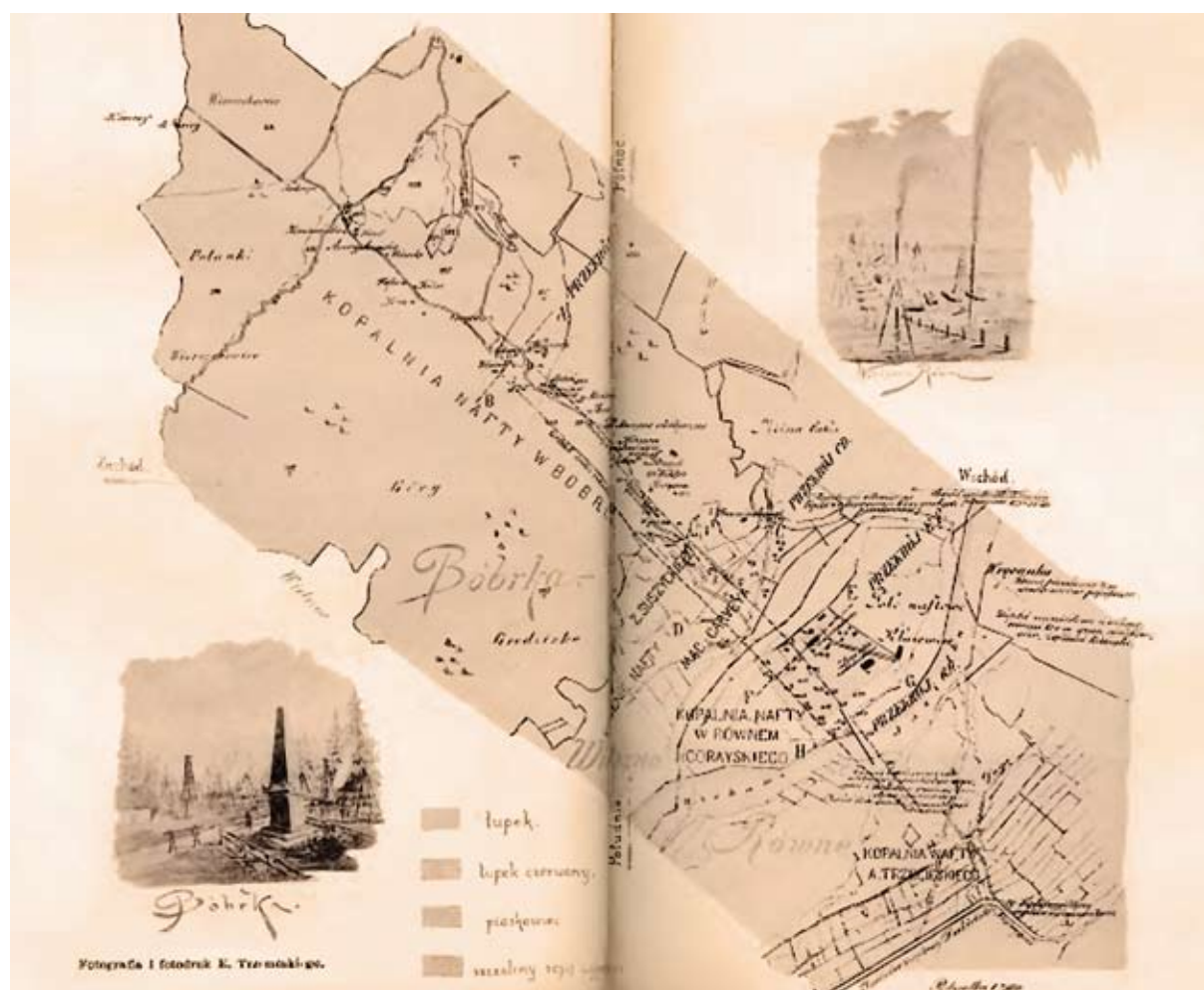
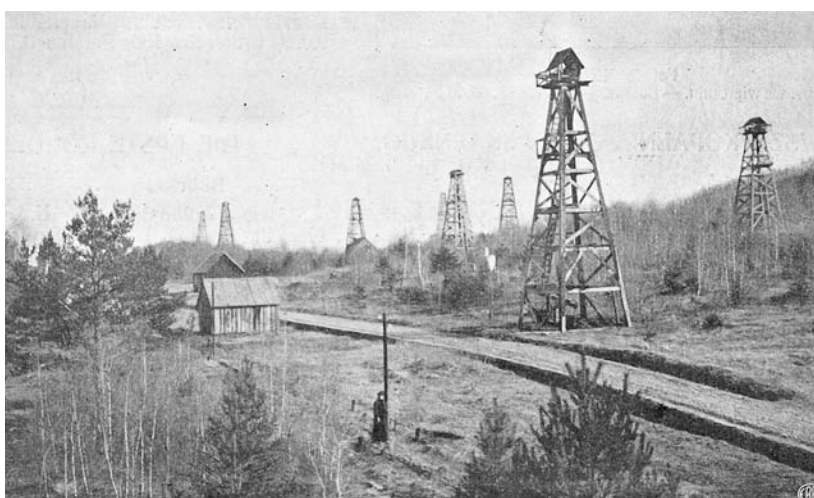
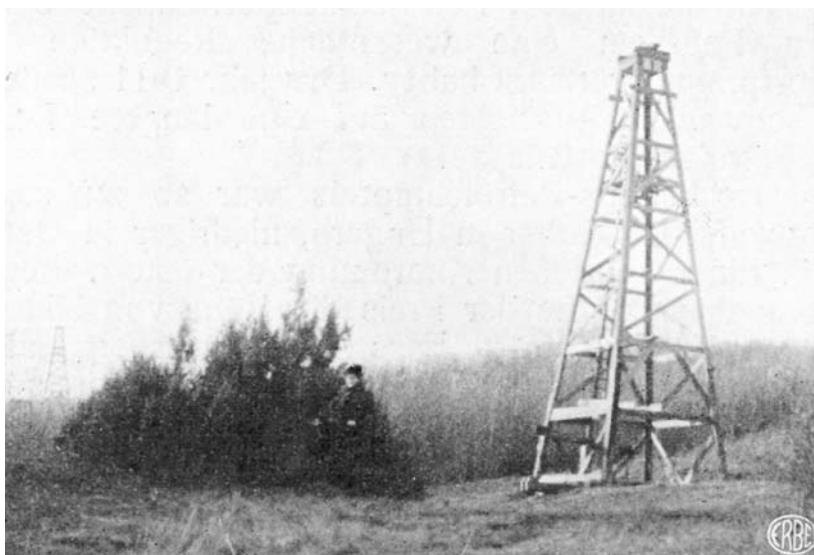


Fig. 16 Oil mine in Bóbrka, Klaudiusz Angerman – Naftowy pas Bobrzecki ("The Bóbrka oil belt"), /in:/ "Kosmos", 1895

In 1893, when the owners gave their shares in the mine under the management of an oil trader who came from Canada – William Henry Mac Garvey, Zenon Suszycki resigned from office. Two years later, the mine became the property of *Galicyjskie Karpackie Naftowe Towarzystwo Akcyjne* (The Galician Carpathian Oil Stock Society), whose major stockholder was Mac Garvey. William Mac Garvey was a unique character – a pioneer and industrialist who came to Europe from Canada and, as the first in Europe, started in 1881 near Hannover oil drillings using the Canadian method, which is associated with his name. In 1884, he began large-scale drillings in Galicia (initially in the present poviats of Sanok and Lesko, then in the Gorlice-Jasło, Krosno and Borysław areas), which has revolutionised the previously used drilling methods. The Canadian system, later improved by Mac Garvey himself, as well as Poles, was perfectly suited to the difficult geological conditions of the Carpathians and, largely thanks to this innovative method, which allowed deeper drilling, new oil deposits have been discovered, and years later Galicia reached the third – after the United States and Russia – position in the world production



Fig. 17 William Henry Mac Garvey, source: <http://oc.mik.krakow.pl/pionierzy/mcgarvey/>



of crude oil. W. Mac Garvey, like Łukasiewicz, supported the civilizational development of Galicia and was the author of many innovative methods and inventions in the oil industry.¹³ As a curiosity, it can be mentioned that, on

¹³ ... in 1885 in Kryg, he installed the first pumping rigs, in 1887 in Glinik – the first iron oil tanks (...), in 1899 he patented the eccentric auger of his idea, a wonderful invention that eliminated inconvenient expanders from the drilling process. In 1902 in Boryslaw, he drilled the first shaft of over 1000 m in depth, in 1905 he tried in that basin the Pennsylvania cable drilling with a rig of his own design, and in 1914 – rotary drilling. In 1909, he fought a fierce and successful fight with the Austrian Government for the construction of large oil reservoirs in Galicia and a great refinery in Drohobycz, threatening to contract with the English Vacuum Oil Company; the Government, in the interest of the Viennese producers, refused to allow this construction, making the Galician oil industry completely independent from Austrian refiners. S. M. Brzozowski, Garvey William Henry, a biography /in:/ Polski Słownik Biograficzny ("The Polish

his initiative in 1889, in Równe (near Bóbrka), the first electric lighting of mines was installed.

After World War I, the Bóbrka mine was part of the oil concern "Małopolska" – Grupa Francuskich Towarzystw Przemysłowych i Handlowych w Polsce (The French Industrial and Commercial Society Group in Poland). During World War II, in the years 1939-1944, it was taken over by the Germans and belonged to German oil companies.

After World War II, it was nationalized. In the 1950s, after the discovery of new oil fields, the mine was again developing very successfully. Currently, the mine is the property of the state-owned company PGNiG S.A. and is subject to the supervision of the State Mining Authority. The mine has operated continuously for more than 160 years, and crude

Biographical Dictionary"), Vol. XVIII, after: <http://www.ipsb.nina.gov.pl/a/biografia/garvey-william-henry-mac-garvey>



Fig. 18 The Oil Mine in Bóbrka, author: R. Klein, /in:/ "Ropa", no. 16, vol. IV, 30 August 1912

Fig. 19 The Oil Mine in Bóbrka, author: R. Klein, /in:/ "Ropa", no. 16, vol. IV, 30 August 1912

Fig. 20 Oil Mine in Bóbrka, around 1930, the Bóbrka Foundation Archives

oil is extracted even from the oldest shafts, dug at the time of Łukasiewicz, which is unique on a global scale.

On a side note of this short history, also worth mentioning is an interesting episode in the first period of operation of the Bóbrka mine, related to the discovery of mineral waters and the foundation of a hydrotherapy centre.¹⁴ In 1868, deposits of mineral waters were encountered in Bóbrka. Mineral waters were discovered in two of the mining wells: "Karol" and "Idzi". On the initiative of the owner of Bóbrka, Karol Klobassa, water samples were tested by scientists, who highly appreciated its quality and therapeutic properties. Bóbrka's water had similar composition to the mineral waters from the nearby spa town of Iwonicz Zdrój.

Karol Klobassa built a hydrotherapy centre near the mine (the exact location of the currently non-existent buildings is unknown).¹⁵ Around 1870, it comprised several accommodation buildings, including so-called bathhouses. More and more patients were coming to Bóbrka, but the plans for further expansion of the spa were disrupted when it turned out that the strength of the springs was small.¹⁶

¹⁴ More on this topic in article by B. Olekarz, *Wody mineralne z Bóbrki. Zapomniana historia zakładu wodoleczniczego* ("Mineral Waters of Bóbrka. The Forgotten History of the Hydrotherapy Centre"), "Wiek Nafty", no. 3, R. XXIII, September 2014, pp. 13-17;

¹⁵ So far, no iconographic materials or maps, or plans of the hydrotherapy centre in Bóbrka have been found.

¹⁶ As B. Olejarz wrote, op. cit., Klobassa, at the instigation of Józef Dietl, pumped water for several months in order to examine the capacity of the spring and verify whether intensive exploitation would change its characteristics or not. As a result, the spring filled with crude oil.

TECHNOLOGICAL DEVELOPMENT OF THE MINE IN THE 19TH CENTURY

In the following outline of this topic, issues related to oil processing and the distribution of petroleum products were omitted.

The dynamic development and increased significance of the Bóbrka mine in the 19th century was influenced by many different factors. In addition to efficient management, the introduction of new, innovative drilling methods was extremely important. The progress in drilling technologies was crucial for the further development of the mine.

In the first years of the mine's existence, the shafts (called "kopanki" – cellars) were dug manually, and therefore were shallow – up to several dozen meters. Also, quite primitive tools and methods of work were used (e.g., manual air fans, gunpowder and dynamite for rock splitting). Initially, there were also no skilled workers present there; and so, Hungarian and German miners were brought in.¹⁷

This situation changed in the 1960s – Bóbrka was already considered an exemplary enterprise, using state-of-the-art technical equipment. Very soon, alongside the original well digging, a method of manual impact drilling, the so-called free-fall drilling system, began to be used for drilling shafts. This method made it possible to make the boreholes deeper. It was used not only for newly dug shafts, but also for deepening the existing shafts, which resulted in a significant increase in extraction and higher profits. In Bóbrka, this system has been used since 1862.¹⁸ This method, which was recognised as the beginning of the Galician oil drilling industry, was introduced, independently of each other, by Robert Doms in Borysław and Henryk Walter (a mining engineer and geologist) in Bóbrka. Although most of the literature indicates 1861 as the date of drills in Borysław and the next year in Bóbrka, *the works by H. Walter made using the free-fall system with Fabian's scissors, were much more practical and this method was adopted and spread throughout Galicia*.¹⁹ One of the earliest drilled shafts in Bóbrka Walters was called "Walter" in honour of H. Walter's invention. In addition, H. Walter introduced further modernisations in the mine – he improved the ventilators used by miners working in the wells, and in 1866 he brought the

improved Fabian's scissors for manual impact drills.²⁰ The manual drilling method was not satisfactory, however, especially when working on very hard deposits. The productivity and pace of work were low, and the working conditions of the workers were hard. Therefore another, very important step in the field of mine modernisation was the use of a steam machine for drilling and pumping oil. The device was probably introduced in Bóbrka as early as in the second half of the 1860s and in 1873 its functioning was described in detail.²¹ *It was probably done independently by A. Fauck drilling in Klęczany and William Schütte in Mencina and Bóbrka, where he collaborated with Łukasiewicz at that time*.²² Initially mainly locomobiles were used as steam machines. The impact drilling technique was improved in Bóbrka, i.a. by introducing a type of rod wire. Efforts have also been made on the important element of extraction – sealing off confined groundwater. It was only in 1874 that the first deep-water closures were made in Bóbrka using casing pipes imported from the United States.

The already mentioned Albert Fauck, a famous German driller, was invited in 1870 to Bóbrka by Łukasiewicz. After his stay in the United States, A. Fauck arrived in Galicia and at the Klęczany mine drilled for the first time using impact drilling with a cable wire (the so-called Pennsylvania method). In 1870-1872, he also tried to introduce this method in Bóbrka and Ropianka. However, it did not give the expected results due to the specific geological conditions of the Carpathians, so it was abandoned, and the method of impact drilling with free-fall scissors, powered by a steam machine, continued to be used.²³

Another method of drilling, which quickly changed the Galician oil mining, enabled drilling on much larger depths, contributed to the formation of new mines and significantly increased profits of the mines, was the so-called Canadian system.²⁴ This method was first applied

¹⁷ J. J. Cząstka, *Dzieje przemysłu naftowego...*, pp. 10-11

¹⁸ J. J. Cząstka, A. Giermański, K. Mischke, *Wiertnictwo naftowe, /in:/ Historia polskiego przemysłu naftowego*, Vol. 1, Brzozów-Cracow 1994, pp. 214-215

¹⁹ P. Franaszek, *Myśl techniczna...*, p. 63

²⁰ Information after: W. Bonusiak, *Szejk z Galicji. Ignacy Łukasiewicz 1822-1882*, Rzeszów 2007, p. 95

²¹ P. Franaszek, op. cit., p. 72, indicated the 1860s as the time of introduction of a steam machine to the mine in Bóbrka, while W. Bonusiak, *Szejk z Galicji...* p. 93, stated that the use of a steam machine in the mine in Bóbrka in 1873 was described for the first time in the work of Edward Windakiewicz *Olej i wosk ziemny w Galicji*, Lviv 1875, who, at the command of the Austrian Ministry of Agriculture, presented the development of the oil industry in Galicia.

²² P. Franaszek, *Myśl techniczna...*, p. 72

²³ J. J. Cząstka, *Dzieje przemysłu naftowego...*, p. 13

²⁴ The history of the introduction of the Canadian system

in Galicia at the beginning of the 1980s thanks to the Bergheim and Mac Garvey drilling company. Drilling towers used in the Canadian system, with their characteristic form and structure, for a long time constituted an inherent part of the Galician cultural landscape of oil fields. Bóbrka was not the first mine in Galicia where this method was introduced, but it definitely happened in the 1880s.

According to the information provided by W. Bonusiak, based on data from 1897, *in 1861-1868, there were supposedly around 200 thousand hundredweight of oil extracted in Bóbrka. If we accept these numbers as true, as well as the production in Galicia in the years 1862-1868, stated in the "Nafta" magazine, of (...) approximately 810 hundredweight, it turns out that Bóbrka provided almost 1/4 of oil production in Galicia at the time.*²⁵ Compared to other Galician mines, Bóbrka looked exceptionally well also in terms of technical level. It is shown by all sorts of historical sources. Such assessment appears, for example, in the work of Władysław Szajnocha from 1881, who, by characterising the technical equipment of the mines, described their condition, quality and level as "miserable", indicating only Bóbrka as a commendable exception.²⁶ In the review of the condition of Galician mines, developed in that same year by the order of the National Department, the advanced level of the mine in Bóbrka was confirmed.²⁷

Finally, it should be emphasised that the development of the oil industry in the area of the Austrian partition was, especially in the initial period, the result of the Polish scientific and economic activity, resulting from positivist intellectual formation and the search for ways to economically improve the former Polish lands.

THE FOUNDATION AND DEVELOPMENT OF THE OPEN-AIR MUSEUM²⁸

The origins of the Museum date back to the 1950s, when, at the initiative of Zespół Historii Polskiej Techniki (the Polish Technology History Team) at the Polish Academy of Sciences, the Main Board of the Association of Petroleum Industry Engineers and Technicians (APIET) started the operation of recognition, registra-



Fig. 21 The Mine in Bóbrka in the 1950s, source: <http://www.eioba.pl/a/1n4c/kopalnia-w-bobrze>

tion and collection of historical items, tools and devices related to the petroleum industry. What's important, these activities concerned all sectors of the oil industry – petroleum drilling and mining plants, oil refineries, and establishments of quarrying and distribution of petroleum products.²⁹ In 1961, the Committee of Caring for the construction of the Ignacy Łukasiewicz Open-Air Museum of Oil Industry in Bóbrka was appointed, and the supervision over financial, legal and substantive matters in terms of organization and construction of the Museum were taken over by the Main Board of the Association of Petroleum Industry Engineers and Technicians. Within the area of the active Bóbrka mine, a separated area for the operation of the Museum was provided, renovation and restoration works were performed on selected historical facilities and equipment located in the mine (i.a., the mechanical workshop and forge from the period of Łukasiewicz, the "Franek" cellar) and a collection was started in dedicated premises of equipment, tools and artefacts from other mines and petroleum industry units. At the same time, historical

in Galicia and the characteristics of the equipment and methods of operation – cf. P. Franaszek, *Mysł techniczna...*, pp. 84-100

²⁵ W. Bonusiak, *Szejki z Galicji*, pp. 119-120

²⁶ W. Szajnocha, *Górnictwo naftowe w Galicji wobec ustawodawstwa górniczego*, Cracow 1881, pp. 45 and 61

²⁷ W. Znamirowski, *Przegląd stanu kopalń nafty i wosku ziemnego w Galicji w drugim półroczu 1881*, Tarnów 1882 after: W. Bonusiak, *Szejki z Galicji*, p. 100

²⁸ An outline of the formation and history of the Museum has been developed mainly on the basis of the detailed information contained in the publication: *Bóbrka Naftowe Dziedzictwo*.

²⁹ *Bóbrka Naftowe Dziedzictwo*, p. 46



Fig. 22 The Exhibition Pavilion of the Museum in Bóbrka, Photo by A. Fortuna-Marek

collections were started of all kinds of historical, iconographic and photographic documents, books and periodicals, and historical memorabilia. And so, the year 1961 is considered the year the Museum was founded. In the first years of its construction and organisation, the Museum was largely financed from corporate funds of petroleum mining companies. Financial and organisational problems caused that in 1965, the Main Board of the APIET appointed the Department for Construction of the open-air Museum in Bóbrka as a body of the APIET. This did not, however, resolve the financial problems and only in 1972, in connection with the celebrations of the 150th anniversary of the birth of I. Łukasiewicz and the annunciation of the *Year of Ignacy Łukasiewicz*, after carrying out a number of important works for the construction of the open-air Museum, the Museum was opened for visitors. In that time:... *a series of constructions, buildings, equipment and tools was erected, reconstructed or remodelled, that have a unique character in the development of the petroleum technology. In particular, the following were made: a prototype device for manual drilling from 1862, and the original equipment for the impact drilling system with the Pennsylvania and Canadian methods powered by a steam machine, the so-called locomobile. Rotary drilling equipment for medium and large depths was built, impact drilling device of the Bitków type – for deep drilling, and transportable devices for impact drilling for medium depths. A large number of equipment for processing and exploitation of crude oil and gas holes was brought together, i.a., processing lifts, pumpjacks, exploitation headers, devices for the separation and purification of oil and gas. Renovated historical whims, oil compressor stations, boiler rooms, main roads and paths.*³⁰ In 1974, in “Bipronaft” Kraków, the *General zoning plan of the Oil Industry Museum* was developed, within which, i.a. the borders of the Museum were set

out, the area was divided into sectors for current and prospective exhibitions of individual industries, and elements of the exhibitions in the scheduled sectors were planned. The Board of the APIET became the land owner of the open-air museum, which covered around 19 ha. At that time, works essential for the development of the Museum and for the protection of historical properties were carried out, such as: refurbishment of the old mine’s wooden administration building – the so-called Łukasiewicz House, along with adaptations for the purposes of exhibitions, construction of a replica of the Polish-Canadian drilling rig with the interior adapted to catering purposes, maintenance of the obelisk donated by Łukasiewicz, reconstruction of the “Naftusia” building. In the petroleum mining sector, a number of devices and tools for drilling and exploitation were exhibited. Efforts to recreate the natural environment of the old mine – tree stand, vegetation and birds – were also an important initiative. At the beginning of the 1980s, next to the repair and maintenance works carried out, the preparation of exhibition of the interiors of historical buildings of the workshop and the forge must be mentioned (in the petroleum mining sector), and the opening of the refinery and distribution of petroleum products sectors.

In 2000, the exhibition pavilion was commissioned.

In 2004, the Foundation of the Ignacy Łukasiewicz Museum of the Oil and Gas Industry in Bóbrka was established, whose primary purpose is to conduct the Ignacy Łukasiewicz Museum of the Oil and Gas Industry. Over the last several years, the Museum managed by the Foundation was growing rapidly, and its activity focuses both on maintaining historical facilities and equipment in a good condition on an ongoing basis – along with carrying out the necessary repair and maintenance works, expanding the open-air museum’s exhibitions, modernisation of the interior exhibitions with the use of multimedia techniques – and activities in the field of promotion and popularisation of the Museum and knowledge of the history of the oil and gas industry, and protecting historical technical facilities and equipment located outside of Bóbrka.

The Museum in Bóbrka, created with the efforts of the petroleum, gas and refinery environments, is a unique place – located at the site of a historical, still active mine with preserved relics of infrastructure dating back to the pioneering times of its operation, and Ignacy Łukasiewicz, the “father of the Polish oil industry”. Other exhibits presented in the open-air museum – reconstructions of 19th- and 20th-century original equipment brought from other mines – complement the collection, and their placing surrounded by the preserved relics of the mining landscape raises the quality of authenticity.

³⁰ *Bóbrka Naftowe Dziedzictwo*, p. 48

1.1.3 Ignacy Łukasiewicz – the man and his role in the development of the Galician oil industry

The life and activities of Ignacy Łukasiewicz were characterised in numerous scientific and popular-science publications. All researchers emphasise the role his inventions and later achievements in mining and processing of crude oil played in the development of the oil industry in the Austro-Hungarian monarchy. Sometimes he is called the father of the Polish oil industry, referred to as a great inventor, and, moreover, already his contemporaries highlighted his numerous qualities of character. Łukasiewicz appears in those sources as a patriot, social activist and philanthropist, and a man of extraordinary characteristics and principles.

Ignacy Łukasiewicz was born in 1822 in Zaduszniki (presently the Mielec powiat in the Subcarpathian voivodeship), in an impoverished noble family. In the years 1832-36, he studied at the post-Piar school in Rzeszów, and then, due to bad financial situation of the family, he was

forced to abandon his education. He found employment at a pharmacy in Łańcut, where in 1836-1840 – next to practice – he gained knowledge and skills in chemistry and pharmacy. For the next several years (1840-46), he continued his apprenticeship as a chemist's assistant working in a pharmacy in Rzeszów. From the early teenage years, he was active in democratic and independence organisations, associated also with Edward Dembowski. In 1846, he was arrested and sent to prison in Lviv. Released in 1847, he worked in Peter Mikolasch's pharmacy "Pod Żółtą Gwiazdą" in Lviv. During this time, he studied at the Jagiellonian University, then at the University of Vienna, where in 1852 he received a master's degree in pharmacy. The mentioned Lviv pharmacy went down in history as the place where in 1852/1853 Łukasiewicz, together with John Zeh, after many laboratory studies and experiments with the method of fractional distillation, obtained paraffin. Łukasiewicz, seeking a practical use for paraffin as fuel for lamps, commissioned a Lviv sheet metal worker, Adam Bratkowski, to make a paraffin lamp adapted to the obtained product. The first public use of paraffin lamps and paraffin was recorded on 31 July 1853, at the Lviv Hospital in Łyczaków, during an important night-time surgery. That day is considered the symbolic date of birth of the Polish oil industry. In 1854, Łukasiewicz moved to Gorlice to continue the research on paraffin and its use, while working at a local pharmacy. In Gorlice, the world's first street paraffin lamp was lighted then. The year 1854 was an important date in Łukasiewicz's life. At the instigation of Titus Trzeciecki, he started the exploitation of crude oil in Bóbrka, which gave the beginning of, probably, the world's first mine of this raw material. Łukasiewicz quickly transformed from a pharmacist and inventor into an industrialist. Since then, in addition to continuing working in pharmacies for some time (in Gorlice, Jasło, Brzostek), he devoted himself to the extraction and processing of crude oil, actively and in a wide range acting in the field of the development of the oil industry. Next to conducting the mine in Bóbrka, he established distilleries in: Ulaszowice, Kłęczany, Polanka, Chorkówka, Ropa near Gorlice. In the refineries – like in the Bóbrka mine – he systematically modernised these enterprises. Looking for new oil sites, he was also involved in establishing or was a shareholder of several other mines, e.g. in Ropianka, Podgórzyn near Gorlice, Smereczna, Uherce Mineralne, Solina. Łukasiewicz, aware that the development of new industries required many operations – the need for dissemination of petroleum products, acquisition of market outlets, obtaining capital – took an active part in national and international exhibitions (e.g. in Lviv and Vienna). At the world exhibition in Vienna in 1873, Łukasiewicz was awarded a medal for paraffin and asphalt, and a di-



Fig. 23 Ignacy Łukasiewicz, source: https://upload.wikimedia.org/wikipedia/commons/9/92/Ignacy_Lukasiewicz.jpg

*ploma of recognition for the services to the oil industry, and Fauck – a medal for the machine used in the mine in Bóbrka.*³¹ Also the activity of Łukasiewicz regarding the dissemination of the mining progress, changing the oil industry's legal situation for the better, creation of petroleum mining schools and establishment of the petroleum association is being underlined. In 1877, he participated in organising the Congress in Lviv, and in 1879, on his own initiative, he created the National Oil Association in Gorlice, which, i.a., supported Polish oil entrepreneurs in adopting more favourable legal solutions. From 1876 until his death he was a member of the parliament for the National Sejm, undertaking many initiatives, which aimed at lifting Galicia up from the

economic and social backwardness. Łukasiewicz was not only a pharmacist, inventor and entrepreneur, but also an independence activist, political and economic activist, community activist, positivist, good employer – for instance, at the enterprises he managed, he organised “kasy brackie” – community financial unions and “kasy zapomogowo-pożyczkowe” – benefit and loan financial unions for workers. With his partner from Bóbrka – Klobassa, he founded the parish church in Zręcin, existing to this day. The Museum of the Oil and Gas Industry in Bóbrka may be considered a kind of monument to this outstanding man, meritorious for the socio-economic development of the Polish lands during the period of the partitions of Poland.

³¹ W. Bonusiak, *Szejk z Galicji*, p. 126

1.2 Formal description of the asset

1.2.1 The characteristics of the geographic and geological location

Bóbrka is a village in the South-Eastern Poland, in the Subcarpathian Voivodeship, in the Chorkówka commune, within the Krosno powiat. Geographically, the village belongs to the mesoregion of Kotlina Jasielsko-Krośnieńska, which is located in the southern part of Pogórze Środkowobeskidzkie. The entire area belongs to the Outer Western Carpathians sub-province. Kotlina is a broad, longitudinal land subsidence between Pogórze Strzyżowskie and Pogórze Dynowskie from the North, Pogórze Jasielskie and Pogórze Bukowskie from the South and Obniżenie Gorlickie from the West.

Kotlina comprises a belt of hills and valleys with altitudes of around 280-350 m above sea level with a flat landscape, diversified in the South-East with uplands and elongated, flat humps. Through Kotlina Jasielsko-Krośnieńska flows Wisłoka and Jasiołka, which outflows from it, and Wisłok with its many inflows. Because of its fertile soils, it is an agricultural area, while natural resources, mainly in the form of crude oil and natural gas, make it an area of extraction (Krośnieńsko-

Jasielskie Zagłębie Naftowe) – one of the oldest in Europe and the world. In this region, there are also valuable mineral waters, on the basis of which developed two well-known spas in Poland – in Iwonicz-Zdrój and Rymanów-Zdrój.

The geological structure of Poland is currently characterized by 5 oil provinces. Deposits of crude oil in Bóbrka – according to this classification – belong to the deposits of the Małopolska province. According to the results of scientific studies, crude oil formed in all periods of geological history – from the Cambrian period in the Palaeozoic Era to the Tertiary in the age of the Cenozoic Era.

The *Bóbrka-Rogi* oilfield, still in operation, located in Bóbrka, is currently one of the best known in terms of the geological structure of the Carpathian deposits. *The deposits are located in an anticline on the NW-SE axis, cut into blocks by lateral faulting, which causes the depth of the oil-bearing levels to increase towards the East (...).*

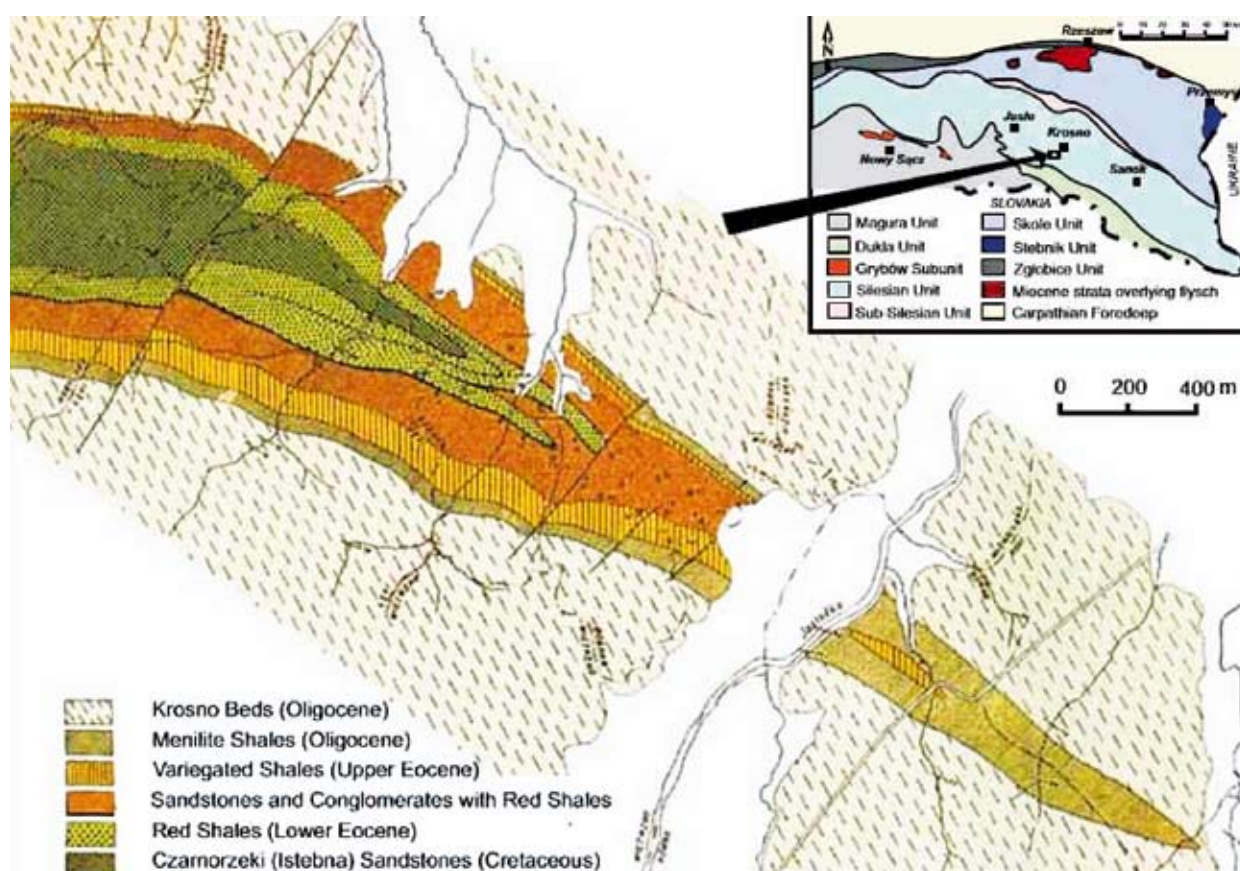


Fig. 24 Geological Map of the Eastern part of the Bóbrka-Rogi anticline, according to Obtulowicz (1932), /in:/ Radwański A. B., The Ignacy Łukasiewicz Memorial Museum of the Oil and Gas Industry in Bóbrka and historic monuments of petroleum and salt industries in the vicinity of Krosno (the Polish Outer Carpathians), "Geoturystyka" 3 (18) 2009, p. 52

In the core of the anticline, *czarnorzeckie* (Istebna, Upper Cretaceous-Palaeocene) shales are deposited, and the wings are built by layers of *ciężkowicki* sandstone (Palaeocene-Eocene) and sectioned by layers of speckled shale (Palaeocene-Eocene).³² Crude oil is present in four levels of the *ciężkowicki* and Istebna sandstones. These sandstones, well sealed with clay rocks, are the best reservoir rocks of the Carpathians.

In the geological studies, carried out intensively since the 1870s, it was already stressed out that the Carpathians have a specific geological structure with a complex layout of geological strata, adverse and difficult for conducting mining activities. This had major

impact on the type of equipment used and oil drilling methods adopted. These geological conditions were the reason that many times in the history of the development of the Carpathian oil mining, the attempts to incorporate contemporary techniques, used, e.g. in the US, ended in failure and it was necessary to find alternative methods or their creative improvement and adjustment to local conditions. The geological diversity of the Carpathians was one of the causes of a situation where one of the primary parts of petroleum mining, which is drilling, was in the region *to some extent an autonomous field, dependent primarily on innovative and rationalising activities*.³³

³² Radwański A. B., *The Ignacy Łukasiewicz Memorial Museum of the Oil and Gas Industry in Bóbrka and historic monuments of petroleum and salt industries in the vicinity of Krosno (the Polish Outer Carpathians)*, "Geoturystyka" 3 (18) 2009, p. 58

³³ P. Franaszek, *Myśl techniczna w galicyjskim wiertnictwie naftowym w latach 1860-1918*, Kraków 1991, p. 17

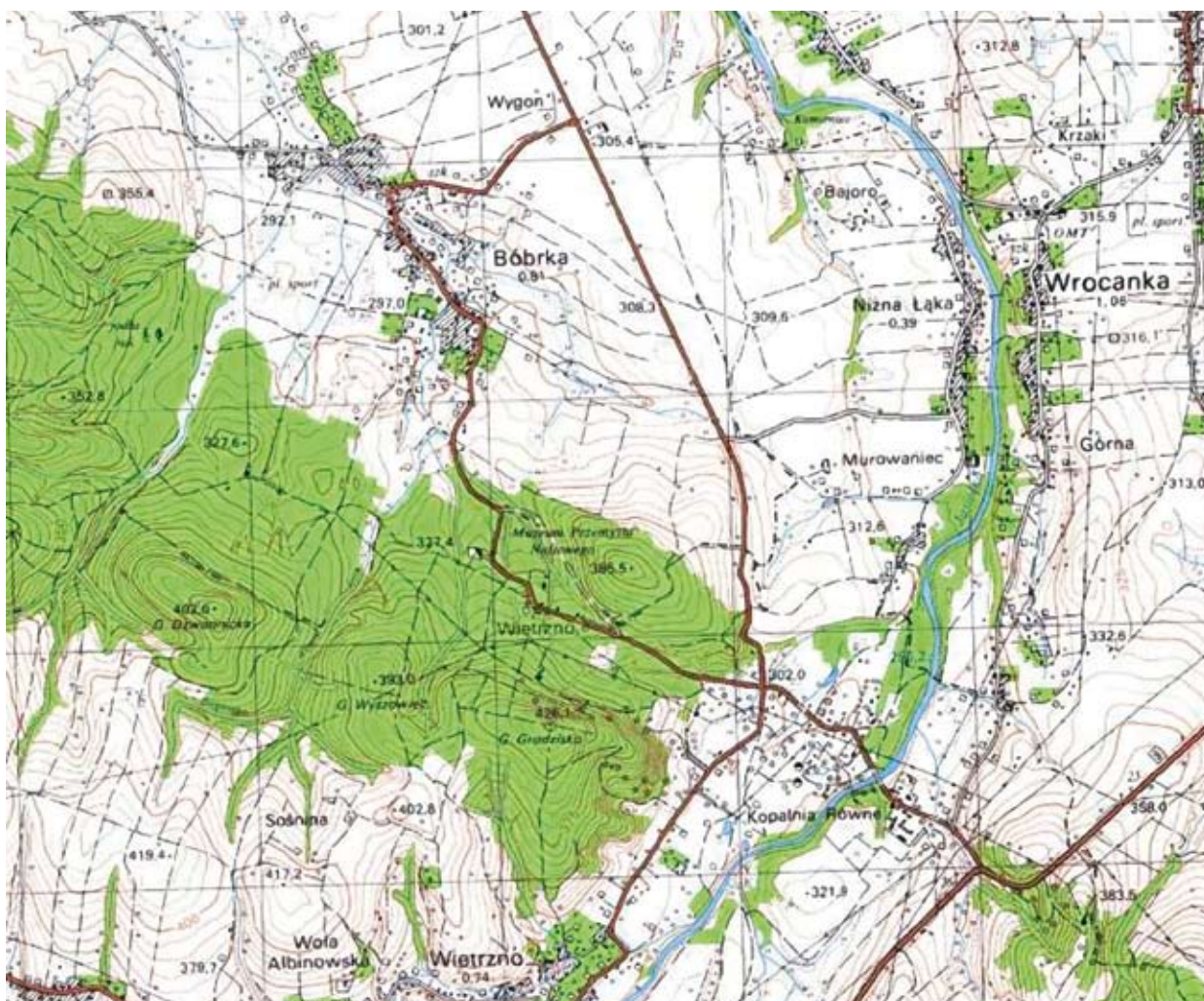


Fig. 25 Location of the Museum of the Oil and Gas Industry in Bóbrka, source: <http://mapy.geoportal.gov.pl/imap/?gpm=g-p0&actions=acShowServices>

1.2.2 Brief description of the mine

The Ignacy Łukasiewicz Memorial Museum of the Oil and Gas Industry, situated at the historical site of the crude oil mine, is located within the administrative borders of the village of Bóbrka. It is a significant distance away from the village, to the South of the developed area, on the South-Eastern edge of the large forest complex creating a wide band over a length of approx. 20 km from Wietrzno to the South-East to Radkowa to the West. The Museum is located on the Western side of the local road going from Bóbrka to Wietrzno, along which flows the Jasiołka river. At a little distance to the South-East of the Museum is the national road no. 19 – Rzeszów-Barwinek.

The Museum is situated in forest, unpopulated surroundings, near the village of Bóbrka. The Museum area, separated from the area and fenced, includes exhibition spaces in a natural forest setting. The road network of the Museum makes it look like a park with a landscape composition, free, with dominating forest elements. The

composition axis of the Museum area is created by two approximately parallel avenues on the East-West setting, which are connected with multiple lateral and circular avenues with a calligraphic pattern.

The essence of the Museum's site composition is based on the co-existence of three components – the historical (and still functioning) oil mine, the exhibition of reconstructed and authentic elements illustrating the development of oil and gas mining in chronological order, and the auxiliary infrastructure of tourism. The whole village is set in a forest landscape, seemingly of natural character, actually created as a concept of re-naturalisation of the area and return to the forest surroundings of the origins of the exploitation of oil in the area.

The historical complex of the oil mine in Bóbrka is preserved in pieces, and its elements constitute separated enclaves within the Museum. These are, at the same time, the most important elements with the highest documentary values, since they witnessed the origins and continuity of operation of the mining enterprise



Fig. 26 The Museum of the Oil and Gas Industry in Bóbrka, source: <http://mapy.geoportal.gov.pl/imap/?gpmap=gp0&actions=acShowServices>



Fig. 27 The Museum of the Oil and Gas Industry in Bóbrka, aerial photograph, the Bóbrka Foundation Archives

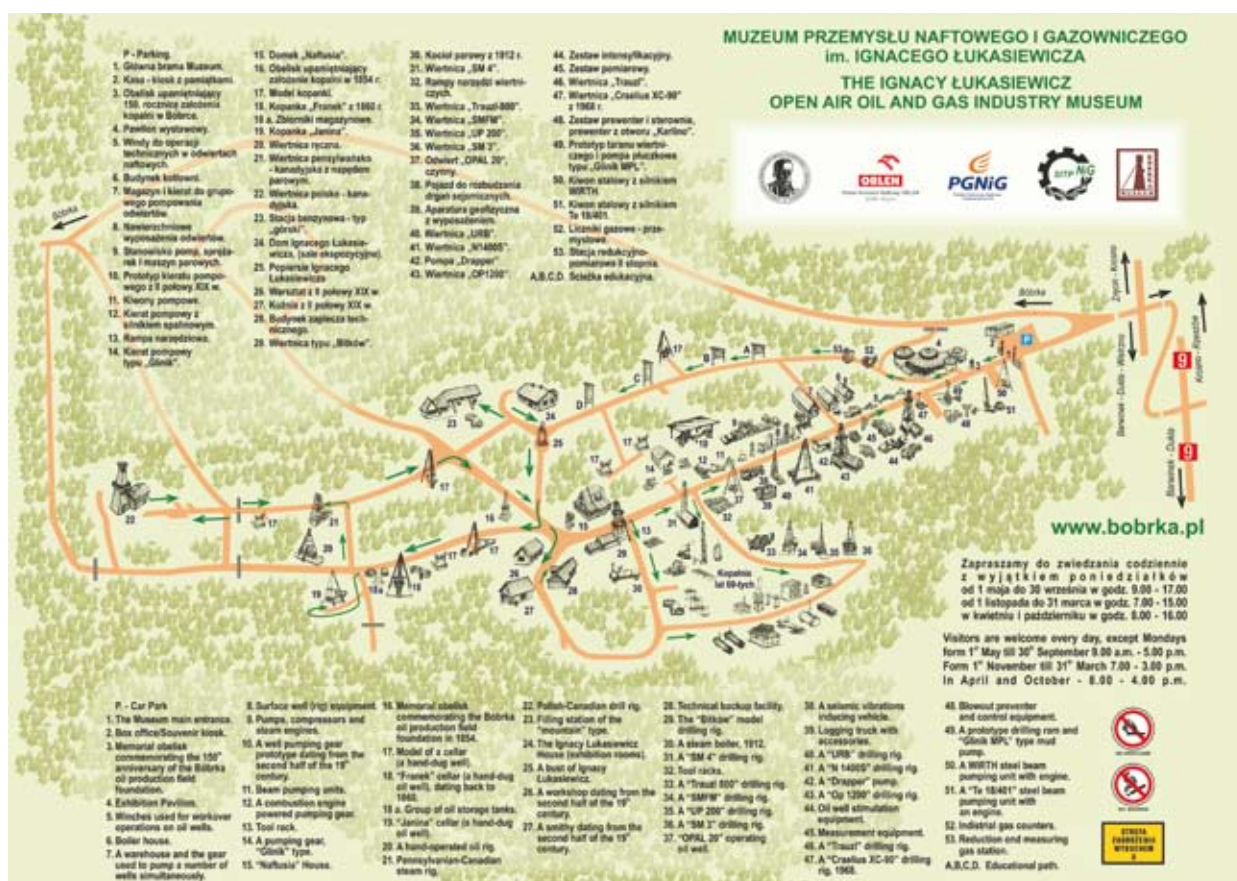


Fig. 28 Plan of the Museum, source: <http://bobrka.pl/pl/plan-muzeum>

in this area. The key “nodes” of the exhibition, and the most valuable groups of original facilities are: the complex of buildings of the boiler room, of the storage and the whim, complex of buildings of the forge and workshop, the “Franek” and “Janina” cellars, the obelisk and the so-called Ignacy Łukasiewicz House, along with the historical greenery composition.

A museum co-existing with a functional mine is seen as a natural continuation of the history of the place. This evolution created a second layer of land use, which consists of reconstructed and original exhibits related to the history of oil and gas mining. The layer can be described as added value, not depreciating the most precious historical values of the place. The auxiliary infrastructure of tourism, together with the museum pavilion, is a further consequence of evolution of the place, subordinated to its value and, at the same time, formally complementing the composition of the area.

The equipment exhibited in the open-air museum comes from different periods – from the emergence of the oil industry in the mid-19th century to the 1980s. Noteworthy is the collection of (original and reconstructed) items illustrating the complete equipment from the 19th-century mining period. Exhibits from the 20th century are characteristic of the history of the Polish oil and gas mining. All elements of equipment show the history of the

civilisation, the progressive process of modernisation of the mining industry. They are located on the grounds of the Museum, along the tourist route, grouped by theme, although not always in chronological order. The thematic groups concern, i.a. the mine from the 1960s, the exhibition of the surface infrastructure of an exploitation borehole, crude oil stabilisation, storage and dispatch, all of which are based on the original devices transferred from other mines. Thematic groups are complemented by individual devices and machines obtained from other mines in Poland.

The tourist infrastructure is discreetly blended into the landscape. It is present in the form of alleys of the tourist route, and the main pavilion of the Museum, located at the entrance to the Museum, a reconstruction of the Polish-Canadian drilling rig in the recreation area of the Museum, and the Museum exhibition in the interior of the Ignacy Łukasiewicz House – are the connecting points.

In the main Pavilion of the Museum located are the administrative, educational and commercial functions of the Museum. The exhibition addresses the issues of geology, exploitation of oil and gas and mining traditions. The conference room and educational workshops complement the facility. Interesting is the architecture of the Pavilion, well blended into the local landscape in terms of dimensions, referring also to the industrial forms (gas tanks).



Fig. 29 Plaque on the obelisk. Photo by A. Siwek



Fig. 30 Exhibition of lifts for technical operations in oil boreholes – a thematic group, original devices, transferred from other mines. Photo by A. Siwek



Fig. 31 Main Pavilion. Photo by A. Fortuna-Marek

The Museum area is in its entirety entered into the register of historic monuments, as an area item. It remains open to doubt, whether the buildings on the Museum grounds are protected by the entry into the register of historic monuments (the first protection concept), or the status of museum exhibits (in accordance with the more recent decision of registration in the register of monuments, contrary to the legal situation of the Mu-

seum – the issue is discussed in more detail in Chapter 4.2). The Museum does not have the legal feature of a “registry museum” within the meaning of the Act on museums and the recommendations of the Minister of Culture and National Heritage. This is actually a thematic collection belonging to legal persons, organised in accordance with basic museum standards, made accessible to visitors.



Fig. 32 Gate. Photo by A. Siwek

1.3 Brief description of the condition of the asset

Description of the condition of the asset is the sum of a number of determinants, including, in particular, the legal and proprietary status, the maintenance protection status in formal and practical terms, the management system, the functional determinants and the impact of environmental risks and natural factors of material destruction. All of these factors apply to both the asset, understood as the oldest oil mine (historical substance), and the Museum (and its collections), understood as a continuation of the tradition and identity of the place with an extended function of a documentation centre of the history of the oil and gas mining in the country. For the condition of the asset, important is the technical status of the functioning oil mine, as it is a factor of potential mining risks, and at the same time an essential element of authenticity of the place. At the presented stage of development, the overall picture of the asset in this regard has been outlined. Detailed references are made in the second part, in connection with protection and strategic guidelines.

1.3.1 State of preservation of the historical substance

The initial and general look at the Ignacy Łukasiewicz Memorial Museum of the Oil and Gas industry in Bóbrka allows for the conclusion that the preservation status of the historical substance of the historical mine, which is the backbone of the exhibition and other accumulated Museum exhibits, is satisfactory. The museum functions and consistently performs its statutory objectives within the framework of activities of the Foundation of the Ignacy Łukasiewicz Museum of the Oil and Gas Industry in Bóbrka, whose primary purpose is to conduct the Ignacy Łukasiewicz Museum of the Oil and Gas Industry in Bóbrka. Therefore, the current legal and proprietary status of the area and the Museum's collections is clear and gives a basis for the project's sustainability, despite the recognised issue of the Museum's status within the meaning of the Act of 21 November 1996 on museums. The maintenance status in formal terms requires explanation, and in practical terms – is consistently implemented. The status of the management system allows for the implementation of statutory objectives of the Museum, although for the full development of the collection and promotion of the value of the space, more substantive facilities may be needed. The functional determinants, the way

of making accessible and the specificity of collections intended essentially for presentation in open spaces, generate current restoration needs, but do not create any additional risks to the historic substance. A separate problem is the condition of the contemporary and historical greenery in the Museum area. In this regard, the health status of the stand is proper, requiring monitoring and ongoing interventions, and the question of legibility of the historical greenery composition remains the problem of maintenance, awaiting solution. There has been no impact noted of the specific environmental risks, apart from the inevitable occurrence of natural factors of material destruction (e.g., corrosion, etc.), which remain under the control of the Museum. The specificity of the historical mine and the active oil cellars is associated with a range of mining risks (explosion, fire), however, it remains in the field of observation of the staff of the active mine, which is a factor stabilising the level of safety of the place.

1.3.2 Technical condition

The technical condition of individual components of the historical crude oil mine is made up of the specifics of the design and the substance used for construction of the facilities and equipment, and the maintenance activities. The oldest complex of buildings underwent maintenance works and is permanently secured. In the case of parts of buildings, thorough analysis is required in the scope of the repair interventions made and attention needs to be paid to the aspect ratio of the historical substance and the additions, from which particular attention to authenticity of the preserved substance should arise. Good technical condition is supported by the state of use (for exhibition purposes) and constant supervision of the buildings. The technical condition of machinery, equipment and exhibits in the outdoor part of the Museum requires constant supervision and periodic maintenance reviews. The unused "Naftusia" building and the Polish-Canadian drilling rig, not listed in the restoration plans, are in a worse technical condition. The status of the administration and exhibition pavilion, which is an integral part of the Museum infrastructure, must be specified in the documents of the periodic reviews required in relation to the facilities of public use. The technical condition of the functioning mine, essential for the specificity, but also the safety, of the Museum is specified in the documents related to the mining law.

LEVEL 1



I. DESCRIPTION AND ANALYSIS OF THE ASSET AIMING AT CHOOSING CHARACTERISTICS, FOR WHICH THE REFERENCE GROUP IS TO BE SELECTED

The asset is characterised by the following features:

The spatial scale, comprising of the historical location, landscape, historical (relic) composition of greenery and the functional dimension, the scale of the architectural and technical infrastructure (that is, the complex of buildings and historical equipment collected in the Museum), the functional scale, created by the operational oil mine and Museum of the history of technology, and the intangible scale – which comprises historical and professional traditions, management systems and methods and the atmosphere and feel uniquely associated with the place and its added museum function.

Individual scales interlock and overlap, but at the same time are identifiable in the context of specific attributes and their elements. Analysis of the space through the specified scales (attribute categories) allows for the recovery (verbalisation) of the actual values of the place, and at the same time the creation of a network of management monitoring indicators and reference points for the place's management itself.

I.1. SPATIAL SCALE

HISTORICAL LOCATION

Geographical dictionary of the Kingdom of Poland from 1880 on the location of the Bóbrka mine:

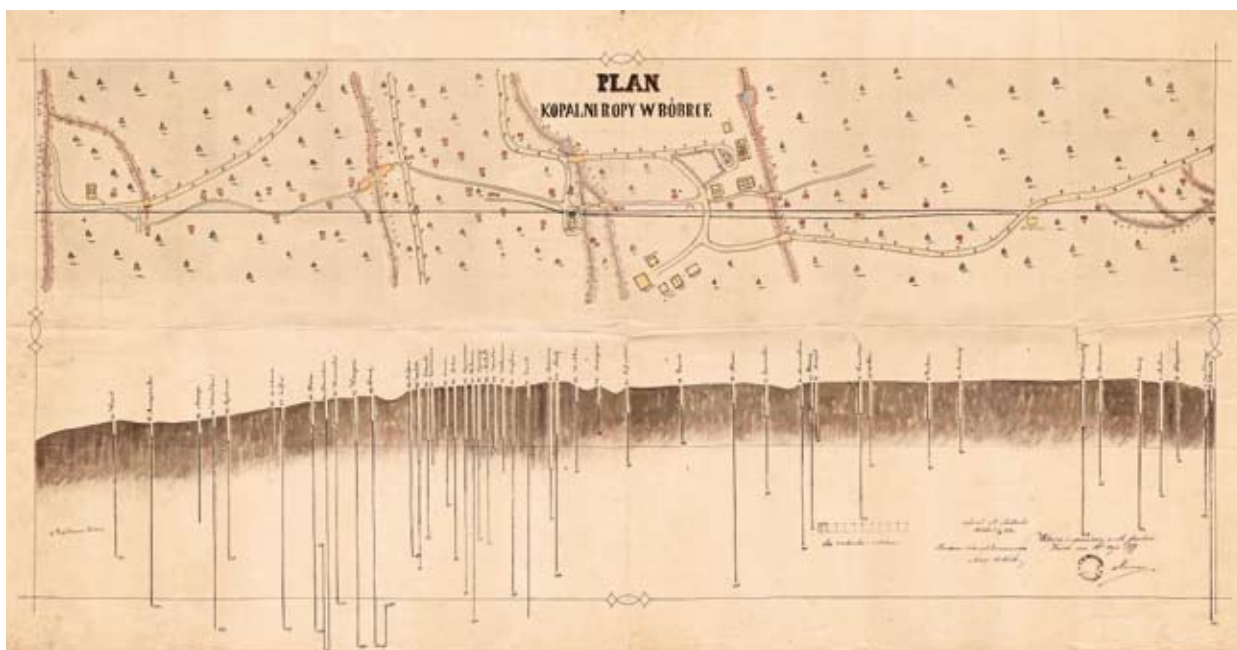
In the area of the manor, in the hills surrounded by a pine forest, there is one of the first in Galicia oil mines, owned by Karol Klobassa. Oil springs have trickled here for a long time and the peasants used the oil to lubricate their shoes, however, no one paid attention to it. It was only in 1854 that Tytus Trzeciecki with Ignacy Łukasiewicz, the creator of the oil industry in Galicia, began their search for more generous petroleum sources, that after several years of attempts led to the discovery of extremely abundant petroleum wells. Since 1861, ex-

*ploitation of paraffin on a broader scale began in Bóbrka /.../. Today, over 30 wells are functioning, 5 steam machines are used, each having the force of 8 horses or 120-150 workers.*³⁴

That source text, originating from the period close to the initial years of the mine, gives an idea about the location and scale of the project. From the Museum notes appears that in the years 1854-1880, over 60 shafts were manually drilled in Bóbrka, with a depth of a few up to 150 metres. Shafts preserved to this day, the "Franek" and "Janina" cellars, were built around 1860. The "Franek" cellar has the depth of around 50 meters and "Janina" – 132 meters. Both are witnesses of the mining history and document the location of the mine and deposits. The fact that they are still active is key in assessing the authenticity and documentary value of the Museum's collections. For the characteristics of the historical location of the mine, important are the following premises (attributes):

1. Geological conditions associated with natural oil spills.
2. The presence of oil deposits that has enabled continuous industrial operation for the past 163 years. Natural landscape and historical land cover (pine forest), which has been subjected to multiple modifications.
3. The fact of closing within the Museum the whole area of the historical mine with the preserved construction elements and, above all, the oil-bearing wells, active to this day.
4. Active wells – oil-bearing cellars, which are unique on a global scale, and at the same time illustrate the beginnings of the world's oil industry.

³⁴ Słownik Geograficzny Królestwa Polskiego i innych krajów słowiańskich, Vol. I, Warsaw 1880, p. 261



Fot. 33 Adolf Jabłoński, "Plan kopalni Bóbrka" ("The Bóbrka Mine Plan"), 1879, in the collections of Muzeum Przemysłu Naftowego i Gazowniczego w Bóbrce (the Memorial Museum of the Oil and Gas Industry in Bóbrka)

THE MINING LANDSCAPE

The Museum premises cover the whole area of the historical mine. Mining started in uninhabited forest areas. During operation of the mine, the landscape has evolved. Historical elements include: the shape of the surface (related to the geological qualities of the area) and the positioning of the preserved components of the mine's infrastructure. Vegetation, forest covering most of the Museum's terrains, is a secondary element originating in the mid-20th century, introduced with the intention to re-naturalise the area and reconstruct the historical landscape. The road network is a sum of the contemporary museum functions.

Analysis of the landscape of the mine as a potential value leads us to identification of the underlying problem – the function of variation in time, and, therefore, the inability to clearly articulate the criteria of authenticity for this issue. In assessing the authenticity of the landscape of the mine, it should be noted that the mine, due to the nature of the operation (the development of the mine, i.e., through searching for new mining sites and the continuous improvement of the equipment of the mining infrastructure) has been, since its inception, subject to transformations – both in terms of location and distribution of cellars and shafts, the type of equipment, buildings, and the shape of the environment and the landscape. Permanent interventions and changes were, in a way, inherent to the logic of use and development of oil mining. In the early days of extraction, the search for new exploitation sites was somewhat unpredictable and uncoordinated, with time

attempts were made to discover new oil deposits using large-scale geological surveying. A positive aspect of the characteristics of the area, occupied by the current mine and Museum, affecting the assessment of its value, is the fact that the current borders of these two institutions include the whole area of the historical mine.

The evolution of the landscape has run:

- from a pine forest rising among the hills in the area of manor lands, where natural oil spills were a peculiarity,
- through a pine forest "perforated" with exploration and extraction holes,
- to a mining landscape at the height of development, characterised by extensive architectural (wooden buildings) and technical (drilling devices, mining equipment, transport and storage facilities) infrastructure. The characteristics of this period included, on the one hand, extensive interference with the environment and disruptive, and ad hoc transformation of the existing landscape and, on the other hand, in connection with the settling of the enterprise, attention paid to elements of aesthetics and identity of the place (the obelisk – a monument, greenery composition accompanying the administration facilities). In the mining and exploitation layer, the investments carried out at the time were presumed to be temporary. The volatility of the position of the devices or the perishability of their structure are characteristic of this branch of technology.
- the phase of destruction associated with the limited operation of the deposit, which resulted in the lack



Fot. 34. Relics of the historical cultural landscape of the mine.
Photo by A. Siwek



Fot. 35 Relics of the Green.
Photo by A. Siwek

of need to maintain the qualities of the terrain, removal of used-up facilities, equipment, machinery.

- the last stage of transformation is the process of making the area part of the museum, which results in recomposing the pine forest, maintenance of historical buildings and equipment, complementing the presented contents with elements of reconstruction of historical equipment and complementing the museum contents with exhibits illustrating the successive stages of development and evolution of oil mining.

Each of the phases of evolution of the mining landscape has historical value, some relics of the individual phases accumulate and create the contemporary identity and value of the site.

For the characteristics of the cultural landscape of the mine important are the following premises (attributes):

- the lonely, uninhabited character of the terrain,
- the existing and the traces of the long-lost cellars, still visible in the field as forms of terrain (e.g. recesses) and as archaeological layers (hidden under the ground, buried, but graspable with archaeological methods),
- land cover – the pine forest (museum re-composition) and relics of the greenery composition (historical greenery),
- the historical facilities and equipment complex, creating enclaves of historical landscape of the original mine, together with the reconstructed equipment from the first period of the mine's operation that complements the landscape,

- the museum's infrastructure with the administration and museum facilities and the outdoor exhibition of mining equipment,
- the communication network, where historical routes of the first mine should be distinguished and routes of the contemporary mine, and museum routes related to presentation of the collection.

GREENERY COMPOSITION

Within the Museum, green plays a decisive role, as a "background" and the main actor of the exhibition area. Actually, the entire existing tall – and arranged – greenery, is a contemporary creation. The pine forest is a result of attempts to re-naturalise the area for the purposes of the museum. It is a historically justified "background" for the concept of displaying the museum's exhibits. The relics of historical concept are recognisable in the obelisk and the so-called "Łukasiewicz House". Preserved residually in the form of individual specimens of old stand, elements of the greenery composition, which accompanied the administration building, stand out in the forest and industrial landscape. In their current form, they are not fully legible, they require recomposing based on research and source information. However, the surviving old stand specimens and the proportion of woodland and open space, as well as the viewing relation within their borders are relics of an earlier greenery composition of high documentary value.

For the characteristics of the composition of green important are the following premises (attributes):

- the area and the health status of the pine forest,
- the number of preserved specimens of the old tree stand,
- viewing relations in the park composition (axis – “Łukasiewicz House”, axis – obelisk),
- alleys and communication routes of the Museum of park nature, related to the historical composition of the green and to the contemporary concept of land arrangement.

FUNCTIONAL DIMENSION OF THE MUSEUM AND THE MINE AREA

In the context of space, a separate thing, very important for the specific nature of the place, is the infrastructure of the functioning mine. The fact that the Museum contains in it portions of the operational mine infrastructure is essential for distinguishing it among other oil industry museums. Accordingly, the elements of mine equipment and the mine’s communication and technological routes double its value – to the real value of the technology they add the “conceptual”, educational and historical one. Hence, their presence in the spatial context of the Museum cannot be ignored.

For the functional issues, important are the following premises (attributes):

- the technical infrastructure of the mine, its positioning and relation to the Museum,
- communication network of the mine, in parts that do not overlap with the communication routes of the Museum.



Fig. 36 Workshop building from 1864. Photo by A. Fortuna-Marek



Fig. 37 Workshop interior. Photo by A. Siwek

I.2. The scale of the mine’s facilities and equipment, i.e. the scale of architectural and technical infrastructure

The specific nature of the Museum of the Oil Industry Bóbrka is a combination of three elements: the historical mine from the 19th century, the open-air museum of mining equipment from the 19th and 20th centuries, and the mining establishment. The individual elements interlock and overlap, creating a network of artefacts and landmarks (“attractors” according to the concepts used in geography of tourism) with high historical and cognitive value.

The uniqueness of the space is determined by the preserved, unique on a global scale, complex of retained elements of the first mine from the mid-19th century, that, in addition, is active to this day.

In the category of items related to the 19th-century mine, special attention should be paid to exhibits that are reconstructions of historical equipment made for

display and educational purposes, and for making the historical sites more legible (surface reconstruction of cellars). These are the elements necessary due to the historical nature of the equipment and infrastructure of the 19th-century mine, which by nature were volatile and intended for ad hoc use. At the moment of cessation of their use, they lost their material value and were disposed of or left to decay. These devices, built from timber, quickly degraded. Their reconstruction, based on historical accounts and mining manuals, as well as memories of people connected with the tradition of oil mining in Bóbrka naturally complements the presentation of the historical mine and is important for the integrity of the message. Similarly, for the integrity of the message and the authenticity of the place, important are exhibits illustrating the development of the oil industry in subsequent periods, transferred from other



Fig. 38 Forge building. Photo by A. Siwek



Fig. 39 Forge interior. Photo by A. Siwek



Fig. 40 Storage room and whim for group borehole pumping. Photo by A. Fortuna-Marek



Fig. 41 Whim interior. Photo by A. Siwek

mines in Poland. Their accumulation is the result of the historical evolution of the oldest mine in the memorial (historical) centre of the oil industry, which was related to the decrease in the economic importance of the site and the growing understanding of its historical and documentary significance. The museum function is seen as a natural historical accumulation, resulting logically from the specificity of the place.

Therefore, for the presentation of the object scale, we must refer to the following groups of objects:

- I Historical facilities and equipment from the second half of the 19th century.
- II Devices that are reconstructions of 19th-century drawings and manuals, which complement the original 19th-century mine infrastructure.
- III Original equipment from the 20th century, which has been transferred to the museum during the creation of the exhibition and its supplementation.
- IV The museum pavilion.

The following are the characteristics of the different groups and objects they include.³⁵ In the context of emergence of attributes and determination of values, synthesis of common characteristics for different groups of properties was the objective.

³⁵ Based on the compilation by Barbara Olejarz, Director of the Ignacy Łukasiewicz Museum of the Oil and Gas Industry in Bóbrka.



Fig. 42 Pumping wheel. Photo by A. Fortuna-Marek



Fig. 46 The “Naftusia” House. Photo by A. Siwek



Fig. 43 Boiler room building from 1867. Photo by A. Fortuna-Marek

I Historical facilities and equipment from the second half of the 19th century.

Workshop building from 1864.

A wooden frame building, gabled roof with a wide angle of the roof. The roof russ and architectural detail are wooden, the rooftop with a vertical formwork. Traditional building technique, characteristic of the era and region. Economical, utility forms. In the building, there are historical machines, equipment and tools, such as a turning shop, a drill, a device for embossing leather sleeves for plunge pumps. The devices were propelled manually from an annexed building, through a central transmission system. It was said to be “napęd na cztery baby” (a “four-hag” drive). Later, the devices were propelled using a steam machine.

Forge from 1856

A wooden log building, gabled roof with a wide angle of the roof, open truss. Truss and architectural detail were wooden. The building technique was traditional, characteristic of the era and region, with analogies to rural and manor forges. Economical, utility forms, large scale. A massive, two-hearth, brick forge furnace. At the forge, prototypes of devices and tools for digging wells, drilling, extraction and storage of oil were manufactured. Until only recently, forges in old mines were the basic technical facilities. There are 2 hearths here, in which a forged tool was heated to incandescence. The high temperature was obtained by blowing on coke in the hearth. Bellows, made from goat skins, were propelled manually. Next to



Fig. 44 Administration building from 1864, the so-called Ignacy Łukasiewicz House. Photo by A. Fortuna-Marek

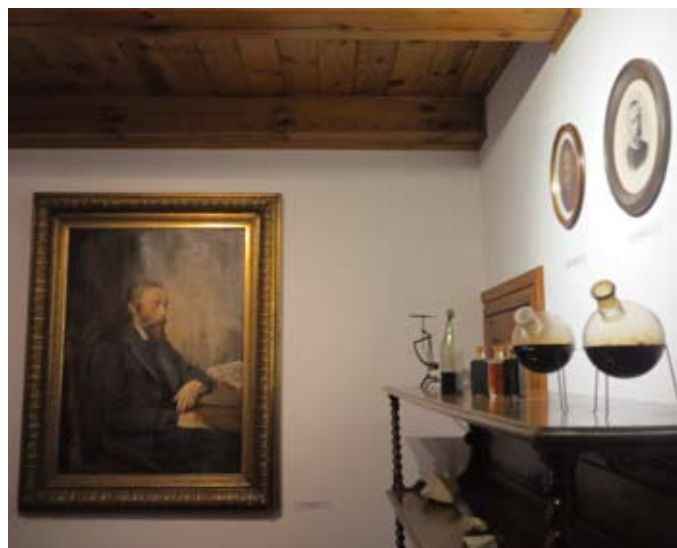


Fig. 45 Administration building interior. Photo by A. Siwek



Fig. 47 "Franek" cellar from 1860. Photo by A. Siwek



Fig. 48 "Franek" cellar from 1860. Photo by A. Siwek

the hearth, there is a well (a small tank) filled with water for hardening forged items. Also, original tools and accessories such as huge pliers-tongs, hammers, cutters, forms and horse shoeing tools were preserved. For sharpening the drills, a so-called "baba" ("hag") was used, i.e. a heavy barbell suspended on a sheave, with which the hot bottom of the drill was hit. Blacksmiths, next to drillers, were the elite among oil mine workers. The forge was an essential part of the industrial complex.

Storage room and whim for group borehole pumping (around 1875).

Wooden buildings, frame structure, boarded. Typical designs of utility and industrial buildings with efficient structure and form and with function subordinated to the technological needs of the mine.

The wheel was used for group propelling of plunge pumps, through which crude oil was pumped from boreholes. The construction was built around 1875, it has the original design of transferring power from a steam, internal combustion or electric engine to the pumping wheel through multiple snap-ins and flat wide fabric and leather belts. On the main shaft of the whim, there were cranks, which turned the snap-in's rotation into back-and-forth motion, which, through steel elements, was transferred to the wheel. Cable transmissions were pinned to the wheel, that transmitted the power to plunge pumps. The system of pumping wheels, placed over the area of the mine, supplied power to pumps on several holes at the same time.



Fig. 49 "Janina" cellar from 1878. Photo by A. Siwek



Fig. 50 Commemorative obelisk. Photo by A. Siwek

The building of the boiler room from 1867

A wooden frame building, vertically boarded. Open roof truss, roof with wide angle. A prominent cast iron chimney stabilised with steel wire lashings.

In the boiler room, there is a shell boiler with the heatable surface of 30 sq. m., which was fired with coal and coke. In the 19th century mine, the steam generated in the boiler room was the primary source of energy. It was used in steam machines, which served to drive the whims and drilling equipment. Hot steam was used for cleaning extracting pipes of paraffin residue and for heating rooms.

Administration building from 1864, the so-called Ignacy Łukasiewicz House

A wooden frame building, with two-bay layout, gabled roof with a wide opening angle. Wooden ceilings, plastered, whitewashed walls, wooden floors. As a result of repeated repairs and functional adaptations, the degree of preservation of the original substance is limited. Preserved were the location, external form and historical features of the building.

Since the time of Łukasiewicz, the building has served many functions. The mine's administration and the management's and workers' apartments were situated there. In 1972, the building was renovated and adapt-

ed for the exhibition purposes. Currently, inside are, i.a. rooms arranged to look like an old pharmacy, pharmacy laboratory and a manor dayroom. The displays are enriched with multimedia presentations.

The "Naftusia" House

A wooden frame building, repeatedly re-adapted, now formed humbly in a modernist and regional fashion, made permanent during the last greater reconstruction in the 1970s. Originally, it was a building, in which workers lived, erected in the 1860s. Over time, it was being adapted on an ad hoc basis to different functions. In the 1970s, the building has undergone thorough modernisation, which changed both its original function and architectural appearance. Since then, it served as a small hotel. It is not currently in use.

The "Franek" cellar from 1860

A mining well dug manually to the depth of 50 m, then deepened by manual drilling to 150 m in depth. The cellar, even after all this time, is still filled with oil. It is one of the most important documentary elements – a testimony of the origins of oil mining and a unique document of the oldest stage of operation of the mine. The first oil wells were drilled with primitive tools: iron barbells, pickaxes, shovels. They were holes, usually with a square section of 1.2 x 1.2 m. The walls of the well

were secured against soil running with wooden casings. A driller (digger) slid to the bottom of the well in a wooden bucket attached to a hemp, and later steel, rope. The same bucket was used to remove the dredging spoils from the well. The air was pumped into the well manually, with special fans made from wooden planks.

The “Janina” cellar from 1878

Dug manually to the depth of 132 m, and then deepened with a manual drilling rig to the depth of 250 m. Inside are the original casings. Currently, oil is extracted with a plunge pump. Pipes and a pump cable were inserted into the well, and over the cellar, a pumpjack was installed, propelling the pump. It is one of the most valuable tokens of authenticity of the place. A testimony of the early activity of the historical mine, and also confirmation of continuity of operation of oil extraction, all in one place.

It should be pointed out that, to this day, these two historical cellars (dug shafts), from the oldest period of operation of the mine are active. The “Janina” cellar is still exploited – which is unique on a global scale.

The commemorative obelisk

A sandstone obelisk, topped with a cast-iron cross; in the part of the base, there is a plaque with a com-

memorative inscription and mining symbols. A modest monument in the spirit of a 19th-century historicism. Founded in 1872 by Ignacy Łukasiewicz to commemorate the founding of the oil mine in 1854. One of the few pieces of evidence that Bóbrka was the cradle of the world oil industry. And, at the same time, a testimony of awareness of the particular importance of the place.

Pump for pumping oil of the “Drapper” type from the 19th century

The pump was driven through cable transmission from the whim to the group oil pumping.

A prototype of the pumping wheel from the second half of the 19th century

One of the oldest devices for group propelling of plunge pumps, characterised by the fact that the teeth of the whim were removable and made of hard wood. On the ends of the last snap-in’s shaft, cranks were fitted that turned the rotation of the snap-in into back-and-forth motion, which, through steel elements, was transferred to the wheel, to which pump transmissions were connected. The whim was usually driven by steam machines.



Fig. 51 Manual drilling rig. Photo by A. Fortuna-Marek

II Devices that are reconstructions based on 19th-century drawings and manuals, complementing the original, 19th-century mine infrastructure

Manual drilling rig

Made based on the original design by Doms. Drilling using this device at the Bóbrka mine was introduced by Henryk Walter. This method consisted in the use of a free-falling drill-chisel, weighted with a steel rod. An essential element of this method were the scissors by a German constructor, called "Fabian's scissors". The assembly: chisel – steel weight – Fabian's scissors, that was fixed at the end of the swing arm, was manually lifted over the drilling spot, to the height of the scissors' stroke and hooked in their upper point. By a fast rotary move, the weight with the chisel was thrown from the hook, falling freely and, hitting the rock, crushed it. By turning the assembly, a hole was obtained with the chisel's diameter, typically around 0.5 m. As the hole was drilled, wooden rods were added, and the walls of the hole were secured with sheet metal riveted pipes. The bottom of the hole was cleaned of the debris using a metal pipe-spoon (dipper). The drilling rig consists of a tripod, a swing arm with the drilling cable fixed to it,

and a large wheel with the diameter of 5 m, called the propellant wheel, with rungs placed on its circumference. In the centre of the wheel is an exhaust drum. The drum is wrapped with a rope, which runs through a sheave suspended on the top of the tripod. Inserting and pulling out the drilling assembly, as well as drilling activities were carried out by manual activation of the propellant wheel with the rungs placed on it. The spoon for cleaning the bottom of the hole from the dredging spoils was inserted into the hole on a hemp or steel rope from a manually propelled turnstile, put next to the hole.

The Canadian drilling rig with locomobile

In 1872, engineer Albert Fauck introduced in Bóbrka a new method of drilling on poles using the Canadian system. To drive the drilling rig, he used locomobiles, that is a propellant assembly that included: a steam boiler, a steam machine and a transmission device. The rotary motion of the machine, through the belt snap-ins



Fig. 52 Canadian drilling rig with locomobile.
Photo by A. Siwek



Fig. 53 Steam locomobile. Photo by A. Fortuna-Marek



Fig. 54 Polish-Canadian drilling rig. Photo by A. Siwek

and cranks and steel elements mounted on them, was converted into back-and-forth motion and passed on to a transverse beam – swing arm, at the end of which the drilling assembly was suspended. The frame of the drill had 2 drums wrapped with ropes – to control the drilling assembly and cleaning the hole using a spoon. Operations were carried out by a driller using levers (planes). Holes drilled with that device could have the depth of even 500 m. Part of the reconstruction is the original steam locomobile manufactured in Hipolit Cegielski's facilities in Poznań (late 19th century).

The Polish-Canadian drilling rig

A replica of the drilling rig brought by Henry Mac Garvey and adapted by Polish specialists for drilling in the difficult conditions of the Carpathians. Not only the design, but also the drilling system was modernised. This drilling rig was used to drill the richest oilfields in the Polish oil industry, in the area of Schodnica, Borysław and Tustanowice. Thanks to it, in 1909 Galicia reached the level of oil extraction of more than 2 million tons and was the 3rd largest in the world. The rig could drill to a depth of 1500 m. The interior of the drill is adapted to catering needs, not available to the public. Inside the device is an original component –

a drilling frame with two drums: a drilling drum, which was connected to the drill (chisel) for impact drilling and a spoon and manipulating drum, which used the spoon to remove the dredging spoils from the borehole. The drums were driven using conveyor belts and a steam machine. Drum drive was controlled by the borer using two levers – planes.

The inside of the rig was adapted for events. The building is located in the recreation area of the Museum.

Cellar models:

"Wiktor", "635 Błazej", "634 Mineralna", "632", "Cecylia", "Paweł"

They were recreated based on drawings found in publications from the early years of cellar digging. They are located in places where the 19th-century cellars were, according to a map from 1879. The reconstruction consisted in re-creating their surface elements.



Fig. 56 Drilling rig of the “Bitków” type. Photo by A. Siwek

III Original equipment from the 20th century, which has been transferred to the Museum during the creation of the exhibition and its supplementation

Exhibition of tanks

Three steel, riveted operating and storage oil tanks. Such tanks were placed mainly at the borehole group pumping. Oil was pumped into these tanks directly from the wells and then pumped to the main tank, which usually was located at the mine.

Drilling rig of the “Bitków” type

It was used for impact drilling of boreholes with a depth of around 1500 m. It was built in 1923 in the Bitków oil mine. The “Bitków” drilling system, implemented by Polish constructors, was used in two versions: with a swing arm or a pullstart. The principle of pullstart rope drilling was the following: the drilling assembly (drill – weight – scissors)

was attached to the drilling rig rope. After inserting the drill to the bottom of a borehole, the rope was pulled through a sheave on the crank of the snap-in’s shaft. The rotary motion of the snap-in, with a crank on it, caused rhythmic raising and free falling of the drilling assembly, resulting in rhythmic strokes of the drill into the bottom of the hole. Hence its common name, the “pullstart method”. Rotation of the drill for centrically drilling a hole was obtained by fitting the drilling assembly to a rope by a special component (“pasterka”). As the drilling went on, the rope was gradually released so that the drill’s stroke into the bottom of the hole was caused by the elasticity of the rope. Thanks to that, more efficient drilling was obtained, however, it required a lot of talent and skill of the drillers.



Fig. 55 Exhibition of tanks. Photo by A. Siwek



Fig. 57 Portable steam boiler from 1912. Photo by A. Siwek



Fig. 58 Vehicle used for raising seismic vibration. Photo by A. Siwek

Portable steam boiler from 1912

It was coal- or wood-fired, and has the original instrumentation. Wheeled chassis allowed to drag the boiler with horses to the place of the conducted drilling and exploitation works.

A service lift, WES 15-20, with mechanical drive on Kraz-257 chassis, intended for comprehensive treatment of oil and gas boreholes.

The "SM3" drilling rig

Impact drill with cable from 1935, designed by Stanisław Szerauc and Mieczysław Mrazek. This is another adaptation of the SM1 and SM2 drill by the above constructors. The rig was used for drilling depths of up to 800 m and diameter of 5". It was built on a wooden frame, it only has 2 rope drums. It was quite difficult to transport and assemble in mountain areas without any roads.

The UP-200 drilling rig

The UP-200 drilling rig was designed for rope, impact drilling of large-diameter holes (wells), up to a depth of 200 m, with the final diameter of 12". Can also be used for dredging, reconstruction and cleaning of holes with depths of up to 900 m, the drill bit with a diameter of 5". This is a mobile drilling rig, built on a common frame with a mast and drive, on a wheeled chassis for easy transport and assembly. Constructed by Fabryka Maszyn "Glinik" Gorlice.

The "SMFM" drilling rig

Drilling rig modernised by Fabryka Maszyn "Glinik". Designed for impact, rope drilling of holes with depths of up to 800 m and the final diameter of 5". Just like the "SM4" rig, it is made entirely of steel. It was modernised by introducing a 2-speed gearbox, enabling changing the main shaft speed. A spring clutch was introduced to run 3 rope drums through roller chains. Hand and foot

levers are placed at the driller's spot to control the process of drilling. Below the frame is a crankshaft, on which a "pullstart" disc is wedged, propelled by a flat belt from the main shaft. Cranks have 3 holes, allowing to adjust the lift (stroke) of the drill at 460, 700 and 1000 mm. On the shaft of the multi-sheave drum a chain wheel is placed that drives the rotating table. The rig is equipped with a two-pole mast of the MM (Mieczysław Mrazek) type.

The "Trauzl" 800 rig

Commonly used in the Polish oil industry, of Austrian design. This is a portable drilling rig, for impact drilling of holes with a depth of up to around 800 m. Constructed on an iron frame, its kinematic system is similar to the Polish rig of the "SMFM" type.

The "SM4" drilling rig

This is an original type of drilling rigs designed by Polish constructors: Stanisław Szerauc and Mieczysław Mrazek. The symbol "SM" derives from the names of the constructors. The first rigs, SM1, SM2 and SM3 were made in the years 1930-1935, constructed on wooden frames. The SM4 rig has an iron frame-based structure, was made by Fabryka Maszyn "Glinik" Gorlice and commissioned in 1949. This is a mobile drilling rig, on a wheeled chassis, adapted for easy transportation and dragging in the field. A complete drilling frame consisting of 3 cable drums: for drilling operations, pipe spooning and manipulation, and pullstart – all mounted on a common iron frame. This significantly shortened the drilling rig's construction time. The device is designed for drilling holes with a depth of up to 800 m. A Polish telescopic, two-pole, parallel "Narada" mast made of pipes was adapted to the drilling rig.

Ramp for drilling tools

On the ramp are diverse, original tools and equipment for drilling, hole screening, inserting plunge pumps and many other works. They are a document of the development of techniques and achievements of Polish constructors. They have characteristic names.

Borehole "OPAL 20"

Made using a drilling system at the end of the 19th century, from which crude oil is extracted. Above the hole, installed is a single pumping crane, a so-called "konik pompowy 600" (a "pumping horse" – pumpjack) manufactured since 1954 by Fabryka Maszyn "Glinik" Gorlice. The borehole is still active.



Fig. 59 Mine in the 1960s. Photo by A. Siwek

Pumping wheel of the "Glinik" type

A modernised traditional whim, propelled with an electric motor. A device for programming periodic pumping of boreholes according to a schedule was used in its construction. Next to it, view of a pumping wheel. The whim is activated during guided tours.

A pumping whim with an internal combustion engine

A whim with a new design, in the form of a closed reduction box. The belt attachments were replaced by a system of gears. On the main shaft there were cranks, whose back-and-forth motion was transferred through steel elements to the pumping wheel forming a complete set of the device. The drive of an internal combustion or electric engine was transferred to the reduction box using V-belt pulleys.

Tool ramp

On the ramp exhibited are the tools and equipment used for drilling and exploitation of oil and gas.

A vehicle for raising seismic vibration, used from 1976.

Equipped geophysical gear from the 1980s.

The "URB" drilling rig.

The rig was used for rotary drilling of small, shallow (up to 30 m) shot holes, for raising elastic waves us-



Fig. 60 Exhibition: storage and dispatch. Photo by A. Siwek



Fig. 61 Fuel station of the "mountain" type, Photo by A. Siwek

ing dynamite in carried out seismic works, for examining deep geological structure of rocks. This is a mobile drilling rig, manufactured by the Soviet Union, built on a chassis of a car with built-up fixed mast, a rotating table and a washing system, driven by a car motor, entered into service in 1955. Until that time, drilling for seismic survey was done with manual tools. That primitive way proved to be inefficient.

Surface drilling equipment is used for tight inlet of oil and gas from spontaneous and pumped wells, separating oil from gas and their cleaning and preparation for transport.

PUMPS AND COMPRESSOR STATION.

The "N 1400 S" drilling rig.

Designed and manufactured by Fabryka Maszyn "Glinik" Gorlice in the 1980s. It was used for rotary drilling of boreholes with a depth of up to 4500 m.

The "OP 1200" drilling rig from 1957.

The drilling rig adapted for rotary drilling of boreholes of up to 1200 m in depth. The drilling rig and all of its components, including drilling rig, multi-sheave, hook, rotating table, pumps and cleaning head, extractor and all accessories, were designed and manufactured by Fabryka Maszyn "Glinik".

"KRAZ" pump generator is mounted on a USSR-made

car chassis. It was used for cementing casing pipes in wells. The generator consists of 2 pumps with a discharge capacity up to the pressure of 320 atm., water tanks and a funnel for mixing cement with water. Powered by a separate internal combustion engine and a car engine. The generators were also used to perform hydraulic fracturing operations in oil wells.

Cementing generator on the Tatra 148 chassis. ACF 1050 cementing generator.

Measuring lift on a Gaz 66 car chassis.

It was used to carry out various operations in the wells using cable techniques, i.e., to lowering and lifting the measuring instruments to and from the wells in order to carry out measurements of the deposit parameters.

The "KRAZ" sand mixer is a specialised device used for hydraulic fracturing (delamination) of oil or gas deposits in order to enhance their efficiency. Sand mixer made in the USSR, built on a "KRAZ" car chassis. It was used for mixing the medium with sand that was injected in the borehole in order to uplift the created fracture.

The "Trauzl" rig of Austrian production, used for rotary drilling up to a depth of 3000 m.

The "Craelius XC-90" drilling rig of 1968. Used for making shallow, horizontal holes in quarries and vertical holes for installing explosives.

Preventer from the "Karlino 1" borehole. Used to close the outlet of the borehole, in the case of eruption of oil or gas. When drilling the exploration hole "Karlino 1", as a result of unexpected drilling into an oil deposit with abnormally high deposit pressure, an explosion of oil and fire in the borehole occurred. Huge heat did not allow to approach the borehole in order to take down the damaged preventer. The preventer was shot with artillery projectiles from a distance of around 80 m. A special head was put on the hole's outlet and the fire was extinguished. The extinguishing operations lasted for more than 4 weeks.

A prototype of a drilling ram, constructed at the Oil Institute in 1956 by Eng. Józef Ostaszewski. The principle of operation is based on strokes of water injected from the surface to the drill, through a spring valve, located in the lower part of the hydraulic system. This causes rhythmic strokes of the drill into the bottom of the borehole. The ram was used to make shallow trench holes for geological surveying.

A scrub pump of the "Glinik" type.

One of the types of pumps used in drilling and exploitation, designed and manufactured by Fabryka Maszyn "Glinik" Gorlice.

Equipment for treatment of oil boreholes.

Extraction lift made in Poland 1993 WEG-175 and a mesh mast MES-15. This type of treatment is used to regenerate the extractive components located inside the well.

A steel pumpjack with a WIRTH motor.

Lifts of technical operations in oil wells.

The extraction gear was used, i.e., for inserting and lifting the pump cord and plunge pump, cleaning of the bottom of the hole, rescue works.

Pumpjacks.

Pumpjacks (jack pumps) were installed at the outlets of boreholes from which the oil was extracted, using plunge pumps. A typical pumpjack consisted of a foot-ing beam, support, and a swing arm. At one end of the swing arm mounted were, through a pumping stick, rods driving the pump – and on the second end – transmission, transmitting the back-and-forth motion from the pumping whim to the pump's piston.

Reduction and measuring station – II degree. It is a set of devices used for reduction and regulation of gas

pressure, measurement of the parameters of gas and separation of gas.

The mine in the 1960s.

Created in 2010, the complex featuring original devices from the 1960s is a reminder of the recent history, of technology that in today's mines has been completely replaced by the latest inventions. The mine of the 1960s brought together devices that, only until recently, were used in oil mines, and today are replaced by contemporary technology; they are a valuable and irreplaceable object of research of the history of the oil industry. In the sector, there were established: crude oil exploitation, stabilisation exhibitions, tanks exhibition and media and dispatch manipulation displays.

Exhibition – surface infrastructure of the exploitation borehole (original devices transferred from other mines):

1. The service head of the pumped borehole, equipped with shut-off valves and a pumping stick.
2. Pump crane "IŻP-5/1000", powered by an electric motor.
3. A mesh mast "MES-15/20", equipped with a multi-sheave with hook and rigging.
4. Extraction lift, built up on a caterpillar tractor "Mazur (D)-50".
5. Oil-gas separator "R10/1000", together with gas meter and fittings.
6. Pipes and rods ramp, with installed exploitation pipes.

Exhibition: Oil stabilization (original equipment transferred from other mines):

1. Tube furnace with a burner and control system. Oil is heated inside.
2. Stabilisation column. Heated oil cascades down the shelves, causing separation of light hydrocarbons from oil. Light hydrocarbons, in gas form, are transferred through a rectifier to a condenser. Oil flows through cooling spraying and on to storage tanks.
3. Condenser is designed to cool down warm hydrocarbons with cold water, flowing within the mantle of the condenser which causes the transition from gas to liquid (gasoline).
4. Cooling spraying is used to cool down the purified oil, gasoline and cooling water for the condenser.
5. Water and gasoline separator is used to separate gasoline from water before storage and transport.
6. Mine operation office, where office equipment from that period is collected (reconstruction).



Fig. 62 Interior of the Museum Pavilion. Photo by A. Siwek

Exhibition of storage and dispatch (original devices transferred from other mines):

1. V-25 m³ tank – oil storage after stabilisation
2. V-20 m³ tank – gasoline storage
3. V-5 m³ tank – working gasoline tank
4. V-5 m³ tanks of crude oil extracted directly from a borehole.
5. Compression station, in which there are impeller pumps with electric motors together with piping and fittings for conveying oil, gasoline and water.
6. Car nozzle for oil and gasoline and a mobile tank GAS 53 – used for transport of crude oil.

Reconstructed using the original “mountain” type station.

IV The Museum Pavilion

The Exhibition Pavilion, commissioned on 12 May 2000; it houses three exhibition halls, a conference room, administration facilities, archives and library. In the exhibition halls, presented are exhibitions related to oil mining, gas mining and refining industries. Its architectural form refers to the specific nature of the place, and, at the same time, the scale of the facility does not cause degradation of the landscape values.

1.3. The asset's function

THE INDUSTRIAL FUNCTION AND ITS CONTINUITY

The mine in Bóbrka has been in operation continuously since its opening in 1854; it still extracts crude oil on an industrial scale (although the size of the extraction is not large today). What's more, the oil is also extracted from one of the oldest shafts – the "Janina" cellar, which dates to 1878. This phenomenon is unique on a global scale. Although the current mine uses contemporary equipment for extracting oil, however, the mine preserved many elements of the historical mine's infrastructure – both original and reconstructed. This applies both to oil shafts, a variety of drilling and exploitation equipment, and wooden buildings – industrial and administrative – which are an inherent part of the historical mine.

From the example of the mine in Bóbrka, operating for over 160 years now, we can learn about the evolution of the scientific and technical theory and its practical applications in the field of the two most important branches of the oil mining industry – drilling and exploitation of crude oil. The researchers of the history of the oil industry point to the specificity of the Galician oil mining, especially in terms of drilling.³⁶ Because even though the search for new methods in this respect was, in the 19th and the beginning of the 20th century, typical for all countries where oil mining was developing, the discipline gained particular importance in Galicia, where the geological layout of the Carpathians made, first of all, drilling works that much more difficult. Therefore, *works on new drilling methods and designs formed the basis of creative activities of people associated with the Galician oil industry (...), and innovations introduced in petroleum mining of Galicia were almost exclusively related to drilling.*^{37,38}

In the context of the industrial function, of large value is also the current exhibition of the open-air museum, where the collected equipment, machinery, tools, illustrate the evolution of the foreign and Polish technological know-how over the period of more than 160 years of intensive development of the oil industry.

THE ADMINISTRATIVE FUNCTION OF THE HISTORICAL COMPANY

The Bóbrka mine is most likely the first in the world, or at least one of the oldest places in the world,

where oil extraction began on an industrial scale. One of the obvious functions of the historical oil company was the administrative function. A material testimony of that function is the historical wooden building, preserved within the mine area (the so-called Łukasiewicz House), from 1864, that is from the very beginning of the functioning of the oil company, established in 1861 by Łukasiewicz, Klobassa and Trzeciecki. It served many functions – it housed the administration of the mine, but also accommodation of the management and workers. Today, in the building, adapted to the museum function, contained are exhibitions related to the life of I. Łukasiewicz – layout of a historical pharmacy, pharmacy laboratory and a manor dayroom from the era. An important element illustrating this function are also, collected in the Museum, historical documents (originals and copies) related to the operation of the company.

THE MUSEUM FUNCTION

Currently, with the original industrial use present, the museum function is the dominating one. Undertaken over 60 years ago, the initiative of creating a museum of the oil industry in Bóbrka had two main objectives.

First, initiators wanted to preserve and save the crude oil mine that is considered the oldest in the world as a historical place, buildings and equipment, as well as the commemoration of Ignacy Łukasiewicz, an outstanding person related to Bóbrka.

Second, as intended by the originators and organisers, it was supposed to be a place where presented would be exhibits showing the history of development (from inception to almost contemporary) of the various branches of the petroleum industry – oil and gas mining, refinery and petrochemical industries, and transport and distribution of petroleum products. They also wanted to preserve equipment that is no longer in use, which, due to the rapid technological progress in these industries, are decommissioned and often destroyed. It was a very innovative approach at the beginning of the 1960s, given the fact that recognition of the value and importance of the relics of technology is even now not commonly known, and in the Polish conservation environment protection of the industrial heritage is a relatively young field. However, initiating the collection of all sorts of documents, cartographic, iconographic and photographic materials was just as important. It should be noted that the first stage of the creation of the Museum was based largely on social commitment of people who wanted to save the material testimonies of the rich tradition of the Polish oil industry.

³⁶ P. Franaszek, *Myśl techniczna w galicyjskim wiertnictwie naftowym w latach 1860-1918*, Kraków 1991, pp. 5-6

³⁷ P. Franaszek, op.cit., p. 5

³⁸ P. Franaszek, op.cit., p. 6

I.4. Identified values of the asset

Presentation of the history of the site and the characteristics of the elements and features of the asset allows to extract the most important values of the asset understood as the historic mine and the equipment and infrastructure of the current Museum.

VALUES REPRESENTED IN BÓBRKA:

- Geological and natural /crude oil, Carpathian geology, landscape, greenery composition/
- Historical and scientific /origins of the global phenomenon, continuity – the longest functioning oil mine in the world, social and intellectual conditions (positivism, industrialism, innovative thinking, social concepts, exchange of technical know-how on a global scale) and illustration of the historical and economic processes /industrialization, the scale and pace of development, limited development due to lack of cooperating industry, funding issues, transformation of rural, farming economy into industrial, forming of social class/.
History of the technology /illustration of the origins and development of a new industry and a new discipline of science and technology – oil extraction industry and the “art” of engineering/

Industrial archaeology.

- Historical (material):
 - the oldest mine (cellars, buildings, tools, location, spatial relations, historical landscape);
 - the longest-functioning mine – contemporary equipment, organisational structure, mining tradition, landscape);
 - the Museum as a form of evolution of the mine and place (reconstructions, original machines and equipment illustrating the development of the discipline);

Intangible values

- a number of values with high emotional charge connected with the person of I. Łukasiewicz and the still living – in the minds of the local community, in the region and in Poland – “legend” of the inventor of paraffin lamp – as a medium of positive social patterns and a factor shaping patriotic identity and building a sense of pride;
- mine as one of places of education of professional staff of the Polish oil industry;
- mine as a place for integration of Polish and foreign scientific and technical know-how (international exchange of scientific and technical experiences; inventive initiative; a creative hub – optimisation improvements of equipment and foreign inventions);
- the history of formation of the open-air museum, including the reconstruction of mining equipment by employees of the mine based on publications of the era – a manifestation of the still-living skills in the field;
- cultivating mining traditions.

The predominant value – testimony of the origins and development of exploitation of one of the most important natural resources of the contemporary world.

The historical value (in the context of historic monuments) – a technological monument related to the development of the Polish engineering, social, and national initiative.

I.5. SPECIFICATION OF THE ASSET'S TYPE AND INDICATION OF THE REFERENCE GROUP REPRESENTING A COMPARATIVE CONTEXT

Trying to precisely determine the reference group for the mine and museum in Bóbrka, which may serve as a comparative context (necessary later to assess its value in relation to other objects of a similar type and nature), it is important to assign the asset at the beginning to a specific typological group. Typological groups that are defined in the document "Criteria and procedures for classifying an object as a Historic Monument" may serve as a reference point for comparative analysis; the document was recommended in 2005 by the Polish Monument Protection Council at the Ministry for Culture, and developed in the National Centre for Research and Documentation of Monuments. It listed typological groups (categories of monuments) that can be considered Historic Monuments, and their characteristics and values. From among eight different categories, the mine in Bóbrka should be viewed in the following group:

Sites of industrial heritage, civil engineering that:

- *represent the traditional or unique industry fields, rooted in the industrial culture of the Polish lands,*
- *possess preserved old production equipment (technological lines, machines) allowing the recreation of the traditional methods of production,*
- *are the works of the engineering art with preserved technical equipment in the historical spatial and landscape layout.*³⁹

The mine is undoubtedly a part of the industrial heritage. According to the TICCIH Tagil Charter, the industrial heritage "consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education."⁴⁰

The specific nature of Bóbrka is, i.a. that, next to the still functioning, active mine with preserved original active oil shafts and the historic cultural landscape, the analysed area of the asset has been adapted to the

new museum function. The museum exhibits both preserved in situ historical oil shafts and equipment, and utilises the historical buildings, but also presents within the old mine objects reconstructed from the Bóbrka mine, and a rich collection of reconstituted and original devices, but coming from other places and from other development periods.

To sum up, selection of a group of monuments which constitute a reference group depends on the combination of the following elements:

DETERMINATION OF A TYPOLOGICAL GROUP

- Area of analysis:
 - first – crude oil mines of the former Galicia
 - then – mines from the area of Europe and the United States and Canada, with particular emphasis on the Titusville, Pennsylvania mine, competing with Bóbrka for the primacy of establishment
- The period of foundation
 - 3rd quarter of the 19th century as a pioneering period of oil mining development
- Functional characteristics of the asset
 - technological heritage
 - industrial objects
 - crude oil mines
 - monuments related to the petroleum industry
 - method of digging, drilling and exploration/ their development, change, innovation – evolution of technological know-how/
 - technological processes /historical/
 - continuity of extraction
 - combining the historical industrial function (mine) and the administrative function of the historical oil company
 - combination of functions of the mine and the open-air museum
- Equipment of the mine
 - crude oil extraction equipment
 - equipment the open-air museum illustrating the development of the oil industry
- The "material-related" characteristics of the asset
 - the mining landscape.

Reference group: oil mines in Europe and in the world and equipment complexes stored in museums of the oil industry /3rd quarter of the 19th century/ cultural landscape of the oil industry/ valuable equipment/ industrial production period/ continuity of production, subject to the currently limited scale.

³⁹ http://www.nid.pl/pl/Dla_wlascicieli_i_zarzadcow/opieka-nad-zabytkami/pomniki-historii/kryteria-wyboru/

⁴⁰ The International Committee for the Conservation of Industrial Heritage (TICCIH) The Nizhny Tagil Charter for the Industrial Heritage, July 2003, as translated by: W. Affelt, *Dziedzictwo techniki, jego różnorodność i wartości*, "Kurier Konserwatorski" no. 5, 2009, p. 5

1.6. DETERMINATION OF THE CRITERIA FOR EVALUATION AND ASSESSMENT OF THE ASSET IN THE LIGHT OF THE SELECTED CRITERIA IN RELATION TO THE REFERENCE GROUP

Characteristics and analysis of the historical mine and the complex constituting the museum exhibition in Bóbrka, as well as wording the elements to define the reference group, giving basis to indication of characteristics that decide on the values of the asset. In the case of the mine in Bóbrka, in particular the following leading evaluation criteria should be considered:

- time of foundation
- location and the cultural mining – landscape
- equipment of the asset
- the asset's function

The mine in Bóbrka has not until now been really a subject of studies, covering the place in a broader aspect of comparative studies, related to issues of historic sites and objects of industrial heritage.

Trying to assess the value of the mine in Bóbrka in relation to a larger than the region of the Carpathians spatial and geographical scale, two important issues must be kept in mind. First, the specificity of the geological structure of the Carpathians, as emphasized by all researchers, had a major impact on the type of equipment used here (especially drilling equipment), their development, and the need for adaptation of contemporary drilling methods and systems borrowed from other oil mining centres (e.g. American) to local conditions. In addition, the landscape form of the Bóbrka mine, like other mines located in the Carpathian Mountains or foothills, is unique and different, due to the distinctive natural landscape. It seems that these two aspects (geological and natural) make it difficult to assess the mining landscape of Bóbrka in a broader geographic context, referring, for example, to the mines in North America.

In all historical studies written in Polish, the mine in Bóbrka is presented as a place that is exceptional for many reasons. For the most part, it is considered to be the oldest oil mine in Poland and in the world. In addition, in the 19th century it was already a perfectly functional business, not only using the latest technological developments, but creatively transforming and improving them, which had a considerable impact on the development of the oil industry in this part of Europe. In addition, in the time of its inception and in the first decades of excellent development, with Bóbrka associated was Ignacy Łukasiewicz – inventor of paraffin lamp, an outstanding person in the field of research and treatment of oil. In the Bóbrka mine worked also numerous professionals, widely known in the field of

petroleum mining, whose accomplishments in the field of progress and development of the industry in this part of Europe are assessed as significant. In the scale of the oil industry in Galicia, Bóbrka was also considered already by the 19th-century experts as an exemplary mine – in many ways, not only because of the use of contemporary equipment and technology, but also as an exceptionally well organised, safe place of work, with high social standards, which was rare back in the day.

Evaluation of the value and importance of the historical mine in Bóbrka should be confirmed in a comparative analysis. In the following structure, the analyses of: the historical oil mines in Poland, Europe and the world, whose beginnings date to the 3rd quarter of the 19th century are taken as a reference group, which constitutes a comparative context – on a national and international scale. The subject matter of the comparative analysis should also be the historical equipment of the mine and devices collected in the open-air museum and, to a lesser extent, the cultural landscape of the oil industry. An important point of reference for illustrating the value of the asset is also the function of the facility. The Bóbrka mine is most often presented as the only technological relic of this type in Poland. The beginning of the development of the mining industry date back around the world to the 2nd half of the 19th century. The year 1854 – the year of establishing the mine in Bóbrka, has been almost universally recognized in the Polish research literature as the beginning of the industrial exploitation of crude oil in the current Polish lands. With regard to the current Polish borders, provided is also information that two years earlier, in 1852, on the initiative of Prince Stanisław Jabłonowski in the “Empty Forest” near Siary and Sękowa, the first mine was built and that it was in the Gorlice lands that the world oil industry was born.⁴¹ However, cellars created in the “Empty Forest” initially aimed to supply the raw material for the production of asphalt. Paraffin was treated as a by-product – it is therefore hard to talk about oil industry in this case. Currently, some of those cellars were removed, some exist in the form of mining sinkholes. No historical items of mining equipment, devices or infrastructure were preserved in the area. There is no functioning mine here, and the directed in the nearby Libusza Museum of the

⁴¹ Such information is given i.a. by T. Pabis, *Książę Stanisław Jabłonowski* – publication on the website: http://www.libuszamuzeum.iap.pl/?id=50226&location=f&msg=1&lang_id=PL



Fig. 63 Museum of the Oil Industry and Ethnography in Libusza, source: http://www.libuszamuzeum.iap.pl/?id=50162&location=f&msg=1&lang_id=PL



Fig. 64 Mine in Wańkowa, source: http://www.nafta-polska.pl/plsc_imagescache_12286658.jpg

Oil Industry and Ethnography collects exhibits related to the history of the oil industry in the area of Gorlice and Jasło, but on a much smaller scale than the Museum in Bóbrka does.

In the comparative analysis with regard to Poland, one can also refer (and demonstrate the value of Bóbrka) to the historical mines or their relics, which to this day are functioning in the villages located in the immediate vicinity of Bóbrka; they are still in use and are now functioning as part of the same mine as Bóbrka. These are the mines in Wietrzno, Łęki Dukielskie, Kobylany and Równe. Within these towns located may be operational boreholes from the 19th century and beginning of the 20th century. There are also remains of a mine's infrastructure, e.g. whim facilities together with equipment in Wietrzno and Łęki Dukielskie, building of a machine hall, building of a former administration office. All of these objects are much younger than the Bóbrka mine infrastructure – they come from the mid-20th century (from the 1920s, '30s, '40s and '50s), and some of them underwent multiple modernisations.⁴² None of these places has as rich and diverse equipment as Bóbrka (facilities, equipment and infrastructure), illustrating the origins and development of oil mining, nowhere else the mine function is also enriched with a museum function. Another point of reference should be the land of Gorlice and Jasło (the historical Gorlice-Jasło basin) – it is an area of intense development of mining and the oil industry since the 1850s; an area

closely – like Bóbrka – associated with Ignacy Łukasiewicz and other pioneers of the oil industry, and, at the same time, a region that competes with Bóbrka in terms of primacy and importance for the history of the oil industry.

Verification of the preserved remains of the mines – facilities, equipment and infrastructure – is also required in other areas in the Subcarpathian region, intensively exploited since the beginning of the development of oil mining. One of these places can be, for example, the mine in Wańkow, a little younger than Bóbrka, but also referred to as one of the oldest in the world, with preserved buildings and devices. A good point of reference in this comparative context can also be the mines with preserved historical buildings, shafts and devices, located on the cross-border *Petroleum Trail*, which runs through Polish and Ukrainian lands, connecting the most important towns related to the oil industry in Galicia in the 2nd half of the 19th century. This extended analysis may demonstrate similarities, but will also allow to confirm the significance and uniqueness of Bóbrka in the national context.

The comparative group should also include the Borysław basin, which is considered – due to the scale of the phenomenon – the world's oil industry hub of the 2nd half of the 19th century. *In a short period of time, in the area of Borysław several thousand oil shafts were established and close to a thousand companies incorporated, handling their operation, with more than ten thousand employees.*⁴³

⁴² We thank Mrs. Barbara Olejarz, Director of the Museum in Bóbrka, for this information.

⁴³ <http://www.nafta-polska.pl/historia-naftownictwa/borys%C5%82aw/>

On a broader – international – scale, the comparative group should undoubtedly include all the places, on different continents, which played an important role in the history of the oil mining during the pioneering period – in the 1850s and 1860s – and then in the period of the turbulent, 19th-century development. This analysis aims not only to demonstrate the uniqueness, importance and value of the mine in Bóbrka, but is also very important for the selection of other places of comparable value, in the event of plans to apply Bóbrka for entry on the UNESCO List. These other assets should meet the selected criteria and complement each other in such a way, that they would represent – on a global scale – a unique, universal value. It should be noted that for the purposes of any efforts to enter the mine in Bóbrka to the UNESCO World Heritage List, more detailed research should be undertaken – both regarding the identification of the existing assets in the specified herein reference group, deepening the knowledge on the grade of preservation of historical equipment in these places, and the analysis of the extent, to which the current function of each object reflects the historical functions.

Such assets with a need for diagnosis should be those mines, preserved in the world, which played an important role in the history of the oil industry in the 2nd half of the 19th century. This will be for sure a number of places in different parts of the globe, i.e., in the United States, Canada, Russia and Romania. The significance of the Polish lands at that time may be proved by the information that: *in the year 1900, in the world about 20 million tons of crude oil were mined, half of that came from Russia, a little less from the U.S., about three hundred thousand tons from the Polish lands, the rest from Dutch India, Romania and Burma.*⁴⁴

In Bóbrka, there still functions an oil mine, but the whole area of the historical mine – considered a legally protected historic monument – belongs now to the Museum of the Oil and Gas Industry. Therefore, in the context of identification of potential places to assess the value of the asset in relation to the reference group, worth analysing are the most important, operating in Europe, open-air museums dedicated to the history of the oil industry. Undoubtedly, a point of reference for the open-air museum in Bóbrka are museums of the oil industry focused in the (created in 2003 in Wietze) network of European museums of oil that combines 11 museum institutions. These are the following museums: Dukes Wood Oil Museum (England), the Vienna Technical Museum (Austria), Pölevkivi Muuseum Kohtla-

Järve (Estonia), Musée Français du Pétrole Pechelbronn (France), the Petroleum museum Stavanger (Norway), Museum of the Oil and Gas Industry in Bóbrka, National Oil Museum of Ploiesti (Romania), Almond Valley Heritage Trust Livingston (Scotland), Engelbergs Oljefabrik Ängelsberg (Sweden) and Magyar Olajipari Museum Zalaegerszeg (Hungary).⁴⁵ Among these museums only one – in Wietze – is located on the grounds of a historical mine.⁴⁶ The mine in Wietze, North of Hanover, in Lower Saxony, operated from 1859-1963, and in 1970, in its area an open-air museum of the German oil industry was opened (Deutsches Erdölmuseum Wietze), in which there are numerous remnants of the operation of the mine. The Wietze oil was extracted both by the borehole method and the underground mining methods (shafts, tunnels).

In the world, the beginning of the oil industry is most often associated with the drilling of the first oil well – in the US, in Titusville, Pennsylvania in 1859. The first company searching for oil in America is supposedly the Pennsylvania Rock Oil Company of New York, which was founded in 1854. Reorganized in 1858, it adopted the name Seneca Oil Company.⁴⁷

It was Seneca Oil that employed a former railwayman, Edwin L. Drake, who drilled the first exploitation oil shaft with a depth of 69.5 feet near Oil Creek in Venango County. Edwin L. Drake used a steam engine that powered the impact drilling rig for his drilling. In Bóbrka, the mine was established a few years earlier, but the method of auger drilling was used here in 1861, and it may have been a cause of giving primacy to Titusville. The Drake Well Museum and Park, dedicated to the first oil extraction site in the U.S., is located in Cherrytree Township, a few miles from Titusville.

A place in a way comparable to Bóbrka can be the Museum in Oil Springs, Ontario, Canada (The Oil Museum of Canada). The Museum is located at the site of the first oil shaft in Canada from 1858 and is considered a historical national asset and the site of the first industrial oil field. There are seven buildings there, four of which constitute historic sites – two are considered legally protected heritage of the province of Ontario (Ontario Heritage Designations). In areas adjacent to the Museum, oil is still extracted.

⁴⁴ <http://www.nafta-polska.pl/historia-naftownictwa/hossa-na-%C5%9Bwiecie/>

⁴⁵ K. Probiez, N. Volkmann, M. Marcisz, W. Hänsel, *Eksploatacja ropy naftowej metodami górnictwa podziemnego w dawnym złożu Wietze (Niemcy)*, „Przegląd Górniczy”, no. 6, 2015, p. 62

⁴⁶ The information was given by Mrs. Barbara Olejarz

⁴⁷ D. Yergin, *Nafta, władza, pieniądze*, Warsaw 1991, p. 15

Another important criterion, next to the time of establishment and preserved equipment, in the assessment of the value of Bóbrka – in relation to the comparative group referred to above – is the function of the asset. The current coexistence of the continuously operating since its establishment in 1854 mine oil and the open-air museum dedicated to the history and development of the Polish oil industry – is a unique case in Poland. With regard to the Polish industrial heritage, such coexistence of industrial use and museum function occurs – in a completely different mining field – in the salt mines in Wieliczka and Bochnia, assets regarded as cultural heritage of the highest importance and values on a global scale.

According to the current knowledge, it is also the only such place in the world where within the historical oil mine, moreover from the period of the birth of industrial oil mining, continues to operate an oil company, which extracts (though on a small scale) oil for industrial purposes. In that context, Bóbrka is thus, most likely, a unique asset on a global scale, as a functioning and continuously operating oil mine, originating in the period of conception of the world oil industry. In addition, the oil is extracted not only from new wells, but also from one of 19th-century cellars, which should be considered a real phenomenon. At the same time, the area of the mine, the historical buildings and equipment are legally protected as historical assets and additionally utilised as an open-air museum. Such combination of functions makes Bóbrka a unique asset. The continuity of the original use is, for each historical object, an aspect that enhances the assessment of its value. In the case of such a specific historic monument as an oil mine, which is also the oldest, or one of the oldest, in the world, is something unprecedented, exceptional. At the same time, legal protection in the form of an entry in the register ensures the preservation and protection of the mine in the scope of the surviving to this day material testimonies of the historical mine (area of the mine with relics of the historical cultural landscape and the original, 19th-century buildings and devices). The current existence of the Museum in that area, together with an exhibition in the form of equipment – reconstructed and transferred from other sites, illustrating the development of the industry from the 1860s to the 1960s can be thought of as added value.

To sum up – on a national scale, the historical oil mine in Bóbrka is a unique historic monument – the first petroleum mine, a monument depicting Polish contribution to the development of the oil industry, with preserved original and reconstructed technical relics representing the heritage of the petroleum mining industry and the art of engineering; a place associated with the activities of a prominent Pole – Ignacy Łukasiewicz, known primarily as the inventor of paraffin lamp, and with many well-known pioneers of the oil industry in this part of Europe – leading mining engineers, geologists, businessmen...

It seems that the oil mine in Bóbrka is also distinguished by outstanding values in relation to similar technical relics on an international scale. Bóbrka is the world's oldest or one of the oldest places of industrial extraction of raw material, which played a key role in the development of civilisation, the place of preserved historic sites like buildings and devices which are an original, from the period of creation of the infrastructure of the mine, place showing the remarkable history of the development of engineering and the international exchange of experience and expertise of the field's pioneers. And, although Poland is currently not a potentate in the global oil industry, without the mine and museum in Bóbrka, knowledge about the origins of the global oil industry would be incomplete. The historic mine in Bóbrka, an outstanding historic site of technology with all the richness of its history and the preserved material testimonies (buildings, equipment and relics of the mining landscape), undoubtedly carries a unique proof of the still-living civilisation whose importance for the progress of the contemporary world is not to be underestimated. It is also a place with preserved *in situ* complex of technical objects, which represents a very important stage in the history of mankind – a pioneering, specific period of development of the oil industry.

Regardless of the adopted – in different countries and studies – findings as to the site of world's first mine, there is no doubt that Poland belongs – next to Romania, Russia, USA and Canada – in the ranks of the few countries in the world that have given rise to the world career of this field of industry, and the oil mine in Bóbrka is of fundamental importance for the industry's development in the South-Eastern Europe.



Fig. 65 Borysław, source: http://www.nafta-polska.pl/sci_imagesteaserbox_5248276.jpg?t=1414233510



Fig. 66 Deutsches Erdölmuseum Wietze, source: <http://www.erdoelmuseum.de/seite138254fotos.html>



Fig. 67 Deutsches Erdölmuseum Wietze, source: <http://www.erdoelmuseum.de/seite138254fotos.htm>



Fig. 68 Drake Well Museum and Park, source: <https://www.google.pl/search?q=drake+titusville+museum&client=firefox>



Fig. 71 The Museum in Oil Springs, Canada, source: <https://www.lambtononline.ca/home/residents/museums/oilmuseum/Pages/default.aspx>



Fig. 69 Drake Well Museum and Park, source: https://www.yelp.com/biz_photos/drake-well-museum-and-park-titusville?select=Pzq33-RinkXvdqItZs0qeQ&userid=IwHLuykqmqmGVNHJ_UCwXWg

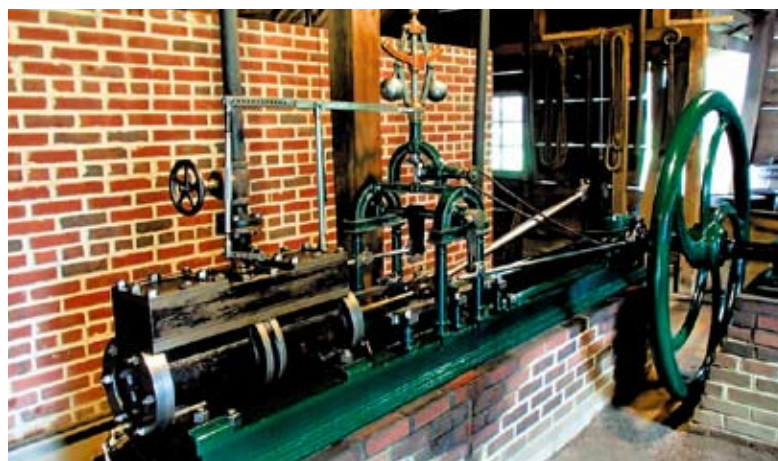


Fig. 70 Drake Well Museum and Park, source: https://www.yelp.com/biz_photos/drake-well-museum-and-park-titusville?select=Pzq33-RinkXvdqItZs0qeQ&userid=IwHLuykqmqmGVNHJ_UCwXWg

LEVEL 2



LEVEL 2

I. ANALYSIS OF THE ASSET'S VALUE – DETERMINATION OF THE ATTRIBUTES OF THE ASSET AND ASSESSMENT OF THEIR AUTHENTICITY AND INTEGRITY

In the analysis of the value of the mine and Museum in Bóbrka, attributes were defined – understood as the key features and elements of the asset, which are decisive for the assessment of the value of the historic site. There were also attempts to determine how the specified and briefly described attributes satisfy the condition of authenticity and integrity – so relevant in assessing the value of the monument. In the tabular overview of attributes, their structured list was presented, starting with the ranking of attributes in several categories relating to: spatial scale, architectural and technical infrastructure scale and functional scale. In each of these sets of attributes, individual attributes were distinguished, sometimes their components (elements), a brief description and an evaluation of authenticity and integrity. In the characteristics of the attributes, key issues were

indicated that determine the specific nature of the attribute or its element (more detailed characteristics are contained in chapter Features of the asset material for the designation of a comparative group).

In accordance with the assumptions of the evaluation system of assets with the highest value, the proposed evaluation of the mine and Museum in Bóbrka aims, first of all, at disclosing its various values related to its material form, better understanding its complexity and systematised knowledge of the monument (from the point of view of factors important for its protection). An analysis of the values of the monument's components (by specifying attributes of those values) carried out in the above manner provides a basis for determination of its protection and the range of possible interference.

ATTRIBUTE CATEGORY	Attribute	ELEMENTS OF THE ATTRIBUTE	CHARACTERISTICS OF THE ELEMENTS OF THE ATTRIBUTE	AUTHENTICITY	INTEGRITY
SPATIAL SCALE	The historical location of the mine in Bóbrka	Location in relation to the town of Bóbrka	The location of the historic mine in an undeveloped, forest area, where oil spills to the surface have been observed for a long time. Contemporary continuation – maintaining isolation of the museum areas from residential and economic development areas.	Spatial isolation in forest environment – an important element of authenticity of the place. An important element in the perception of the historical mine and individuality of the contemporary Museum (also a narrative element of the museum, concerning the exploration and extraction of oil in areas other than Bóbrka). CONCLUSION: for the protection and management of the area, it is important to record the buffer zone in the land development plans, for the distance to the developed areas to be maintained.	Integrity determines the area of the Museum – the historical mine and the buffer zone, which is the forest area, isolating it from developed areas.
		Location in relation to geological conditions	The essence and cause of the location of the historical mine here and not elsewhere were the natural oil spills observed in forest areas, conditional on the geological structure of the deposit and the specificity of the geological strata. Therefore, preserving active, accessible oil wells is a historical document, and demonstrates the phenomenon of geological structure of the deposit.	Presentation of kopanka – an oil-bearing well (cellar) and the opportunity to observe the oil in its natural state is essential for the assessment of the authenticity of the place, is the trump card of the Museum and an invaluable historical document. CONCLUSION: Preserved access to the oil outlet in its natural state (a well – kopanka) is a conservation priority of the Museum.	Presentation of the geological context is an essential factor of integrity of the place. It complements and explains the documentary nature of the historical elements. <u>It is a priority.</u>
		Location of the historical mining facilities and equipment from the 2nd half of the 19th century	The preserved in situ buildings, equipment, oil-bearing wells of the 19th century and traces of old wells and cellars (also in the archaeological layer), as the most precious resource of the Museum and document of operation of the historical mine, applying for the title of the world's oldest one.	The most important and irreplaceable element of authenticity of the place. Tracking historical origins of oil extraction, reflecting the scale and nature of the pioneering exploitation activities. Unique on a global scale. CONCLUSION: To maintain authenticity of the place, a restorative approach to the preserved substances and traces of mining is necessary, including in the context of making the sealed wells and cellars and the borders of the historical complex more legible.	Integrity is conditioned by the recognition within the Museum of the exhibition area of the historical mine in its entirety. An additional factor that complements the integrity of the complex, is to preserve clear spatial relationships between the different elements of the historical mine and illustrating the historical range of the mine in the area. A postulate of protection is preservation of a clear distinction of the historical mine in relation to the exhibition of the later mining and exploration equipment.

SPATIAL SCALE		The landscape	
Borders	Two aspects of the border issue: 1. The historical, related to the mine from the 19th century. 2. The contemporary – related to the borders of the property and area of the Museum. The borders of the historical mine are included within the premises of the contemporary Museum. The borders of the Museum protect the historical substance and enable presentation of the further history of the oil and gas mining in Poland.	The authenticity of the place is determined by the borders of the historical mine from the 19th century, and conditioned by a later development, the borders of the Museum. The historical borders are key for the assessment of the authenticity of the place. The contemporary borders act as an element of protection and allow the continuation of the historical narrative without compromising the authenticity of the mine complex from the 19th century. CONCLUSION: In the context of the authenticity, it is essential to show the range (borders) of the historical mine in relation to the borders of the contemporary museum.	The borders indicate the scopes of responsibility and the Museum's narrative framework. They are a key factor in determining integrity of the space, both historical and contemporary.
Geological conditions and terrain	The terrain and character of vegetation result from the geological substrate conditions, determine the landscape. The presence of oil deposits resulting from the geological specificity is a causative element of the history of the site.	Authenticity in geological terms remains intact and is the cornerstone of the history of the site and its presentation. The terrain reveals and documents sites of exploitation interference, gaining major importance in presentation of authenticity of the place.	The geological scale greatly exceeds the possible framework of the museum. Therefore, in the context of integrity it has a supporting role. It should be included in the museum narrative, where the geological context must be shown as widely and comprehensively as possible.
Natural conditions – afforestation	The state of the terrain, known from historical sources from the pre-exploitation period, and the subsequent changes arising from the stages of development and decline of the exploitation of oil were connected with changes in vegetation — from wooded areas (pine forest), to large deforested areas with endaves of exploitation facilities and equipment, to secondary afforestation as part of a retrospective composition of the area of the museum. Currently, the forest is a landscape backdrop for the museum infrastructure and serves as a protective curtain for the museum.	The present status of afforestation of the land, although largely secondary, is important for the perception of authenticity of the place. Afforestation is a characteristic element of the adopted concept of the museum presentation and is a factor of authenticity, both in the context of the historical mine (in part as reconstruction complementing the presentation), and the contemporary museum (the authenticity of concept).	Maintaining afforestation of the terrain is an important factor for the integrity of concept of the place's presentation.
Composition of the museum exhibition	The museum's premises are developed consciously and on a multi-stage basis. There are elements of the historic mine from the 19th century that accumulate there, as well as added exhibits presenting mining techniques and their history. These are elements that determine the landscape of the place.	Authenticity can be assessed in two aspects – of the historical mine representing the museum's exhibition axis and of the composition of the whole museum area, which is the result of a decision to preserve the historical mine, and complements the presentation of the history of the oil industry. In the context of composition, the preserved elements of the historical mine guarantee authenticity of the place (although it is an industrial landscape preserved only in part).	The essence of integrity of the composition scale is reconciling the distinctness of the historical part and the added layer of the exhibition. Integrity is disturbed by unsuccessful location of new exhibits (e.g. the fuel station reconstruction in a visual relation with the "Łukasiewicz House" complex).

SPATIAL SCALE		The landscape	
	Endaves of the historical buildings and mining equipment from the 19th century.	The buildings of the oldest mine, cellars, traces of mining works from the 19th century create endaves of the most valuable historical mining landscape, they are invaluable as historic monuments. As results from historical conditions, the preserved parts of the mine do not form a concise historical landscape and instead are divided into endaves with high local clarity and weak ties between each other.	The elements of the museum exhibition are building a new identity of the landscape and can only be assessed in the context of the museum concept, for which authenticity of the devices and machines forming the presented collection is essential. Their location in the field is secondary – so authenticity of the items, not their landscape context, is decisive. CONCLUSION: The museum composition is a factor that has a major influence on preserving authenticity of the historical layer (the 19th century mine), and at the same time is a factor conditioning the contemporary landscape identity of the place.
	The historical (relic) composition of greenery	Known from historical records and legible in the form of single specimens of old stand, the historical composition of greenery accompanying the administrative building (the Łukasiewicz House) and the monument composition was transformed due to changes in land use. It is, just like the preserved buildings, a historical document and an important component of the historical landscape. It is of historic value.	The preservation of the legibility of the relics of the 19th-century mines is crucial to authenticity of the place. This authenticity refers to the landscape relationships in the endaves as well as to the visual and functional interrelationships of the individual endaves.
	Communication network	System of historical roads and contemporary communication routes serving technical purpose and that warp the museum exhibitions. A factor that organises the space and determines the reception of the place.	An essential element of authenticity of the place. Preserved partially and not fully legible now. Suitable for conservation interventions and re-composition works. Authenticity of this element of the landscape should be assessed in the spirit of the Florence Charter and criteria for assessing authenticity of garden compositions.
			Integrity of the landscape layer of the 19th-century historical mine is definitely a challenge and a priority of the exhibition and conservation activities. It requires local complementary re-composing and highlighting the historical links of the preserved elements. In the present situation, it is possible to talk about satisfactory integrity of the landscape complex, however, we can identify the need for target landscaping adjustments.
			A significant factor of integrity of the landscape. Testimony of evolution of the concept of the mine area development.
			Integrity – the communication network decides first of all about the integrity of the contemporary Museum exhibition. Plays an important role in the perception of the Museum landscape.

THE SCALE OF THE ARCHITECTURAL AND TECHNICAL INFRASTRUCTURE	Historical facilities and equipment from the second half of the 19th century.	Landscape interiors, axes and scenic relations	The specific nature of the layers of the museum site development and their blending into the forest background causes the area of the Museum to become a system of intimate landscape interiors interconnected by communication (and scenic) axes and joined together – to various degrees – by scenic relations. The degree of scenic relations is important both for the comprehensive narrative of the museum, and for the perception of the individual elements of the exhibition.	The area of the museum is a kind of landscape creation which is the sum of intimate landscape interiors of different nature and degree of authenticity. Authenticity of the preserved in situ enclaves of the 19th-century mine is, of course, the highest value. However, important for the perception of the museum are also the arranged exhibition interiors, where, in accordance with the museum concept, attempts were made to reconstruct the landscape relations characteristic of a given segment of the collection (e.g. the mine from the 1960s). These are the elements that are essential for the perception of authenticity of the exhibits, and at the same time acquire the values of authenticity of creation (added, contemporary) in the context of building the concept of the Museum.	Integrity of the landscape in the context of maintaining integrity of the scenic relation of the old 19th-century mine components is a priority. However, we cannot ignore the contemporary perspective, and the context of landscape integrity must also cover the entire area of the Museum, taking into account the positioning of the created landscape interiors of the exhibition section. In the present state of land use, landscape integrity should be the object of detailed analysis and adjustments.
		Historical buildings	Buildings from wooden logs, with production and inventory use and serving as sanitary facilities and the mine manager's headquarters. An important document of the functioning of the historical mine. Partially preserved and subjected only to basic conservation works, and partially transformed as a result of secondary functional adaptations.	Elements of fundamental importance for the assessment of authenticity of the place. Even transformed buildings, but still in their historical location, have an important documentary value. A conservatory approach and the pursuit to preserve the smallest detail of the historical substance are necessary.	An important factor of integrity of the place, decisive on the historical message and documentary value.
		Historical extraction sites	Active cellars – petroleum wells. A global-scale phenomenon due to continuity of functioning. Sealed extraction spots that remain archaeological sites.	The highest degree of importance to the assessment of authenticity of the place. Priority directive to preserve the open oil wells, as a measure of authenticity of the place.	An important factor of integrity of the place, decisive on the historical message and documentary value.
		Greenery composition	Historical element of land use accompanying the buildings and functionally complementing the area of the mine. Preserved as a relic.	Single specimens of old stand are important for the assessment of authenticity of the place and continuity of use. The composition is not preserved in its entirety, requiring better legibility within acceptable landscape reconstructions. A complementary factor of authenticity, but of supporting character due to the legibility and preservation state.	An important factor of integrity of the place, complementing the historical message.
		The obelisk	A monument composition, a proof of the mine's founders' self-awareness regarding the significance of the undertaking. A unique, on a global scale, oil mining memento, whose importance is increased by the direct relation with Ignacy Łukasiewicz.	An element of the highest importance to the evaluation and perception of the authenticity of the place.	An important factor of integrity of the place, decisive on the historical message and documentary value.

THE SCALE OF THE ARCHITECTURAL AND TECHNICAL INFRASTRUCTURE					
Infrastructure of the contemporary mine within the Museum	Operating devices	Active technical infrastructure of the contemporary oil mine.	In the context of authenticity, a significant factor in the phenomenon of the longest continuously-running mine. Maintains the mining character of the place.	In the context of integrity, a very important supplement to the history of mining and the mining nature of the place.	
	Museum collections	Small-scale collections include objects, documents and archival materials, and a specialty library. An important element of the scientific program of the museum.	In the context of authenticity, it is an added item with a similar meaning to that of the outdoor exhibition of machinery and equipment.	In the context of integrity of the concept of the museum, an extremely important element of the collection.	
Exhibition Pavilion and small-scale museum collections	Museum buildings	Exhibition pavilions and the headquarters of the management and administration of the museum. Element of the contemporary identity of the place. A necessary component of the functioning of the system.	In the context of authenticity, it is an added item.	In the context of integrity, significant are the location and scale, which do not affect the landscape integrity of the historical mine and the outdoor exhibition.	
	Exhibits presented in outdoor exhibition	A collection of mining machines and devices from the 20th century, illustrating the successive stages of development of oil and gas mining. Items taken out of the historical context in which they operated, but constituting a valuable historical evidence of the stages of evolution of the discipline. Fundamental framework of the outdoor museum exhibition.	Authenticity should be evaluated in two aspects. 1. Authenticity of the object – is high and significant, since they are machines and equipment that were actually used in petroleum mining. 2. Authenticity of the context of the place. It is a complex problem, because they are mostly items transferred from other locations. However, the sole concept of the museum is the result of recognition of the place's value and the willingness to protect not only the relics of the mine from the 19th century, but also oil mining traditions. We therefore get another aspect of the place's value, its contemporary identity, with which the collection is in sync as an element of authenticity	Integrity of the collection derives from the adopted concept of presentation of the history of oil mining. Contribution to integrity of the place lies in supplementation of the historical presentation launched by the oldest mine in Bóbrka. In general, integrity may be considered at the level of the contemporary identity of the place and then it is high.	
Original equipment transferred to the museum	Exhibits presented in outdoor exhibition	A collection of mining machines and devices from the 20th century, illustrating the successive stages of development of oil and gas mining. Items taken out of the historical context in which they operated, but constituting a valuable historical evidence of the stages of evolution of the discipline. Fundamental framework of the outdoor museum exhibition.	Authenticity should be evaluated in two aspects. 1. Authenticity of the object – is high and significant, since they are machines and equipment that were actually used in petroleum mining. 2. Authenticity of the context of the place. It is a complex problem, because they are mostly items transferred from other locations. However, the sole concept of the museum is the result of recognition of the place's value and the willingness to protect not only the relics of the mine from the 19th century, but also oil mining traditions. We therefore get another aspect of the place's value, its contemporary identity, with which the collection is in sync as an element of authenticity	Integrity of the collection derives from the adopted concept of presentation of the history of oil mining. Contribution to integrity of the place lies in supplementation of the historical presentation launched by the oldest mine in Bóbrka. In general, integrity may be considered at the level of the contemporary identity of the place and then it is high.	
	Cellar models	Models of surface parts of historical cellars located at their actual sites. They highlight the location of the historical mining holes.	Added components. Authenticity of location is dominant over authenticity of substance. A significant factor, complementing the presentation of history and range of the first mine. In this context, a relevant factor for the presentation of authenticity of the place.	An important factor of integrity of the place, decisive for the historical message and educational value of the place.	
Devices which are reconstructions of items from the 19th century	Reconstructions of equipment	Made on the basis of source information, reconstructions of devices that, by nature, were volatile and intended only for temporary use. Elements relevant to the supplementation of the historical narrative about the shape and operation of the old mine.	Added components. Their material authenticity is limited. They are, however, relevant to the presentation of the place and, as auxiliary elements, serve the display of historical authenticity of the mine.	An important factor of integrity of the place, decisive for the historical message and educational value of the place.	

FUNCTIONAL SCALE	Function			THE INTANGIBLE SCALE	Historical and professional traditions
	The industrial function and its continuity	The most important feature, in relation to the industrial function, is the continued use of the mine since its foundation to this day. Physical media of this attribute are the active historical cellars, one of which is still exploited, which is a phenomenon on a global scale. In the old mine and the current museum, oil extraction also takes place at several other sites, which is a testimony of the modern continuation of the industrial functions within the historical mine.	A key element of authenticity of the place.		
	The administrative function of the historical mine And the contemporary	The historical function is represented by the preserved in situ historic administration building from 1864, known as the Łukasiewicz House. The contemporary function is contained in the new museum pavilion and is a consequence of the need to manage the place.	In the historical context, supplement of authenticity of the place, associated with the operation of the mine. Authenticity of the administrative function is preserved in part. Preserved location, external form and memory of the historical function of the building and the first director of the mine. Currently, performs auxiliary functions in the context of authenticity of the place, essential to the operation of the museum.	A significant factor of integrity that includes historical and contemporary conditions and the factor of continuity of the function. The high rating of integrity results mainly from the coexistence of the industrial (the original function of the asset) and the museum function, thanks to which, i.e., presentation of the historical development of the mine was possible.	A supporting element of the integrity of the place, demanding a fuller presentation.
	museum function	The Museum was created to preserve and save the oil mine in Bóbrka, deemed to be the oldest in the world. Associated with Ignacy Łukasiewicz. A consequence of the foundation of the Museum is presentation of the history of development (from inception to almost contemporary times) of various branches of the petroleum industry – oil and gas mining, refinery and petrochemical industry, and transport and distribution of petroleum products.	In the historical context, the function is used for maintaining authenticity of the place, but is not an element of authenticity. In the context of contemporary identity of the place, the museum function is a component of authenticity of the place, as a natural evolution from the enterprise to a centre of documentation of the history of mining.	A significant factor of the contemporary and functional integrity of the place. The high rating of integrity results mainly from the coexistence of the industrial (the original function of the asset) and the museum function, thanks to which, i.e., presentation of the historical development of the mine was possible.	A significant element of the integrity of the perception of the place.
	The first oil mine in the world /an enterprise/	The essence of the functioning of the museum – documenting and preservation of evidence of the oldest oil exploitation site on a global scale.	A significant factor of authenticity of the perception of the place.	A significant element of the integrity of the perception of the place.	
	The birthplace of oil mining /profession/	The tradition of development of the profession of an oil miner.	A factor of authenticity that requires presentation and enhancing.	A supporting element of the integrity of the place, demanding a fuller presentation.	

THE INTANGIBLE SCALE				
People associated with the place	Ignacy Łukasiewicz	The leading figure associated with the origins of exploitation and use of crude oil in Poland. Actually present in Bóbrka and associated with its development. "The face of the mine"	An important factor of authenticity, confirming the pioneering role of Bóbrka across oil mining in Poland and, more broadly, in a global context.	A significant factor of integrity, binding the tangible and intangible values into one consistent whole.
	Co-owners The authors of the descriptions and manuals Engineers The founders of the Museum	A group of representatives of the time, who contributed to development of the mine, the profession of an oil miner and the oil industry, knowledge of the oil industry and, finally, to preservation of the memory of the pioneering exploitation activities in Bóbrka.	An important factor of authenticity, confirming the pioneering role of Bóbrka in oil mining and documenting subsequent historical stages of evolution of the mine in Bóbrka.	A significant factor of integrity, binding the tangible and intangible values into one consistent whole. Highlighting the continuity of the place's function and explaining the evolutions through time.
Management methods and systems	Tradition of mining management and the role of mining law in the place's management	An element of historical functional continuity in the intangible aspect	An important factor of authenticity, complementing the characteristics of the place as an actual oil mine	An important factor of integrity, related to the uniqueness of the place as a continuously-running oil mining site.
	The memory of the first mine	Represented in publications, museum narrative, symbolised by the obelisk.	A significant factor of authenticity of the perception of the place.	A significant element of integrity of the perception of the place.
The atmosphere and perception uniquely associated with the place and its added museum function	The open-air museum	Feeling the old times of the presented equipment, decisive on the perception of the museum narrative.	It results from authenticity of the place.	A significant element of integrity of the perception of the place.

II. FORMULATION OF PRELIMINARY CONSERVATION GUIDELINES FOR THE PROTECTION OF THE ASSET

The predominant value, which should determine the activities associated with the asset:

The predominant value – testimony of the origins and development of exploitation of one of the most important natural resources of the contemporary world.

The historical value at (in the context of historic monuments) is a technological monument related to the development of the Polish engineering, social, and national initiative.

CONCLUSIONS AND RECOMMENDATIONS DETERMINING THE WAY OF DEALING WITH THE ASSET:

Attributes that should be preserved (may be reconstructed)

- All attributes – regardless of the assessment of their rank and significance in the analysis of the value of the asset – should be preserved. Characteristics of the attributes and their components and assessment of their authenticity and integrity allows to indicate those features and elements that essentially decide on the mine's and museum's value. A predominant rule should apply here, that all attributes and their original, authentic and integrity-determining components must be preserved and highlighted. The development and needs of the museum cannot negatively influence the preserved original and authentic substance and historical form. All new arrangements, changes in land use (including surroundings of the historical buildings) should especially consider the historical investment. Particular concern should be given to preserving in good and unchanged condition all the authentic elements and those that decide on the integrity of the asset.

In relation to the separated and characterised attributes and their components, these are primarily:

- The relics of the historical cultural landscape of the mine:
 - preservation of and making legible all the historical elements of the mining landscape – the terrain (related to the geological conditions of the land) and positioning of the preserved historical buildings, devices and other elements of the mine's infrastructure;
- making legible and possibly reconstructing and recomposing other elements: the accompanying greenery, composition of paths, division into sectors, etc. – based on historical and land-

scape studies and land arrangement designs. The concept of the target presentation of the place is necessary due to some randomness of the present land use.

- Equipment – the original and historical facilities – carrying out conservatory maintenance; in the case of transformed buildings, e.g. the "Naftusia" house, the architectural and historical research made in order to determine the degree of preservation of the historical substance, depending on the results of the diagnosis – a conservatory project of adjusting the form and highlighting the historical values (which may also be the layers documenting the continuity of the functioning of the complex).
- Equipment – 19th-century cellars, the obelisk and other elements from the pioneering times – relics of the historical infrastructure of the mine – conducting current, conservative maintenance works in order to preserve their unchanged form.
- Equipment – devices that are reconstructions based on 19th-century drawings and manuals, complementing the original, 19th-century mining infrastructure – conducting current, conservative maintenance works.
- Equipment – original devices from the 20th century, that were transferred to the museum during the creation of the exhibition and its supplementation – conducting current, conservative maintenance works.
- Equipment as a museum collection – thematic verification of the collection, determination of the directions of development (the needs to acquire exhibits to complement the presentation of events).
- Function:
 - maintaining the exploitation function (even on a small scale) is a very important recommendation, since it is an attribute (industrial function and its continuity) that significantly influences the high rating of the asset's value, authenticity and integrity;
 - contemporary functions of particular historical buildings should, to the maximum possible extent, make visible their historical functions.

Recommendations regarding the manner of conducting conservation works

- A general recommendation is to consider, in all museum operations concerning the historical mine and collections of mining exhibits, conservation pragmatics, regardless of any potentially existing legal requirements in that regard. Operations con-

cerning buildings, machines and devices that constitute museum resources, should be preceded by a full historical and technical characteristic of the facilities, should result from the individually developed programs of conservation works and should take into account the predominance of the rule of preservation and protection of the authentic substance of the object of the works (the exhibit).

- It is necessary to precede, in each case, conservation and repair works with tests adequate to the scale of the potential interference or transformation.
- It is necessary to perform architectural and historical tests of selected architectural objects located in the premises of the mine, in order to determine the degree of preservation of the historical substance.
- It is necessary to make inventory of the arranged greenery and relics of the historical stand.
- It is recommended to perform an evaluation of the historic value (as technical historic sites) of the original devices from the 20th century that were transferred to the museum during the creation of the exhibition and its supplementation.

Recommendations as to the manner of using the asset

- The development and needs of the Museum cannot negatively influence the preserved values of the asset.
- The possible development of the Museum and the exhibition must be subordinated to the necessity to protect and highlight the scenic and functional relations of the historical mine and preserve the legibility and functionality of the historical wells – cellars. Protection of that separated enclave in the Museum's collections seems to have precedence in all conservation strategies.

Apart from the above recommendations, it is also advised:

- to develop a historical and landscape study of the mine that uses the archived plans, iconography, analyses of the source materials;
- to develop a comprehensive concept and project of territorial planning and arrangement of the mine area, in order to emphasize the oldest areas and re-evaluate the mining landscape relics. The project(s) should concern both the clarification and possible recomposing of the spatial layout, arranged greenery, and the surroundings of the historic buildings, e.g. the Łukasiewicz House;
- to develop a landscape and scenic analysis, which will be a basis for delineating a zone of conservative protection of the complex (surroundings of

the historic site entered into the register of historic monuments, a buffer zone in the event of applying for the UNESCO List entry).

CONCLUSIONS ARISING FROM THE EVALUATION OF THE ASSET USING THE SMART VALUE METHOD

According to the assumptions of the SMART Value method, evaluation of the oil mine in Bóbrka was based on two major stages (levels). As part of the first stage, recognition and comprehensive characteristic were made of all the observed features of the asset that are significant for the formulation of various values of the asset and, first of all, determination of a reference group (a comparative group).

Characteristic and comparative evaluation conducted in such manner, based on criteria, and the performed assessment of the asset's value (in light of the selected criteria in relation to the reference group) allowed to place the mine and museum in Bóbrka on an adequate level in the hierarchy of similar historic sites in Poland, Europe and the world. The evaluation confirmed that the asset is unique on a national scale and significant on a European and global scale, at the same time defining the uniqueness. Such evaluation process showed some exquisite values of the mine in Bóbrka, important for the cultural heritage in Poland – values that predetermine the asset to be recognised as a Historic Monument. Determination of reference criteria and comparative group in a broader – European and global – context was also a good starting point for possible future attempts of the asset's manager to enter it into the UNESCO World Heritage List, since the performed value analysis allowed to indicate a comparative group of sites and potential partners.

At the second stage of the Bóbrka mine evaluation, the tangible and intangible attributes and their components were defined, characterised and assessed (with regard to preservation of their authenticity and integrity). Their variety and the many related aspects of historic values contributed to better recognising and understanding the place's multidimensionality. According to the assumptions of the SMART Value method, *determination of the value's attributes aims at finding those components of the historic site that are essential (necessary) for the preservation of its comprehensive value.* Analysis of the value of the asset, performed at this stage (without comparing and referencing the comparative group identified at the first stage of evaluation) is necessary primarily in such situations, where there is a need to undertake any actions and interventions towards the asset. This part of the evaluation process should be treated mainly as a starting point to be used by conservators-restorers in all works on the object and in its surroundings. Systematised learning about the

asset, from the point of view of factors important for its protection, is actually very significant for activities undertaken by conservation services and repair and conservation works contractors. Based on the indications arising from the evaluation, it is easier and more precise to define the conservation guidelines, defining the method of dealing with the asset, as well as indications relating to the scope of possible interference.

Evaluation using the SMART Value method also showed specific areas for detailed testing, necessary for better

understanding the asset and its value. Moreover, in the context of the – necessary for developing for assets with outstanding value – management plans, the performed evaluation allowed for determination of the types and areas of risk and enabled identification of preliminary conclusions and recommendations for execution of the management plan. Evaluation performed using the SMART Value method may be therefore considered a starting point and a necessary ingredient of the management plan of the asset.

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ANALYSIS OF THE VALUE

OF THE PAPER MILL PREMISES

IN DUSZNIKI-ZDRÓJ



FORMAL DESCRIPTION OF THE PROPERTY



FORMAL DESCRIPTION OF THE PROPERTY

1.1 Historical analysis of the property

1.1.1 Historical context of paper production¹

Invention of paper and using it as a basic carrier of information is widely regarded as the most important civilizational achievements. The history of papermaking dates back to the early 2nd century A.D. and the paper itself was invented in China. Later, paper production spread to other countries in Asia and in the 8th century, the art of making paper was popularized in Asia Minor and Middle East. In the 10th century, paper started to be produced also in north-African countries.

The first workshops in Europe were established in the 12th century – in the lands conquered by the Arabs (Iberian Peninsula) and, probably, in Sicily. The first paper manufactures in Spain and Italy were opened in Valencia and Fabriano already in the year 1100 and 13th century respectively. In France, the first papermaking workshops were founded in the early 14th century. Gradually, papermaking was becoming increasingly popular in North and East Europe. The first paper mills in Germany are dated at the early 14th century, e.g. the workshops in Cologne and Mainz. In the 15th century, paper was also produced in Poland, England, and Switzerland.

The Europeans improved the papermaking technique they acquired from the Arabs. The technique and the special process of producing laid paper was developed in the 18th century by Italian papermakers of Fabriano. Paper was laid on wired screens and identified with

watermarks. The paper pressing method was improved by introducing the screw press. Implementing the hammer grinder powered by water wheel was a revolutionary change in the papermaking process. The moment this machine was introduced into papermaking is considered the beginning of paper mills. All these changes resulted in production being more effective and the quality of paper being improved.

In Poland, papermaking traditions are dated at late Medieval. Paper mill in Prądnik Czerwony outside Cracow built in the late 15th century (construction works started in 1491) is considered the first Polish paper production workshop. In Rzeczpospolita, papermaking was developing rapidly – until mid-seventeenth century, at least 112 paper mills had been built. In the period of Old Poland, papermaking centres included area outside Cracow and Gdansk, as well as Greater Poland and Masovia regions. According to the information being available, in the years 1650–1770, approximately 75 paper mills used to be in operation in Rzeczpospolita. The first laid paper production workshops were established in the late 15th century. In Wrocław, a paper mill was functioning already in the year 1490. In subsequent centuries, there were over 100 papermaking workshops in Silesia.

A number of conditions, i.e. social, economic, cultural, and natural ones influenced the development of the papermaking business in the pre-industrial era. In order to be provided with hydropower, paper mills, as any other mill, needed to be located at a river or a larger stream. As quality of paper was contingent upon quality of water, clean current water was critical in the production process. As paper production required using a number of complicated machines and pieces of technical equipment, highly-qualified labourers needed to be employed in paper mills. Paper could not be

¹ This chapter is based on published and non-published material, including in particular: *Młyny papiernicze na świecie – analiza porównawcza*, J. Bałchan, A. Chudziak, B. Dębowska, K. Jankowski, D. Kacperowska, M. Nowicka, ed. dr. hab. M. Szymczyka Ph.D.; collection of the Museum of Papermaking in Duszniki-Zdrój, Duszniki-Zdrój 2015; K. Małeczyńska, *Dzieje starego piapiernictwa śląskiego*, Warsaw-Wrocław, Cracow, 1961

塘漂竹斬



Fig. 1. Chinese drawing depicting the papermaking process. Source: https://pl.wikipedia.org/wiki/Papier#Historia_papieru_na_C5.9Bwiecie



Fig. 2. Papermaking in Europe. Source: <http://www.peace-paperproject.org/dardhunter.html>

were not only great sources of rags but also good markets for selling paper. What was also of considerable importance to papermaking business was good distance to routes and roads. The paper mill in Duszniki was satisfying all the aforementioned conditions for a few hundred years and, therefore, it could function, develop, and enjoy prominence.

Once machine production was popularized in Europe, the rapid development of handmaking paper was no longer stimulated. Industrial revolution in the paper-making industry started in France in the late 18th century and followed from introducing the paper machine. What distinguishes paper factories from paper mills is that water wheels and handmaking were replaced with paper machines using e.g. steam engines or water turbines as sources of power. Paper machine, after having been improved in England, was growing in popularity. Machine production of paper developed rapidly in Europe in the period of 1930s and 1940s. Consequently, paper mills declined in trade and had to be closed – they had no competitive advantages over the modern workshops.

The paper mill in Duszniki-Zdrój, considered a material that is relevant by its use or its invention, Polish listed monument, and wooden property of outstanding architectural significance is put into the context of the old European tradition of handmaking laid paper. It is also worth emphasising that it was mentioned by travellers already in the 17th century as the famous paper mill. For several centuries, the paper mill was famous not only for products of outstanding quality but also of its architectural value. Generations of researchers and historic preservation specialists found its beauty and outstanding historical value greatly significant. At present, the premises function as a museum where paper is still produced for demonstration purposes by deploying old medieval methods.

produced without rags which were used for making paper pulp. The rags were purchased from inhabitants of the local areas, however, following the development of paper mills, this source turned out to be insufficient. In some periods, paper makers suffered from the lack of rags. Therefore, local authorities granted paper mills various privileges under which paper makers enjoyed exclusive right to collect and purchase rags in a certain area. Furthermore, paper mills were situated in close proximity to cities, which, because of being populous,

1.1.2 The history of the paper mill and development of Duszniki²

It is unknown when exactly the first paper mill in Duszniki was built. Archive documents confirm that the manufacture dates back to the second half of the 16th century. In 1562, Ambrosius Tepper the papermaker, sold the mill to Nicolaus Kretschmer, member of a family of royal paper makers of Saxony. It is, however, presumed that the paper mill in Duszniki had been functioning long before 1562. Gregor Kretschmer, who inherited the paper mill in 1588, is credited with economic development of the manufacture. Since 1599, in paper production, Gregor had been using crystal-clear spring water running in pipes from his neighbour's estate. This allowed for increasing the quality of paper made in Duszniki. In the second half of the 16th century, the paper mill developed successfully, along with the city where it was located. In Duszniki, it is the time when the cloth industry develops, the trade booms, and iron ore extraction grows. The development of the city is also reflected in building brick-and-mortar town hall and parish church, establishing a hospital, and purchasing, by the town authorities, the Homole Castle from emperor Rudolph II. The oldest watermark depicting Saint Peter, which was used in the paper mill in Duszniki, dates back to the late 16th century. Following the outbreak of the Thirty Years' War, the city could not develop so rapidly any more.

Although the paper mill was destroyed in flood which hit Duszniki in 1601, Gregor Kretschmer managed to rebuild the premises in 1605. This date is displayed on the lintel on north-facing external wall of the building. A different year, i.e. 1606, and a monogram were engraved on an anemometer installed on the chimney, which was dismantled in 1912.³

It is possible that for rebuilding the premises the remains of the sixteenth-century building were used, i.e. a part of the masonry-made lower ground floor and parts of the floor of the current paper mill, e.g. the part featuring a sixteenth-century fascia portal and the bay latrine supported with stone-made corbels.⁴ Dendrochronology analyses of the wooden elements of the building being conducted in the last few years confirmed the date of rebuilding the premises.⁵ The age of wood cut in the early 17th century (1602–1605) was confirmed in testing samples collected from ceiling and floor beams. It was also confirmed that the seventeenth-century wooden elements have never been displaced. R. Eysymontt is of the opinion that the transformations taking place in the subject paper mill in the 17th century were not consistent. Judging by different elements of architectural detailing, Eysymontt assumes that "there were two construction stages in the 17th century: one in the early time (lower ground floor walls, a part of beam ceiling) and one in the late 17th century (wall rustication, vaults). The double window in the lower ground floor may be dated at the early 18th century⁶.

Gregor Kretschmer is credited with making the paper mill in Duszniki famous. He had sufficient funds to rebuild the premises destroyed in the flood and enhance the quality of paper through improving the papermaking process. In recognition of his accomplishments in the 17th century, Emperor Rudolf II of Austria bestowed gentry title von Schenkendorf upon Gregor Kretschmer. A document Emperor Rudolf issued on 13 August 1607

² The history of the paper mill has been recorded as a result of studying published and non-published materials, including: R. Eysymontt and A. Szelaąg, D. Eysymontt (collaboration), *Młyn papierniczy w Dusznikach Zdroju – ocena wartości historycznej i artystycznej budynku dusznickiego młyna papierniczego wpisanego na listę Pomników Historii wraz z analizą historyczno-ikonograficzną polichromii zdobiących ściany pomieszczeń papierni na trzeciej kondygnacji oraz analizą historyczno-stylistyczną portretów dusznickich papierników ze zbiorów Muzeum Papiernictwa w Dusznikach Zdroju*, Museum of Papermaking in Duszniki-Zdrój, Wrocław 2016; R. Eysymontt, "Przemiany architektoniczne młyna papierniczego w Dusznikach na tle przemian ekonomicznych miasta Duszniki do początku XIX w." in *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, p.9–41, G. Grajewski, "O podejmowanych przed 1945 rokiem próbach ratowania młyna papierniczego w Dusznikach-Zdroju," *Rocznik Muzeum Papiernictwa*, vol. 9, Duszniki-Zdrój 2016, pp. 9–30; Kwapis K., "Młyn papierniczy z suszarnią i pawilonem wejściowym," *Karta Ewidencyjna Zabytków Architektury i Budownictwa*, NID Archive, 2007; Małczyńska K., *Dzieje starego papiernictwa śląskiego*, Wrocław 1961; Sarnecki K., "Papiernia w Dusznikach," *Przegląd Papierniczy*, 1964, vol. 12; Szymczyk M., "Stan badań nad historią papiernictwa na ziemiach polskich," *Rocznik Muzeum Papiernictwa*, vol. 1, Duszniki-Zdrój 2007, pp. 11–26; Tomaszewska W., "Historia zabytkowej papierni w Dusznikach," *Przegląd Papierniczy*, 1959, vol. 11; Tomaszewska W., "Z dziejów zabytkowej papierni w Dusznikach," *Przegląd Papierniczy*, 1966, vol. 5; Windyka T., "Młyn papierniczy w Dusznikach," *Muzealnictwo*, vol. 41,

1999; Nomination for Listing the Paper Mill in Duszniki-Zdrój in the List of Polish Listed Monuments, developed by A. Stefaniszyn, T. Windyka, M. Szymczyk, ed. M. Szymczyk, Duszniki-Zdrój 2009.

³ G. Grajewski, *O podejmowanych przed 1945 rokiem...*, p. 14. At present, a replica of the anemometer is fixed on the entrance pavilion.

⁴ Dating provided by: R. Eysymontt, "Przemiany architektoniczne młyna....,"

⁵ M. Krąpiec, *Dendrochronologiczne datowanie drewna z Muzeum Papiernictwa w Dusznikach Zdroju*, Cracow, 2015.

⁶ R. Eysymontt, "Przemiany architektoniczne młyna....," *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, pp. 20.

in Prague, confirming granting Gregor Kretschmer and his brother a coat of arms, has been preserved.⁷ The document is enclosed with a portrait of Gregor – Christian Wilhelm von Schenkendorf dated at 1671.⁸ Gregor Kretschmer became a part of the history of Duszniki – not only as the prominent owner of the famous paper mill but also as the citizen who rendered great service to the town. In honour of his achievements, a Holy Cross church was built on the hill adjacent to the paper mill. The church, where Kretschmer was buried, has not been preserved today.⁹

Next generations of the Kretschmer von Schenkendorf papermaker family developed the paper mill and maintained high quality of paper. In 1623, after Gregor had died, his son Samuel purchased the paper mill from his step mother. After his death, the workshop was run by his wife. In 1657, the paper mill was owned by Christian Kretschmer, Samuel's son. Christian, who was also the mayor of Duszniki, supplied all offices in Duszniki with paper. In 1685, he was granted a monopoly on collecting rags from the entire Kłodzko District. After Christian had died in 1689, his wife Zuzanna inherited the workshop. This was later owned by his son, Christian Wilhelm – the last member of the Kretschmer family to own the paper mill.

In the late 17th and 18th century, the town was developing again. It was the time when new buildings made of masonry material were built around the Market and along Kłodzka Street, which connects the Market with the paper mill. In the late 18th century, Duszniki were also known as a health resort, rapidly developing in the first quarter of the 19th century.

In 1706, the paper mill was purchased by Johann Anton Heller of Frýdlant in the Czech Republic. For over a hundred years, the paper mill was owned by the Hellers and their heirs, the Ossendorfs (until 1822).

The Hellers extended the paper mill and modernised paper production. In 1709, Anton Heller purchased the 'lower mill', where he intended to organize a smithy and, later, lumber mill. The building, however, was used for warehousing and production purposes and was dismantled in the 1950s.

It is still not certain when exactly the wooden drying house adjacent to east-facing wall of the paper mill was erected. In literature, two different dates are provided: 1709 and 1747. T. Windyka has strong reasons to believe that the drying house was built in the first quarter of the 18th century, whereby the building existed already in the 1737 (it is presented in a drawing provided with this date).¹⁰ Although two dendrochronology analyses were conducted in the subject premises, the exact date of their construction is still unknown.¹¹ In the first study, it was determined that construction elements of the building are made of wood, which was cut in the period between Autumn 1742 and Spring 1743. The second study revealed that the subject premises feature secondary and primary wood dated at the early 17th and 18th century respectively. The eighteenth-century wooden beams having been analysed were dated at 1705, 1708 (secondary wood) and the 1840s (used in load-bearing columns in the drying house). As it was impossible to determine the exact date of cutting the younger wood, it was assumed that *terminus post quem* dated at 1746, as per the age of the most recent sample. R. Eysymontt, having analysed the aforementioned information, dated the drying house building at the period of 1743–1747. Like authors of other analyses, he distinguishes the older part of the building (of log-frame structure), which might have been used as the rag laundry and is dated at the turn of the 16th and 17th centuries.¹²

Additionally, following the studies conducted to date, it was impossible to determine the chronology of the representative entrance pavilion. Most frequently, the edifice is dated at the early 18th century – the dates vary from 1709 to 1769, when the premises were substantially renovated after the flood.

⁷ This document, which was mentioned for the first time by W. Hohauser in "Die Papierfabrikation in der Grafschaft Glatz," *Glatzer Vierteljahrschrift für Geschichte und Heimatkunde der Grafschaft Glatz* of 1886, was found in 2016 by R. Eysymontt in Wrocław State Archive Department in Kamieniec Ząbkowicki (The City of Duszniki Files, no. 100).

⁸ R. Eysymontt, *Młyn papierniczy w Dusznikach Zdroju*, mps, Wrocław 2016, p. 10.

⁹ The church was dismantled in 1950s. Tombstones of the Kretschmers, mentioned in the literature, have not been preserved.

¹⁰ T. Windyka, "Młyn papierniczy w Dusznikach," *Muzealnictwo* vol. 41, Warsaw 1999, p. 16 The lithography entitled *Reinerz aus dre Vogelschau* (1737) was published in 1862 in F.A. Pompejus, *Album der Grafschaft Glatz...* However, in *Młyn papierniczy w Dusznikach Zdroju*, p. 34, R. Eysymontt writes that: *It is not, however, certain when Werner painted the view which inspired Pompejus.*

¹¹ M. Krąpiec, *Wyniki analizy dendrochronologicznej prób drewna z siedziby Muzeum Papiernictwa w Dusznikach Zdroju*, Cracow 2007, Archive of the State Museum; M. Krąpiec, *Dendrochronologiczne datowanie drewna z Muzeum Papiernictwa w Dusznikach Zdroju*, Cracow 2015, Archive of the State Museum.

¹² R. Eysymontt, *Młyn papierniczy...*, p. 34; The authors of the nomination for listing the paper mill as the Polish Listed Monument believe that the drying house was built approximately in 1747 and its construction followed from extending a small seventeenth-century building situated at the flume, east of the paper mill.



Fig. 3. Duszni-Zdrój, O. Pompejus, litograph (1862) inspired by F. B. Werner. Source: <https://dolny-slask.org.pl/942837,foto.html>



Fig. 4. Duszni. Litograph by W. Steinmentz, 1838. Source: <https://dolny-slask.org.pl/4745315,foto.html?idEntity=519097>

It was in the 18th century when the property was most prosperous. The owners implemented a number of state-of-the-art technological solutions and installed modern production machines, e.g. overshot wheel (1719), the “Hollander beater” (1737) used to make paper pulp of rags (the first device of this kind on the territory being currently within the borders of Poland)¹³, as well as machinery used for chopping rags and smoothing paper. These innovative solutions resulted in the quality of paper produced in Duszni being considerably enhanced. The value of this unique product was appreciated and, hence, Frederick II appointed Anton Benedict Heller, who inherited the paper mill from his late father in 1742, and ¹⁴ his son-in-law, Johann Joseph Ossendorf, the official suppliers of paper to the Prussian court. Anton Benedict Heller, who owned the

paper mill in the period of 1742–1772, was also the landlord of the site.¹⁵

In the first half of the 18th century, further renovation and adaptation works were carried out. As a result, the following elements were created: the wooden volute gable in west part of the building, the large wooden garret room in north-facing part of the roof, the staircase, and, presumably, the walls and ceiling parts supported by volute-like struts above the corridor on the second floor¹⁶.

Once Prussia started to hold domination over Silesia and Kłodzko Land, supply of rags became severely depleted. This posed serious problem for the paper mill in Duszni. In 1769, the premises were damaged after heavy floods sweep through Duszni. It is, however, unknown how seriously the paper mill suffered. Some researchers claim that it was when the entrance pavilion was built.¹⁷

In 1772 (or, according to other sources – in 1769), soon after the paper mill had been damaged, Johann Josef Ossendorf, paper maker of Czech nationality and married to Antonia Josefa, Benedict Heller’s daughter, was

¹³ The date of and information on introducing the “hollander” in the production process and the fact that it was the first device of this kind used on the territory being currently within the borders of Poland can be found in the nomination for listing the premises as the Polish Listed Monument. M. Szymczyk, Ph.D., recommended that it is critical to determine when exactly this happened. As implementation of this device was a quantum leap in technological development (see: R. Eysymontt, *Przemiany Architektoniczne...*, footnote 25), the date must be proven by reliable sources. This will be also of great importance for assessing values of individual components of the subject serial property with the purpose of inscribing it on the UNESCO List.

¹⁴ The time when Prussia held dominion over Kłodzko District.

¹⁵ In Podgórze, he owned Bronnendorf manor, also known as ‘Papiermacherhof’ or ‘Papierhof’; see: R. Eysymontt, “Przemiany architektoniczne młyna....,”

¹⁶ R. Eysymontt, “Przemiany architektoniczne młyna....,”

¹⁷ E.g. M. Kutzner, R. Eysymontt

appointed the supervisor of the facility. Johann Ossendorf serves only a short time – after his untimely death in 1779, his wife inherited the workshop, which she renovated. The date '1802' (which may be the time of completing renovation works) and Mrs Ossendorf's initials are displayed above the entrance to the lower ground floor in north-facing part of the building (A. O. H. 1802).

In the early 19th century, following Napoleonic wars, paper production was cut. In 1806, Antonia Josefa Ossendorf sold the paper mill to her son-in-law, Johan Leo Königer. In 1822, Johann Leo Königer, who was the last owner related to the Hellers, sold the facility to Joseph Wiehr, a miller from Ząbkowice. It was until 1939 that the Wiehrs had been the owners of the paper mill – in the period of 1842-1847, the building belonged to Joseph's widow and from 1847 to 1899 – to Carl I Wiehr and Carl II Wiehr.

In the second half of the 19th century, the papermaking industry underwent revolutionary civilizational changes – once automated machinery was adopted, production of hand-made paper was no longer profitable. In 1905, the paper mill in Duszniki gave up production of laid paper. Consequently, Carl Wiehr decided to modernize the paper mill through adoption of a state-of-the-art paper and cardboard paper production machinery, redevelopment of the production room, deepening of the flume, and replacement of water wheel with the turbine. The changes, however, did not keep the paper mill competitive with large, modern factories. In the early 1930s, the area surrounding the paper mill was changed extensively, following the erection of the bridge over the Bystrzyca River, east of the subject facility.

It is possible that paper was no longer produced in the subject facility in 1937. In 1939, the premises became the property of the city authorities whose representatives decided to open a museum there. However, once the second World War broke out, the idea of opening the Museum of Papermaking was given up.

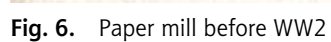
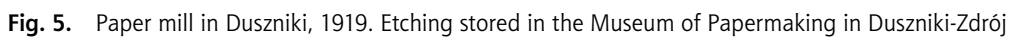
The seventeenth-/eighteenth-/early-nineteenth-century spatial and architectural forms of the paper mill premises (paper mill, drying house, entrance pavilion) have been well preserved. Renovation works conducted in the 19th century did not affect the body of the building; they only concerned changing the functional layout of the interiors. In the early 20th century (around 1905), the new papermaking machinery required the interior of the ground floor of the paper mill to be redeveloped. As the water wheel was replaced with the water turbine, it was not only the production process but also the area surrounding the paper mill that had to be adapted. The works involved, e.g. deepening the

flume. Economic and financial standing of the owner resulted in the premises falling into disrepair. As historical significance of the subject property increased in the early 20th century, it was possible to receive financial aid to renovation works. In 1912, only a few of these works were carried out – roof shingles and decorations on external walls were repaired. Additionally, the chimney at north-facing wall of the paper mill was dismantled. This decision was challenged as impoverishing the general expression of the building, the loss of valuable evidence of the past and the characteristic architectural element. The wooden balcony on south-facing wall might have been attached to the building in the 1930s. In the early 1940s, a number of necessary renovation works were carried out: the roof was protected and repaired, which resulted in its form being changed (large, rectangular, non-original dormers in north part were replaced with eyebrow dormers; eyebrow dormers in the southern part were shortened); west gable was renovated, as was the roof of the entrance pavilion; south wall was supported with buttresses¹⁸.

After WW2, despite the works having been carried out, the building was dilapidated. Moreover, constantly changing entities being responsible for the premises (in the period of 1945–1952: city authorities, papermaking business, city authorities) as well as the lack of decision on the use and development plans for the paper mill (re-launching paper production or opening a museum) were also disadvantageous.

After WW2, the technical condition of the badly maintained paper mill was deteriorating. Conservation, renovation, and adaptation works were launched in the late 1950s and led to opening The Museum of Papermaking in 1968. This saved the historic site from being reduced to rubble and opened a new chapter in its history.

¹⁸ Detailed information is provided by G. Grajewski in "O podejmowanych przed 1945 rokiem...", pp. 9–30.



1.2 Formal description of the property

1.2.1 Location

The paper mill premises are located in Duszniki-Zdrój, Kłodzko District, Lower-Silesian Region. They are situated on the outskirts of the city in its north-east part at the Bystrzyca Dusznicka river (tributary of the Nysa Kłodzka), which sections the premises off Kłodzka Street. The premises in question are situated at the crossroads of Kłodzko-Kudowa Zdrój (national road no. 8) facing north and Sprzymierzonych Street running towards Zieleniec and facing east, several metres below their level. Several metres north of the paper mill premises, there is the Bystrzyca Dusznicka River. Further north, behind the river, there is national road no. 8. East of the drying house, along Sprzymierzonych Street, there is a bridge dating back to the inter-war period. South of the premises of historical significance, on the tract of land where the Museum of Papermaking is situated, there are contemporary buildings, including an exhibition pavilion and a boiler house. In west and south-west part, one can find a fibre crop garden. The area where the paper mill is located is sectioned off with contemporary fencing. Further south, there is Chopin Estate with several blocks of flats and, in west, there are old tenement buildings.

1.2.2 Short description of the paper mill premises

The paper mill premises consist of two conjoined buildings: drying house built in the 18th century and the main building referred to as the 'paper mill', which was initially used for manufacturing and residential purposes. Analysis of its structure allows us to find traces of several phases of construction works carried out between the 16th and the early 19th centuries. In north part of the paper mill, there is a peculiar polygonal entrance pavilion, erected presumably in the second half of the 18th century. A covered porch and a wooden bridge over the Bystrzyca Kłodzka river connect it to the hanging mill and to Kłodzka Street respectively. Furthermore, in north-east part of the mill, there is an extension which might have been built in the 19th century.

The ground plan of the main edifice of the mill is that of a prolonged rectangle. It is a two-storey building with high, stone-made lower ground floor and mostly wooden, beam construction of the second floor (south-west part of the storey is made of brick). The property is covered with a distinctive high, shingled, gable roof with several rows of continuous vent bores located along the roof, which are typical of paper mills. In north part of the roof, there is a large wooden garret room covered with gabled roof. Two wooden gables crowning the side walls of the subject building are of different design – east-facing one is



Fig. 7. Paper mill in the cultural landscape of Duszniki-Zdrój Archive of the Museum of Papermaking in Duszniki-Zdrój

triangular in shape, whereas west-facing one features impressive volutes on sides and a triangular tympanum on top provided with wooden moulding. This volute-ornated gable typical of masonry Baroque buildings makes the mill a truly distinctive property.

Both north (front facade) and west side of the building are richly ornated. The decorations include the following elements in particular: rusticated lower ground floor and arches ornamented with small rosettes and half-rosettes. These decorations are made in light-red and sand-coloured plaster and indicate floor divisions. On south-facing side of the building, half-timber framing. Next to it, there is another distinctive element, i.e. a bay latrine supported by profiled stone trusses.

The impressive paper mill building tells of the past glory and prosperity of the workshop and is the evidence of importance and wealth of paper maker families of Duszniki.

The interior of the mill was used not only for production but also residential purposes. Paper itself was made on the ground floor, where living and cloth sorting rooms might have been situated. Upper floors, except two rooms on the first floor used for residential purposes, were used as drying space. Wall and ceiling paintings depicting ornamental, floral, architectural, and human-shape compositions dated at the 17th, 18th, and 19th centuries have been preserved as well¹⁹. As it is uncommon to find polychrome paintings in mills and other industrial buildings, the ornaments in the paper mill in Duszniki are consid-

¹⁹ Polychrome paintings dated according to the most recent and not yet published analyses conducted in 2017 by Andrzej Kozieł and Adam Szelaq.



Fig. 8. Paper mill premises. Photo by A. Fortuna-Marek



Fig. 9. Paper mill premises. Photo by A. Fortuna-Marek



Fig. 10. Paper mill building facing west.
Photo by A. Fortuna-Marek



Fig. 11. Drying house facing south-east. Photo by A. Fortuna-Marek



Fig. 12. Entrance pavilion facing east. Photo by A. Fortuna-Marek

ered unique. Some rooms on the ground floor have both barrel and groin vaults. Well-preserved, sixteenth- and seventeenth-century portals are valuable, original decorative elements. At the moment, on the lower ground floor, laid paper is produced for demonstration purposes. Other rooms function as exhibition rooms and offices.

Construction of the drying house attached to the mill in the 18th century incorporates framing. This is a compact building with high roof and vent bores typical of paper mills. The walls are wooden, dark-brown, with no decorations. Initially, the ground floor of the building in question used to be used for warehousing raw materials, whereas paper used to be drained on the upper floors. Currently, the interior is being adapted for exhibition, office and education purposes.

Another element of great importance for the composition of the paper mill premises is the entrance pavilion of peculiar shape and form. It is a two-storey building of small size, octagonal in plan and covered with

a dome. The walls are decorated much like the main walls of the main building.

The architectural form of the paper mill in Duszniki-Zdrój is typical of paper mills in general. It is a property that is relevant by its use or its invention, whose spatial composition, architectural form, and floor plan of particular rooms were determined by the function it used to serve initially – laid paper production plant. The mill and the entrance pavilion were made more visually attractive by being richly painted and provided with ornaments in Baroque ²⁰ style.

²⁰ Having applied comparative analysis and conducted iconography studies, R. Eysymontt claims in "Przemiany architektoniczne młyna..." (p.19) that the architectural decorations date back to the year 1800 and, hence, he defines them as being more typical of classicism.

1.3. Short description of the current condition of the property²¹

PRESERVATION OF ELEMENTS OF HISTORICAL SIGNIFICANCE

Once the paper mill was listed in the register of historic monuments and sites in 1956, works aimed at preserving the facilities could be carried out. First, the property was temporarily preserved and afterwards, in the period of 1959–1971, thorough renovation and conservation works were conducted. To certain extent, they affected the form and elements of great historical significance, e.g.: redeveloping the passage connecting the drying house with the paper mill, replacing structural elements of the truss, replacing a part of the structure of west gable. In order to support the structure of the paper mill, pillars made of materials of masonry construction were erected in the former production rooms.

In the years 1962–66, several renovation and adaptation works were conducted, e.g. concrete foundations were laid, stone-made walls were rebuilt, structural elements of the drying house were conserved and partly replaced, the doors and window frames were replaced. In the next years, rooms on the ground floor were adapted for producing laid paper; process piping was laid and production machinery was installed (some parts were collected from other facilities and some – reconstructed), which allowed for relaunching production of laid paper on small scale. The structure of the drying house was reinforced once again by installing compression braces. Walls of the drying house were provided with new formwork, identical to the previously installed one.

In the 1990s, wooden structural elements of the ceilings were replaced with steel beams, new wooden flooring was laid, and external walls were plastered. Moreover, the entrance pavilion was renovated – wall structure was reinforced.

In 1998, the paper mill premises were severely affected by flooding. In order to repair the damage, a number of different renovation works needed to be carried out. These involved reinforcement of structural elements of the drying house, renovation of the external walls, replacement of windows and installations, as well as renovation of the interior (including replacement of flooring) of the paper mill building.

After 2002, new plaster was laid on the external walls of the paper mill. Its colour was different from the previously applied one and its selection was based on results of stratigraphy studies, chemical analyses, and spectroscopy analysis of pigments. Further renovation works were carried out in the period of 2007–2008 and involved adapting the attic in the paper mill building, which used to serve paper draining purposes, for a new use – as an education, exhibition, and conference room. The change of the former use of the building as well as the assessment of its technical condition resulted in the original structure of the building being affected – the works involved building a new staircase featuring an elevator for the disabled, raising the floor level, replacing selected structural elements of the ceiling, and reinforcing ceiling beams with contemporary materials. In the years 2014–2016, comprehensive renovation works involving adaptation of the drying house for new uses (workshop, offices, exhibition rooms) were carried out as part of the project named “Renovation and Adaptation of the Drying House for Culture-Related Purposes and Providing the Museum of Papermaking in Duszniki-Zdrój with Fire Protection, Including Preservation and Digitalization of the Collected Assets.”

A number of extensive renovation, conservation, and adaptation works carried out in the paper mill premises concerned also polychrome paintings (1970s) in two rooms in the paper mill building. These involved, e.g. comprehensive restoration works (1986–87) which resulted in making the subject rooms available to museum visitors, as well as conservation works carried out in 1997. Polychrome paintings were also subject to minor conservation and preservation works carried out in 2000, 2002–2004, and 2007. As of yet, no painting conservation works have been carried out in the ‘Under the Dome’ room.

Short reports being provided with insufficient number of photographs or the lack of such documents make it difficult to assess how original the paintings are, i.e. which parts are reconstructed or designed and applied by conservators. However, information provided in documents produced in the period of 1986–87 concerning preservation of the polychrome paintings sheds some light on the subject matter: “In room no. 1, 70%, 40%, and 35% of paintings on the ceiling, on west- and north-facing wall, and on east-facing wall has been preserved respectively (per 1 square metre) ... In room no. 2, 70% of paintings on north-facing wall has been preserved. There are no boards in the space between windows.”²²

²¹ The text is based on the following publications and documents: J. Bałchan, “Zarys dziejów papierni w Dusznikach-Zdroju w latach 1945–1968 w świetle źródeł archiwalnych,” *Rocznik Muzeum Papiernictwa*, vol. 1, Duszniki-Zdrój 2007, pp. 157–164; Jan Bałchan, “Muzeum Papiernictwa pod kierownictwem Władysława Kazimierczaka w latach 1969–1981,” *Rocznik Muzeum Papiernictwa*, vol. 3, Duszniki-Zdrój 2009, pp. 19–26.

²² Documents on conservation works, ed. S. Szoc, Wrocław 1997, tspt in the archive in the Museum of Papermaking, p. 7

Since listing the paper mill in the register of immovable historic monuments, preservation of the distinctive features and elements of the architectural form of the buildings has not been deteriorated. The most extensive adaptation works were carried out in the interiors – not only with regard to the room layout, as a result of which such contemporary elements as the lift were installed, but also with regard to materials being applied, e.g. drywalls, new flooring, glass casing for drying house windows, etc., which affect the character of the interior and its authenticity.

TECHNICAL CONDITION

Although each building is in good technical condition, the properties vary in terms of degree of preservation. The drying house, where a number of renovation and conservation works were carried out in the last few years, ranks first in terms of the technical condition. The condition of the paper mill building is satisfying and the condition of the entrance pavilion requires improvement. The first floor of the latter building needs to be treated as a priority – due to its location, it is affected by damp.

The paper mill building – general technical condition is good. The condition of structural elements, i.e. foundations, ceilings and the roof framework was improved in 1990s and 2000s. Although the external walls are in ac-

ceptable condition, plaster requires fixing in certain places. The protective paint layer in the formwork of the wooden gable in east part of the building has visible defects. There is moss on north part of the shingled roof. On the lower ground floor, plaster on the interior walls needs fixing – the defects may follow from high humidity being the consequence of the purpose for which this part of the facility was used. The staircase, which has not been renovated for a long time, is in poor technical condition.

The condition of the polychrome paintings in the two rooms on the first attic floor should be assessed by a fine art conservator. The technical condition of the ceiling polychrome paintings in the 'Under the Dome' room is unknown as it has not been assessed by any specialist yet.

The condition of the equipment of historical significance is good, yet it varies from piece to piece.

The drying house – the technical condition of the structure is good, which follows from the last extensive renovation works (ceilings, walls, roof structure). Roof shingles need impregnation. Interior finishing elements are predominantly contemporary.

Entrance pavilion – general condition of the lower floor, which is particularly exposed to damp, is acceptable. The upper floor, which provides access to the Museum, is in good condition.

LEVEL 1



I. DESCRIPTION AND ANALYSIS OF THE PROPERTY AIMED AT SELECTING REFERENCE GROUP ATTRIBUTES

I.1. LOCATION AND THE SURROUNDING AREA

The paper mill is located within the confines of the city, in its north-eastern part, at the Bystrzyca Dusznicka river. It is situated at the Kłodzko – Kudowa-Zdrój crossroads in north (separated by the channel of the Bystrzyca Dusznicka river and Kłodzka Street) and the road heading Zieleniec (Sprzymierzonych St.) in east. Due to the nature of the manufacturing process, paper mills used to be built outside city centres, on the outskirts of urban settlements, between a river and a flume. In Duszniki, the old water system has not been preserved (no flume displayed). However, the mill's location on the river bank still provides an important historical context. It is also clear, despite the transformations having been made, that the mill was situated outside the original city centre, in close proximity to the former tract leading from Wrocław to Prague. The premises, in spite of a number of paper production-related elements being no longer displayed, e.g. the flume, is a clear, well-exhibited accent of historical significance in the cultural landscape of the city, contrasted with postmodern socialist architecture found further in south.

The current form of the paper mill surroundings results from a number of works and transformations undertaken over the years – some of them were completed already in the pre-war period, e.g. the bridge over the Bystrzyca river built in 1930s, and others – between 1950s and the present. Most of the works involved adaptation the premises to a new use – the museum of papermaking. In 1959, the flume was filled with soil, which resulted in the premises being deprived of the important functional system, which used to be an integral part of the property. This fact affected the authenticity and integrity of the site being analysed.

In the early 1970s, the paper mill was fenced (contemporary form, no elements similar to those of the

early 20th century), the embankment facing Sprzymierzonych Street was cleaned and adapted, and stairs to museum courtyard were built.

In the years 1974–76, the 'exhibition shed' was built close to the paper mill, in the southern part of the tract of land (the building where the museum shop, cafeteria, toilets, and boiler room are located).

Another contemporary element located in the paper mill is an outdoor exhibition showcasing paper production machines of large size, which were brought here from various parts of Poland.

Several years ago (early 21st century), a garden was opened west to the mill, where fibre crops used in crafting and paper making are grown.

The aforementioned changes and outcomes of works resulting in the present use of the paper mill as well as works carried out temporarily can be assessed as positive, neutral, and negative.

I.2. COMPOSITION LAYOUT OF THE PAPER MILL PREMISES

The paper mill premises consist of three interconnected buildings – the main building, i.e. the paper mill, the drying room, and the entrance pavilion. Their layout and functional spaces result from their purpose (paper laying room) – jointly, as the entire complex, and individually, according to the function each building served in the manufacturing process.

In this layout, the paper mill and the drying room, which are rectangular in floor plan and partly adjacent to one another, have their facades crowned with roof ridges facing the road. The entire composition is complemented by the octagonal pavilion, access to which is provided by a small bridge, and which



Fig. 14. Entrance Pavilion over the Bystrzyca Dusznicka facing east.
Photo by A. Fortuna-Marek



Fig. 15. Museum courtyard facing east.
Photo by A. Fortuna-Marek



Fig. 13. Aerial view over the paper mill.
Archive of the Museum of Papermaking in Duszniki-Zdrój

is connected to the paper mill by a roofed passage, as well as a low extension adjacent to the paper mill building and the drying house. In front of the paper mill building, where the paper used to be originally produced, there is an entrance pavilion, serving predominantly decorative function. As the amount of paper manufactured was strongly dependent on the size of the drying house, the eighteenth-century property,

which was built later than the mill itself, is the evidence of development and prosperity of the paper mill. The drying house having been used for precisely defined purposes was conveniently conjoined with the paper mill, so that wet paper could be moved easily. The way of connecting the paper mill and the drying house was adapted predominantly to the technical use of the properties.



Fig. 16. Paper mill surrounding area facing south. Photo by A. Fortuna-Marek



Fig. 17. Outdoor exhibition. Photo by A. Fortuna-Marek

Although these buildings were erected in two different periods and of different materials, their spatial structure is coherent, logical, and, in spite of each building having different construction and having been used for different purposes, their functional relations are clear and easy to recognise. Even though the spatial composition of the premises and interrelations between individual buildings were determined by the industrial

function they served, the predominantly functional layout stands out as clear, harmonious, and coherent. This increases the value of the paper mill premises as the architectural complex of historical significance. The premises are authentic and integral in terms of their layout.



Fig. 18. New garden set-up with contemporary buildings in the background. Photo by A. Fortuna-Marek



Fig. 19. Aerial view over the paper mill – facing south-west. Archive of the Museum of Papermaking in Duszniki-Zdrój

I.3. BUILDINGS OF DISTINCTIVE EXTERNAL FORM

THE MAIN BUILDING – PAPER MILL

The most important and the oldest part of the premises is the stone-and-wooden paper mill building of hybrid structure (lower ground floor and a part of the first floor made of masonry material; a part of the floor made of half-timber framing). It is a magnificent five-storey building, rectangular in floor plan. Three storeys are located within the roof. The cuboid, compact, and rather 'squat' building has a high-rise, gable, steep, shingled roof. The vast roof is provided with three long 'rows' of vent openings covered with mono-pitched roofs. These functional elements are typical of not only paper mills but also architectural form of buildings of this type. What is a highly distinctive element in north-facing field is wooden extension in form of large attic room covered with gabled roof, where staircase is located.

External walls of the paper mill are carefully designed. The north-facing facade and the wall facing west are distinguished by ornaments and architectural details meticulously designed in a baroque manner.²³ Having been painted bright and saturated colours, these walls

attract particular attention. The facade is covered with plaster and, on the first floor, decorated with semi-rusticated elements.²⁴ On the lower ground floor, window frames are simple, stone-made, covered with plaster. Moreover, there is a distinctive doubled window in west part of the building.²⁵ The peculiar ornamental elements on the wall at the height of the second floor of the main building prove that the wall decorations are artistic in nature. Symmetrically decorated wall in this part of the building is accentuated with regular, shallow pillars of different width, which support semi-circular arcades. Within the arcades, there are wooden return window framings. Above windows, in the areas marked off by the arcades, there are plaster-engraved rosettes and semi-rosettes located in alternative order. Bright colours complement the design of the walls – iron-red marbled wall with bright (sandy) pilasters and areas above the arch crowns.

The wall facing west, in the lower ground and second floor area features similar style, decorative elements and colours as the front facade. The ground floor is bossaged with three asymmetrically located windows

²³ Having applied comparative analysis and conducted iconography studies, R. Eysymontt claims in "Przemiany architektoniczne młyna..." (p.19) that the architectural decorations date back to the year 1800 and, hence, he defines them as being more typical of classicism. Eysymontt also provides several analogical examples from Silesia, e.g. facade of the tenement house at 1 Rynek/ Mikołaja Street in Wrocław and Prince Hohenlohe Palace at 12 Wita Stwosza in Wrocław.

²⁴ R. Eysymontt considered this decoration typical of the seventeenth century, when the paper mill was transformed – R. Eysymontt, "Przemiany architektoniczne młyna...", *Rocznik Muzeum Papiernictwa*, vol. 10, p. 19.

²⁵ According to Eysymontt, "Przemiany architektoniczne młyna...", *Rocznik Muzeum Papiernictwa*, vol. 10, p. 20, this window may date back to the early century as preserved.



Fig. 20. The paper mill facing north. Photo by A. Fortuna-Marek



Fig. 21. The paper mill facing north-west. Photo by A. Fortuna-Marek

in simple, painted, stone framing. On the level of the second floor, the colours as well as decorative and articulation elements correspond with the ones used on the front facade: arcade articulation, pilasters, rosettes and semi-rosettes, marbleized elements. Windows and painted false windows are in return window frames.

What is unique in this wall is the large, three-storey, wooden gable sectioned with frames and panels, ornated with large, wide volutes and crowned with a massive triangle tympanum. In the tympanum, on the fifth floor, there is a protruding, profiled, wooden moulding featuring one vent opening provided with a wooden shutter. The peak of the paper mill building was designed in Baroque style

and, according to results of dendrochronology tests having been conducted, is dated at the 1730s.²⁶ Given the paper mill in Duszniki-Zdrój, the volute-ornated peak typical of Baroque architecture is an extraordinary decoration – it is an adaptation of elements char-

acteristic of Baroque religious and secular buildings to an industrial building which, additionally, is made of materials uncommonly used for this purpose.²⁷ Moreover, the decoration in question proves that the paper makers working in Duszniki-Zdrój aimed at emphasizing their social and economic position by ornamenting the building sumptuously. The wooden volute is, in the light of the current studies, a unique architectural element.

On the rear, South-facing wall (and its east part in particular), different solution was applied – there is no architectural detailing.²⁸ The formal means having been applied prove that this side of the building was used for different purposes – more use-related and being used for production instead of representation. The ground floor is plastered yet decorated with no bossaging. Different colours were applied to distinguish it from the second floor. Windows and doors differ in size and shape (square, rectangular), they are placed asymmetrically, on various levels, without any particular order being preserved.

The colour of the second floor is juxtaposed with the colour

²⁶ R. Eysymontt, in "Przemiany architektoniczne młyna...", suggests two periods in which west-facing gable might have been built – either the first decade of the 18th century or the period after 1733. The dendrochronology test conducted in 2010 by M. Krąpiec indicated that the wood sample being analysed dates at winter 1732/33. It seems, however, that one sample is insufficient to be absolutely certain of the result. In his paper, R. Eysymontt provides several similar volute-ornamented gables in Silesia, the present Czech Republic, and Duszniki-Zdrój itself, e.g. edifice of a former post office. M. M. Szmyczyk, head of the Paper Making Museum, mentions also volute-decorated gable of the Saints Peter and Paul church in Duszniki, nothing of which remained in place.

²⁷ However, in "Przemiany architektoniczne młyna..." on page 18 R. Eysymontt presents weaver houses in Chełmsk Śląski and Międzyzlesie, whose gables are covered with wooden boards. Even so, they are nowhere near reproducing decorative elements of Baroque buildings in wood.

²⁸ It is well-known, however, that architectural detailing of a small, west part of south-facing wall on the second floor level is identical to the detailing applied on north- and west-facing walls. This can be seen in pre-war photographs.



Fig. 22 Part of the north-facing wall.
Photo by A. Fortuna-Marek



Fig. 23 Rosette – element of architectural décor.
Photo by A. Fortuna-Marek



Fig. 24 Paper mill facing west. Photo by A. Fortuna-Marek



Fig. 25 Mill gable facing west. Photo by A. Fortuna-Marek

of the ground floor (bright, sand-like colour). The masonry part (facing west) is clearly distinguishable and the longer part facing east has beam construction. Dark wooden elements of contrasted colours, e.g. pillars, and brightly plastered masonry filling are the main features of the subject building. The three outermost axes meet in the wooden bridge with a balustrade supported by wooden profiled trusses. This construction provides access from and to the building and it is connected with the drying house.

In west part of this wall, on the level of second floor, there is a distinctive bay window, which was presumably created in the 16th century. It is covered with a small gabled roof, supported by stone corbels, provided with a stone drainpipe and projects considerably from the wall. Below the *dansker* in question, there used to be a flume. According to R. Eysymontt, this element was created in the 16th

century and is “immensely archaic, representing medieval architecture design.” Furthermore, the scholar emphasises that “construction of corbels supporting bay window in Wojnowice Palace, which was built in 1513, is identical to the one applied in the paper mill in Duszniki.”²⁹ Eysymontt mentions also other similar bay windows supported by sixteenth-century corbels and notices that the corbels in Duszniki were built with less meticulousness.³⁰

Original portals and windows created in different periods have never been modified and, hence, they are important

²⁹ R. Eysymontt, *Przemiany architektoniczne młyna....*, mps, p. 13.

³⁰ As above, p. 13.

elements of the external design of the paper mill, e.g.

- stone-made portal on the ground floor on north-facing wall carrying the following inscription in the lintel: “G.K.1605. A.O.H.1802”, which reads as initials of Grzegorz Kretschmer, the date of rebuilding the mill after the flood in 1601, initials of Antonina Ossendorf-Heller and the date of another renovation/rebuilding/extension;
- semi-circle stone-made portal, partly covered by wooden casing of the bridge connecting the mill with the pavilion, located on the central axis on the second floor of north-facing wall;
- double window on the ground floor of north-facing wall, 18th century (?).
- small door frame with stone-made jamb in west part of the ground floor on south-facing wall.

The distinctive elements and architectural detailing which particularly accentuate the two walls of the main building, make the premises exceptionally unique and truly representative – as for a paper mill building. The detailing consists of the following elements in particular: bossaged lower ground floor and distinctive arcade-like sections of the wall (both carved in plaster and painted) ornamented with rosettes and semi-rosettes. Wall decorations are complemented with peculiar colours – bright red and beige colour with marbleized elements. The lack of any distinctive decorations on the rear wall proves for which purposes the building was used. The facility is provided either with use-related elements, e.g. the bay window, or with the ones that emphasise the half-timber construction of the edifice. Nevertheless, even this wall is divided into two sections reflecting the internal use of the building – window frames and stone-made profiled Dansk consoles prove that in this particular part, the mill was used for residential purposes. On the other side of the wall, one can notice beam construction, which is the evidence that this part of the mill interior was used for production. Arcade-like ornaments in west part of this wall, which we know from archive photographs, are no longer displayed. Side walls of the paper mill are accentuated by high, yet differently designed gables. The east gable is triangular, partly covered by the adjacent drying house; west gable is distinguishable by its size and the volute decorations crowned by triangular, corniced band.

On one hand, the external architectural design of the mill features elements typical of paper mills. However, on the other hand, it includes components characteristic of brick residential buildings of representative design. Ornately decorated architectural detailing exemplifies the former social status and wealth of the paper mill owners. The external architectural form of the premises still reflects both uses of the paper mill functioning as a workshop and a pre-industrial residence. The solutions and forms of artistic media embody the essence



Fig. 26 Paper mill: south-facing face of the wall.
Photo by A. Fortuna-Marek



Fig. 27 Bay window in the south-facing wall of the paper mill.
Photo by A. Fortuna-Marek



Fig. 28 Inscription on the north portal.
Photo by A. Fortuna-Marek



Fig. 29 Paper mill facing south-east, 1938?. Source: <http://dolny-slask.org.pl/860198,foto.html?idEntity=518292>

of the perfect fusion of functions and forms.

The paper mill in Duszniki, with its distinctive form resulting from the purposes for which the premises were used in the past, is a perfect example of an architectural structure featuring ornately decorated walls uncommon for buildings of this type. For this reason, its value should be analysed not only in terms of being an industrial building of historical significance but also in terms of being an architectural masterpiece of the Baroque style typical of Czech and Silesia.

The drying house, which was built probably in 1740s, is a wooden building of considerable size situated south-east to the paper mill and connected to it by an extension in north. Additionally, there is also a wooden bridge in south. The construction of the drying house incorporates framing and the building itself is cuboid, three-storey and rectangular in floor plan. It is crowned with high, steep, gabled, shingled roof within which there are three storeys. Along the roof, there are three distinctive rows of vent bores. All walls of the drying house are made of wooden boards in vertical uniform layout inter-

rupted by rows of rectangular and square windows on each floor. Furthermore, the external walls are divided horizontally by modest inter-floor mouldings. Side walls are designed similar to the longer walls. Triangular gables slightly project from the walls. All walls and the shingle are painted dark brown. In terms of the purposes for which the subject building was used, the wooden, roofed bay construction projecting asymmetrically from west-facing wall of the drying house is a very peculiar accent. It used to house a mechanism of a lift which, from the outside, served all floors of the building. Several windows feature wooden shutters.

Unlike the paper mill, the drying house has no particular architectural detailing and hence, it stands out due to its large and simple form reflecting the manufacturing purposes for which it was used. The high-rise, multi-storey drying house is tangible evidence of how prosperous the paper mill in Duszniki used to be.

It was also in 1950s that south-facing part of the building was 'suspended' over the flume running 'inside' it, along its south part. Nowadays, following

multiple renovation works carried out in the drying house, nothing remains of that system.

The entrance pavilion, built presumably in 1740s, is a one-of-a-kind architectural element of the paper mill premises. It has distinctive floor plan, size, and architectural detailing. It has octagonal-shaped floor plan, features two storeys and is covered with octagonal shingled dome. The first floor is stone-made, situated on the base course of the building and covered with plaster. It is sectioned off from the second floor by a simple moulding – beam construction. The walls are ornately decorated – their detailing and colours refer to the arcades on north- and west-facing walls of the paper mill. Just like the paper mill, the pavilion also features return window frames. The drum of the dome is decorated with wooden, profiled moulding. It seems that the formal means having been applied aimed at making the paper mill premises

more representative and hence, emphasising the social status and importance of the paper makers in Duszniki. The form of the pavilion reflects certain elements of garden structures of belvedere type.

It needs to be emphasised that, for a long time, the road to west of the paper mill used to be the only open route – all transportation came from the town. Therefore, the architect and the investor might have designed the pavilion and the decorative walls to face west and south on purpose – in order to emphasise the rank and status of paper mill owners.³¹

³¹ I appreciate that Dr G. Grajewski paid attention to this aspect.



Fig. 30. Drying house: south-facing face of the wall.
Photo by A. Fortuna-Marek



Fig. 32. Drying house facing north-west.
Photo by A. Fortuna-Marek



Fig. 31. The mill and the drying house facing south-west.
Photo by A. Fortuna-Marek



Fig. 33. Entrance pavilion and the bridge facing north.
Photo by A. Fortuna-Marek



Fig. 34. Entrance pavilion facing north-east.
Photo by A. Fortuna-Marek

I.4. INTERNAL HISTORICAL FORM OF THE STRUCTURES

PAPER MILL

Nowadays, the interior of the lower ground floor of the paper mill, where the paper making process used to begin, features a hall covering a large part of the building at its entire width. It is supported by four brick pillars and, in its north-east corner, it features a room of small size. Additionally, there is a small room in south-east corner. In west, there are two rooms adjacent to this hall, which were re-adapted and divided along the crosswise axis of the paper mill into four. In south-facing part of the main hall, there is a wooden platform dividing the interior into two levels.

After the war, the functional division of the lower ground floor was changed several times. As before the war, the paper mill and its equipment were already in poor condition and after the war a major part of tools and machines were destroyed, it is difficult to reconstruct the functions that individual parts of the lower ground floor used to serve before the war. Inventory of the paper mill made in 1960 provides insight into the purposes for which the lower ground floor used to be used: "Inside the main building, on its lower ground floor, there were manufacturing rooms only (...). On the lower ground floor, there was a large hall stretching over the width of the entire building, covered with beam ceiling and binding joist running along the longer axis of the building. It was founded on supports made of masonry and wooden materials. In a part of the room, there was a wooden platform dividing the interior into two low levels. In the ceiling above the platform, there used to be two square chutes [currently non-existent – AFM]. In south-west corner, there are small doors by which two conjoined pools are situated. In the floor, there was a channel running to the other room. There were also two smaller rooms conjoined to the main production hall: one in the front section, featuring a barrel vault, watch glass, four windows, and a stone-made pool in the centre; the second room was located at the back of the building and featured a cross-barrel vault and one window."³² T. Windyka also makes an attempt to reconstruct the functional division of the interior of the lower ground floor: "in the lower ground floor of the main building there were three production rooms. In the largest room, which is currently used as the main paper production workshop, important papermaking equipment, e.g. mortar and pools, might have been operated. Presumably, that was also the place for wash-

ing rags, which were dropped through the chutes from the sorting room located on the upper floor. In the production hall, there were water channels carved in the floor supplying water to the paper mill equipment, e.g. the mortar. The adjacent room (at present, for example, a sand container can be found here) featuring barrel vault and watch glass, was used for rag maceration, which made it easier to garnet and grind the rags. The rags, once being macerated, were moistened and heated. This conclusion is based on the remnants of the flue duct removed in 1912. In the adjacent room (currently printing room), which also features barrel vault and lunettes, there used to be a gluing room and a dry press."³³

Obecnie – zgodnie z historycznym użytkowaniem – przyziemie z dużą halą wykorzystywane jest do rękodzielniczej produkcji papieru czerpanego. In the rooms located in west part of the building, furnish was processed and purified. Moreover, there is a drying room of small size, staff area and a training room. On the lower ground floor, one can also find paper laying equipment. Original machines have not been preserved and the existing ones consist of both reconstructed and original elements acquired from other paper mills located in Poland. The equipment includes in particular: grinding machine, also called the 'Hollander beater', purifying equipment, paper laying vats, drying presses, and the smoothing press. There is also a contemporarily arranged training room for delivering museum science classes. Other rooms on the lower ground floor include: paper finishing, drying, graphic design, and utility rooms.

This layout is typical of a paper mill as a manufacturing workshop.

Spatial arrangement of the second floor: two-bay with entrance hall in north bay. Bays in east part are divided by a corridor. The building on this level was initially used for manufacturing and residential purposes – it is assumed that a rag sorting room and paper stock room used to be located here; Moreover, paper mill owners' flat was arranged in the three rooms situated in west part of the building.

Currently, apart from the entrance hall, there are six office rooms and five exhibition rooms where collections covering the history of papermaking, i.e. of the paper

³² M. Kutzner, "Czeska papiernia w Dusznikach," in *Artem ad vitam*. Kniha kpocte Ivo Hlobila, H. Danova, K. Mezihorakova, D. Prix (eds.), Praha 2012, p. 548.

³³ T. Windyka, "Młyn papierniczy w Dusznikach," *Muzealnictwo* vol. 41, Warsaw 1999, p. 16–17.



Fig. 35. Part of the hall in the lower ground floor of the paper mill. Photo by A. Fortuna-Marek



Fig. 36. Paper laying equipment on the ground floor. Photo by A. Fortuna-Marek



Fig. 37. The main foyer in the paper mill building. Archive of the Museum of Papermaking



Fig. 38. Polychrome decorations in the first room on the first attic floor. Archive of the Museum of Papermaking

mill in Duszniki, other mills in Lower Silesia, Poland, and around the world are showcased. Although the room layout on this floor has not been radically modified, conversion of the paper mill into museum resulted in the functional plan being altered. What visitors beginning their visit to the museum will find in the hall is collections and memorabilia covering the history of the paper mill – seventeenth- and eighteenth-century portraits of paper makers of Duszniki. Currently, rooms on this floor are used for office and exhibition purposes.

Nowadays, the residential rooms which used to be arranged on the second floor no longer serve their original purpose. Following the paper mill's conversion into museum, the functions served by the former sorting room and rag stockroom have changed as well.

Three upper (attic) floors were used predominantly for draining paper, except for two rooms on the first attic floor, which were originally used as owners' summer flat. Well-preserved wall and ceiling paintings are the evidence of the original use of these rooms. Currently, the entire floor is used for exhibiting museum collections. Its original layout is preserved, including a large room in the part facing east, which covers nearly a half

of the floor area, and six rooms seated in two bays along east-west axis. Two most upper attic floors are arranged in form of open space and are not currently used.

Inside the mill, there are peculiar and unique stone-made portals – the fascia portal on the second floor is of particular importance as it is dated at the third quarter of the sixteenth century.³⁴

In south-west room on the second floor, there is a peculiar structure projecting outside the building – a bay latrine dating at the 16th century, which features contemporary toilet display.

Analyses and date studies on certain elements of the interior, which were conducted by R. Eysymontt are of particular importance to the description of the original internal form of the building. This includes, for instance seventeenth-century vaults in the lower ground floor, the eighteenth-century staircase, walls and ceil-

³⁴ R. Eysymontt, "Przemiany architektoniczne młyna...", *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, p. 26.



Fig. 39. Paper mill attic, currently not used for any purposes. Photo by A. Fortuna-Marek



Fig. 40. Portal on the second floor of the paper mill. Photo by A. Fortuna-Marek



Fig. 41. Contemporary display of a toilet in the bay latrine. Photo by A. Fortuna-Marek

ings supported by volute-profiled struts located above the corridor on the second floor. Furthermore, it is also worth noticing certain similarities between the layout of the second floor and the design of two-bay palaces two-bay palaces³⁵.

The spatial plan of the interior of the paper mill as well as a number of elements of architectural detailing typical of old paper mills have been preserved. These include paper lying rooms where paper sheets were hand-formed, the structure of the rafter framing sectioning off large multi-storey attics used for drying paper, roofs with vent bores, and vent windows on gable walls. The distinctive architectural form of the buildings (the external form in particular) was neither affected by the richness of accumulated historical heritage created in different periods nor damaged by contemporary interventions to the historic site. The important combination of the form, function and materials applied is clearly displayed.

The seventeenth-century spatial and functional plans of the interior of the main building underwent considerable changes in the early twentieth century. The reason was that the laid paper was no longer hand-made – manual manufacturing was replaced by machines. In order to meet technical requirements imposed by the new production process, paper mill owners adapted the ground floor of the main building to new use by installing a small papermaking machine and equipment for making paper pulp out of ground rags. Fur-

ther changes were made during adaptation works and, afterwards, when the mill started to function as the museum. In spite of the changes, the building is still clearly divided into two areas – the production part on the lower ground floor and the residential part decorated with polychrome paintings (summer flat) on the first attic floor. What is, however, no longer displayed is the functional division of the first floor the subject paper mill into production and residential areas.

DRYING HOUSE

In its west part, the drying house, rectangular in floor plan, is connected to the paper mill building by a passage. On the first and second floors, the drying house is divided into two bays. Other floors are open-space. Original functional plan is unknown. What we know, however, is that originally, the building was used for draining paper and keeping stock. Currently, the drying house is being adapted for new use.

³⁵ R. Eysymontt, "Przemiany architektoniczne młyna...", *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, p. 18.



Fig. 42. Drying house – interior after renovation works.
Photo by A. Fortuna-Marek



Fig. 43. Drying house – interior after renovation works.
Photo by A. Fortuna-Marek

1.5. DECORATIONS INSIDE THE PAPER MILL³⁶

Wall and ceiling paintings decorating the former summer flat of the paper makers of Duszniki are the most valuable elements of the interior decor in the main paper mill building. The polychrome paintings are partly preserved in two rooms on the third floor of the paper mill, i.e. on the first attic floor. These paintings, most probably created in different periods, i.e. in the 17th, 18th and 19th centuries, reflect different styles in interior decor applied in residential rooms. Diverse and ornately decorated motives, i.e. ornaments, floral twigs, figures, and architectural forms make them stand out from other flats. These decorations were made by applying dispenster to wooden walls and ceilings.

No other decoration in the first room is as perfectly preserved as the tray ceiling paintings featuring dry acanthus twig. Wall paintings are 'enclosed' in a painted, marbled bordure. On north-facing wall, there is a genre scene – women and men having a stroll on a terrace with balusters, colonnade, and two column-supported domed garden houses. In the background, one can notice greenery and a blue sky. The scene is interpreted as depiction of the spa in Duszniki, as of late 18th or early 19th centuries. The west-facing wall featuring two windows is decorated with architectural forms (columns painted on both sides of the windows), garlands, and a scene interpreted as *Joseph and Potiphar's Wife*, taking place indoors, under a bal-

dachin. On south-facing wall, there is a conch painted above the door to the second room. The east-facing wall features various architectural forms and an eagle, which refers to the watermark used by the paper makers of Duszniki in 1756.

In the second room, the well-preserved paintings decorate the ceiling and two walls. The seventeenth-century painting on north-facing wall is considered the oldest in the paper mill premises. It reaches half of the wall and features floral elements such as flowers and dry acanthus twig. The polychrome painting on west-facing wall which is dated at the late 19th century features ornately decorated window framings and painted 'frames' alternating with decorations featuring geometrized floral elements and strongly coloured 'regent grating'. Moreover, polychrome-painted board with hardly visible paint layer featuring fruit garlands has been preserved as 'evidence' of richness of accumulated historical heritage from different periods. The ceiling is framed with geometrised floral ornament.

The ceiling is ornated with rather unsuccessful forced perspective in form of an oval divided by pilasters between which there are recesses and panels. Its approximate age is dated at century are preserved.

The following factors determine the value of painting decorations in the paper mill premises in Duszniki-Zdrój:

- The polychrome painting is unique in buildings of this kind.
- Paintings done in different periods represent changing styles in Silesian art, from the early seventeenth-century and late seventeenth-century early baroque paint layers, throughout the eighteenth-century

³⁶ The following description is based on S. Szoc's findings (co-author of conservation and preservation works as well as author of polychrome inventory survey). While working on this study, A. Szeląg recorded different findings.



Fig. 44. Part of painting decoration on ceiling in the first room.
Photo by A. Fortuna-Marek



Fig. 45. Part of polychrome paintings on the north-facing wall in the first room. Photo by A. Fortuna-Marek



Fig. 47. Part of painting décor in the 'Under the dome' room.
Archive of the Museum of Papermaking.
Photo by A. Fortuna-Marek



Fig. 48. Painted ceiling in the "Room under the dome".
Photo by A. Fortuna-Marek



Fig. 46. Part of polychrome paintings on the west-facing wall in the first room. Photo by A. Fortuna-Marek

Baroque paintings to late nineteenth-century paintings featuring the 'regent grating' motive.

- Being ornately decorated, e.g. with floral twigs, genre scenes, and architectural details.
- Interesting iconographic scenes, e.g. the eagle referring to the watermark used by the paper makers of Duszniki since 1756; a biblical scene – *Joseph and Potiphar's Wife*; allegedly a view over Duszniki of the late 18th (?)³⁷ or early 19th (?) centuries³⁸.
- Art technique – dispenster applied on wood.
- Rich colours applied in certain scenes and motives.

It must be added that, in addition to the aforementioned paintings, a painting featuring floral twigs was uncovered in the "room under the dome," above the current ceiling. On the walls between the ceilings, there is an ornamental frieze dated at the 17th century.³⁹ The polychrome paintings preserved in two rooms in the paper mill, which were initially studied by art conservators in terms of their age, style, and iconography as part of conservation works carried out, until recently, had not fallen within the scope of art historians' interest in the broader aspect of style-related, comparative or iconographic studies. A. Szeląg was the first to make such an attempt.⁴⁰ According to him, the paintings in Duszniki were done in the same period, i.e. approximately 1800. The only exception is the polychrome painting on north-facing wall in the "Room under the dome". In the latter case, Szeląg points out the decoration's similarities to selected works of art created at the turn of the 16th and 17th century and in the early 17th century. At present, A. Koziół and A. Szeląg are studying the paintings in the paper mill in Duszniki.⁴¹

³⁷ Dating analysis by S. Szoc, co-author of conservation and preservation works and author of polychrome inventory.

³⁸ According to T. Windyka, park furniture depicted in this painting refers to structures designed by construction inspector, Ch. Geisler of Wrocław, and installed in the local nineteenth-century spa park in 1802. T. Windyka, "Młyn papierniczy w Dusznikach," *Muzealnictwo* vol. 41, Warsaw 1999, pp. 17–18.

³⁹ A. Szeląg, "Dekoracja malarska papierni" in R. Eysymontt, A. Szeląg, D. Eysymontt, op. cit., p. 54.

⁴⁰ As above, pp. 45–55.

⁴¹ According to A. Koziół, polychrome paintings date at 1770–1780. He is also of the opinion that they were done by Caspar Rathsmann for Johann Joseph Ossendorf. He considers theatre decorations engraved in copperplate as being models for the genre scenes with illusionistic architecture in the background. Koziół also emphasizes that although these pieces may not be exquisite works of art, they are interesting in terms of their iconography. Additionally, the biblical scene, *Joseph and Potiphar's Wife*, is

I.6. MATERIALS, SUBSTANCES AND THE STRUCTURE

The structure of the paper mill is mixed. It is built predominantly of wood, natural stone and ceramic brick. Foundations and external walls are made of masonry material and ceramic bricks. Mortar applied in foundations and in the lower ground floor is composed of sand and clay, and lime respectively. Longer walls of the second floor have beam construction and are filled with ceramic bricks joined by lime mortar.

Internal walls on the ground floor are made of crushed rock gravel held by lime mortar (original) and brick held by cement and lime mortar (contemporary). Rooms with thick stone walls have barrel vault with lunettes and cross vault. The ceiling of the main room in the paper laying area has beam construction. Above the lower ground floor, the internal wooden load bearing structure is of frame type and consists of pillars and binding joists. The internal frame structure of the upper floors is filled with brick, partly covered with wooden boards and slaps. The roof framework is wooden, its structure consists of collars and purlins, and it involves three queen posts. The collars are the beams of the ceiling of the third and fourth floor. This type of construction followed from functional reasons. It allowed for sectioning off multi-storey attics used for drying paper. Wooden dowels (original) and nails (non-original) join individual elements of the roof framework. Some original elements of the structure are preserved, including inscriptions and fixing marks. Other elements include parts and pieces either fixed in different periods or attached contemporarily.

R. Eysymontt supposes that the vault of the lower ground floor in the paper mill was built in the 17th century. *What is worth noticing is the sharp cross vault, which continues the style of the gothic rib vault. Presumably, it replaced wooden ceilings. Although these vaults may be of different age, they may be dated at 17th century when compared to correlated premises located nearby.*⁴² Barrel vaults with sharply framed lunettes in the lower ground floor are dated at the same period.

the only one or one of the very few pieces of art of this theme in Kłodzko District and Silesia. The decoration on north-facing wall in the "Under the dome" room as well as on the museum exhibition is dated at the 17th century. The authors are grateful to Professor Andrzej Koziół for providing fundamental information on the studies being conducted as well as their preliminary results.

⁴² R. Eysymontt, "Przemiany architektoniczne młyna...", *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, p. 19.



Fig. 49. Paper mill building – barrel vault with lunettes in the lower ground floor. Photo by A. Fortuna-Marek



Fig. 50. Roof framework of the paper mill building. Photo by A. Fortuna-Marek

What makes the paper mill distinctive is the varied structure of each floor and the variety of materials having been applied. Original elements and materials are preserved, as is the richness of accumulated historical heritage. One can also see changes in which contemporary conservation and preservation works resulted – both to the construction itself and to the materials applied, e.g. strengthening the construction on the lower ground floor level with binders and steel pillars, modifications to the roof structure made in 1960s and present-time works.

The original material dated not only at the period of erecting the paper mill premises but also at subsequent periods in which further richness of historical heritage was accumulated, has been confirmed by dendrochronology dating.

In certain rooms, elements of the half-timber framing are displayed in order to show the original structure of the walls:

- north-facing wall in the hall on the second floor – beam construction with straight brackets,
- beam construction of the walls in two other rooms on the second floor,
- half-timber framing with empty fillings; queen posts preserved and displayed on the third floor.

Vaults and ceilings:

- barrel vault with lunettes and cross vault in the lower ground floor
- barrel vault in the room facing south-west, located on the second floor,
- in the paper laying room on the lower ground floor – wooden beam ceiling supported by wooden longitudinal binder and walls.

Stairs:

- half landing staircase, stairs made from reinforced concrete, running from the lower ground floor to the second floor,
- wooden stairs of winder type, running from the second to other floors, supported by walls and a central post with a date engraved in its upper part, “1721”,
- two quarter landing stairs made from reinforced concrete, adjacent to recently built elevator in the extension.

The drying house is made of wood and has frame construction. The foundations are made of brick, stone, and reinforced concrete (foundations of east-facing wall were replaced after flood in 1998). The load-bearing frame construction consists of pillars and binders seated on wooden sill plates. In the lower ground floor, the construction is reinforced with wooden columns. The oldest and most interesting element is a part of the lower ground floor featuring log cabin structure dating at the late 16th century. All floors have wood-beamed ceilings provided with binders. The roof framework is wooden, its structure consists of collars and purlins, and it involves triple queen post. Between the lower ground and the second floor, there is a contemporarily-built half landing staircase made from reinforced concrete. Other floors are connected with straight wooden stairs.

All buildings are shingle-roofed. Windows are wooden, non-original and feature sections known from nineteenth- and early twentieth-century iconography.



Fig. 51. Staircase structural column in the paper mill building. Photo by A. Fortuna-Marek



Fig. 52. Log cabin structure of the oldest part of the drying house. Photo by A. Fortuna-Marek

I.7. PAPER MILL EQUIPMENT – ORIGINAL ELEMENTS BEING PRESERVED AND ADDITIONAL MUSEUM EXHIBITS

MANUFACTURING EQUIPMENT

A certain part of the original equipment showing hand production in the Duszniki paper mill was removed in 1905, following modernisation of the subject property. Consequently, interior of the lower ground floor was rebuilt and provided with tar paper devices as well as with cylindrical paper and cardboard making machine.

Currently, only a small part of the original paper laying equipment has been preserved. i.e.:

- 19-century paper laying moulds with riddles;
- eighteenth-century wooden paper drying hangers;
- nineteenth-/twentieth-century metal cardboard drying clip hangers;
- cart for transporting paper within the drying house;
- crane for moving wet paper between the floors of the drying house.

Vent bores installed on the roof of the paper mill and the drying house, which were provided with air flow regulation flaps, used to be of considerable importance in the paper making process. They are typical of paper mill buildings. In Duszniki, they have been preserved in their original form.

Other machines and production equipment, which are still used for making paper for demonstration purposes, have been either brought from various papermaking and printing workshops located around Poland or reconstructed from original tools. Before the idea of relaunch-

ing production of the laid paper was put into effect in 1970, technology pipelines and production equipment had been installed. The paper laying equipment was brought from Jeziorno workshop and the 'Hollander beater' used for preparing paper pulp – from Jelenia Góra.

Moreover, the present papermaking equipment consists of handicraft papermaking tools, which are a part of the museum collection. These include, for instance: Seventeenth- and eighteenth-century paper smoothing presses, e.g. press from printing house in Trzebnica (17th century). The museum collection includes also a number of machines and tools used in industrial production.

The number of hand-laid and machine-made paper sheets stored in the Museum of Papermaking in Duszniki is two thousand. These include also hand-laid paper sheets decorated with filigrees of Duszniki and Silesia dated at the 17th and 21st century.



Fig. 53. Flaps for regulating air flow.
Photo by A. Fortuna-Marek



Fig. 54. Paper laying equipment – the 'Hollander Beater'.
Photo by A. Fortuna-Marek



Fig. 55. Paper laying equipment – the press.
Photo by A. Fortuna-Marek

RESIDENTIAL EQUIPMENT

The most important elements which are related to the residential function of the paper mill include several portraits of the paper mill owners, painted in the 17th and 18th centuries. At present, they are displayed in the entrance foyer in the paper mill building.⁴³ These oil paintings portray: Samuel Kretschmer, Wilhelm Kretschmer, Joseph Ossendorf, Anton Benedict Heller and his wife, Anna Francesca Heller. The portrait of Anna Francesca Heller is signed by Caspar Rothsman, Silesia-based painter of the century are preserved. Recently, the portraits of Anton Benedict Heller and Joseph Ossendorf have been considered to have been painted by the same artist.⁴⁴

⁴³ More on the paintings, i.e. their dating as well as statistical and comparative analyses can be found in A. Szelać's study.

⁴⁴ A. Szelać, "Zespół portretów właścicieli dusznickiej papierni w zbiorach Muzeum Papiernictwa w Dusznikach-Zdroju;" *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, pp. 43–56.

Additionally, there are two other oil paintings in the museum exhibition rooms – alleged portraits of Maria and Joseph Wiehr, which are claimed to have been painted in early 19th centuries century.

In 1937, Günther Grundmann, who had been Historic Preservation Officer for Lower Silesia since 1932, called for preserving the paper mill in Duszniki: "Seven oil paintings hanging in the entrance hall bridge the three families with the present time."⁴⁵

The residential function is also represented by museum collections representing the history of Duszniki, e.g. furniture, paintings, dishes, medals depicting citizens' material culture. Eclectic furniture of Duszniki made in 1880s complement the interior design of the flat of the paper makers of Duszniki.

⁴⁵ G. Grajewski, „Um die Erhaltung der Papiermühle in Reinerz” – „O zachowanie młyna papierniczego w Dusznikach” in *Rocznik Muzeum Papiernictwa*, Vol. 19, Duszniki-Zdrój 2015, p. 117.



Fig. 56. Portraits of the papermakers of Duszniki displayed in the hall in the museum. Archive of the Papermaking Museum



Fig. 57. Portrait of Joseph Ossendorf. Archive of the Museum of Papermaking



Fig. 59. Alleged portraits of the Wiehrs. Photo by A. Fortuna-Marek



Fig. 58. Portrait of Anna Francesca Heller. Archive of the Museum of Papermaking

I.8. FUNCTION OF THE FACILITIES

PRODUCTION AND ITS AVAILABILITY

The traditional process of making paper was depended on the need to power the machines being operated. Specific location of paper mills, i.e. between a river and a flume, was determined by acquisition of hydropower. Flume, i.e. branch of a steep watercourse (usually in form of an artificial canal, sometimes as a shortcut between river bends) was of considerable importance. Hydropower was used for propelling water wheel, which was essential for generating power.

Only a small part of the former system consisting of watercourses and papermaking equipment has been preserved in the paper mill in Duszniki. In the early 20th century, during modernisation works which resulted in switching from handmaking to industrial production, the flume was redeveloped by lowering the channel

and replacing the old wheel with the Francis turbine. In 1959, the flume was filled with soil, which resulted in the premises being deprived of the important functional system, which used to be the integral part of the property. At present, the location of the paper mill at the Bystrzyca Dusznicka river is the only preserved element of the former water system. Nowadays, nothing of the flume has remained and the location of the old water wheel is unknown. Museum management planned to reconstruct the flume channel and the water wheel already in the 1950s.

The medieval technique of manufacturing laid paper in the European system had not changed until the late 18th century, in spite of introducing progressively advanced equipment. In the paper mill in Duszniki, the laid

paper had been produced until 1905. At present, this old method is still used in the museum in Duszniki, in spite of different technology, raw materials, and source of power being used. Papermakers in Silesia used predominantly linen rags (yet, there were also cotton and hemp ones), which were sorted by colour into white and multi-coloured ones, then cut and putrified. Afterwards, this material was used for making paper stock in mortar propelled by water power. In the 18th century, the mortar was replaced by the 'Hollander beater', where the rags, after having been soaked with water, were grounded down and pounded. Consequently, the furnish was smoother and more homogenous. The 'Hollander beater', as the mortar, was also propelled with hydro-power. Those days, this innovative solution was first introduced in Silesia, possibly already in 1737.

Paper stock was sieved to form paper sheets, i.e. to make laid paper. Subsequently, paper sheets were decorated with watermarks, drained under the press and hanged on special hangers. The drying process required the drying rooms to be of considerable size. Hence, paper mills used to be provided with vast, multi-storey attics with vent bores. In order to make the sheets smooth, they needed to be dunked in gelatine size (later, the size started to be added to furnish) and then smoothed with stone or hammer.

In spite of changing the purpose of the paper mill (paper laying manufacture), the former functional layout of the rooms, which is of key importance to the paper-making process, has been preserved. The paper mill is provided with laid paper production workshop and multi-storey attics provided with vent bores critical to the draining process.

Moreover, what additionally makes the Museum in Duszniki of great significance is the fact that, in addition to being used for exhibition purposes, the premises are used for demonstrating the old laid paper production process. Although the paper mill was not used for manufacturing purposes for several years, preserving its original function is of considerable importance to assessment of its authenticity and the integrity of place. The laid paper being currently produced in Duszniki is made of raw materials other than the ones used in the past, i.e. wheat straw stock, eucalyptus, and cotton. Moreover, hydropower propelling the machines was replaced with electricity. Nevertheless, the museum staff still deploys the medieval techniques of producing paper, i.e. spreading paper stock evenly over the sieves provided with watermarks, press moulding, manual draining, and manual pressing. At present, the entire production process, including draining, takes place in the lower ground floor. The rooms in the paper mill and the drying house used for such purposes in the past, no longer serve their original function.

Nowadays, the paper mill in Duszniki is the leading Polish manufacturer of laid paper. It produces paper sheets made of pine, eucalyptus, and cotton used for handwriting, typography and digital printing, as well as for graphic arts. Furthermore, it is the only museum in Poland to design and create sieve patterns independently. This allows it to produce watermarked paper by using the eighteenth-century technique developed in Fabriano and deployed in most paper mills, including the facility in Duszniki.

At present, the paper mill being analysed continues the fifteenth-century Polish traditions of producing laid paper, which in the 19th and 20th centuries were supplanted by machine-made paper.

RESIDENTIAL AND REPRESENTATIVE FUNCTIONS

The rooms in the paper mill premises which already in the 17th century were used for residential purposes are of considerable historical, artistic, and scientific value. These include two rooms on the first floor of the attic (referred to as the 'paper makers' summer flat') with well-preserved wall and ceiling decorations. It is not unlikely that residential rooms might have been located on the second floor as well. However, according to K. Małczyńska, "Silesian paper mills would usually consist of a one- or two-storey building and a number of extensions or smaller buildings which were built in over time. These premises usually housed master's and journey-men's flats."⁴⁶ Therefore, we can see that other paper mill premises in Silesia were also used for residential purposes. However, the polychrome paintings and portraits of papermakers of Duszniki decorating the premises being analysed make the paper mill premises unique, rare, and, to some extent, exceptional. Additionally, the residential function is also emphasised by the ornaments on the exterior walls of the mill. These functional aspects as well as elements of the external architectural form and detailing (entrance pavilion of certain structure, ornately decorated walls) and exquisitely painted rooms make the paper mill in Duszniki a pre-industrial historic site being relevant by its use or its invention. Moreover, its values need to be analysed from the perspective of being representative premises designed in Baroque style.

MUSEUM AND RELATED PURPOSES

The historical value and importance of the paper mill in Duszniki was accepted by historic preservation milieu a long time ago. It was already in the early 20th century when, following the efforts to preserve the paper mill as property of considerable historic importance,

⁴⁶ K. Małczyńska, *Dzieje starego piśmiennictwa śląskiego*, Wrocław-Warsaw-Cracow, 1961, p. 66.

public authorities allocated financial resources to the premises with the aim of carrying out critical conservation and renovation works. In 1930, the first ideas for changing ownership rights emerged – the aim was to convert the private property into state-owned museum. Furthermore, in 1940s, initiative on re-launching production of laid paper was undertaken.⁴⁷ These efforts of German historic preservation specialists aiming at saving the historic site of great significance were put into practice several years later, in 1968, when the Museum was opened. This non-original purpose which the premises serve as a museum can be considered an added value. The Museum of Papermaking produces laid paper using old medieval methods, collects evidence of papermaking history, conducts studies in this field, and runs education and cultural activities pertaining to producing and using paper.

The above-mentioned description of the premises allows for listing the most important values of the paper mill in Duszniki. These include in particular:

Values of historical significance – description of the location

- Representation – one of the few well-preserved paper mills, representing numerous premises used for this purpose located in Silesia, Poland, and Europe in the pre-industrial period.
- Civilizational processes – producing paper for several centuries – product of considerable importance for development of civilisation, i.e. science, culture, and arts.
- Economic processes – paper mill as a ‘witness’ of continuous improvement of the product being made there, i.e. technological development of the production of laid paper.

Values of historical significance – functional context

- Function – it was rather uncommon in the pre-industrial age that one building was used for both production and residential purposes. Additionally, the premises, having been a workshop and a residence at the same time, features representative artistic forms.

- Tradition and continuation – producing laid paper by adopting the archaic medieval method. Reconstructing and teaching production of laid paper
- Product – the premises where paper was produced – a significant invention contributing to civilizational and cultural development; valuable paper sheets decorated with watermarks stored in the museum.

Architectural and artistic values

- Paper mill premises as material being relevant by its use or its invention – specific location and layout of the premises, distinctive architectural form and structure following from the use of the site.
- The paper mill as a residential property of representative form and interior design – it reflected owners’ social position and prominence.
- Material that is relevant by its use or its invention and ‘residence’ of the preindustrial age – the premises used for production and residential purposes, which are reflected in its architectural form.
- Historic site, still being an important element of the cultural landscape of Duszniki-Zdrój.

Intangible values

- Historical and industrial evidence – unique evidence of old methods applied in paper production; one of the very few well-preserved historic monuments being the evidence of how thriving the papermaking industry used to be in Europe and how it contributed to development of science, culture, and fine arts.
- Being related with individuals who played crucial role in history – prominent individuals of local, regional, and international renown.
- History of the Museum, including relaunched production of laid paper and installation of old production machinery.
- Museum collections – evidence of rich papermaking traditions in Poland.

Defining the predominant value – the paper mill premises are not only a material being relevant by its use or its invention but also a residence of the pre-industrial age – the site being used for both residential and production purposes; these two functions are clearly reflected by the external and internal architectural forms, decor, and the pieces of equipment being preserved. The solutions and forms of artistic media embody the essence of the perfect fusion of functions and forms. Value of continuity – producing laid paper by employing medieval papermaking method; ‘living’ evidence of traditional production of laid paper.

⁴⁷ Detailed information on initiatives and actions undertaken before the war broke out, which aimed at protecting the paper mill, can be found in article by G. Grajewski, “O podejmowanych przed 1945 rokiem próbach ratowania młyna papierniczego w Dusznikach-Zdroju,” *Rocznik Muzeum Papiernictwa*, vol. 9, Duszniki-Zdrój 2016, p. 9–29.

II. Defining the type of the property and selecting comparative group

In order to define a reference group for the paper mill in Duszniki, which could provide a comparative context (essential for assessing the value in comparison to other sites of similar type and purpose), it is of great importance to place the subject premises in a certain typology group. According to the typology being applied to world heritage assets, the paper mill in Duszniki-Zdrój is, pursuant to the Convention Concerning the Protection of the World Cultural and Natural Heritage (in which the entire cultural heritage is divided into historic monuments, groups of buildings, and sites), a group of "separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science." The features typical of this typology group include not only attributes characteristic of works of architecture but also elements determining mutual relations between particular buildings of which the group of buildings consists.

What can also serve as reference points are typology groups defined in document "Criteria and procedures for considering an asset a Polish Listed Monument," developed in the State Monument Study and Documentation Centre and adopted and approved in 2005 by the Monument Protection Council under the Minister of Culture.⁴⁸ In addition to typology groups (categories of monuments) of assets which can be considered Polish Listed Monuments, this document also provides insight into their features and values. The paper mill in Duszniki-Zdrój can be analysed according to guidelines specified under two categories, i.e.:

Works of architecture and construction engineering or a group of such works having similar design, construction, and being used for similar purposes, which:

- *have unique architectural detailing,*
- *present examples of applying innovative or unique construction and engineering solutions,*
- *have uniform style or clear and harmonious layers,*
- *have unique decor and elements of original equipment;*

and

Industrial and civil engineering assets which:

- *represent traditional or unique branches of industry deeply rooted in the Polish industrial culture,*
- *are groups of industrial and working-class buildings with clear urban arrangement,*

- *house original production equipment, e.g. production lines, machines, etc., of historical significance, which allow for studying and recreating traditional production techniques,*
- *are works of engineering housing technological equipment in its original spatial and landscape arrangement.*

The paper mill in Duszniki is unquestionably an industrial property of great historical value – an element of industrial heritage. Pursuant to The Nizhny Tagil Charter for the Industrial Heritage (TICCIH), industrial heritage "consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education."⁴⁹

In comparative analyses of works of architecture, construction engineering, and industrial heritage, the most frequently applied comparison criteria include: typology and function, chronology, style, materials used, and reference to certain areas where the specific types of historic monuments or sites are located.

Depending on the comparison scale being adopted, the paper mill in Duszniki can be compared, in terms of its location, to historic monuments and sites in Silesia, Poland, Central Europe or, in broader context – entire Europe.

Given the period in which the paper mill premises were built, references will be made to buildings erected in the 17th, 18th and early 19th centuries. Nevertheless, it does not mean that in the event of nominating a serial asset to be inscribed on the UNESCO List, older assets will not be included in the comparative group.

Given the construction materials used in the paper mill in Duszniki and the issues arising from their application, the premises are categorised as wooden properties, even though the main building and the entrance pavilion are partly made of masonry material.

⁴⁸ http://www.nid.pl/pl/Dla_wlascicieli_i_zarzadcow/opieka-nad-zabytkami/pomniki-historii/kryteria-wyboru/, accessed on 12.11.2016

⁴⁹ The International Committee for the Conservation of Industrial Heritage (TICCIH) The Nizhny Tagil Charter for the Industrial Heritage, W. Affelt, "Dziedzictwo techniki, jego różnorodność i wartości," *Kurier Konserwatorski* vol. 5, 2009, p. 5.

With regard to functional categories, mills, including the paper ones, due to specific production techniques applied and the necessity to provide power, are a peculiar type of material that is relevant by its use or its invention – they are categorised as assets which can be located only in close proximity to specific sources of water, i.e. rivers or flumes. Well-preserved machines and tools as well as reconstructed technological processes are important to consider an asset relevant by its use or its invention. These elements should be also subject to comparative analysis. The period in which the paper mill was built as well as the type of production methods applied there (hand-making) determine the reference group for the premises being analysed in this article – pre-industrial assets.

At the same time, the paper mill premises in Duszniki is also a work of architecture and construction engineering which was used not only for manufacturing but also for residential purposes. Given its peculiar form and architectural detailing, it should be juxtaposed with Baroque properties built in Silesian and Czech cross-border areas.

Recapitulating the aforementioned deliberations, one can state that combination of the following elements is what determines the selection of reference properties:

Analysis area:

- historic monuments and sites in Silesia/Poland/Central Europe/Europe

Construction time:

- 16th, 17th – 18th/ early 19th centuries

Functional description:

- material that is relevant by its use or its invention
- industrial properties
- historic civil engineering landmarks and monuments
- paper mills
- technological processes /continued and discontinued/
- craft and pre-industrial manufacturing /gradual improvement/
- being used for both residential and production purposes at the same time

Production equipment – devices, machines, tools, production lines, etc.

Materials applied:

- wooden/wood and masonry buildings

Style:

- Baroque architecture
- Baroque polychrome paintings.

The reference group is a resultant of the said elements, which are used for defining the scope of interest.

Reference group: /paper mills/wooden/craft/continuous production/valuable decor/Central Europe/seventeenth- and eighteenth-century Baroque monuments/

III. Valuing criteria and value assessment of the property, based on the reference group

Developing general description of the paper mill premises, analysing them as well as defining elements to be used for determining the reference group provide foundations for indicating features which influence the property's values. With regard to the paper mill premises in Duszniki, the predominant value assessment criteria include:

- form of the property
- function of the property
- equipment
- decor
- construction date

The paper mill in Duszniki, although considered a property of unique historical values in Poland, until recently it had not been subject to any comparative analyses. Its importance was confirmed in 2011, when the premises were accorded a status of Polish Listed Monument. This concerns not only studies in the history of arts and architecture but also analyses in which problems pertaining to materials that are relevant by their use or their invention would be discussed. Article by M. Kutzner is the first study aimed at setting the paper mill premises in a broader context of the Baroque and assessing their value.⁵⁰ Moreover, recently, R. Eysymontt has published study on assessment of the historical value and artistic merit of the paper mill in Duszniki. The study also features A. Szeląg's analyses of polychrome paintings and portraits of the papermakers of Duszniki.⁵¹ By applying a comparative method R. Eysymontt provided deeper insight into the subject matter by juxtaposing the premises in question with Silesian and Czech works of art and indicating analogies between the particular elements of their structure, i.e. plan, architectural detailing, portals, etc.

M. Kutzner describes the premises in the following way: "It is a 'factory' inside a large bourgeois house. Despite being of considerable size, it bears resemblance to a shed with a mill and a drying house. The paper mill reflects features of Czech buildings built in the 17th century in terms of shape, proportions, decor, colours. The paper mill can be categorized under semi-folk buildings, yet aspiring to take Czech masonry manors as a pattern by being provided with volute-decorated gables and architectonic articulation of the walls. The paper mill in Duszniki can be therefore called 'of Czech origin' – not only due to the Kłodzko Valley being referred to as the Czech territory."⁵²

R. Eysymontt, on the other hand, provides more details for dating the historic site by indicating elements created in certain periods, e.g. fragments dated at the third quarter of the 16th century; major construction and transformation works – 1605, 1727, 1802. Having recapitulated the results of his analysis of the architectural and design structure of the premises, Eysymontt claims that:

"In the construction phase taking place in the early 18th century, when the property was provided with a wooden volute-decorated gable, the shape of the building was changed into what we know nowadays. In the late 18th and early 19th century, the external decorations of the walls were created. Moreover, the 18th century was also the time when the entrance pavilion was built.

*The paper mill in Duszniki perfectly exemplifies combination of features typical of gentry manors built in Kłodzko areas and Baroque bourgeois tenements or Baroque church gables from Silesia or Czechia. The entrance pavilion follows the design of Baroque garden structures.*⁵³ The author also emphasizes that the premises in Duszniki are one of the oldest paper mills in Europe and the oldest industrial building in Lower Silesia.

⁵⁰ M. Kutzner, "Czeska papiernia w Dusznikach," in *Artem ad vitam*. Kniha k poctě Ivo Hlobila, H. Danova, K. Mezihorakova, D. Prix (eds.), Praha 2012, p. 543-552.

⁵¹ R. Eysymontt and A. Szeląg, D. Eysymontt (collaboration), "Młyn papierniczy w Dusznikach Zdroju..." ; R. Eysymontt, "Przemiany architektoniczne młyna...", *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, pp. 9–41; A. Szeląg, "Zespół portretów właścicieli dusznickiej papierni w zbiorach Muzeum Papiernictwa w Dusznikach Zdroju," *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, pp. 43–45. At present, Andrzej Koziół and Adam Szeląg are conducting further analyses of the polychrome paintings in Duszniki.

⁵² M. Kutzner, "Czeska papiernia w Dusznikach," p. 551.

⁵³ R. Eysymontt, "Przemiany architektoniczne młyna...", *Rocznik Muzeum Papiernictwa*, vol. 10, Duszniki-Zdrój 2016, p. 26.

In spite of the aforementioned findings, R. Eysymontt's support for various hypotheses and establishing previously unknown facts, there are still several issues to be explained, e.g. the date of construction of the paper mill, its design and formal features, as well as its provenance. It is therefore worth claiming that such comparative analyses and archive studies should be continued and architectural studies need to be launched.

Moreover, authors of the nomination for listing the paper mill premises as a Polish Listed Historic Site made certain attempts to set the premises in question in the context of Polish and Central European papermaking plants. They considered the premises in Duszniki the oldest and the most original paper mill in Poland and one of the oldest workshops of this kind in Central Europe.⁵⁴ The following Polish paper mills have been mentioned: 18th-century premises in Konstancin-Jeziorna, where a shopping mall is housed at present, paper mill in Barlinek dated at the mid-eighteenth century, and a paper factory in Dąbrowica outside Jelenia Góra, which, in spite of having been established in the early 18th century, features only buildings dated at the late 19th and early 20th century. Two industrial plants, which are still in operation, were not forgotten either: one in Pilchowice outside Jelenia Góra and another one in Nowa Ziemia outside Chojnow. Nowadays, both plants make cardboard. However, as the authors notice, the premises being still in operation were constructed at the turn of the 19th and 20th centuries, i.e. much later than the paper mill in Duszniki-Zdrój.

The paper mill in Duszniki is the oldest preserved paper mill in Poland. The date of construction also places the premises among several preserved paper mills in Europe. This fact increases its value and importance.

At the national level, the historic paper mill premises in Duszniki are unique by all criteria. The paper mill being analysed is the only well-preserved building of this type in Poland – made of wood and masonry material, where laid paper is still produced for demonstration purposes by using archaic medieval technique, and representing pre-industrial paper mills, a great number of which used to be located across Silesia, Poland and Europe. This criterion of being unique and rare follows from the specific nature of this category of properties. Paper mills, for functional reasons, used to be located in close proximity to rivers and, hence, they used to be struck by devastating floods. Moreover, the most common building material used at the time of building the paper mill in Duszniki was wood, the main problem of which was fire risk. As laid paper became obsolete once modern industrial production methods were introduced, most paper mills widespread across Silesia, Poland (present borders), and Europe, were either closed in the 19th century or converted into factories. When former paper mills started to be adapted to modern industrial production techniques, changes to architectural forms, interior layouts, equipment, and production technology were inevitable.

The paper mill in Duszniki is a well-preserved historic site with a great number of original elements, e.g. external architectural form, which is the result of historical heritage being accumulated in the period of 16th – early 19th centuries; architectural detailing, e.g. sixteenth- and seventeenth-century portals, the bay latrine; interior design including seventeenth-, eighteenth-, and nineteenth-century polychrome paintings and equipment used for paper production and residential purposes (portraits of subsequent owners of the premises).

It is a historic site with premises of distinguishable architectural form following not only from the use of the building but also the specific nature of the product having been produced there. The form consists of the following elements in particular: spatial composition of the buildings and the similarities between them; steep, shingled gable roofs with distinctive vent openings; interior layout with clear division into production and residential zones; multi-storey attics.

Furthermore, in the paper mill in Duszniki, the form is distinguished by artistic merit, i.e. ornamental entrance pavilion, exterior wall decor including Baroque elements accentuating two walls of the mill and making them more representative, as well as unique wall paintings decorating the residential rooms. The latter feature was rather uncommon in buildings of this type. In the light of the information being available as well as several paper mills being still functional

⁵⁴ Nomination for inscribing the paper mill in Duszniki on the list of Polish Listed Monuments developed by A. Stefaniszyn, T. Windyka, M. Szymczyk, ed. M. Szymczyk, Duszniki-Zdrój 2009.

historical groups of papermaking facilities in central Europe, it can be said that the interior design of the paper mill in Duszniki is truly unique. All these elements and features make the historic site truly unique and individual. Architectural detailing, interior wall and ceiling paintings, as well as elements related with residential use of the building, i.e. portraits of three families of paper makers prove that the property was also used for residential purposes.

The paper mill in Duszniki is therefore something more than only material being relevant by its use or its invention built in craft manufacturing era. In addition to its primary function, i.e. paper production, the premises were also used for residential purposes and hence, their owners, wealthy and respected citizens of Duszniki-Zdrój, wanted the site to have distinctive and unique character. They wanted the facility to reflect their social position and affluence. It was rather uncommon in the pre-industrial age that one building was used for both production and residential purposes. Additionally, the premises were used both for production and residential purposes, the latter of which are accentuated with artistic forms of representative character. The representative form of the property as well as the paintings that can be found inside the residential rooms rank the paper mill in Duszniki high among the most prominent buildings of this type. The external architectural form of the premises still reflects both uses of the paper mill functioning as a workshop and a pre-industrial residence. The solutions and forms of artistic media embody the essence of the perfect fusion of functions and forms.

The paper mill in Duszniki, in addition to being a museum, still functions as a workshop where traditional laid paper is produced on small scale. Although only a few of original machines are preserved, the production method being used is identical to the one used in the past. Although in the past there used to be a considerable number of paper mills in Poland, the property in Duszniki is the only mill still being used for its original purpose. Nowadays, however, the production is not profit-oriented. It was the manager's conscious decision to demonstrate the handmaking of paper – for demonstration purposes and for keeping the old tradition alive.

Continuing the tradition of producing laid paper aims at preserving and emphasising the original function and use of the premises, in spite of irreversible functional changes. This aspect can be analysed in terms of non-material values, under which the tradition of producing laid paper falls – it is an integral component of the material value of a property that is relevant by its use or its invention; preserving and sharing technological know-how of producing laid paper.

Combination of these values makes the historic site integral, authentic, and particularly valuable.

In terms of assessing values of the paper mill in Duszniki, the fact that nowadays the property functions as a museum can be considered in two aspects: On one hand, adapting the premises for new use resulted in reducing its value and making it necessary to carry out works affecting the original structure of the subject buildings. Several unwelcome changes followed from changing the production and residential function of the paper mill by converting it into a museum and offices and, hence, adapting it to contemporary use and opening to public. On the other hand, this non-original purpose which the premises serve after having been converted into a museum can be considered an added value. In the past, the paper mill used to be an important and special part of the papermaking business in Silesia. High quality of paper produced there made it well-known and highly valued. At present, the paper mill, now the Museum of Papermaking, is the most important venue in Poland where the history and techniques of papermaking are presented.

In the museum, there are collections devoted to the past glory of the mill and allowing for studying the history of papermaking extensively. The Museum is also the largest Polish centre where Polish papermaking traditions are documented. A large collection of watermarked sheets of paper from most paper mills across Poland, west Pomerania, and Silesia is also of great significance and value. It proves that the number of laid paper workshops was considerable in Europe.

Additionally, the objects of historical value which are showcased in the paper mill in Duszniki also carry non-material values – they are unique material evidence of the former craftsmanship traditions, past glory of papermaking, and technological development of the production of laid paper. The paper made in Duszniki was of superior quality – it was even referred to as 'being made to last forever'. In recognition of his accomplishments in the 17th century, Emperor Rudolf II of Austria bestowed gentry title von Schenkendorf upon Grzegorz Kretschmer, the then owner of the paper mill. The workshop held monopoly over supplying paper to public institutions in Wrocław. In the 18th century, the paper mill in Duszniki was the first workshop in Silesia and most probably in Poland to introduce the 'Hollander beater', a ground-breaking device used for producing paper pulp derived from rags. The paper mill in Duszniki contributed to development of culture and arts, e.g. Frédéric Chopin wrote letters and music on sheets made in Duszniki.

High value of the premises was noticed already in the early 20th century. It received recognition as a site of great historical value which requires protection. First

attempts at opening Museum of Papermaking in the premises being presented had been made before the outbreak of World War II. As Silesia used to be a historically multicultural area where different cultures met and merged, the location of the paper mill makes it of even greater value.

Given the historic monuments and sites in Poland, it must be agreed that the paper mill in Duszniki is a truly unique property representing the highest historical, artistic, and scientific values.

What is, however, more difficult at this stage of studies and analyses is to assess the value of the premises in light of the selected criteria and against the reference group defined in accordance with the typology (material that is relevant by its use or its invention), including additional comparative criteria, i.e. broader area (Central Europe) and chronology (mills built in the pre-industrial age).

With regard to the countries in Central Europe, the authors of the aforementioned nomination indicated: a) paper mill in Velke Losiny (Czechia), which cherishes longer traditions than the workshop in Duszniki, yet its buildings were constructed in the 19th century only; b) German premises in Niederzwönitz – constructed in the 17th century but converted into cardboard production plant in the 19th century.⁵⁵

The paper mill in Velke Losiny, located in the valley of the Desna river in Olomouc Region (Moravia), consists of eight buildings most of which are conjoined in accordance with the technical use of the premises. The mill in Velke Losiny was operating as corn mill already in the late 16th century; later, it was converted into paper mill. However, the preserved properties, including the main building, are dated at 19th century. The present neoclassical design follows from extensive redevelopment works carried out after 1823. The mill is made of masonry, features a distinctive steep mansard roof provided with four rows of vent openings. Walls are decorated symmetrically, feature semi-rusticated stripes, profiled mouldings, and window framings. Velke Losiny is proud of the centuries-long and unbroken tradition it has been cherishing since 1596 – the laid paper production methods have not changed since then. The property is still used for its original purposes, i.e. producing paper. In the 1980s, Museum of Papermaking was opened in a part of the premises, yet this function is not predominant in mill's operations.

The historic site in Velke Losiny was nominated for inscription on UNESCO Tentative List in 2001. For several years, initiatives have been undertaken on preparing cross-border serial nomination for the paper mills in Velke Losiny and Duszniki-Zdrój. Following initial comparative analysis of these paper mill premises, it can be stated that both sites are unique examples of sixteenth-century industrial heritage and great tradition of producing laid paper, which in both cases contributed to stimulating and facilitating civilizational and cultural development. Moreover, it seems that the historical values these premises have make them distinctive and unique. However, the attributes and importance of these values differ in both cases. Nevertheless, it can be stated that these values complement each other. The paper mill in Duszniki is older than the property in Czechia and its walls and interiors are elaborately decorated with, for instance, unique polychrome paintings. What makes the paper mill in Velke Losiny unique is the fact that the laid paper has been produced here continuously for several centuries since the workshop was opened. Additionally, there are more elements of the original papermaking equipment in the paper mill in Czechia than in the workshop in Duszniki. They provide insight into different stages of the production of hand-made paper, e.g. three 'Dutchmen' with iron vats (app. 1800), wooden press (late 18th century), calender used to smooth paper (1883) and steam heater (20th century).

Recently, R. Eysymontt has conducted tentative analyses of other European paper mills. These premises were indicated as worth considering in terms of selecting partners for making a cross-border, serial inscription.

⁵⁵ Nomination for inscribing the paper mill in Duszniki on the list of Polish Listed Monuments developed by A. Stefaniszyn, T. Windyka, M. Szymczyk, ed. M. Szymczyk, Duszniki-Zdrój 2009.



Fig. 60. Paper mill in Velké Losiny. Photo by A. Fortuna-Marek



Fig. 61. Paper mill in Velké Losiny. Photo by A. Fortuna-Marek



Fig. 62. Paper mill in Velké Losiny. Photo by A. Fortuna-Marek



Fig. 63. Paper mill in Velké Losiny. Photo by A. Fortuna-Marek

tion of paper mills on the UNESCO World Heritage List. The workshop in Duszniki can be compared to similar premises in Bad Homburg, Arnstadt and Alte Donbach in Germany, Auvergne in France, Basel in Switzerland, and Arnhem in the Netherlands.⁵⁶

The paper mill in Duszniki-Zdrój represents several attributes which can be considered unique and greatly authentic. Therefore, the subject facility ranks very high when compared with the paper mill in Velke Losiny or other paper mills in Europe. The workshop in Duszniki-Zdrój has a number of distinctive features which make it truly outstanding, i.e. architectural detailing and interior paintings which are rather uncommon in buildings of this type. The paper mill in Duszniki is not only the material that is relevant by its use or its invention but also the work of architecture. This unusual combination of forms and functions results in the subject site being ranked very high among other assets falling under this typology category.

At the current stage of the analysis, it can be hypothetically assumed that given the aforementioned valuing criteria, the paper mill in Duszniki, when compared to other assets in Central Europe, can be considered a property of significant historical value. It must be, however, taken into consideration that in order to achieve this, further in-depth studies and analyses must be conducted.

⁵⁶ R. Eysymontt and A. Szeląg, D. Eysymontt (collaboration), "Paper mill...", pp. 40–44.



Fig. 64. Paper laying room in Velké Losiny.
Photo by A. Fortuna-Marek



Fig. 65. Museum exhibition in Velké Losiny.
Photo by A. Fortuna-Marek



Fig. 66. Basel Paper Mill – The Swiss Museum for Paper, Writing, and Printin (Schweizerisches Museum für Papier, Schrift und Druck), Source: <http://www.papiermuseum.ch/museum/#GALERIE>



Fig. 67. Basel Paper Mill – The Swiss Museum for Paper, Writing, and Printin (Schweizerisches Museum für Papier, Schrift und Druck), Source: <http://www.papiermuseum.ch/museum/#Lebendige>



Fig. 68. Basel Paper Mill – The Swiss Museum for Paper, Writing, and Printin (Schweizerisches Museum für Papier, Schrift und Druck), Source: http://www.industriemuseum.lvr.de/de/bergisch_gladbach/schauplatz_3/papiermuehle_alte_dombach.html

LEVEL 2



I. ANALYSING THE VALUES OF THE PAPER MILL – DEFINING VALUE ATTRIBUTES AS WELL AS ASSESSING THEIR AUTHENTICITY AND INTEGRITY

What was defined in the value analysis conducted for the paper mill in Duszniki are attributes, regarded as key features and elements of the property which are of key importance in the value assessment process. Additionally, it was also verified how the detailed and shortly-described attributes satisfy the conditions of authenticity and integrity, which are of great significance in assessing values of any historic monument or site. The attribute table shows systematized list of these attributes placed under several categories: spatial scale, architectural scale, the scale of movable properties, and functional scale. Each set of attributes consists of individual attributes, their elements, short description, as well as assessment of authenticity and integrity. The most important aspects affecting the unique character of each attribute or its element have been provided in the description of attributes (for more detailed description, see: Level 1, chapter 1 – Description and analysis of the premises for the purpose of selecting features to be taken into account when selecting the right reference group). In the juxtaposition table, several features and elements which, with regard to the paper mill in Duszniki, are not regarded as attributes understood in the usual manner, are highlighted in blue. This pertains to the immediate *surrounding area* of the property, where, at present, there are no original elements reminding of the former use of the property, any *collections of artefacts* and *museum-related functions*. It has been assumed that the contemporary use of the surrounding area exerts direct influence on how other attributes are perceived. Furthermore, the use of the premises, which is different from the original one, is a specific added value of the property.

Pursuant to value assessment standards applied to properties and sites of the highest value, the value analysis to be conducted for the paper mill in Duszniki aims at revealing different values of the site

in question, linking them with its tangible form, improving the understanding of its complex nature, as well as learning more about the historic site in a more systematized manner (given the aspects of great importance to the protection of the site). Elements of the historic site, values of which are analysed in this way, provide basis for selecting protection measures to be applied as well as the scope of intended works to be carried out.⁵⁷

⁵⁷ B. Szmygin, "System wartościowania Smart Value," tspt

ATTRIBUTE CATEGORY	ATTRIBUTE ELEMENTS	DESCRIPTION ATTRIBUTE ELEMENTS		AUTHENTICITY	INTEGRITY
SPATIAL SCALE	Location	Location, given the city layout	Location on the outskirts of urban settlement	The specific location of the paper mill is still clear, in spite of the city being developed The historic site being analysed is authentic in terms of its location – at the river and historic trail connecting Wrocław to Prague (Kłodzka Str. at present). Being situated at the road heading to Zieloniec (adjacent to Sprzymierzonych Str.), which was built in 1930 following the construction of the bridge on the Bystrzyca Kłodzka River) is an important element of accumulated history and heritage. The lack of flume, which is an important feature of location of any paper mill, negatively affects examination of authenticity.	The integrity requirement is partly satisfied. Lack of flume, which is typical of paper mills.
		Location, given the watercourses	Distinctive location at the river (resulting from the use of the premises) and the flume (not displayed at present)		
		Location, given the roads	Location where two roads cross, including original (preserved) trail from Wrocław to Prague		
	Spatial layout Paper mill premises	Size	The size of the premises has not been modified – the paper mill, the draining house and the pavilion of large and small size respectively.	High degree of authenticity in terms of the layout, the size, and access to different parts of the properties. The spatial composition of the paper mill premises has not been changed since the 18th century. Changing the use of the building, however, resulted in the need for introducing other modifications, to technological solutions in particular.	The condition of integrity being satisfied to high degree. The attribute components being preserved reflect the original composition layout
		Composition layout	Distinctive, unique composition of the premises being dominated by two buildings: the paper mill and the drying room, which are rectangular in floor plan and partly conjoined with each other with an extension in north and a wooden bridge in south. The entire composition is complemented by the octagonal pavilion, access to which is provided by a small bridge and which is connected to the paper mill by a roofed passage. It is interesting how the drying house is situated – moved to south, relatively to the longitudinal axis of the paper mill and situated at an angle.		
		Access to and from the buildings	The original access routes connecting the paper mill and the drying house as well as the mill and the entrance pavilion have not been changed.		
Spatial layout Paper mill premises	Functional and technological connections	Changing the use of the building, from production- to museum-related resulted in the functional connections between the paper mill and the drying house declining in importance. The crane in west part of the drying house, which was used for moving wet paper to certain floors of the building, is tangible evidence of the former technological solutions applied. What is also still clearly visible is the functional connection between the mill and the pavilion, which must have been used as the main representative entrance.	No original elements of the surrounding area have been preserved. The form of the surrounding area is contemporary and adapted to the current use of the premises – museum of papermaking. At present, the flume is no longer displayed.	Not applicable	
	Surrounding area	Contemporary design of the surrounding area and its elements: Fencing, auxiliary building located south to the paper mill premises; outdoors exhibition showcasing papermaking machines of considerable size dated at different periods and collected from different places; garden where fibre crops used in crafting and papermaking are grown, situated west to the paper mill.			

SCALE		Internal form of the paper mill	
Spatial arrangement	Spatial arrangement of the paper mill	The lower ground floor features one room of considerable size (laid paper production workshop) and several auxiliary rooms. Spatial arrangement of the second floor: two-bay with entrance hall in north bay. Bays in east part are divided by a corridor. Moreover, on the first floor of the attic, there is a large open space room stretching across the entire width of the building in its east part and several rooms in west part of the property arranged in two-bays. Both the second and the third floor of the building in question are of open-space type and feature clearly displayed roof framework. The original use of the lower ground floor of the building has not been changed – it is where the laid paper is still being produced. On the second floor, there is an entrance hall, staircase, offices as well as exhibition rooms located east and west to the hall respectively. The first attic floor features an exhibition area. The second and the third attic floors are not used.	No interior on either floor has undergone profound alterations in terms of their spatial arrangement. Following adaptation works and converting the premises into the museum, spatial arrangement of certain rooms had to be changed. This, however, does not affect the high results obtained in the test of authenticity in which this attribute element was analysed.
	Functional layout of the paper mill	Following the change of the use of the property, in order to meet new standards, the functional layout had to be changed. The premises, which were originally used for residential and production purposes, currently function as the museum. The long-established tradition of paper 'production' cherished by the Museum in Duszniki, the original paintings preserved in the papermakers' flat, as well as interior design (although non-original, yet of great historical importance) reflecting the former residential use of the building have positive influence on the result of the test of authenticity of the functional layout. In spite of the changes having been made to it, the functional layout is clearly authentic in the lower ground floor, where laid paper is still produced. In spite of the changes, division of the building into two areas is still clearly displayed – the production part on the lower ground floor and the residential part decorated with polychrome paintings (summer flat) on the first attic floor. What is, however, no longer displayed, is the functional division into the production and residential areas on the first floor of the paper mill being analysed. Access to the floors is provided by stairs in north part of the building. The chute connecting the former sorting room on the second floor with the lower ground floor is no longer displayed, although it was displayed in the 1960s.	The spatial arrangement is highly integral, yet, given the changed function, it is difficult to examine the integrity of the functional layout. Some elements of this layout are still displayed in the paper mill building – the lower ground floor housing the laid paper production workshop and the papermakers' flat; in the drying house, the functional layout is not integral.

SCALE			
Internal architectural form of the drying house	Spatial layout of the drying room	Two-bay layout of the first and second floor; other floors are of open space type.	The interior of the building has been altered not only with regard to the room layout, as a result of which such contemporary elements as the lift were installed, but also with regard to materials being applied, e.g. drywalls, new flooring, glass casing for drying house windows, etc., which affect the character of the interior and its authenticity.
	Functional layout of the drying house	Adaptation works in progress: ground floor – museum workshops; floor – offices; third floor – exhibition room	The aesthetic qualities of the interior, which it has displayed since the last renovation works, have negative impact on the authenticity of the property. In most cases, contemporarily applied materials fail to match the historical character of the interiors and the original purpose for which the premises were used.
	Polychrome paintings	Polychrome works painted in different periods by artists representing different degrees of skill depict changes in Silesian art occurring in the 17th century as well as in the period of 1770 – 1780. Works of particular iconographical significance: – eagle – reference to the watermark used by the paper makers of Duszynki since 1756; – allegedly a biblical scene – Joseph and Potiphar's Wife; – allegedly a view over Duszynki of 18th century. Rich colours applied in certain scenes and motives	Although the painted wall and ceiling decorations are not fully preserved and have been reconstructed to a certain degree, they are greatly authentic, especially in terms of their form and substance. Moreover, as these polychrome paintings are material evidence of the residential use of the premises, they are of great importance in the test of authenticity.
The paper mill – material and structure	Interior design of the paper mill	The construction of the paper mill is mixed. It is built predominantly of wood, natural stone and ceramic brick. The lower ground floor and the second floor (in part) are work of stone masonry. Most of the second floor is made of wood, has beam construction, and is filled with ceramic brick held by lime mortar. The roof framework is wooden, its structure consists of collars and purlins, and it involves three queen posts. The collars are the beams of the ceiling of the third and fourth floor. The roof is shingled. Original sixteenth-, seventeenth-, and nineteenth-century portals are well-preserved. Wooden construction elements of stairs dated at the 20 century are preserved. Non-original window framing, reconstructed as shown in works of iconography. Most doors were reconstructed contemporarily.	With regard to this attribute, the integrity requirement is partly satisfied. Given the construction, it can be assumed that original structures, unlike materials applied in the interiors, are complete.
			The paper mill was renovated several times and its poor condition in the post-war period resulted in a number of conservation and renovation works needed to be carried out. Some of them also involved replacing elements of historical significance. In spite of the works affecting the subject facility, the paper mill premises are greatly authentic in terms of structure and material. Original elements and materials have been preserved; richness of accumulated historical heritage and outcomes of contemporarily conducted renovation works are clearly displayed – both with regard to the structure and materials being used. Original elements dated at the 16th century, which were presumably used in the paper mill, e.g. the sixteenth(?)century portal.

As the use and the spatial layout of the building have changed completely, it is difficult to analyse integrity of the building in question.

They are also greatly integral.

With regard to this attribute, the integrity requirement is partly satisfied. Given the construction, it can be assumed that original structures, unlike materials applied in the interiors, are complete.

SCALE	Construction of the drying house and materials applied therein	Wooden building with frame construction. The load-bearing frame construction consists of pillars and binders seated on wooden sill plates. In the lower ground floor, the construction is reinforced with wooden columns. All floors have wood-beamed ceilings provided with binders. The roof framework is wooden, its structure consists of collars and purlins, and it involves a triple queen post. The roof is shingled. Most doors, window frames, flooring, and finishing materials are contemporary.	Authentic construction and materials – original and reconstructed Contemporary works affecting the structure, e.g. replacing some parts of the foundations, ceiling, and roof framework had no major influence on authenticity of this attribute. Interior finishing materials, i.e. flooring, wall plaster, were subject to most extensive changes affecting authenticity.	The materials and elements of historical significance are greatly authentic.	The entire set of laid paper production tools and machinery formerly used in the paper mill is integral (complete) only to small extent. However, when the equipment acquired from other laid paper production workshops is taken into consideration as value added, the integrity of this attribute can be considered of great importance in assessing the value of the subject premises. Some production equipment originally used in the paper mill in Duszniki needs to be discussed in detail.
THE SCALE OF MOVABLE PROPERTIES	Construction of the entrance pavilion	In terms of construction and materials, the pavilion resembles the paper mill – the lower ground floor is made of brick and the second floor is of half-timbered construction. The roof is shingled.	The original equipment is greatly authentic, yet only a few parts of it have been preserved. These artefacts are showcased in the museum and are not used for production purposes. The acquired and reconstructed equipment, which is a creative combination of tools and machines used for producing laid paper by applying traditional methods, seems to be a material carrier for authenticity of function (paper mill) and tradition (the old production method).	The materials and elements of historical significance are greatly authentic.	The entire set of laid paper production tools and machinery formerly used in the paper mill is integral (complete) only to small extent. However, when the equipment acquired from other laid paper production workshops is taken into consideration as value added, the integrity of this attribute can be considered of great importance in assessing the value of the subject premises. Some production equipment originally used in the paper mill in Duszniki needs to be discussed in detail.
	Paper mill equipment	Only a small amount of the original equipment has been preserved in the paper mill, i.e.: 19-century paper laying moulds with riddles; - eighteenth-century wooden paper drying hangers; - nineteenth-/twentieth-century metal cardboard drying clip hangers; - cart for transporting paper within the drying house; - vent openings provided with air flow regulation flaps - crane for moving wet paper between the floors of the drying house; - Other machines and devices either reconstructed or acquired after the war from different paper mills across the country. In 1960s, this collection of artefacts allowed the prominent papermaker of Jeziorna, Teodor Chojnowski, to re-open laid paper production workshop in Duszniki. Seven portraits of members of three papermaker families of Duszniki Museum artefacts, e.g. furniture of great historical value, which remind of the residential function the building used to serve, complement the equipment.	Residential equipment is greatly authentic – original paintings which used to hang in the paper mill are complemented by museum artefacts representing material culture of the residents of Duszniki.	It is difficult to achieve concrete results in the analysis of integrity. Obviously, the original and non-original (museum artefacts) elements being preserved, fail to satisfy the requirement of completeness. Nevertheless, the fact that even a part of these elements exist, has positive influence on the outcomes of the test of integrity.	Given the collection of artefacts, it can be stated that the paper mill in Duszniki was of particular significance. It is the evidence of papermaking traditions in Poland and allows for studying the history of papermaking.
	Museum artefacts	The collection of various papermaking artefacts and items related to the history of Duszniki is of considerable size. Laid paper sheets with watermarks produced in Duszniki are of particular significance.	There is no doubt that the artefacts are authentic, although given the original use of the premises, they are non-original and somewhat 'alien'. Since the paper mill started to function as the museum, these elements complement its historical and scientific value.	Given the collection of artefacts, it can be stated that the paper mill in Duszniki was of particular significance. It is the evidence of papermaking traditions in Poland and allows for studying the history of papermaking.	Given the collection of artefacts, it can be stated that the paper mill in Duszniki was of particular significance. It is the evidence of papermaking traditions in Poland and allows for studying the history of papermaking.

FUNCTIONAL SCALE	Function	Production and its availability	As paper mills utilize hydropower, a river is the essential trait about their location. In the subject paper mill, paper is produced by using old methods, even though the raw materials and the production equipment are no longer the same. Rooms playing an important role in the production process have been preserved – multi-storey attics and laid paper production workshop on the lower ground floor where completely reconstructed production line can be found. Several tools and machines originally found in the paper mill in Duszyniki have also been preserved.	The requirement of authenticity is partly satisfied: – no flume being displayed – the mill no longer utilizes hydropower; the raw materials currently used are different from the ones utilized in the past. However, the medieval method is still employed – laying the stock on sieve screens, hand-pressing, hand draining. The layout of important production rooms has been preserved to large extent – the entire lower ground floor formerly used as laid paper production workshop as well as multi-storey attics featuring vent openings in the roof and special windows critical to the draining process. The use of most rooms playing an essential role in the production process has been changed – multi-storey attics in the paper mill building and the drying house were particularly affected. What is greatly authentic is the laid paper being still produced in traditional way for demonstration purposes. The tools and equipment are greatly authentic – although there are only a few original tools and machines, the reconstructed production line allows for producing laid paper by employing past methods.	Although the use of the paper mill was changed, positive outcomes of the test of integrity follow not only from the layout and type of important production rooms being preserved but also from laid paper being still produced for demonstration purposes. The paper mill is no longer a production plant and it currently functions as a museum. Obviously, given the 'production function' attribute, the requirements of authenticity and integrity cannot be fully satisfied.
			Two residential rooms on the first floor of the paper mill attic featuring well-preserved wall and ceiling paintings. It is possible that the rooms in west part of the second floor, which are currently used as exhibition rooms, would be used for residential purposes in the past. Opulent architectural detailing of the front wall, the form of west-facing gable, the entrance pavilion whose architectural form, i.e. the octagonal floor plan, the dome, the wall decor, served representative function. Portraits of paper makers of Duszyniki displayed in the entrance hall 'complement' the representative function of the interior.	The decorations and equipment pertaining to the residential and representative function of the paper mill are clear evidence of the original purpose for which the premises were used. The portraits, polychrome paintings and wall decoration are original, although some of them are reconstructed. The second floor no longer serves its original function.	Residential function is partly integral. Although there is some evidence of the 'residential function' attribute, the former flats are currently used for different purposes. In the formerly residential rooms, there is no sign of their past function. No original furniture and equipment is displayed. The representative function is greatly integral – the external form of the paper mill, including the entrance pavilion, still reflect the former glory of the paper mill and the prominence of its owners
FUNCTIONAL SCALE	Function	Residential and representative functions	Given the change of the original use of the paper mill, the fact that the premises function as a museum is considered to be value added.	Not applicable	Not applicable
		Museum and related purposes		Not applicable	Not applicable

INTANGIBLE SCALE				
Historical and professional traditions	The paper mill, dated at pre-industrial age, is where laid paper is still produced for demonstration purposes and where museum collections are showcased.	Papermaking tradition is documented and preserved. Unique evidence of manufacturing hand-made paper.	Important authenticity factor of place attachment	Important factor of perception integrity related to the unique character of the site being a place still being used for its original purpose.
	Papermaker – the profession: continuing the tradition and teaching skills	Continuing the tradition and teaching skills of laid paper production.	Important authenticity factor of place attachment	Important element of place perception integrity
	Generations of prominent royal papermakers	Individuals playing important role in development of Duszniki-Zdrój and Silesia.	Critical element of authenticity, which ‘evokes’ the feeling of identity among local communities.	Important place perception integrity factors.
	Caspar Rathsmann, the painter.	Local guild artist related to the family of the papermakers of Duszniki; author of the polychrome paintings and portraits of the papermakers.	Authenticity factor being of considerable importance in studying Baroque paintings in Silesia.	Important place perception integrity factors.
Frédéric Chopin	Letters and musical compositions written on paper sheets produced in Duszniki.	Authenticity factor arousing the feeling of pride.		
Paper mill as paper production workshop	The feeling reflected by a number of attributes.	Important authenticity factor of place attachment		
Richness of accumulated historical heritage	The paper mill as a ‘residence’ of the papermakers of Duszniki	The atmosphere and perception reflected by a number of attributes, e.g. the entrance pavilion, ornately decorated external walls, polychrome paintings in interiors.	Important authenticity factor of place attachment	Important place perception integrity factors.
	Museum	The feeling of historical character of the premises and the role that paper played in development of civilisation, culture, and arts.	Results from authenticity of the premises and museum collections.	
Emotional attachment to the place and historical heritage				

II. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS CONCERNING PROTECTION OF THE SUBJECT FACILITY

CONCLUSIONS AND RECOMMENDATIONS FOR HANDLING THE PROPERTY

Superior value which should determine actions to be undertaken in the paper mill premises:

Predominant value – the paper mill is not only a material that is relevant by its use or its invention but also a residence dated at the pre-industrial age – the site being used for both residential and production purposes; these two functions are reflected by the external and internal architectural forms, decor, and the equipment having been preserved. The solutions and forms of artistic media embody the essence of the perfect fusion of functions and forms. Value of continuity – producing laid paper by employing medieval papermaking method

Attributes which should be preserved (it is possible to reconstruct them)

All attributes, regardless of their importance and the role they play in value assessment, should be preserved. Describing attributes and their elements as well as testing their authenticity and integrity allows for indicating features and elements which exert major influence on the value of the paper mill premises. It should be a general and fundamental rule that all attributes should be preserved and displayed, including their original and authentic elements affecting integrity of not only the entire premises but also each building individually.

Serious attempts should be made to preserve all authentic elements intact, i.e. not transformed.

Given the described attributes and their elements, these attempts involve:

With regard to the attribute:

- Spatial layout
 - preserving the layout of the buildings and connections between them intact.
- External form:
 - making no changes to the body of the buildings, divisions, wall articulation, the entire architectural detailing, portals, and window frames;
 - It is prohibited to conduct any extension or redevelopment works affecting the architectural structure of the subject premises;
 - prior to commencing works aimed at renovating and conserving the external walls of the paper mill, reconstruction of the decorations

on south wall (depicted in the archive photographs) is worth giving consideration. In the event of the decision on commencing such works being positive, it should be ensured that the reconstructed decorations will be clearly distinguishable from the original ones, e.g. by applying brighter colours.

Window frames in the drying house – in future, the present window frames should be replaced with windows of more traditional design.

- Internal form of the paper mill:
 - it is recommended not to change its current form;
 - It is prohibited to conduct any extension or redevelopment works in the interiors;
 - original and authentic elements should be displayed;
- Internal form of the paper mill – renovation and adaptation works recently conducted inside the drying house – the scope of works as well as the techniques and materials applied exerted negative influence on authenticity of the interiors. The current functional layout differs from the original one. All the modifications and works affected the buildings, some rooms and floors which, as a result, have lost their original character;
- Interior decor – polychrome paintings
 - it is recommended to carry out comprehensive conservation and preservation works not affecting the premises and, subsequently, to preserve the real estate in good condition.
 - furthermore, it is also recommended to study the condition of polychrome paintings in the 'Under the dome' room and preserve them in accordance with the previously developed schedule of conservation works;
 - technical condition of polychrome paintings should be monitored by professionals. The manager of the premises should take appropriate actions aimed at removal of any changes or damp.
- Material and structure:
 - it is recommended to preserve and conserve all original elements of this attribute, which are dated at the time of building the paper mill and which provide evidence of the richness of accumulated historical heritage.
 - there are sound reasons behind removing secondary paint layers from the oldest part of the drying house (wall of log cabin structure);

- in the event of conducting renovation and conservation works in the staircase in the paper mill building, all original elements dated at 1720s must be preserved.
- Equipment:
 - carrying out preservation and conservation works
 - preserving, conserving, and improving the display of the very few preserved pieces of equipment formerly used in paper production;
 - carrying out works aimed at conservation of equipment used for residential purposes – five portraits of the papermakers of Duszniki displayed in the entrance hall;
 - undertaking initiatives aimed at including the recently found document confirming that a noble title, von Schenkendorf, was conferred on Gregor Kretschmer into the record of museum collections, together with a metal plate featuring a portrait of Christian Wilhelm Kretschmer (alternatively: making copies).
- Function:
 - it is greatly important to continue production of laid paper (even on small scale) – this attribute (industrial function and its continuance) results in a property ranking high in value, integrity, and authenticity assessments;
 - at present, the contemporary function of each property being a part of the premises, i.e. the paper mill, the drying house, and the pavilion, should reflect the original use of each building. It is therefore recommended to continue production of laid paper in the lower ground floor of the paper mill building as well as use the drying house for its original purpose, i.e. drying paper using old methods;
The functions that the rooms in each building serve at present should resemble, to the greatest possible extent, the original purposes for which these rooms were used.
- Surrounding area
 - the area surrounding the paper mill differs from its original form. This follows from contemporary alterations, arrangements, and change of the layout of the properties and functional areas. Nevertheless, this area plays significant role in enhancing and emphasising the positive aspects of the paper mill premises. For this reason, any actions or changes to the surrounding area should be aimed at showing the functions that each building originally served;
 - as a result of the planned investment involving transformation, extension (redevelopment) and adaptation works, the exhibition pavilion and

the boiler hose must neither dominate other buildings of the paper mill premises nor compete with them in terms of size, architectural form, and function. It is recommended to conduct landscape analyses before extending the current building.

There are sound reasons behind the plans to reconstruct the flume (or its part) and the mill wheel.

- When planning alterations and re-arrangement of the area in the southern part of the subject tract of land, not only flume reconstruction but also reference to original arrangement of the area should be considered. These works should increase the value of the surrounding area, e.g. by emphasising original use of the land.
- It is recommended to obscure the existing disharmonious facilities in south, for instance, by planting greenery and/or redeveloping/extending the exhibition pavilion and the boiler house.

It is also recommended to change the unattractive road signs at the crossroads of Kłodzka and Sprzymierzonych Streets. Posts and road signs made of high-quality materials and standardized in terms of colour should be designed and made.

General recommendations concerning conservation and restoration works

- It is strongly recommended to involve preventive conservation in any restoration and conservation works carried out in the subject paper mill premises (including interior and equipment).
- Before undertaking any actions affecting the architectural structure of the buildings, their decor and equipment, the properties should be thoroughly analysed and identified; the works should follow from individually arranged schedules and be aimed at preserving and protecting the authentic elements of historical significance in particular.
- Moreover, studies fitting the scope of planned alterations should be conducted prior to conservation and restoration works;
- The conservation and restoration works should be carried out by experienced and reliable conservation companies;
- Any earthworks should be supervised by an archaeologist.

General recommendations concerning the use of the premises

- The values of the premises must not be affected by development of the museum.

- The contemporary use and possible works aimed at adapting specific buildings and rooms for new uses should clearly reflect the original functions they used to serve.
- New investment projects to be carried out in the closest proximity to the paper mill premises must result in the size, architectural form, and functions of the premises of historical significance being preserved.

Apart from the aforementioned conclusions and recommendations, it is also suggested to:

- Conduct preliminary research on source materials, i.e. archive, iconography, and cartography evidence and analyse them in order to examine controversial issues and establish facts critical in value assessment, e.g. the date of using the 'Hollander beater' for the first time.
- Conduct architectural analysis of each building. The results of dendrochronology analyses having already been conducted should support the architectural studies. Given the numerous periods in which the premises were damaged, redeveloped and transformed, the renovation works involved replacing wooden parts of the properties. It therefore seems that dendrochronology analysis alone is insufficient for dating the premises more precisely and, ultimately, uncovering layers accumulated in certain periods. Cross-disciplinary approach, i.e. architectural, archaeological, iconographical studies utilising specialist methods, e.g. dendrochronology, analysing mortar, plaster stratigraphy, etc., can make the assessment of elements of historical significance more objective, allow for uncovering layers accumulated in certain periods more precisely, as well as confirm or specify chronological dating

carried out so far. It is planned to use the results of specialist studies and analyses already conducted, e.g. dendrochronology. Moreover, it is also intended to encourage closer cooperation between a dendrochronology specialist and architectural investigator who will indicate the 'areas' to be sampled and the number of samples of wood needed for deciding when the paper mill premises were built and when they underwent architectural transformations.

- Continuing studies on polychrome paintings (archive, comparative, conservation, technological studies) with the aim of, for instance, precisising iconography identification and providing more details on divergent opinions on the results of dating studies and style and formal assessment.
- Subsequently – identifying and analysing older polychrome paintings currently covered by the ceiling in the room referred to as the 'Room under the dome'.
- Continuing comparative studies according to which the paper mill being analysed belongs to a group of properties designed in Czech and Silesian architectural style.
- Conducting further studies and comparative analyses in the broader territorial (paper mills preserved in Europe) and periodical (all paper mills built in the pre-industrial era) context, including value assessment criteria indicated in this study; the aim is to nominate such properties and sites that would be of outstanding universal value for inscription on the World Heritage List.
- Conducting landscape analysis which would allow for establishing historic preservation zone (buffer zone) for the premises in question and developing guidelines for preserving the existing landscape links and relations.

ASSESSING THE VALUE OF THE SUBJECT PROPERTY BY APPLYING THE SMART VALUE METHOD – CONCLUSIONS

The values of the paper mill premises in Duszniki-Zdrój were analysed by adopting SMART Value method. The analysis was conducted in two stages. What was defined and described at the very beginning were all the features and elements of the paper mill which are important in defining the values of the premises and establishing a comparative group. Once the type of the asset was defined and elements indicating under which reference category the subject facility falls were selected, it was possible to define the scope of interest. Next, an attempt was made to assess the value of the subject premises according to the criteria defined for the selected reference group.

The analysis and comparative value assessment (in light of the selected criteria) proved how prominent and important the paper mill in Duszniki is. The value assessment confirmed that the subject facility is unique in Poland, important in Europe, and was rightfully listed as Polish Listed Monument. The applied method allowed for indicating similarities and differences between the subject paper mill and the facility in Velke Losiny, which, together with the historical site in Duszniki, is going to be inscribed on the World Heritage List (UNESCO). At the same time, what is critical in light of the attempts being made to inscribe both paper mills on the World Heritage List, SMART Value analysis proved that it is necessary to broadly identify pre-industrial paper mills preserved in Europe and establish cooperation with new partners (site administrators) for the purpose of submitting a serial cross-border nomination (in order to increase the chance of listing the properties in UNESCO catalogue). It has been confirmed in comparative value analysis that the paper mill in Duszniki can be considered a property of outstanding historical value in Central Europe, with regard to the specific reference group.

Integrity and authenticity of tangible and intangible attributes as well as their elements were defined and described in the second stage of the value assessment. As these elements are diverse and the historical values are multi-faceted, it was possible to analyse and understand the multidimensional nature of the subject site. According to the SMART Value method, value attributes are defined in order to indicate elements being critical for preserving the total value of a historic

monument or site. If any works need to be carried out in a historic property or site, it is at this stage when value analysis is of critical importance (excluding comparisons and references to the reference group defined in the first stage of value assessment). Historic preservation specialists and conservators working in historic monuments or sites need to treat this part of the value assessment process as starting material. Given the factors playing essential role in works carried out by historic preservation officers and conservation-renovation specialists, it is of considerable importance to analyse the asset in a systematized manner. Basing on recommendations following from the value assessment, a number of conclusions and proposals were defined for the paper mill in Duszniki. These pertained to, for instance, preservation, display, and reconstruction of attributes, the way of using the subject property and the scope of possible works.

Values of the paper mill in Duszniki-Zdrój were analysed by adopting the SMART Value method. What was produced as a result was a great number of recommendations concerning studies to be conducted in order to understand the subject property and its values much better. What is more, the property manager has already started certain analyses, e.g. archive and architectural studies as well as analysis of decorations painted inside the paper mill premises (in terms of dating, author, genre, foundation, iconography, etc.). These studies have already resulted in establishing previously unknown facts about the history of the premises and the artefacts found therein. This led to advancing new scientific theses. It can be claimed that the value analysis having been conducted for the paper mill in Duszniki resulted not only in revealing a wide *spectrum* of values of the subject premises but also in indicating the scope of and recommendations for in-depth analyses. This contributed to development of studies concerning Silesian art and architecture.

System-based value assessment conducted by adopting the SMART Value method also resulted in defining different types of possible threats and showing the direction in which the site should be developed. This allowed for drawing preliminary conclusions and making recommendations on implementing the site management plan. Value assessment conducted by adopting the SMART Value method can be considered not only a starting point but also a critical element in protecting historic monuments and sites of the highest value.

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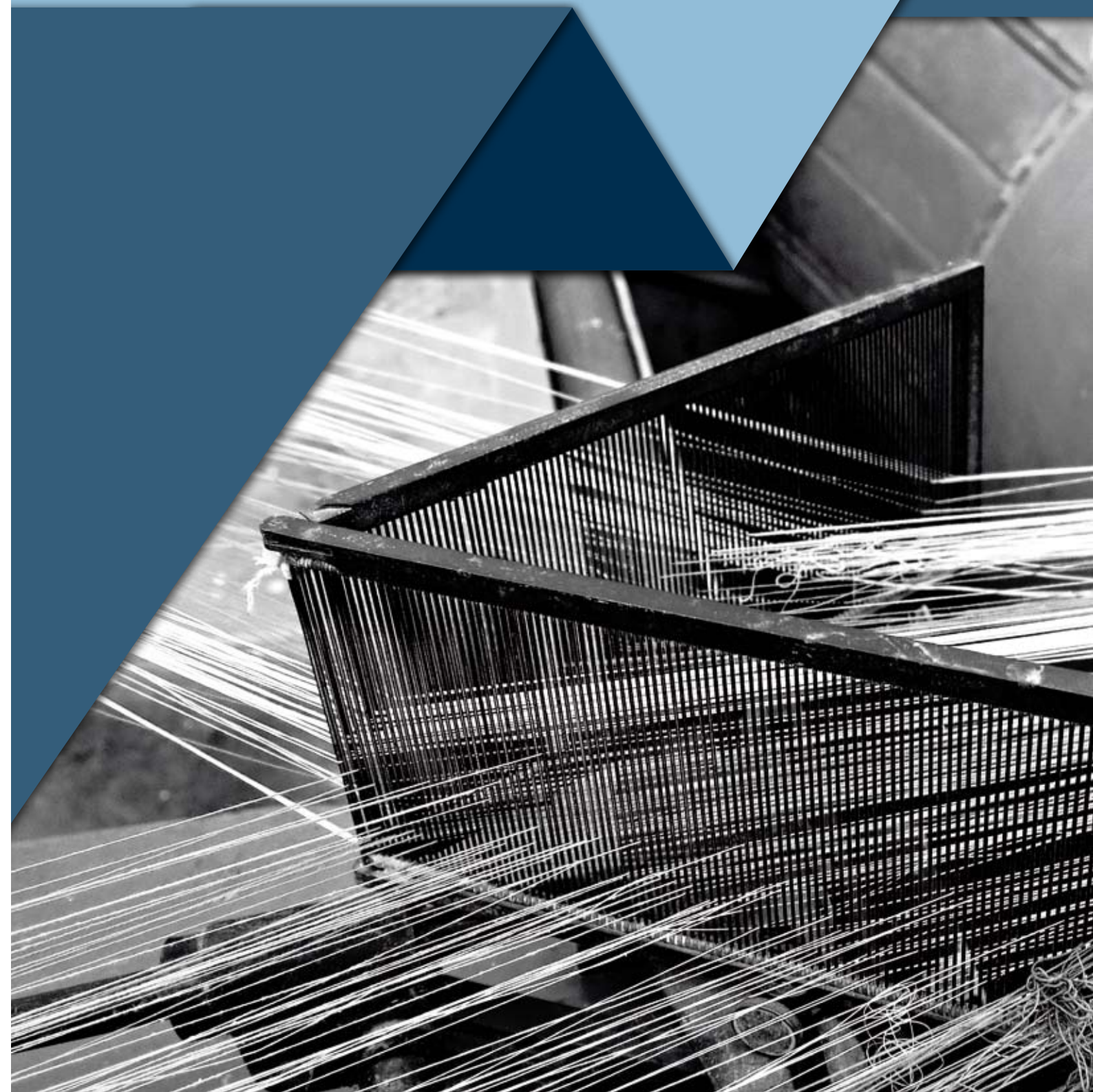
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ŻYRARDÓW

THE 19TH-CENTURY FACTORY

SETTLEMENT ANALYSIS OF THE VALUES



CHARACTERISTICS OF THE ASSET



CHARACTERISTICS OF THE ASSET

1.1 Historical description of the asset

1.1.1 The historical and technical context of the linen industry¹

LINEN IN THE HISTORY OF CIVILIZATION

Flax – *Linum usitatissimum* L. – is an industrial plant used by man from pre-historical times as a source of fibres, but also as an oily and healing plant. Wild flax comes from the South-East coast of the Mediterranean Sea and from Asia Minor. It grows in a cool and moderate climate. It has been used already in the Palaeolithic era, it was cultivated in Egypt, Mesopotamia at least since the fifth millennium BC. Linen products are mentioned in the Bible. They were known in the Greek and Roman cultures, by the Celts, Gauls, Germans and Slavs. Linen was used in the Polish lands already in the early Middle Ages. Throughout the ages, in Europe linen was, next to cotton, a basic textile raw material. Linen fabrics were used for sewing garments, equipping and adorning houses and for economic purposes.

Flax was originally processed at home weaving workshops. Over time, weaving turned into a specialized guild craft. Colonies of weavers emerged, i.a. in Silesia and Greater Poland. Technically, the development of flax processing occurred in the 16th and 17th centu-

ries, and the next step to industrial production, were: the system of working under contract and the first manufactures created in the 18th century. Textile production, including linen, was revolutionized in the 18th century, when high-speed shuttle for manual looms (1733, J. Kay), and mechanical looms (1785, R. Cartwright) were invented in England. The next steps of the technical revolution were the use of water, and then steam drives, which helped transform the production of fabric from a craft labour into an industry. At the end of the 18th century, the European high-performance textile industry was born. The fabric was made from natural raw materials: flax, hemp, cotton, animal hair (wool), silk.

Methods of factory production of linen yarn and mechanical weaving were developed. The textile industry grew rapidly especially in England, France, Belgium, the Netherlands, the German countries and in the Russian Empire. In the 19th century, linen products were manufactured on a massive, industrial scale. The decline in popularity of linen products was related to competition of cotton fibres, brought to Europe from overseas colonies. However, linen is used as a textile material to this day. In the second half of the 20th century, in the period of the Polish People's Republic, the "Polski Len" ("Polish Linen") brand was promoted as a symbol of national elegance and design, which was to combine folk traditions and the modern character of design concepts. Unique designs and limited original collections belonged to interesting artistic achievements of that day.² Linen was, and still is, used in production of lingerie, decorative, clothing, technical, packaging,

¹ Prepared based on: M. Michałowska, *Leksykon włókiennictwa*, Warszawa 2006; S. Kieniewicz, *Historia Polski 1795-1918*, Warszawa 1983; L. Bazyłow, *Historia powszechna 1789-1918*, Warszawa 1981; I. Kostrowicka, Z. Landau, J. Tomaszewski, *Historia gospodarcza polski XIX i XX w.*, Warszawa 1984; and the current educational and exhibition materials of the Linen Industry Museum in Żyrardów. The presented basic information about the history and production processes of the linen industry, taken from literature, are used to show the background for the development of Żyrardów and does not claim to constitute any independent compilation on the topic. The overview of the above information is, however, a necessary component of the method of determination and presentation of the values of the historic complex.

² J. Kowalska, M. Możdżyńska-Nawotka, *Modna i już! Moda w PRL*, Cracow 2015.



Fig. 1. Flax, O. W. Thome's Herbarium (1885), by: <https://atlas.roslin.pl/plant/7321>



Fig. 2. Museum cultivation of flax varieties. Photo by A. Siwek

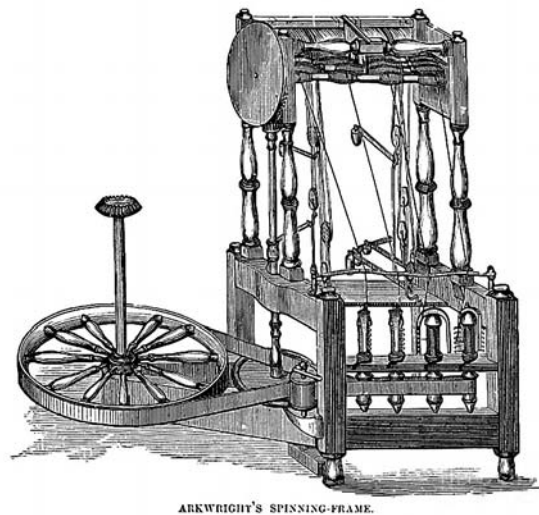


Fig. 3. The mechanical loom. Illustration from the 19th century, by: https://etc.usf.edu/clipart/79800/79829/79829_arkwright.htm

thread and cordage (tow) fabrics, as well as oil and paper. It has medical and dietary uses and is used for feed production.

It should be noted that in the 19th century, the textile industry played a special role in industrialization and economic development of lands of the Kingdom of Poland under the Russian rule.

Stabilization of the political situation in Europe, as a result of the terms of the Congress of Vienna, after the turbulent period of the Napoleonic wars, cemented the Tsar's powers over a significant part of the Polish lands. A patch of the former Commonwealth, referred to as the Kingdom of Poland or the Congress Poland, enjoyed limited political freedom. This relative freedom allowed to introduce local economic policies. Under this policy, in the first half of the 19th century, industrial development was one of the priorities of the government in the Kingdom. In the 1820s, the Sejm of the Kingdom

of Poland initiated the creation "in cruda radice" of the Łódź Industrial District, which, in addition to Łódź, covered nearby towns like Pabianice, Zgierz, Aleksandrów Łódzki, Konstantynów Łódzki, Ozorków, as well as more distant ones, such as Tomaszów Mazowiecki, Zduńska Wola and Sieradz. As a result of a deliberate action, craftsmen – weavers – were brought here from Silesia, Greater Poland, and later also from Germany. The customs policy, introduced in 1822, opened the broad markets in the Russian Empire to the local manufactures. Soon, in the place of weaving colonies and work under contract, factories appeared.

Favourable natural and legal conditions sparked the rapid industrial development of Łódź that lasted until the end of the 20th century. The basis for the development of the city was provided by the textile – weaving and cloth – industry. In terms of raw materials, the textile industry of Łódź was based on processing wool (cloth) and cotton. The same favourable legal and

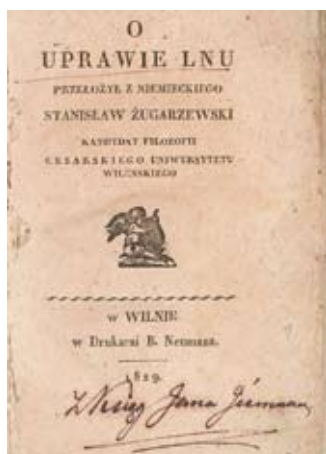


Fig. 4. A guide for flax cultivation, 1829 by: <https://polona.pl/item/33171769/4/>



Fig. 5. Łódź – Geyer's White Factory (1835–1837). Photo by A. Siwek



Fig. 6. Żyrardów spoolers – at the gates of the Linen Industry Museum. Photo by A. Siwek

organizational conditions were used in establishment of the industrial area in Żyrardów. The efforts of the Łubieński family, the local landowners, to modernize the farming economy were joined together with the trends to industrialize, characteristic of the 19th-century economic changes in Europe, and the innovative technical know-how, introduced by a French engineer and inventor, Philippe de Girard, were all utilized. Ultimately, in Żyrardów established was a specialized linen production centre, which at the end of the 19th century surpassed other European centres in terms of processing raw material and production of fabrics. Convenient local conditions, i.e., the agricultural facilities and manpower resources, communication network (roads and rail), access to water, availability of space for the deployment of all stages of the production process, as well as share capital, innovation and legal support – all were used for that purpose. Despite the changing economic situation and new restrictions in the Russian

partition, introduced after the uprising, business initiatives, initiated in the first decades of the 19th century, developed throughout the entire century, in the second half of the century reaching the status of notable European textile production centres. At the same time, in large-scale workers' environments, class awareness and the seeds of political organizations started to emerge. Dawn of the modern labour movement began, which affected the social and political face of the 20th century. Textile factories of the Kingdom of Poland, due to their economic rank, employment scale, the impact on urban complexes and the fact of generating social and political processes constitute an extremely momentous testimony of the transformation of civilizational changes taking place in Europe in the 19th and 20th centuries. In their history, as in a lens, focus the trends that shaped the European society of the time, and interweave the threads for the evolution of the modern, mass culture of Europe.

FLAX AS AN INDUSTRIAL RAW MATERIAL

Treatment of flax is a multi-stage process. Whether at a cottage workshop or in an industrial system, the sequence of actions must be maintained. Flax processing technology affected the production system and organization of the factory, so it should be given some attention. Technology-wise, industrial production was continuously developed. However, the essential stages of the manufacturing process remained unchanged.

Flax for the textile industry provides long fibre from the central part of the stalk, which is used for the production of high-quality combed and warp yarns, as well as fabrics and short fibre from the upper and root parts of the plant that is used for the production of weft carded yarns. Natural vegetable textile fibre is obtained from the stalks of biennial or perennial green plants. The processing of the raw material includes retting, swingling, scutching, combing and spinning. The length of a flax fibre ranges from 20 to 140 cm, depending on the plant variety and growth conditions. It is a much thicker and less flexible fibre than cotton, uneven due to its structure, slightly shiny, greyish-silver or cream in colour. It is characterized by high durability, crumpling, stiffness, hygroscopicity and its resistance to dyeing.

Flax processing involves a series of stages, from raw material acquisition, through its processing, to the use of obtained threads, yarns or canvases. Flax must be collected manually, preferably by pulling the entire plants out from the ground. After collecting, they are placed on the ground for 24 hours to settle down so that they do not bend during drying. Then, in order to dry them, the harvested flax sheaves are stood against each other in groups. After drying, with the help of a comb or, on an industrial scale, in a rippler, the heads are separated from the straw, i.e. seed pods are separated from stalks. This is followed by retting. This is the stage of pre-treatment of flax straw. It consists in separation of usable fibre from shive, i.e. the woody part of the stalk. For this purpose, biochemical methods are used. In cottage workshops, by exposing the straw to weather conditions, especially dew (hence the name: dew retting). On an industrial scale, by soaking the straw in retteries. Industrial retting takes place in pools with heated water or special ditches with retting baths. As a result of the activity of bacteria, mould and yeast, fermentation of the straw occurs. The soaking time depends on the class of straw and additives, the so-called medium (urea), and varies from 62 to 212 hours. During retting, the temperature of the bath must be between 19-38°C. The next step is drying of the straw. The oldest way was to dry the straw in the sun. In the industrial process, this process is accelerated in drying rooms. For this purpose, sets of driers consisting of wringers and mechanical driers are construct-

ed. The next step is the mechanical processing of flax straw, which provides flax fibres: long (combed) and short (tow), and shives. In the cottage workshops, this process was performed manually by swingling, scutching and combing. In the industrial production cycle, this took place mechanically in a swingling and scutching assembly, which was accompanied by swingles and scutching turbines. Swingling is breaking and crushing of dried and prepared flax stalks to separate the fibre from the woody part of the straw and completely remove the hard shives. Manually, the effect is achieved with the aid of swingling knives, in a more developed technology – with the use of a manual swingle. On an industrial scale, mechanically on swingles used since the early nineteenth century. The finishing of the mechanical treatment is the scutching of the fibres, which is intended to finally cleanse the long fibre from the remains of the shives. Cottage industry used a manual scutching tool. In the industrial cycle, the straw goes to a transporter, which moves it between two scutching reels. During two sections of scutching (length of the reels of each section of approx. 2.5 m) obtained are several intermediates: scutched fibre (long) – full-valued raw material for the production of high-quality combed yarns, scutching product – an intermediate for further processing for carded (tow) yarns, shives for fibre boards and retting waste for the paper industry. The most valuable result of the scutching process is the long fibre which is then sorted, classified and packed in loose bundles 20 kg each. In this form, it goes to the preparatory department of the combing and spinning mill. Combing is the final stage of treatment of long flax fibres before spinning. Is used for final removal of impurities, separating long and short fibres and maximum straightening of the fibres. The fibres were combed manually with a wooden, and later metal, dense comb. Mechanical combing also uses a system of metal combs and is intended to arrange individual fibres parallel to each other to obtain stripes that make quality combed yarns.

In the process of industrial combing, spreading, doubling and drawing machines are used. An important stage, prior to spinning, is obtaining roving in a roving machine. It is a ribbon made of fibres that is outstretched, thinned and slightly twisted. In this form, the raw material goes to the spinning mill. Spinning is the process of manual or mechanical manufacture of yarn from textile raw materials (wool, silk, cotton, flax, etc.). Since the ancient times, spinning consisted in manually weaving by drawing a band of fibres from the distaff or spinning reel, and outstretching it to the correct thickness while twisting and winding of the resulting yarn on a coil embedded in the spindle. Spinning on an industrial scale is similar, although it uses mechanical tools that significantly increase the speed of work and



Fig. 7. Parts of the exhibition of the Linen Industry Museum in Żyrardów. Photo by A. Siwek



Fig. 8. The Linen Industry Museum. Photo by A. Siwek

the homogeneity of the obtained products. Mechanical spinning can be wet or dry, and uses spinning machines. Wet spinning was most often used in flax spinning rooms. The roving ribbon of flax was immersed in a trough with water, then it was passed through a set of stretching rollers. It was subject to, subsequently, twisting and winding onto a special spinning coil. At the end of spinning, the yarn is spinned onto conical sorting coils. Errors that occurred during the process of spinning were eliminated here. After that, the yarn goes to the weaving mill, where preparation for weaving takes place, i.e. preparation of the warp and weft. Weaving has been known since the ancient times, it consists in interweaving two or more mutually perpendicular sets of threads: the longitudinal, or warp, and the transverse, or weft. The final product is fabric. Manual weaving took place on weaving looms of varying sizes and degrees of technological complexity. For centuries, it has been one of the classic house-works, that meet the basic needs of a household. Gradually, looms were developed and a group of specialized craftsmen – weavers was shaped. A ground-breaking improvement of looms, which increased the weaving speed, was the introduction in 1733 by the Englishman John Kaya of the “flying weaving shuttles”. The shuttle, beat by two elements placed on two sides of the loom, quickly weaved the weft thread on its own. The next step was the introduction of the mechanical loom. The mechanical loom was created as a result of modifications to the manual loom by adding a mechanical drive that enabled automatic creation of a passage, flipping and knocking of the weft and feed of the warp. In the oldest mechanical weaving mills, looms were powered by a collective transmission drive. Over time, mechanical looms were equipped with an individual drive with an electric motor. The mechanical loom was introduced for the first

time by Rev. Edmund Cartwright, in England in 1786. In the 19th century, the design of mechanical looms was perfected by putting into use more and more new inventions and upgrades. Mechanical looms were used in Poland to the mid-20th century. Currently, automatic looms are being replaced by – much more efficient and quieter in operation – shuttleless looms. Mechanical looms are divided into heald and Jacquard. This division is associated with the way the passage is created during weaving. The essence of the Jacquard machine, invented in 1805 by weaver and inventor Joseph Marie Jacquard, is that they can individually control single warp threads according to a schedule. This allowed to obtain multi-coloured and patterned fabrics. Punched cards – cartridges were used to control the process. It must be pointed out that this was the first scheduled control system in the history of technology. Jacquard cards served as inspiration for the first computer control systems. In the linen industry, an important role in the next stage of production played bleaching of the obtained canvas. Bleaching of linen canvas was done by removing the natural impurities of fibres, degreasing and decolourization, in order to obtain the white colour of the fabric. Traditional bleaching was performed by distributing canvas in meadows or rocks next to rivers, where under the influence of the sun and weather conditions the expected result was obtained. Chemical bleaching used in industry consists in using a bath with the relevant chemicals. In the 18th century, the process of bleaching fabric was optimized by cooking it in lye solutions, sometimes with the addition of sulphates or special salts. After the year 1785, chlorine started to be used, and since 1830 – bleaching lime. After bleaching, the canvases were suit for sale or further processing, particularly dyeing. Dyeing is a chemical process, to which the fabric or yarn is subjected, which imbues the



Fig. 9. The 1970s. A commercial of the „Polish Linen”, by: <https://www.facebook.com/Zyrdardownastarejfotografii>



Fig. 10. A piece of a printing screen from the second half of the 20th century. Photo by A. Siwek

fibres with liquid dyes, and then fixes it at approx. 180 or 100°C. The earliest dyes were natural, mineral and vegetable. With time, the colour palette was enriched by further achievements in chemistry. The process was particularly expanded in the 2nd half of the 19th and in the 20th century with the development of industrial chemistry.

To dye the fabrics, water tanks or devices for dyeing fabric in bands or in full width are used. The linen industry is dominated by CPB dyeing, in which a so-called dyeing foulard is used. It is a machine in which the fabric is saturated with dye. One of the popular techniques of decorating linen fabrics was printing. Printing on fabrics is a single or multiple, intended, local colouring of fabrics that makes up a specific pattern repeated at fixed intervals (rapport). Initially, wooden stamps were used. The first roller printing machine was used in 1785, in England. They were improved throughout almost the entire 19th century. One of the improvements was the use of a method of screen printing on a flatbed printer. It is worth noting that in Żyrardów in 1885, there functioned a showroom, in which decoration designs for decorative fabrics were created. A collection of printing screens is a valuable part of the heritage of Żyrardów.

The final stage in the production process was the finishing line. Finishing aims at final refinement and finishing of the fabric. The goal is to obtain better properties. Using a thin coating finish, the look of the fabric is improved and the resistance to crease and soiling is increased. A commonly used finish was starch (obtained from potato flour). In the modern process of linen fabrics finishing, in industrial production also a process of sanforization is used, that is, shrinkage and decatizing in order to reduce the extensibility and contractility of the fabric.

The multi-stage nature of the production process of linen fabrics translated directly to spatial disposition, the size and form of the factory's buildings. The labour-intensiveness and complexity resulted in the necessity to hire appropriate professionals, middle managers and numerous masses of workers, which in turn was reflected in the development of the factory settlement and its inner urban structure.

1.1.2 The outline of the history of Żyrardów³

The name Żyrardów appears after 1829, when within the limits of the village of Ruda Guzowska, a factory settlement started to be constructed. Prior to that, areas of today's Żyrardów belonged to the lands of Henryk and Jan Łubieński and were areas of agricultural use. The centre of the Łubieński estate was Guzów, an old seat of non-city starosty. The Łubieński family was interested in increasing industrialization in the Kingdom of Poland and of their assets. A distinct person was Henryk Łubieński. He was one of the organisers of the Land Credit Society, a member of the Sejm of the Congress Poland and the Director, and then Vice President, of the Bank of Poland. Initiate the creation of the sugar refinery in Kazimierza Wielka, in Guzów (1829) and in Częstocice (in 1839). He established the faience factory in Lubartów, the Huta Bankowa in Dąbrowa Górnicza and the industrial metallurgical plants in Serock, Starachowice and Ostrowiec. He supported the development of railway. For the area where Żyrardów was established, for centuries the local economic centre was Wiskitki, which have been evolving since the 13th century as a settlement at the prince's hunting court, then as a private town (since the 16th century).

3 The history of Żyrardów was prepared based on published and unpublished materials, with particular consideration of the following items: W. Trzebiński, *Studium historyczno – urbanistyczne do planu zagospodarowania przestrzennego Żyrardowa*, Warsaw 1953, typescript in the Archives of the Mazowiecki Voivodeship Historic Monuments Inspector in Warsaw; *Żyrardów. Dokumentacja konserwatorska urbanistyczno-architektoniczna*, State Enterprises MPW, Warsaw 1976. /Team work under the direction of J. Baranowski, academic supervision: A. Rottermund, A. Znojkiwicz, historical documentation: A. Plotkin, urban documentation: J. Kubiak, architectural documentation: T. Szyburska; photographic documentation: K. Kowalska, A. Stasiak, J. Szadkowski/ typescript in the Archives of the Mazowiecki Voivodeship Historic Monuments Inspector in Warsaw; K. Zwoliński, *Zakłady Żyrardowskie w latach 1885 – 1915*, Warsaw 1979; I. Pietrzak-Pawłowska, ed., *Żyrardów 1829-1945*, Warsaw 1980; A. Woźniak, *W sobotę po wypłacie... – Żyrardów*, in: *Biblioteczka wiedzy o Żyrardowie*, Żyrardów 1986; A. Stawarz, ed., *Z dziejów rzemiosła żyrardowskiego*, Żyrardów 1988; *Documentation of the application of the Factory Settlement Complex in Żyrardów for recognition as a Polish listed monument, team compilation under the direction of A. Wilk, Żyrardów 2010*, typescript in the Archives of the Żyrardów City Hall; S. Teofiluk, *Historyczne centrum miasta Żyrardów. Zakres ochrony konserwatorskiej „osady fabrycznej”*, typescript Warsaw 2008, /in the Archives of the City Historic Monuments Inspector in Żyrardów/; M. Szulińska, *Żyrardów miasto Inu. Propozycja utworzenia parku kulturowego*, [in:] *Dziedzictwo przemysłowe Mazowsza i jego rola w turystyce*, ed. W. Kaprowski, F. Midura, J. W. Sienkiewicz, Warszawa 2008; Portal Urzędu Miasta Żyrardowa, *Spacer po XIX-wiecznej Osadzie Fabrycznej*, www.zyrardow.pl /as at 15.06.2016/.



Fig. 11. Jan Łubieński (1788-1878), a graphic by H. Hanfstaengl, 1842, <https://polona.pl/item/5898349/0/>



Fig. 12. Henryk Łubieński (1793-1883), a graphic from the mid-19th century, <https://polona.pl/item/5379170/>

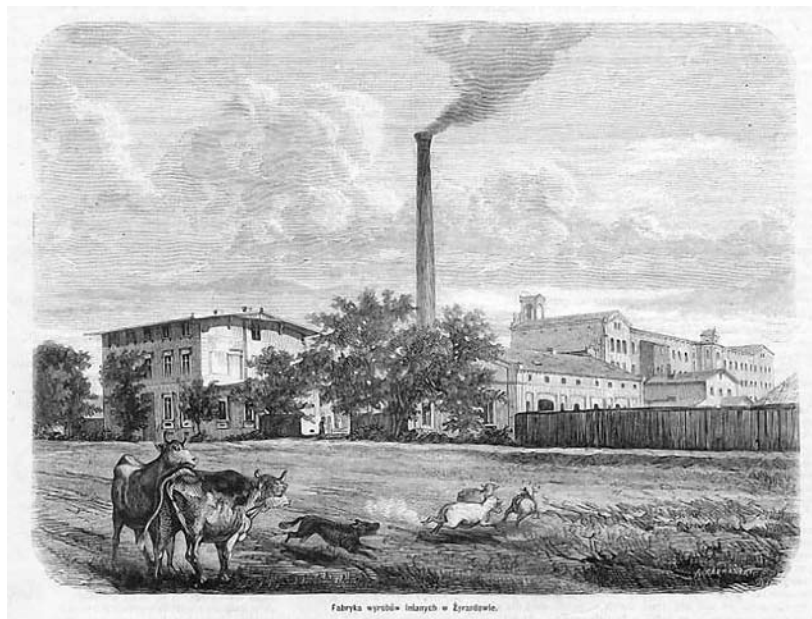


Fig. 13. Żyrardów around 1870, Tygodnik Ilustrowany No. 212 of 20 January 1872, p. 32



Fig. 14. Żyrardów in the phase of full development. Panorama, 1899. Collections of the Museum of Western Mazovia in Żyrardów

Wisłitki also housed a Roman-Catholic parish, covering Ruda Guzowska and the areas that later became Żyrardów. The communication route from Wisłitki through Ruda Guzowska to Mszczonów became the axis, along which a new factory settlement named Żyrardów was established. Initiators of the new venture were Józef Lubowidzki, Karol Scholtz and owners of the Guzów lands – Henryk and Jan Łubieński. The partners have already had experience in creating, since 1825, the mechanical spinning mill at Marymont in Warsaw, which started operation in full efficiency only in 1831. In 1829, they founded the Society of Linen Products, which started the construction of industrial plants and factory settlements in Ruda Guzowska. This location turned out to be perfect. On 9 August 1830, the management of the Flax Spinning Factory was taken over the company named “Karol Scholtz i Współka”.

The factory started operations in 1833, thanks to the involvement of a French engineer and inventor of the mechanical flax spinning machine – Philippe de Girard. The name of the settlement: “Żyrardów” was created from his name.

Initially, the industrial complex consisted of seven buildings centred around a rectangular garden. The centre of the complex was a four-storey flax spinning factory built in 1832-1833 according to the design of Jan Jakub Gay. The factory's development was supported by railway connections. In Ruda Guzowska, one of the Warsaw-Vienna Railway stations was located, which was the first railway line in the Kingdom (and the second in the Russian Empire). Żyrardów was thus the first industrial settlement in the Kingdom of Poland to receive a railway connection. In 1842, the factory employed 800 people. After the wave of crises in 1847 employment fell to 400 people,

and the factory was taken over by the Bank of Poland. The capital-backed settlement continued to grow. The centre of the settlement developed by the expansion of the old farm settlement. The former marketplace, situated across the Wiskitska road, opposite to the factory buildings, has been transformed into a market square. Frontages of the Market Square (Plac Jana Pawła II) were developed with residential houses of low technical standard. In 1857, there was a significant change in the history of Żyrardów. The ownership of the factory, which employed about 500 people and of the settlement, was taken over from the Bank by a partnership of industrialists from the Habsburg Monarchy – Karol Hiele and Karol Dittrich. They came from a German-speaking community in the Czech lands. Through their management, thanks to their own capital and favourable bank loans, the industrial plant was expanded, spinning and bleaching facilities were expanded, mechanical weaving shops were opened and a gas plant was built. By 1867, the settlement had 27 residential buildings. The buildings were erected along ul. Wiskitska (ul. 1 Maja) and at the Market Square (Pl. Jana Pawła II). After 1867, a new, preserved to this day urban complex, i.e. a factory settlement delineated by a uniform spatial concept, with a full range of public and social facilities was started.

Since around 1870, lasted the prosperity period of the factory, which became the largest producer and exporter of linen fabrics in Europe. The increase in production was linked to the need to develop a base for the growing number of employees. The development of the settlement extends over an area of 28 ha, of which 16.5 was the property of the factory. The composition closely linked to the distribution of functions was subordinated to modern social ideas. Greenery and public spaces played an important role in the composition.

Between 1870 and 1871, the first segment of the new, standardized housing estate of the Settlement was erected. 11 two-story, identical brick buildings were constructed, with simplified divisions and architectural details. Residential buildings were accompanied by a system of wooden outbuildings located at the back of the buildings. In 1882, the textile factory reached a significant level of development. It owned 21,248 spindles and 2,078 mechanical looms. In 1885, it employed 8 thousand workers. At the beginning of the 20th century that number reached 10 thousand.

In 1885, the facilities were taken over by the Żyrardów Mill Joint-Stock Society. Among the shareholders, the leading role played the son of Karol August Dittrich, Karol Dittrich, who watched over the expansion of the plant and factory settlement. In the years 1885-1896, factory and the accompanying residential buildings were developing. The area of the Settlement grows almost 11 times. Within the workers' district, build-

ings were erected on the main axis of the complex – ul. Nowy Świat Street (ul. T. Kościuszki), which was developed on both sides, with 15 workers' houses. Ulica Długa (ul. Bolesława Limanowskiego) was developed with 25 detached workers' houses. At ul. Wiskitska (ul. 1 Maja), 13 clerks' and workers' buildings were constructed. In the mid 1880s, the construction of a residential area of a representative nature was initiated. At ul. Parkowa (ul. Armii Krajowej), established in 1885, in the years 1885-1892, erected was a complex of seven villas, surrounded by small gardens for higher staff of the factory. The complex was complemented by Karol Dittrich's Villa, located in the centre of the park, designed by K. Sparman. Since the 1870s, implementation of the public utility buildings was gradually started. Already in 1870 Resursa was established. In 1875, Ochronka (the Day Care) was built (the first pre-school in the Kingdom of Poland), later the schools were constructed (the „old” one in 1882, the „new” one in 1892-96 and „Kantoratschule” in 1896-99), the seat of the fire service (1896), the laundry room, the steam bath, commercial buildings. In 1885, Kantor was erected, a monumental administrative building of the factory. In 1891, the Roman Catholic church of St. Charles Borromeo. In 1896, the hospital was built. In 1898, according to the design of Lessner, a church was built for the Evangelical-Augsburg parish. The turn of 19th and 20th centuries was the peak of development of the Żyrardów factory production and construction of the settlement. In the early 20th century, the expansion of the complex was completed. Already in 1900-1903, the neo-Gothic church of Our Lady of Consolation was built, designed by J. P. Dziekoński, and at the market square, two public utility buildings important for Żyrardów were erected – in 1910, the building of the magistrate, and in 1913, different in its form, the so-called Ludowiec, that acts as a cultural centre for the staff of the factory. Before the outbreak of World War I, in Żyrardów, in 145 multi-family houses (including 132 belonging to the factory) lived most of the crew and the technical staff of the factory. Among the factory development dominated the „old spinning mill”, built between 1829 and 1833 and rebuilt many times, the „new spinning mill” from the years 1910-14, and the „hosiery” from around 1870 (expanded).

Żyrardów in 1895, that is at the peak of its development, was described in the geographical dictionary of the Kingdom of Poland. The Settlement was characterized as follows:

Żyrardów, a factory settlement on the river Pisia, /.../ at the rail-road Warsaw-Vienna, right at the Ruda Guzowska station, at the distance of 6 miles from Warsaw /.../ The Settlement currently houses the parish catholic church made of brick, the Evangelical house of prayer, a school factory with several departments for boys and girls, two primary municipal schools, the municipal court of the 4th district, the municipal office, a great day care with a dozen



Fig. 15. The Great Proletariat – the Great Żyrardów Strike, 1883. A graphic by S. Poznański from 1954

departments for up to 1,500 children, maintained by the factory, a hospital, a pharmacy, 3 factory physicians, 426 homes, 26,500 inhabitants (including 8000 factory workers). The factory facilities include: a flax spinning mill with about 23,000 spindles, a mechanical weaving mill (2,100 weaving workshops), a manual weaving mill (200 workshops), a cotton spinning mill (18,000 spindles), a wool spinning mill (4,200 spindles), a hosiery production shop (more than 700 machines) and 4 bleacheries with ancillary equipment. Approximately 8000 workers are working at these plants. These are mostly Poles. /.../ In 1890, there were 19,074 inhabitants, including 7,967 permanent and 11,107 non-permanent residents (including 1,433 foreign subjects). Among those entered in the books of the permanent population were 2 Orthodox, 1,852 Protestants, 411 Jews, 207 of other denominations).⁴

This dry geographical-statistical description shows the clear domination of the factory in the functioning and formation of the settlement. Also in the social dimension.

However, the factory settlement complex with the scheduled patronage buildings was not the only area of development of Żyrardów. At the turn of the 19th and 20th centuries, there were three areas of private development: to the South-East from the centre the Jewish quarter in Ruda Guzowska, adjacent to the railway line (within the limits of today's: ul. Okrzei, 16 Stycznia, Moniuszki, Bohaterow Warszawy, P.O.W.), to the East from the Guza woods the "Podlas" settlement (within the limits of today's: ul. Chopina, Mostowej, Wyspiańskiego, Radziwiłłowskiej) and the settlement in Teklinów (within today's: ul. Miódowa, Leszno, Szpitalnej, Kilińskiego, 1-go Maja). In 1908, the development of Żyrardów and the neighbouring settlements exceeded two thousand buildings.

To complement the history of the development of the city it needs to be noted that in the working environment of Żyrardów, modern social and political movements were born.

In 1883, and then in the years 1905-1906, the great workers' strikes occurred. The Żyrardów Spoolers became one of the legendary movements in the Polish lands. Their 1883 strike is considered the world's first workers' strike organized by women. The events of the years 1905-1906 took a particularly turbulent course

⁴ *Słownik Geograficzny Królestwa Polskiego i innych krajów słowiańskich*, ed. B. Chlebowski, Vol. XIV, Warsaw 1895, p. 894.

in Żyrardów. In the inter-war period, the city remained a safe haven for the movements of trade unions and workers' political parties.

World War I painfully affected Żyrardów. The Russians, while evacuating the Kingdom, took away some of the machines, blew up many of the buildings, there have been critical devastations. The existence of the factory was jeopardized. Under German management, in 1916, the Żyrardów factory settlement received city rights. The plants underwent immediate reconstruction.

In reborn Poland, in 1919, Żyrardów became the seat of the powiat, and the rebuilt factory was reactivated. In 1924, Żyrardów occupied an area of about 370 ha. Initially, after 1918, the Żyrardów textile factories functioned as a state-owned company. In the years 1923-1934, the factory was owned by the French consortium Bussaca. After a wave of crises, scandals and protests in 1936, the plant was taken over by the National Agricultural Bank.

After World War I and the devastation related to it began a period of gradual inhibition of the further development of the city. This slowdown also contributed to maintaining the character of a factory settlement built in the second half of the 19th century. On 12 September 1939, fights on the outskirts of the city took place; the Polish 30th Infantry Division, led by Gen. L. Cehak, surrendered to the overwhelming German of the 19th Infantry Division. During World War II, the factory was taken over by German management. The Jewish community of Żyrardów was exterminated. The front fights of WWII bypassed Żyrardów in 1945. On 16 January 1945, the Red Army entered the city. Shortly after the end of the war, the factory resumed operations as a nationalized and state-owned company. Production continued throughout the Polish People's Republic period. In that period, the 1905 Revolution, the Linen Industry Plants played the role of the main industrial centre in Żyrardów.

The „Polish Linen” brand was marketed as one of the specialties of our country. In the post-war years, the panorama of the city's industrial plants was complemented by the Polmos Spirits Factory, the Stella's Hosiery Factory and the Tannery. The development of the city expanded by new neighbourhoods of blocks of flats. In the 1980s, Żyrardów, faithful to the tradition of workers' movements, became the arena of social protests in the „Solidarity” movement.

It was not until the changes in the markets, especially the influx of Asian goods into Europe, that in 1997 the linen factories were declared bankrupt and their assets were sold off. Some of the factory buildings were demolished and dismantled, machines scrapped. In part, they function as a continuator of the tradition of the linen workshops, a significant part has been adapted for commercial purposes and lofts. In 1979, the Factory

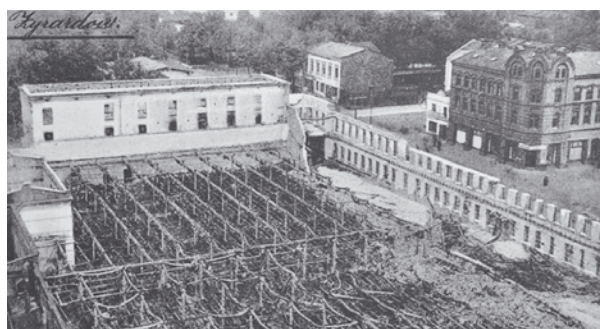


Fig. 16. World War I – destroyed buildings of the factory, 1915. <https://www.facebook.com/Zyrardownastarej-fotografii>



Fig. 17. The Żyrardów Plants Program and press advertisements, the inter-war period, <https://www.facebook.com/Zyrardownastarej-fotografii>



Fig. 18. The interior of the Spinning mill, the 1960s. <https://www.facebook.com/Zyrardownastarej-fotografii>

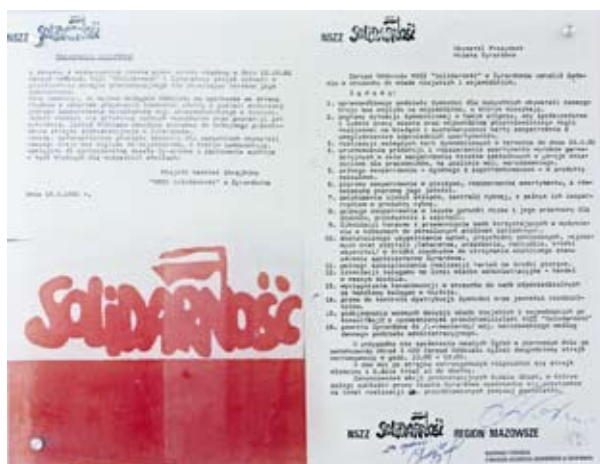


Fig. 19. Memories of the strikes of 1981. Photo by A. Siwek



Fig. 20. Factory buildings adapted to the new functions.
Photo by A. Siwek

Settlement complex was entered into the register of historic monuments and sites as an urban layout, and on 4 January 2012, the Żyrardów Factory Settlement was honoured with the title of a Polish listed monument. History has shaped Żyrardów as a factory settlement, which is a representative example of the nineteenth-century industrialization and a centre of labour social movements, significant on a supra-European scale. Importantly, the urban structure of the settlement reflects both the processing technology of textile raw materials, and the internal professional and social hierarchy of the factory community, characteristic of the global industrial civilization of the nineteenth and early twentieth centuries. The future of the city is connected with the exposition of historical and cultural values. The pursuit of cultural heritage is simultaneously a developmental investment of Żyrardów. In this context, the chances of applying for the UNESCO World Heritage List are also considered.

1.1.3 The figure of Philippe de Girard and his role in the industry's development⁵

The establishment and development of the factory settlement in Żyrardów was a complex, long-lasting process, dependent on many factors and people involved in the success of the project. It is difficult to overlook in this respect the role of Henryk and Jan Łubieński, or later Karol Hiele and the Dittrich family. However, a person of particular importance is still Philippe de Girard. Not only because of lending his name for the name of the newly formed factory settlement. Philippe de Girard was, indeed, a colourful figure, weaving in-

ternational threads into the Polish history, and, above all, an inventor that has enabled the dynamic start of the modern industrial enterprise in the, then slightly forgotten, lands of Mazovia. The first Polish monographer wrote about the inventor in the following way:

Twenty years of working on our lands, and the name of Żyrardów, associate the great inventor of the mechanical flax spinning, with the history of the domestic industry. Met in his own homeland, Girard found shelter and support here. France could and should have done more for him – we gave him everything we could, and received abundant rewards for it, in the form of the beginning of the developing ever since domestic linen industry.⁶

Philippe de Girard was born on 1 February 1775, in the French town of Lourmarin in Provence. He came from a wealthy noble family of the Protestant traditions, in the spirit of Calvinism (the Evangelical-Reformed Church). He received his education in the spirit of Enlightenment rationalism and respect for science. He was educated in the field of natural sciences, chemistry and mechanics. He lived in an extremely turbulent historical period for France. He was a royalist, involved in armed actions against the revolutionary movements. This forced him to emigrate. The loss of estate forced de Girards to take on new challenges. In emigration, they founded the steam soap factory in Livorno, and then, in Marseille, a chemical factory. De Girard also managed salt works in Martigues. From 1795, he was a Professor of chemistry at Nice, and then in Marseille. From the early years, he was passionate about building devices. As a fourteen-year-old, he supposedly constructed a water turbine of his own design that could generate power from the motion of sea waves. He developed a design of an electric condenser. In 1810, he participated in a government competition to build a machine that would make France independent on cotton supplies from the colonies, blocked by the British fleet. He then presented the design of the mechanical flax spinning machine. The competition was not settled, however, in 1812, de Girard launched a flax spinning mill in Paris with two thousand spindles. The next investment projects of de Girard ended in financial failures. As a bankrupt, after 1815, he was encouraged to emigrate to Austria. In the vicinity of Vienna, he founded a linen manufacture. In Vienna, between 1818 and 1820, he constructed a flax combing machine and a machine for manufacturing flax yarn from tow. In 1825, Philippe de Girard came to the Kingdom of Poland, where he was brought by Prince Franciszek Drucki-Lubecki, the then extremely

⁵ F. Kucharzewski, *Filip de Girard i jego prace we Francji i Polsce*, Warsaw 1886; A. Rynkowska, item in *Polski Słownik Biograficzny*, Vol. 7, Cracow 1948-1958, pp. 474-476.

⁶ F. Kucharzewski, *Filip de Girard i jego prace we Francji i Polsce*, Warsaw 1886, p. 3.



Fig. 21. Philippe de Girard (1775-1845), according to H. Scheffer, the mid-19th century. https://commons.wikimedia.org/wiki/File:Philippe_de_Girard.jpg



Fig. 22. F. Kucharzewski, Filip de Girard i jego prace we Francyi i Polsce, Warsaw 1886. <https://polona.pl/item/67863839/4/>



Fig. 23. Statue of Philippe de Girard in Żyrardów, https://pl.wikipedia.org/wiki/%C5%BByard%C3%B3w#/media/File:Pomnik_Filipa_de_Girarda_w_%C5%B-Byardowie.jpg

influential minister of Treasury of the Congress Poland. The Prince sought to focus around him professionals from different fields, in order to raise the level of industrialization and economy of the Kingdom. Philippe de Girard became chief engineer at the Mining Department of the Government Commission of Revenue and Treasury and later adviser to the Bank of Poland, i.e. the institution established for the development of the industry in the Polish lands. His duties included supplying the factories, smelters and mines that were organized at the time, with appropriate machines, and modernization of the existing facilities. His activities have contributed to the modernization of the machine park of the metal-processing and mechanical plants in Białogon, Sielpia, Samsonów and the zinc works plant "Ksawery" in Będzin. Girard was consumed by the Polish patriotic movement; as an engineer, he earned recognition during the November uprising, when he developed a technique of manufacturing rifle butts, and the spinning mill led by him in Marymont undertook the production of reinforcement. The attitude of his brother, Henri de Girard, who fought in the insurgent army, got wounded, and as a result of it died in Paris in 1833, is a proof that that was not only a routine, professional obligation. As a result of working with the Bank of Poland and affiliated with it Henryk Łubieński, de Girard was already in 1825 engaged to create a textile factory in Marymont and then in 1829 – in Ruda Guzowska. Here, the equipment invented by Philip de Girard, mainly the mechanical flax spinning machine, found their use. De Girard was the first technical director of the factory, and the owners of the establishment, to highlight the contribution of the

French inventor, gave the new settlement the name Żyrardów. Commitment to Żyrardów did not inhibit the activity of de Girard, who remained an active technical adviser at the Bank of Poland. He has advised on matters the sugar factory organization in Guzów, or the metallurgical plants in Żarki. In 1844, Philippe de Girard returned to France. He presented there a summary of his inventor's achievements, was awarded an exhibition medal, however, he did not gain wider recognition. Philippe de Girard was the author of at least thirty inventions from different fields of technology, among which are also failed ones, such as a variety of piano called girardeon or the meteorograph used for the registration of weather conditions. Some of the textile inventions, through de Girard's partners, reached England, where after modifications made in the factories in Leeds, returned to the continent under the British brand. Philippe de Girard died in Paris on 26 August 1845; despite the enormous skills and creativity he has not gained the wealth and recognition he had hoped for. The period of working in the Kingdom of Poland seems to be one of the most fruitful and successful in his history. The figure of Philippe de Girard deserves special attention, because he is seen as a representative of the European Enlightenment movement, one of the active participants of the industrial revolution of the turn of the 18th and 19th centuries. His personal history illustrates the process of penetration of the old aristocracy into the industrial bourgeoisie, and his inventions made it possible to launch the process of development of the modern textile industry in Poland, which influenced a number of other historical and social processes in this part of Europe.

1.2 Formal description of the asset

1.2.1 The location of the historical Factory Settlement in Żyrardów⁷

Today's Żyrardów is a powiat town in the Masovian Voivodeship, in the Żyrardów powiat, geographically situated on the Łowicko-Błońska Plain, on the Pisia Gągolina river. Żyrardów is located about 45 km South-West of Warsaw and 90 km North-East from Łódź. It lies in the historical Masovian region. Through the town runs the national road No. 50 and the voivodeship road No. 719, as well as railway line connecting Warsaw with Łódź and Warsaw with Silesia. According to the physical and geographical regionalization of Poland by Jerzy Kondracki, the Łowicko-Błońska Plain (318.72) is the South-Western part of the Middle Mazovia Plain. It is located to the South of the valleys of the Vistula and Bzura rivers. The major cities located in the Plain are: Błonie, Grodzisk Mazowiecki, Łowicz, Pruszków, Skierniewice, Sochaczew and **Żyrardów**.

In geomorphological terms, this area is a morainic denudative plain. This is one of the flattest landscapes of Mazovia. It is dominated by open, agricultural landscape. In the vicinity of Żyrardów, there are forests, the woodland residue of the Guzowski estate, which are connected with the forests of the Bolimowski Landscape Park. Through the plain flow – from the South to the North – numerous tributaries of the Bzura river, among others the Pisia river, which flows through Żyrardów. Around the city, as throughout the plain, recorded are favourable conditions for the development of agriculture, especially fruit and vegetable growing, due to the presence of silts and black earths.

In a historical context, Żyrardów was founded "in cruda radice", within the limits of the Guzowski estate belonging to the Łubieński family, in the village of Ruda Guzowska. The advantage was water availability, provided by the Pisia river, extensive flat lands suitable for construction, extensive farming facilities and the availability of manpower. In the development of the factory settlement, communication conditions played a role: the road from Mszczonów to Wiskitki, and above all, the railway line Warsaw-Vienna, designed from 1835, and operated since 1845.

The historical factory settlement is now part of the central city that has developed concentrically around the

historical core. The area recognized as a Polish listed monument and the adjacent historical buildings are surrounded by development from the second half of the 20th century in the type of block development and detached houses. Despite this, the town maintains a historical scale and a clear form of the historic centre. The historical part of the city stands out with its saturation with greenery and the regularity of layout. Disturbances in regularity and character of the urban layout are visible particularly in the border area between the centre of the old factory settlement and the railway station, and on the outskirts of the industrial development complex. The new development separates the old city cemetery from the historical centre. This blurs the historical spatial relations, because the cemetery is an integral part of the former urban layout and the concept of the factory settlement with full functional facilities.

1.2.2 A brief description of the Żyrardów Factory Settlement Complex

Today's appearance of the historic factory settlement, clearly distinguished from the urban fabric of the modern Żyrardów, is primarily the result of the expansion of the last third of the 19th century. This is not, however, an absolutely homogeneous complex. Historical layers may be distinguished here. Referring to the historical plans contained in the cited urban-architectural-historical documentation of the Monuments Preservation Workshops (MPW) makes it easy to capture the characteristic elements of the complex.⁸

The 1867 plan shows the first stage of establishment of the Settlements and the use of the guidelines of the pre-industrial period. Visible is the layout of the urban Settlement on the two axes of the composition: the current ul. 1 Maja, that is the former Wiskitska Road (parallel to the watercourse of Pisia Gągolina), separating the factory area from the residential area and perpendicular to the axis that binds the residential area to the industrial area of the town and leads through the current Pl. Jana Pawła II (the former marketplace) and the tree-lined ul. T. Kościuszki (formerly Nowy Świat). It is the oldest urban "spine" of the Settlement, associ-

⁷ J. Kondracki, *Geografia regionalna Polski*. Warsaw 2002; W. Pałucki, *Środowisko geograficzno-historyczne do czasu założenia Żyrardowa*, [in:] *Żyrardów 1829-1945*, ed. I. Pietrzak-Pawłowska, Warsaw 1980; J. Porębska-Srebrna, Z. Stępiński, *Żyrardów – przyszłość wczorajszego miasta idealnego* /in:/ *Problemy Rozwoju Miast*, Issue III/2010; Information from the website of the Żyrardów City Hall

⁸ *Żyrardów. Dokumentacja konserwatorska urbanistyczno-architektoniczna*, State Enterprises MPW, Warsaw 1976. /Team compilation under the direction of Jerzy Baranowski/, Archives of the Voivodeship Historic Monuments Inspector in Warsaw.

ated with the pre-industrial conditions and organically absorbed into the first phase of the development of Żyrardów.

A sketch from 1871 presents the planned development of the Settlement and the concept of its adjustment. The layout is characterized by regular, scraper grid of streets and blocks of the development, discipline in its location and clear functional-spatial differentiation of the composition. Visible is the division of the urban space into single-use areas: the industrial, residential and public. The pursuit of symmetrical placement of all the elements is clear. The industrial development focuses, as formerly, in the area between the river and the Wiskitska Road. The residential development creates routes along the communication axes. The market square takes on the character of the settlement's centre, the importance of which is stressed by the designed church, delineating the ideal axis: factory-temple. Visible is the role of greenery in the composition, present in the form of avenue frame of the communication routes and the composed greenery within public spaces.

The plan from 1896 documents the full development of the Settlement. Although there are still a few more essential elements missing (e.g., the church or the so-called "Ludowiec"), the nature of the urban plan is visible. Clearly distinguished is the industrial development area, along the communication axis of the Wiskitska Road and the residential and public areas, perpendicular to it. The connection of the development's square to the inner courtyards and the layout along the streets. The banded development is distinguishable, rhythmized by ul. B. Limanowskiego (formerly ul. Długa) and T. Kościuszki (formerly Nowy Świat), where the dominant role is played by church of St. Charles Borromeo. Closer to the market square dominate the residential and public



Fig. 24. Żyrardów's location in relation to Warsaw, WIG 1946, portion of the entire map in the scale of 1:500,000



Fig. 25. The modern location of Żyrardów, a satellite photo, Google Maps, <https://www.google.pl/maps/@52.2410167,20.8810631,91724m/data=!3m1!1e3>



Fig. 26. Portion of the military staff map, 1915, 1:25,000 scale



Fig. 27. Żyrardów, satellite photo, Google Maps, <https://www.google.pl/maps/@52.2410167,20.8810631,91724m/data=!3m1!1e3>

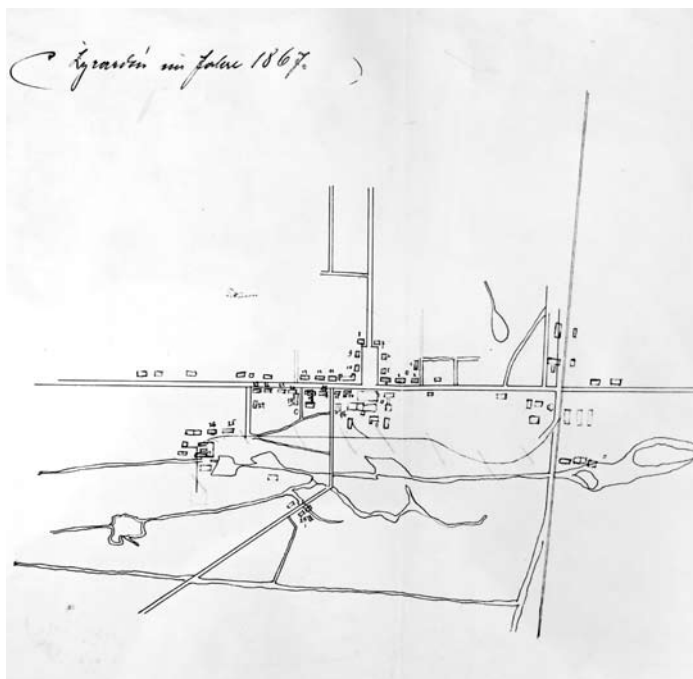


Fig. 28. Żyrardów, 1867. The visible layout of the communication routes, the essence of the complex. The simple axis of the Wiskitski trail and the perpendicular axis of the market square. /Archives of the Voivodeship Historic Monuments Inspector in Warsaw, MPW documentation/

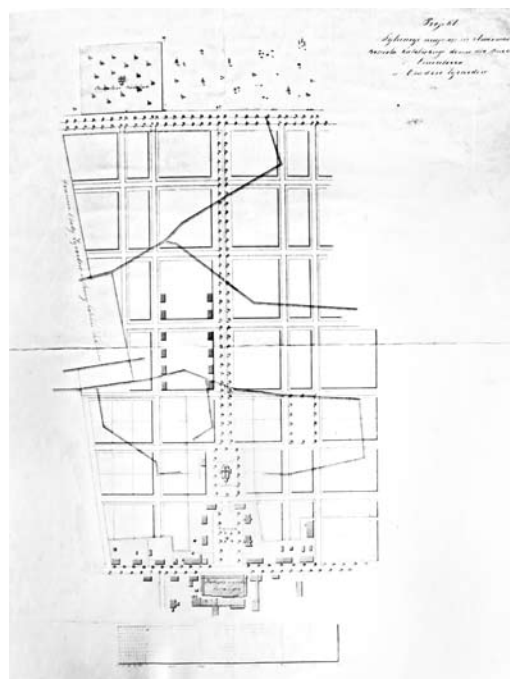


Fig. 29. Żyrardów around 1871, the urban planning concept. /Archives of the Voivodeship Historic Monuments Inspector in Warsaw, MPW documentation/

space squares. The market square has an outstanding frame in terms of scale and representativeness, as well as the public utility function. The complex, later complemented with single projects, determined the current appearance of the historic part of the city. The most advanced stage of the historical development of the city is presented in the 1913 plan.

The centre of the Settlement's composition is today's Plac Jana Pawła II, the old marketplace, which focuses around it the representative public utility buildings, including the Town Hall and the Folk's House. The main axes of the place are finished by the monumental buildings of the factory development and the dominating feature of the city, the church of Our Lady Of Consolation. The composition of the place was integrated with greenery, although its present form is the result of arrangements from the second half of the 20th century, referencing the pre-war designs. The development next to the market square represents all the architectural styles present in the Settlement. From brick buildings of the public office and the day care with various façade detail, through the Neo-Gothic church, modernist-secession (Vienna secession) building of the Folk's House, to the industrial buildings, suspended between the functional industrial architecture and historicism.

An area with an individual character in the city space is the old villa district, located on the western side of ul. 1 Maja (formerly ul. Wiskitska), covering the park

with Karol Dittrich's villa, villas of the management of the old factory and residential buildings for officials and lower technical staff of the plants. Located here are also the most representative public buildings of Żyrardów: Kantor and Resursa. It is an area with the highest quality of architectural solutions and bold styles of the structures. Neo-Renaissance, Neo-Baroque Neo-Gothic, references to classicism and colourful Historicism in the spirit of cottage, or references to the "Swiss style" occur among the representative development of the Settlement. Public utility buildings and houses of post holders stand out from the typical, repetitive solutions of residential buildings for workers. The diversity of design of the façade and the quality of architectural solutions corresponds to the social and property diversity of the Settlement's residents and reflects the management structure of the factory. This element is worth noting, because in the urban structure highlighted were so far particularly the division into functional areas (production, public utility and representation, housing). And the urban layout and architecture of individual buildings reflect also the social, professional and property hierarchy of the old factory settlement's inhabitants and constitute a perfect testimony of the layering of the industrial society of the second half of the 19th century.

In the fabric of the urban layout of the Settlement, the workers' housing neighbourhood located on the east side of ul. 1 Maja clearly stands out. The buildings are

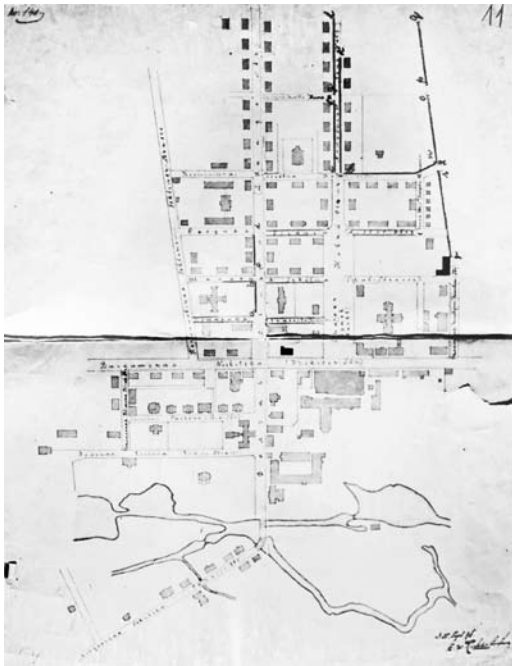


Fig. 30. Żyrardów, 1896. /Archives of the Voivodeship Historic Monuments Inspector in Warsaw, MPW documentation/

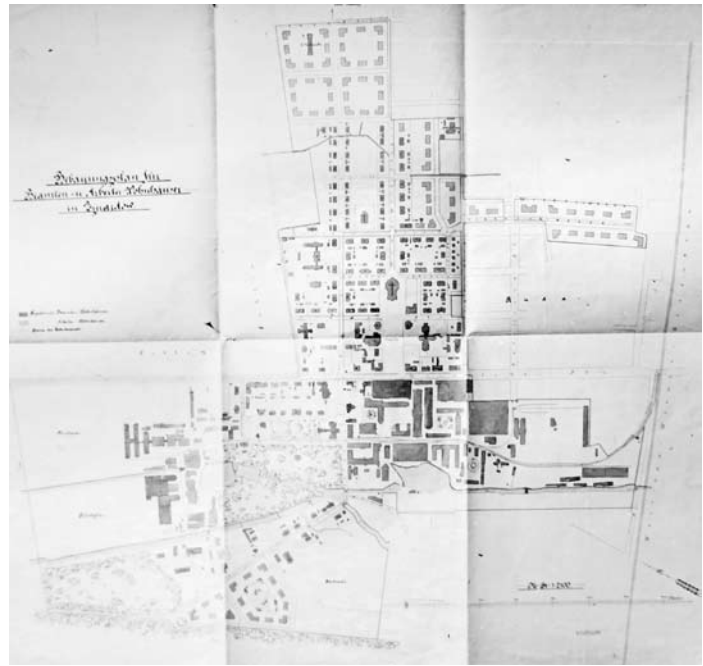


Fig. 31. Żyrardów, 1913. /Archives of the Voivodeship Historic Monuments Inspector in Warsaw, MPW documentation/



Fig. 32. Jan Paweł II Square. Photo by A. Siwek



Fig. 33. Karol Dittrich's villa, included in the composition of the garden, an example of the architecture of mature historicism. Photo by A. Siwek



Fig. 34. A fragment of the quadrangle of residential buildings with accompanying greenery and wooden outbuildings. Photo by A. Siwek

grouped in the form of quarters with internal courtyards or frontage structure along the streets. Residential buildings are complemented by the wooden outbuildings. The façades of the brick residential buildings are rhythmized with brick lisens, cornices and varied brickwork systems. The door and window fittings complement the modest architectural detail of the repetitive buildings.

Among the residential buildings noteworthy is the group of erected earlier, brick plastered and unadorned workers' houses. Their form is the result of balancing between the traditional residential development and the reverberations of classicism in the proportions of the buildings, especially in the angle of incline of the roofs. Dominance of utilitarianism and economic efficiency is visible. An important element of the urban composition is the rhythmic arrangement of buildings and the connection with the avenue communication routes. The development is distributed with spaces between individual buildings, giving a sense of spatial comfort and, combined with the accompanying greenery, creates the atmosphere of a city-garden.

Residential and public utility buildings of the Settlements were built using traditional technology: brick outer walls, mostly non-plastered, wooden ceilings and roof trusses, roofs covered with tarp or sheet metal, mostly gable roofs with a wide angle, sometimes mansard roofs. Construction was often mixed, e.g. there were wooden partition walls in brick buildings. Wooden outbuildings, frame, boarded, sometimes half-timbered with brick filling.

In the area of the historic Settlement complex located are 131 properties entered into the register of historic monuments (out of 201 in the entire city). Among them are 107 residential or residential and service buildings, 21 public utility premises, unused building of the former jail and a park. One of the listed historic monument outbuildings (a so-called wooden shed) has been destroyed and removed from the register of historic monuments. In addition, 38 properties not covered by individual entries into the register are listed in the list of historic monuments, including one residential and service building, one residential building, a bowling alley, a gazebo by the Tyrolean Palace and 34 outbuildings. Most of these objects was erected in the last third of the 19th century and at the turn of the 19th and 20th centuries. The oldest objects in the complex are the created before 1867 residential buildings at ul. 1 Maja 66 and 68, and at Pl. Jana Pawła II 2. The youngest is a residential building at ul. Kościelna 4, constructed after 1913.

The essence of the specific character of the Settlement is the occurrence of repetitive, typical architectural solutions replicated in several functional versions. The following summary, presenting the views and map of the city marked with the occurrence of particular types of buildings prepared by the authors of the preservation documentation of the PKZ in 1976, best illustrates this issue. According to:

Among public utility buildings of the Factory Settlement distinguished should be:

- the church of St. Charles Borromeo;
- the church of Our Lady of Consolation along with the vicarage;



Fig. 35. Multifamily workers' houses. Photo by A. Siwek



Fig. 36. Ul. 1 Maja 66. One of the oldest workers' houses in Żyrardów. /photo: the Archives of the Voivodeship Historic Monuments Protection Office in Warsaw/

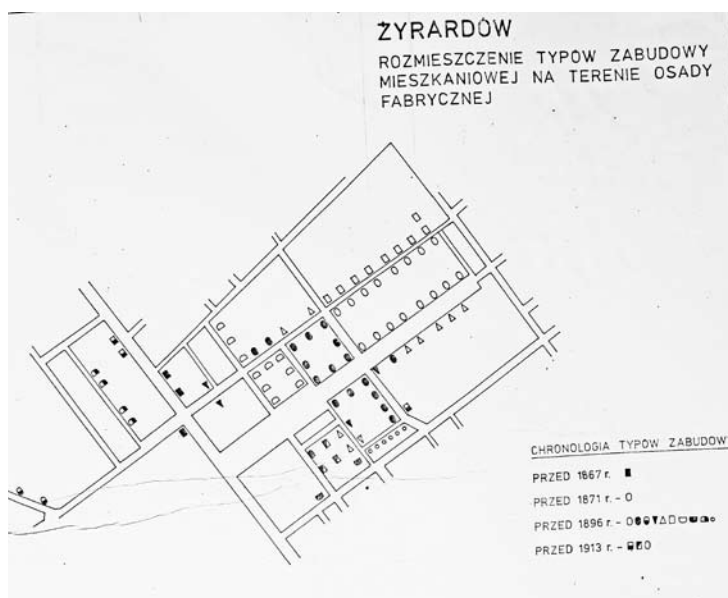
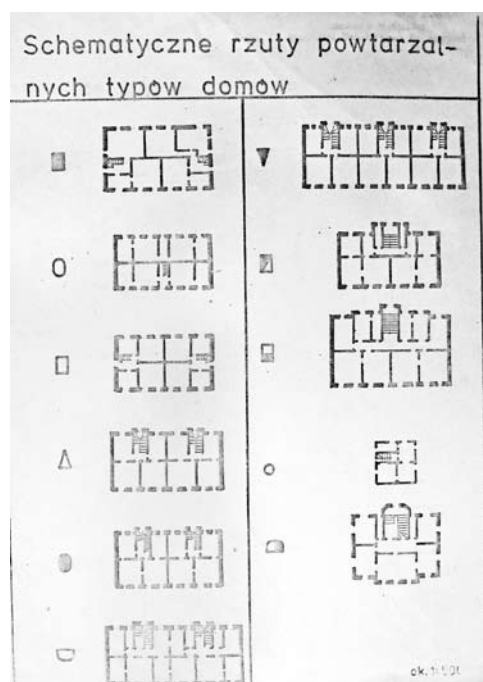


Fig. 37. Żyrardów. Typology of residential buildings, PKZ Warsaw 1976, the Archives of the Voivodeship Historic Monuments Protection Office in Warsaw

- the building of the hospital and the two buildings of the former hospital wards;
- the preschool building /the day care/;
- three school buildings;
- buildings of administrative functions, especially the former Magistrate and former Kantor built in 1885 as the seat of the Management of the Żyrardów Mill Joint-Stock Society;
- buildings with a social and cultural purpose, i.e. the old Resursa built in 1872 (expanded around 1885), a bowling alley and the so-called Ludowiec from 1913.
- the Social Welfare Home building /formerly the shelter/;

In terms of artistic expression, among those buildings the parish church of Our Lady Of Consolation stands



Fot. 38 Parish Church. Facade and interior. Modern condition. Photo by A. Siwek

out. The Neo-Gothic parish Church is the dominant height in the landscape of the city and a keystone of the urban composition. It was designed by Józef Pius Dziekoński. Built between 1900-1903, funded by Karol Dittrich. Inside there are stained glass windows, supposedly by Józef Mehoffer (actually implemented by the designs of artists from Warsaw), Neo-Gothic equipment and copies of European sacral painting. The Church is brick, non-plastered, with three naves, basilica with a transept, two-span separate presbytery with trilateral closure. In the façade, two towers covered with narrow cupolas with rib-vaulted adorned windows.

In terms of form and style from the development of the Settlement's complex also distinguished is the so-called Ludowiec – the Karol Dittrich's Folk's House. It was commissioned in 1913, thanks to funding by Karol Dittrich. He served as a cultural centre for employees of the industrial plants. Functioning here were, i.a. an amateur theatre and, functioning to this day, the "Echo" and "Lira" singing societies. Erected in the final stage of the formation of the Factory Settlement, it is an important part of the composition of Pl. Jana Pawła II. It is the only example of modernist architecture in the area, coming from the form and spirit of the Vienna secession. A structure with a picturesque, irregular and varied shape. Façades programmatically ascetic with limited and simplified decorative design. The main body of the three-storey building houses a cinema room. In the body of the building, dominates a tower covered with a polygonal dome. In construction of the object used were new materials and innovative construction solutions, e.g. a balcony in the auditorium is the supporting rim of the dome made of reinforced concrete.

Inside, preserved are historical design elements, including decorative floors from that period.

A particular role in the spatial layout of the Settlement plays Karol August Dittrich's park, i.e. the park accompanying the Villa of the co-owner of the Żyrardów enterprises. It is a park created in the spirit of a landscaped garden with an area of 5.2 ha, founded in the second half of the 19th century, according to the design of K. Sparman. Compositional layout of the Park is casual, asymmetrical, with calligraphic pattern of paths. The composition results from the terrain and the use of natural watercourses. The impressive stand with 20 natural monuments is valuable. The composition is complemented by garden statues.

A separate, clearly distinguishable group of buildings are the factory facilities. Some of them present modest style forms of historicism, and some of the buildings rebuilt after the ravages of World War I show intermediate features between 19th-century and modernist solutions. The factory buildings in terms of spatial solutions are subordinated to the function resulting from their place in the production process.

In terms of structure, some of them are traditional, brick stone objects, where there are also sometimes so-called Klein's ceilings and cast-iron supports, and some are frame structures, supported on reinforced concrete girders. The design of the New Spinning Mill from the years 1911-1913 was an innovative industrial application of the reinforced concrete frame with brick filling. In the inter-war period, also innovative pre-tensioned concrete structures were used. Most of these are large-scale buildings, designed to accommo-



Fig. 39. „Ludowiec”. Photo by A. Siwek



Fig. 40. The Karol Dittrich park and villa. Photo by A. Siwek



Fig. 41. The factory complex, around 1905, <https://www.facebook.com/Zyrdardownastarejfotografii>





Fig. 42. The Old Spinning Mill and the Old Weaving Mill. Photo by A. Siwek

date numerous work stations or specialized equipment and machinery, often of considerable dimensions. Among the preserved factory buildings, particularly noteworthy are those that played an important role in the technological cycle.⁹ Among them stands out *Stara przędzalnia* (the Old Cotton Mill), the oldest of the industrial buildings, which marks the centre of the former factory settlement. It is a monumental, four-storey building of the mechanical linen spinning mill and weaving mill. It was founded in 1833 according to the design by architect Jan Jakub Gay. This was one of the greatest linen spinning mills in the Kingdom of Poland, and even in Central Europe. During the period of the most dynamic development, as many as 2200 spinning spindles were in use here. On the ground, first and second floors located were the carding, spinning and cutting machines. On the third floor was a small manual weaving mill, which was functioning until a separate one-storey building was built. In Żyrardów functioned 200 manual weaving workshops, but only 24 in the factory, because others were located in the weavers' houses. Among the machines operated in the *Old Spinning Mill* were, e.g., three linen combing devices with combs invented by Philippe de Girard. All devices were driven by a 40 KM-steam machine that was placed

outside of the building, in a separate extension. An evidence of it was a high chimney, not preserved to this day. At the beginning of the 20th century, the *Old Spinning Mill* was connected by a covered passage with *Nowa przędzalnia* (the New Spinning Mill) erected nearby. The building of the *Old Spinning Mill* was rebuilt many times after subsequent ravages of war. It also underwent a process of modernization of the plants after 1945 and the period of destruction after the production ended. Finally, in 2005-2009 was revitalized and adapted to contemporary, non-production functions.

Another monumental industrial building is *Stara tkalnia* (the Old Weaving Mill). It was founded on the initiative of K. Hiele and K. Dittrich, after they took over the Żyrardów factory in 1857. The works were completed at the turn of 1861 and 1862, the mechanical weaving mill reached its full performance. The building is single-storey, with a gable roof, with glazing for the appropriate illumination of the interior. It was the largest weaving mill in Europe, with 500 mechanical looms placed in one hall. The usable area of the *Old weaving mill* was around 6 thousand square meters. On the night of 16/17 July 1915, Russian troops, during the retreat from the Kingdom, blew up the *Old weaving mill*, destroying and pillaging the machine park.

The reconstruction of the factory and the resuming of production for military purposes was initiated by the Germans, and finally completed in 1923. The reconstructed weaving mill was built from stone and reinforced concrete. Currently, after renovation and adaptation works, the building serves commercial and service functions.

⁹ The part concerning the industrial buildings was prepared based on materials of the City Historic Monuments Inspector in Żyrardów (important old, post-industrial objects covered by preservation protection); M. Staniszkis with the team, *Koncepcja urbanistyczna zagospodarowania rejonu Zakładów Lniarskich w Żyrardowie*, typescript 2008; and materials of the Western Mazovia Museum in Żyrardów.

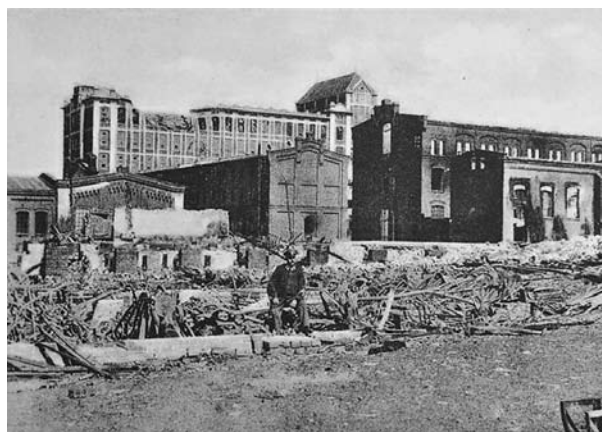


Fig. 43. The destruction of war, 1915, <https://www.facebook.com/Zyrdowntownstarejfotoğrafii>



Fig. 44. The Żyrdów centre over the rooftops of the Old Weaving Mill. Photo by A. Siwek



Fig. 45. The New Spinning Mill, after contemporary functional adaptation. Photo by A. Siwek



Fig. 46. Factory complex during the revitalization process. Photo by A. Siwek





Fig. 47. Part of factory. A fragment of the illustration of the Błoński Powiat of the Warsaw Governorate by Józef Michał Bazewicz, from *Atlas geograficzny ilustrowany Królestwa Polskiego*, from 1907



Fig. 48. Factory buildings complex. Photo by A. Siwek

An important role in the panorama of the city is also played by the *New Spinning Mill* building. The design of the building was prepared in 1909 by an Austro-Hungarian consortium, Pittel & Brausewetter. The building was erected according to the project of architects Alfons Berger and Karol Tanze. The works were performed in 1909-1913. *Nowa Przędzalnia Lnu* (the *New Linen Spinning Mill*) was built from reinforced concrete, and was adapted for high loads resulting from the work of a thousand spindles. Additional load of the structure was the main technological water tank and pumps placed on the top floor of the building. The building was damaged during World War I. In the inter-war period, the destroyed part of the top floor of the west wing was restored. The monumental building, in

the early years of the 21st century, underwent adaptations to residential and service functions.

During the next decades, the building of *Czesalnia Lnu* (the *Linen Combing Mill*) underwent substantial transformations. Built around 1890, expanded in 1900-1914, in the 1960s was completely rebuilt, especially inside. Moreover, in the complex there also are the *old administration building* from 1908, currently used by the Żyrardów Powiat Starosty and the *spinning mill building* from the 1860s, which, as the first object in the old linen plants, underwent revitalization and adaptation for residential premises at the beginning of the 21st century. In the group of objects that were rebuilt many times the *central mechanical workshops* from the 1870s should be noted that were expanded in 1890-1910 and rebuilt in the 1970s. The *pumping station building*, so-called "okrągłak", from 1902 stands out with its characteristic shape.

On the edge of the complex rises the building of *Pończoszarnia Stella* (the *Stella Hosiery*). A typical factory building from the 1870s, also rebuilt several times. The complex is complemented by the *concierge and gate* buildings from 1951-1952. Despite the utilitarian form, characteristics of Socialist-realist architecture can be noted. A separate group of buildings is formed by *Bielnik i Wykańczalnia* (the *Bleachery and Finishing Line*). There is a *yarn cold storage* from 1890-1895 there, rebuilt from an old flax drying room, and then adapted for storage. The building of the old *yarn drying room* from 1895, in the second half of the 20th century housed the finishing line and the archives of the Żyrardów Mill. In the complex preserved were buildings of the *yarn tying room* from 1907-1908 and the *dyeing room* from 1907-1908. An important role in the complex played meet buildings of the *yarn bleachery with preparing room* from 1909-1910 converted in the 1960s and the *yarn bleachery cropping hall* from 1911-1912. A complement of the Bleachery complex were a pond and expansive meadows on which the cloth and yarns were spread out to ultimately whiten under the influence of weather conditions and the sun. This is an important, yet neglected today spatial element of the historical factory complex.

The complex is complemented by the development of the sales department from 1886 and the former fabrics storage from around 1890, as well as the dispatch building, folding hall and the old sewing room with fabrics finishing workshops. An important complement are the buildings of the canvas printer rooms. Architectural forms of these buildings retain the character they gained at the turn of the 19th and 20th centuries. Elements of the underground engineering infrastructure, such as Lindley's sewers, identified during groundworks in the factory premises, usually stay hid-

den from the eyes. An important element of the historical urban complex was the water system – apart from the Pisia river, also accumulation system and water collection ponds for the production process. The inter-war period brought care of the environment. The factory's sewage treatment plant was constructed at that time, which handled wastewater, coming mainly from the bleachery and the dyeing room. That water system was reshaped many times and currently it is preserved in a relic form. The industrial part of Żyrardów's development, in the last decades underwent the largest pressure of transformations, from destruction resulting from the loss of function, to adaptation to new forms of use (large-area trade, residential spaces – lofts). The buildings of the "Old Spinning Mill" in Żyrardów in 2013 was awarded the "Well-Kept Historic Monument" prize in the competition of the General Historic Monuments Inspector. However, in this group of buildings remains still the largest number of objects that are endangered and awaiting redevelopment. Nevertheless, despite the losses and transformations, it can be shown that the preserved elements of industrial development in Żyrardów still constitute a compact industrial zone, legible in the urban fabric of the Factory Settlement.

1.2.3 Borders of the asset

The historical urban-architectural layout of the factory settlement grew gradually, but was contained within a strictly defined spatial frame. This area was widely identified and interpreted in a referenced study of SE MPW Warsaw 1976, under the name: *Żyrardów. Dokumentacja konserwatorska urbanistyczno-architektoniczna*.¹⁰ The study was used to define the area covered by the entry into the register of historic monuments and sites of the factory settlement area as a historical urban layout.¹¹ Study findings were confirmed by later studies, such as those by S. Teofiluk: *Historyczne centrum miasta Żyrardów. Zakres ochrony konserwatorskiej „osady fabrycznej”* from 2008, or by M. Szulińska: *Żyrardów miasto*

Inu. Propozycja utworzenia parku kulturowego, also from 2008.¹² The results of the above findings were used by the authors of the study entitled: *Dokumentacja zgłoszenia Zespołu Osady Fabrycznej w Żyrardowie o uznania za pomnik historii* from 2010, which determined the limits of protection as a Polish listed monument, i.e. within the framework of legal recognition of the most valuable part of the historical urban complex. as a subject matter of special protection.¹³ Final confirmation of the borders of the protected area was found in the Ordinance of the President of the Republic of Poland of 4 January 2012 on the recognition as a Polish listed monument of "Żyrardów – the 19th century Factory Settlement" (Dz. U. Rzeczypospolitej Polskiej (Journal of Laws of the Republic of Poland), Warsaw, 17 January 2012, item 59). The document states:

The aim of protection of the Polish listed monument – "Żyrardów – the 19th century Factory Settlement" is its preservation on account of its artistic and cultural values and the authenticity of the historic urban-architectural layout of the factory settlement, which is a testimony of the glory of the linen industry in the lands of the Kingdom of Poland, innovative urban thinking, and the largest nineteenth-century spinning centres in Europe.

The borders of the area, highlighted as particularly valuable in terms of heritage according to the document, are as follows:

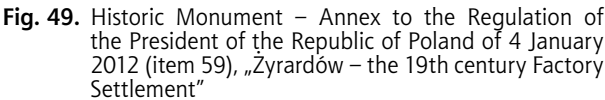
The area of the Polish listed monument "Żyrardów – the 19th century Factory Settlement" includes the nearby district of workers' houses together with public utility buildings, the former "villa district" together with the city park of K. A. Dittrich and the premises of the linen plant. The border of the listed monument runs from ul. Radziwiłłowska in the north-west direction along the Pisia Gagolina river (including the river bed), turns north-east and crosses the inner road leading from the canal to ul. Działkowa (excluding the road), further along the streets: 1 Maja (including the street) and Waryńskiego (excluding the street), turns south-east into the inner access street of the hospital (including the street), and then runs north-east further on the back of the prop-

10 *Żyrardów. Dokumentacja konserwatorska urbanistyczno-architektoniczna*, State Enterprises MPW, Warsaw 1976. / Team compilation under the direction of J. Baranowski, academic supervision A. Rottermund, A. Znojkiwicz, historical documentation: A. Gryciuk, urban documentation: J. Kubiak, architectural documentation: T. Szyburska; photographic documentation: K. Kowalska, A. Stasiak, J. Szadkowski/ typescript in the Archives of the Mazowieckie Voivodeship Historic Monuments Inspector in Warsaw.

11 Entry in the register of urban layout historic monuments – the Factory Settlement. Decision No. A-520 of 30 January 1979.

12 S. Teofiluk, *Historyczne centrum miasta Żyrardów. Zakres ochrony konserwatorskiej „osady fabrycznej”*, typescript Warsaw 2008 /in the Archives of the City Historic Monuments Inspector in Żyrardów/; M. Szulińska, *Żyrardów miasto Inu. Propozycja utworzenia parku kulturowego*, [in:] *Dziedzictwo przemysłowe Mazowsza i jego rola w turystyce*, ed. W. Kaprowski, F. Midura, J. W. Sienkiewicz, Warszawa 2008.

13 *Dokumentacja zgłoszenia Zespołu Osady Fabrycznej w Żyrardowie o uznania za pomnik historii*, team ed. under the guidance of A. Wilk, Żyrardów 2010, typescript in the Archives of the Żyrardów City Hall;



The description is complemented by a map, annexed to the Regulation, with the borders of the area recognized as a Polish listed monument.

At the same time, the following corrections are applicable for such borders, defined and binding for more than 30 years:

b/ inclusion of historical, representative avenues: Al. Ditticha and Al. Hillego, connecting the New Settlement to the railway station, currently ul. Partyzantów and ul. Wysockiego.

These areas, together with the area of the "factory settlement", entered into the register of historic monuments and sites, require updating the preservation, and then revitalization, guidelines.¹⁵

Adding to these conclusions on the borders of the historical urban complex of Żyrardów, highlighted should



¹⁴ Regulation of the President of the Republic of Poland of 4 January 2012 on the recognition of “Żyrardów – the 19th-century Factory Settlement” as a Polish listed monument, *Dziennik Ustaw* (the Journal of Laws) of the Republic of Poland, Warsaw, 17 January 2012, item 59.

15 S. Teofiluk, *Historyczne centrum miasta Żyrardów. Zakres ochrony konserwatorskiej „osady fabrycznej”*, typescript, Warsaw 2008, /in the Archives of the City Historic Monuments Inspector in Żyrardów/;

the importance of the development at today's ul. S. Żeromskiego. On the one hand, it provides an architectural framework for the Park around the Villa of the former owners of Żyrardów, and on the other has a significant historical content. Next to the residential buildings from the turn of the 19th and 20th centuries there is located the former Evangelical church, which is a testimony of multiculturalism of the historical community of Żyrardów. A postcard from the early 20th century, that among the representative views of Żyrardów contains the image of that temple, may be evidence of the rank of the object.

Another area, which is protected separately, but lost the spatial relationship with the complex of the historical centre, is the city cemetery, which was an integral part of the former project. The preservation of the awareness of this fact should be one of the tasks of the protection of the cultural heritage of the former factory settlement.

1.2.4 Description of the asset's functions

The specifics of the Factory Settlement complex in Żyrardów are based on the introduced in the 19th century and preserved to this day in the essential framework, functional division of space into industrial, representative and public utility, and residential zones. That functional division is connected also with the social division, illustrated in the urban tissue through separation of the location and the form of the owner's residence, management housing and groups of workers' buildings. Although in the 21st century, we are dealing with the disappearance or only relic presence of the production functions, the nature of the industrial development still remains legible. In contrast, public utility and residential buildings in the vast majority retain their original features, which generates a considerable historical value, but also a lot of preservation challenges.

In functional terms, significant for Żyrardów are the preserved relics of technological heritage, industrial objects and traces the historical economic process preserved in the tissue of the urban layout – clear in the urban cultural landscape. For the functional and social characteristics of Żyrardów relevant are references to the concept of the ideal city and the city-garden, as well as social trends in an industrial society, legible in the saturation with public utility buildings. An obvious component of the Factory Settlement are the workers' buildings, illustrating the 19th-century phase of development of an industrial society. An endangered element are the technological processes related to the production of linen in Żyrardów. Trends for developing a museum role of the industrial tradition are a viable chance to protect that value.



Fig. 51. Żyrardów showpiece, among the most important buildings – the Evangelical church. Postcard from around 1900, <https://www.facebook.com/Zyrardownastarejfotografii>

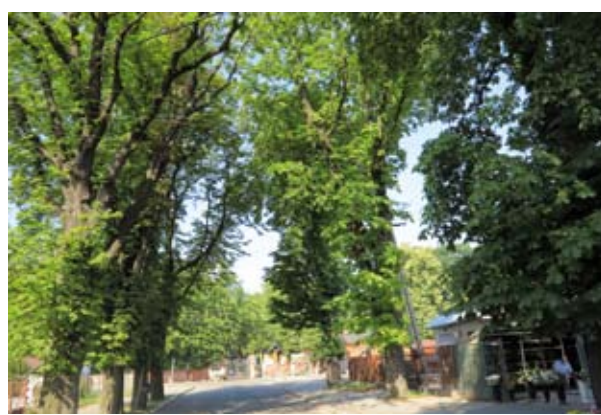


Fig. 52. The avenue leading to the cemetery, the historic part of the cemetery. Photo by A. Siwek

Noteworthy is the fact that the historic centre of the old factory settlement retains the character of a modern urban centre, and the factory buildings complex, despite the functional changes, is still seen as an extracted area within the urban tissue.



Fig. 53. The Linen Industry Museum, a chance for preservation of Żyrardów's technological heritage. Photo by A. Siwek

1.2.5 Ownership of the asset

The historical urban complex is, in principle, a sophisticated historic monument, dependent on many conditions, including conditions resulting from the structure of ownership and management of the areas and objects, setting up the team. In the case of the former factory settlement in Żyrardów, the historical conditions are special. Actually, the whole area within the borders of the Polish listed monument was originally in the hands of one owner. It was each time the owner of the factory complex, because the settlement belonged to the factory as its inseparable part. Nationalization of the plants after World War II, seemingly kept this interdependence, as both the industrial and residential buildings were in the hands of the state treasury as the sole owner. Over time, however, launched were processes of diversification of ownership and management of the complex's elements. The factory complex underwent ownership transformations and divisions, public utility and residential buildings were subject to municipalization. The state treasury was losing influence on the fate of the individual components of the complex. Currently,

the ownership status of the historical settlement is diversified. In the industrial area, intertwined are the elements of ownership of the state treasury, municipality and legal entities. The public utility area is dominated by municipal property, which is owned by the municipality – the City of Żyrardów, represented by the President of the City of Żyrardów. The municipality has legal title to some of the public buildings (42%) and most of the streets and urban public spaces. Religious buildings remain in the possession of religious societies. Remains of the property of the state treasury are under the management the Żyrardów Powiat. The residential sphere is dominated by municipal management, the property of the municipality, although there is a tendency to enfranchise residents and create housing communities, in which, however, the Municipality has large shares. In the context of management of the city and protection of the historic complex, the powers remain with the authorities of the city and in the hands of the City Historic Monuments Inspector who works under an agreement of the President of the City and the Voivode and powers granted by the Voivodeship Historic Monuments Inspector.



Fig. 54. The seat of the city authorities. Photo by A. Siwek



Fig. 55. A room of Resursa. Photo by A. Siwek

1.3 Brief description of the condition of the asset

Description of the condition of the asset is the sum of a number of determinants, including in particular the legal and proprietary status, the maintenance protection status in formal and practical terms, the management system, the functional determinants and the impact of environmental risks and natural factors of material destruction. All of these factors apply to the asset understood as an urban layout (the historical factory settlement) as well as to the individual components of the complex understood as individual historic objects. Among these individual components of the historic complex, as equal elements co-creating the values of the urban layout, noted are both buildings regardless of their scale and formal complexity, and the communication system with historical pavements, greenery compositions, historical watercourses and reservoirs, underground infrastructure, viewing relations, etc. For the condition of the asset, important is the modern function of individual objects, especially industrial ones, since preservation of the industrial tradition is an important part of authenticity, and value, of the place. At the presented stage of development, the overall picture of the asset in this regard was outlined. Detailed references are in the second part, in connection with the protective and strategic indications.

1.3.1 State of preservation of the historical substance

According to the authors of the 2010 application for recognition of the factory settlement in Żyrardów as a Polish listed monument:

The historic complex of the Factory Settlement is preserved in its entirety. The urban layout is clearly outlined in the space of the city. It is distinguished from the later development, randomly scattered beyond its borders. The state of preservation of the historical development of the Settlement is estimated at 95% of the original asset. Taking into account the scale of the undertaking and the powerful resource of historic substance, it must be stated that both the complex, as an urban layout, and its individual elements, from small urban units such as quarters of housing development to individual buildings with their rich architectural forms and details, have not undergone any significant transformations. Almost all objects retained their original functions. The grid of streets built between 1867 and 1898 has remained unchanged, the tradition of maintaining greenery in the streets and other areas originally intended for it, has continued. The few changes in functions and additions made on the site of the historic settlement, mainly in the years after World

*War II, do not negatively affect the original functional program and the legibility and authenticity of the historical layout.*¹⁶

This state of preservation of the urban substance confirms the comparison of the condition described in the SE MPW documentation of 1976 with the present condition. Major changes occur in the sphere of industrial development, but not drastically enough to nullify the character of the whole premise. It must be emphasized that on the scale of Polish historic monuments, Żyrardów boasts unique historical, artistic and scientific values. This preserved 19th-century factory settlement, whose development was related both to the development of industry and the reception of European urban and architectural patterns and important social ideas shaping the 19th century. The city is distinguished by a well-preserved urban layout, legibility of functional connections between industrial, residential and representative areas and the richness of typological variants of the preserved historic substance. This is a significant link in the chain of references to the ideal city, the city-garden, and the urbanization concept of zoning urbanized areas.

Thus, when assessing the state of preservation of historic substance, as the highest urban and architectural values of the complex considered must be its completeness, i.e. preservation of the interdependence of the individual components, created by:

- Urban composition. Urban layout of the Settlement, combining historical stratification with a comprehensive, 19th-century concept of a zonal organization of the urban-industrial complex, subordinated to the pursuit of functional-spatial rationalization, taking into account social ideas and references for the traditions of ideal cities.
- Composed greenery. An integral element of the urban layout, but also an autonomous component of historical stratification. The preserved complex of the several-phase compositions contributing to the character of the city-garden.
- Architecture in all the categories present in Żyrardów, that is: monumental architecture, industrial architecture, public utility architecture, residential architecture, farm buildings and even small architecture (e.g. cast-iron street pumps).

¹⁶ Documentation of the application of the Factory Settlement Complex in Żyrardów for recognition as a Polish listed monument, team compilation under the direction of A. Wilk, Żyrardów 2010, typescript in the Archives of the Żyrardów City Hall., p. 8,



Fig. 56. A fragment of historical residential buildings sunk in greenery. Photo by A. Siwek

The completeness, transparency and homogeneity of the urban complex, the complementarity and interdependence of the industrial, residential and public utility components are all considered paramount values. The Factory Settlement appears as a legible, holistic testimony of important economic, social and civilizational processes, significant for the characteristic of the 19th century and shaping the development trends in the 20th century.

1.3.2 The technical condition

According to the city sources:

... in general, the state of preservation of the complex and the historic buildings should be considered very good. In the case of public utility buildings, the state of preservation is the best – they constitute 18% of the historic buildings of the Factory Settlement complex entered into the register. /.../ Residential buildings, which are mostly

owned by housing communities, are generally in a good condition. Most often noticed issue is the lack of maintenance and repairs carried out to a sufficient extent. They represent 82% of all buildings in the Settlement entered into the register of historic monuments and sites. The state of preservation of outbuildings varies. Currently, there are 31 outbuildings in the area of the Factory Settlement complex covered by preservation protection. 28 of them are characteristic for Żyrardów double-storey wooden sheds with double-sided galleries on the upper floor, one brick, reconstructed according to the original and two one-storey ones, half-timbered with brick filling. Approximately 70% of them represent a good state of preservation, however, requiring comprehensive repairs, others are in poor technical condition, most often caused by lack of structural stability or serious structural defects of the building. /.../ The state of preservation of historical streets, due to their continuous use and current maintenance, is good. /.../ The tradition of maintaining greenery in the areas designed by the creators of the Settlement complex is continued. The greenery that accompanies public utility buildings is



Fig. 57. A fragment of the façade of the building;
. Photo by A. Siwek



Fig. 58. The hallway of a residential building;
. Photo by A. Siwek



Fig. 59. An endangered outbuilding.
Photo by A. Siwek



Fig. 60. The interior of the adapted factory building. Photo by A. Siwek



Fig. 61. A fragment of the façade of the building awaiting development. Photo by A. Siwek



Fig. 62. The new Spinning Mill after adaptation and areas and objects awaiting decisions. Photo by A. Siwek

usually organized and cared for. However, in the residential area, it is necessary to arrange quarters and lines of development in the streets, and to develop these areas in accordance with the best contemporary design patterns of recreational areas for housing premises.¹⁷

To complete this picture, it can be stated that the vast majority of the settlement is preserved in a stable, promising state. Visible are the activities related to raising the standards of performance and maintenance of buildings and public utility sites (e.g. Resursa or the former villa of the owner, currently the Western Mazovia Museum, and the park surrounding it). A major problem are the functional limitations of the historical residential development. Suffice to mention that the original apartments were not equipped with running water and sanitation systems, and tiled stoves were used for heating. Individual upgrades are a threat for the historic substance, with diversified degree of the final utility. Part of the residential development substance has been exploited, and it is more difficult to carry out renovation interventions due to the fact that they were not objects built for a long duration. Loss of functionality and poor original structure are an important reason for the threat to the outbuildings, which are an important component of the urban complex.

The most diverse is the situation of the industrial buildings, some of which have already been subjected to modernization and functional adaptation, some are awaiting such works, and their condition varies from sufficient in terms of technical and ahistorical transformations, to good, with big adaptation potential. In terms of preservation of the substance, most vulnerable to destruction are elements of the technical infrastructure of the factory complex, hidden underground, and hidden from the eyes areas associated with the historical function of the buildings – the water system or areas of bleachery meadows.

1.3.3 Forms of preservation protection

An expression of the perception of the historical, artistic and scientific values of Żyrardów are the numerous entries into the register of historic monuments and sites. Particularly important is the entry into the register of historic monuments and sites of the urban layout – the Factory Settlement. Decision No. A-520 of 30 January 1979 is a proof of early interpretation of the urban-

industrial values of the complex. However, the period during which the decision was being made did not favour precise provisions. Therefore, the decision required interpretation with regard to the scope of protection. Ultimately, the decision was clarified by the Decision of the Mazowieckie Voivodeship Historic Monuments Inspector No. 308/09 of 25 June 2009. In addition, the register of immovable historic monuments with works of architecture and construction, includes 131 objects.

On 4 January 2012, the Żyrardów Factory Settlement was awarded the title of a Polish listed monument. That way, recognition of Żyrardów as a historic complex with unique and the highest – on a national scale – values related to historic substance was confirmed. It should be noted that at the time of recognition of the Factory Settlement as a Polish listed monument, it wasn't the value of individual works of architecture that was recognized, but the value of the concept and substance of the city as a whole.

A complement of the legal forms of protection is the municipal historic monuments record, in which the entire historical development of the Settlement is registered. Entry into the municipal historic monuments record, in accordance with the regulations of the Act on protection and care of historic monuments and sites, results in the need to take account of these objects in local zoning plans. Applicable local zoning plans provide registered objects with protective provisions. The specific nature of the Factory Settlement complex and the difficulties related to the protection of both the objects and the space and their mutual relationship, lay at the basis of the proposal to use another statutory form of protection, i.e. a culture park. The concept proposed by M. Szulińska hasn't been implemented though. Nevertheless, it may be stated that connecting area entries into the register of historic monuments and sites, individual entries into the register of historic monuments and sites, the municipal historic monuments record and protective provisions in the local zoning plans creates effective and appropriate legal framework for carrying out preservation protection.¹⁸ An important factor in determining the effectiveness and quality of that protection is maintaining in the structure of the city's local government administration the unit of the City Historic Monuments Inspector, who, under an agreement, implements some of the powers of the Voivodeship Historic Monuments Inspector. The constant presence of professional preservation services representative in Żyrardów is an essential element of rational and effective system of protection of cultural values.

¹⁷ Documentation of the application of the Factory Settlement Complex in Żyrardów for recognition as a Polish listed monument, team ed. under the guidance of A. Wilk, Żyrardów 2010, typescript in the Archives of the Żyrardów City Hall., pp. 26-28

¹⁸ M. Szulińska, *Żyrardów miasto Inu. Propozycja utworzenia parku kulturowego*, [in:] *Dziedzictwo przemysłowe Mazowsza i jego rola w turystyce*, ed. W. Kaprowski, F. Midura, J. W. Sienkiewicz, Warsaw 2008.

Fig. 63. A sample local zoning plan – annex to resolution No. XXXV/278/13 of the Żyrardów City Council of 29 August 2013 concerning the enactment of the Local zoning plan of the city of Żyrardów covering the area limited by: ul. Limanowskiego, ul. 1-go Maja, the borders of plots located on the Western side of ul. 1-go Maja, ul. Radziwiłłowska, the Pisia river, Górny Staw, plot no. 3516/1, ul. F. Chopina and the rainwater ditch, excluding from the scope of the plan the areas covered by the local zoning plan approved by resolution No. XLI/322/05 of the Żyrardów's City Council of 8 December 2005 on the enactment of changes to the local zoning plan of the city of Żyrardów approved by resolution No. IX/76/03 of the Żyrardów City Council of 29 May 2003 and parcels no.: 3519/36, 3519/23 and 3519/5. / Dz. U. of Mazowieckie Voivodeship of 8 October 2013, item 9971/

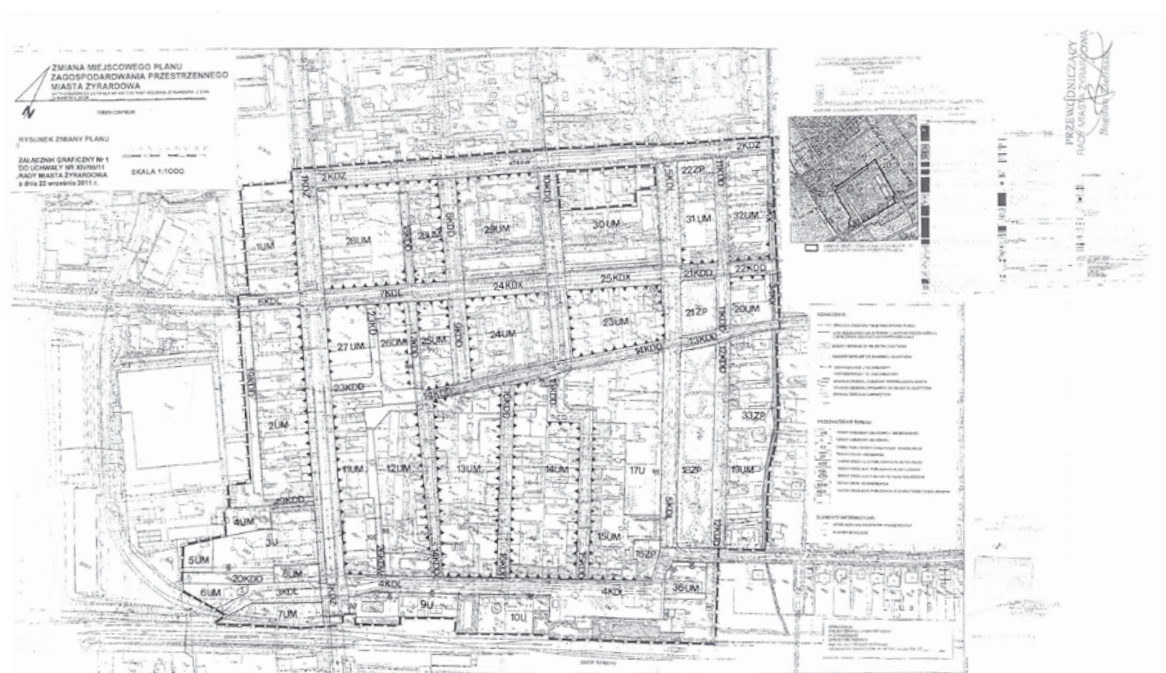
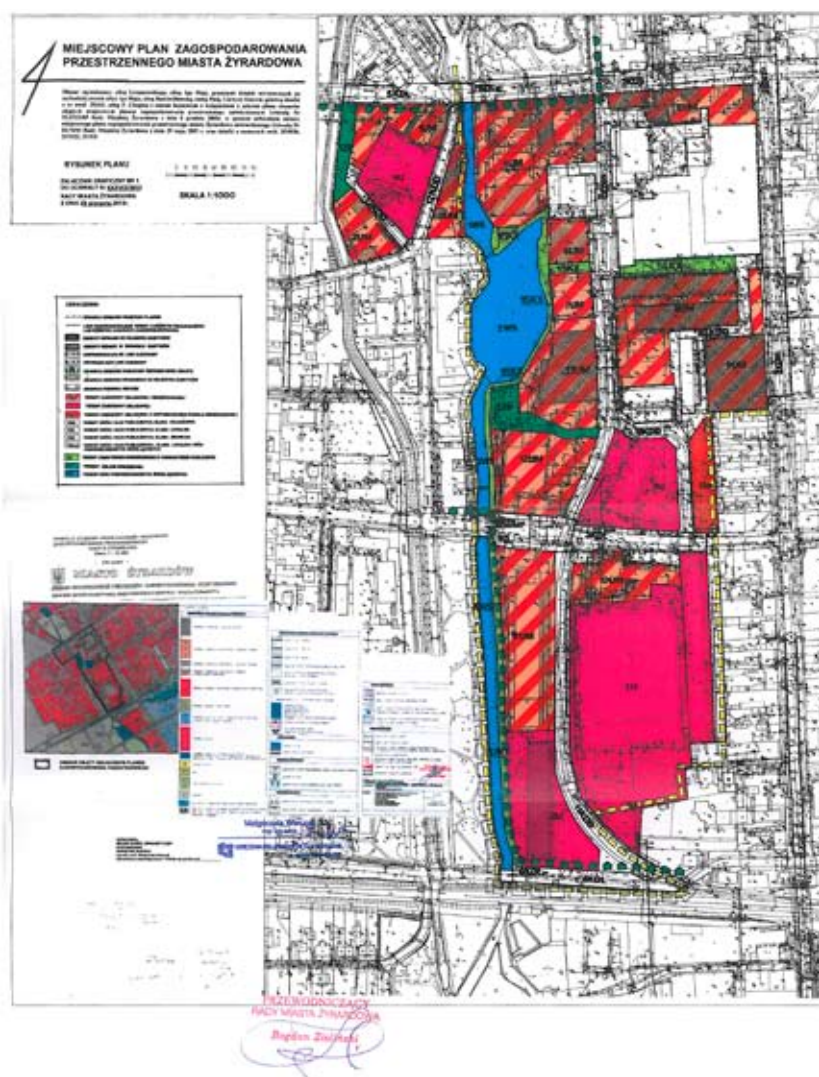


Fig. 64. The local zoning plan of the city of Żyrardów covering the Centre, Resolution of the Żyrardów City Council no. XIV/96/11 of 22 September 2011, Dz. U. of Mazowieckie Voivodeship no. 211 of 19 November 2011, item 6382

LEVEL 1



2. ANALYSIS OF THE VALUES

2.1 DESCRIPTION AND ANALYSIS OF THE ASSET AIMING AT SELECTING THE CHARACTERISTICS, FOR WHICH THE REFERENCE GROUP IS TO BE SELECTED

The description of the asset, presented in the initial part of the study allows to analytically extract a number of value-carrying features of the historic Żyrardów Factory Settlement complex. The data, scattered in individual chapters in this stage of the study are subjected to a process of synthesis enabling to the formulation of proposals in terms of attributes of the values, as well as areas and activities relevant for the strategy for the protection and management of the asset. The asset is characterized by the following features: the spatial scale, which is created by the historical location, the landscape, the historical layout of the roads and the disposition of the public spaces, the historical composition of greenery, the architectural scale, that is, the form and shape of the buildings and their functional dimension, and the intangible scale, including the historical and professional traditions, management methods and systems and the atmosphere and feel uniquely associated with the place and its traditional function. Individual scales interlock and overlap but at the same time they are identifiable in the context of specific attributes and values of their elements. Analysis of the place through those scales (categories of attributes) enables extraction (verbalization) of the actual values of the place, and at the same time creation of a network of management monitoring indicators and reference points for the management of the place. This analysis is an essential step in building a strategy for protection and management of a place of exceptional historic values, especially in the case of places with a complex structure and vast area of occurrence of historic values.

2.1.1 Spatial scale

URBAN LAYOUT

Żyrardów, as an old factory settlement, is undoubtedly a historical urban layout. The scale and form of the development introduced in the 2nd half of the 19th century gave the settlement a city-like character, irrespective of its legal classification. What's more, saturation with public utility functions and representation highlighted that character. Therefore, contrary to the Tsar's legal, tax and naming complications, we are dealing with an urban organism of the industrialization period, *de jure* without city rights. However, with the *de facto* city character far more well-established than in many contemporary cities of the historical Polish lands of the time, which, despite the great past and the ancient metrics, did not get in the stream of economic and civilization transition of the end of the nineteenth century. However, it must be remembered that Żyrardów was built in at least two separate stages. The first from 1829 is associated with the construction of the linen products factory, and the establishment of the small settlement next to the factory, on the farm lands in Ruda Guzowska. This was a typical for that time attempt to raise the profitability of the assets by industrial investments associated with the use of local resources. It's not hard to find parallels for such activities, even in the nearby Guzów, where in 1829, established was a sugar factory (the first in the Kingdom), and next to it a small factory settlement.¹⁹ For this stage of development of Żyrardów

¹⁹ *Słownik Geograficzny Królestwa Polskiego i innych krajów słowiańskich*, Vol. II, Warsaw 1881, p. 919.



Fig. 65. The Żyrardów urban complex. Photo by A. Siwek



Fig. 66. The river in the cityscape. An element of the park's composition, and at the same time an important factor of location of industrial functions.
Photo by A. Siwek

important is the innovative technological know-how of de Girard, which allows to create and maintain a venture despite economic fluctuations. The hallmarks of uniqueness of Żyrardów were obtained only in the second stage of development. That stage was commenced in 1857 when the factory complex was taken over by K. Hiele and K. Dittrich's company and they started to make plans for the "New Settlement", realized in the following decades. It was a group of buildings built in the last quarter of the 19th century, according to a homogeneous functional-spatial concept, in the convention of patronage construction, that decided about the uniqueness of the historical Żyrardów and its city character. The historical urban layout, eventually formed before 1900, comes across as a framework of the most valuable cultural and historic values of Żyrardów. That urban layout from the second phase of the development of Żyrardów, was actually a reference to the traditions and the concept of an ideal city and industrial city, early project of which may be found in the utopian concepts of R. Owen and British implementations from the end of the 18th century, developed in later periods.²⁰ The zonal layout of Żyrardów's functions is ahead of the concept of T. Garnier's *cité industrielle*, and the saturation with greenery precedes Howard's consideration's about a city-garden.

²⁰ A. Fortuna-Marek, A. Siwek, B. Szymgin, *Zarządzanie miejscami światowego dziedzictwa UNESCO w Szkocji – wybrane aspekty w świetle opracowania modelu planu zarządzania*, *Ochrona Zabytków*, No. 2/2015, pp. 199-211.

HISTORICAL LOCATION

Despite the mentioned typicality of the phenomenon of locating an industrial plant on farm lands, the selection of Żyrardów's location was not accidental. In addition to agricultural facilities, the availability of manpower and firewood from the nearby forest, the location was determined by access to water and road networks. The water was a necessary part of the production cycle. That's because processing of flax uses a lot of water. Transport routes were necessary for the supply of raw materials and a convenient export route of products to sell them. It is no wonder, therefore that the river course and the communication route delineated both the leading axis of the factory buildings and its location (between the communication route and the river). Preservation of legibility of these conditions should continue to be a spatial policy of the city.

HISTORICAL LANDSCAPE

The historical urban layout filled with historic architectural fabric creates a unique cultural landscape or, in fact, a historic landscape. The preserved completeness of the complex with the minimal degree of subsequent interference and losses make that landscape integral and authentic. Main and secondary axes and viewing routes, characteristic main and additional viewing points, relationships in the scale of individual architectural and landscape interiors and their sum in the scale of the cityscape designate the network of values summing up both the specificity of the urban layout and

the qualities of the architecture of the city. All that is complemented by areas and routes of composed greenery, which give the complex a character very close to that of a city-garden. Important are the relations of the historic centre with the environment. Especially where the historical city intermingles with the degraded or chaotically modernized architecture of the former districts (in the area of the railway station). Significant are also relationships with the environment of the city, particularly in the industrial part, which was linked with open areas that were used, i.a., for bleaching canvas. The landscape sums up the historical and composition values of Żyrardów, thus protection of those values should also be considered, in the first place, on a landscape scale.

THE LAYOUT OF THE ROADS AND THE DISPOSITION OF PUBLIC SPACES

Both in the context of urban planning and landscape, important are communication routes, the historical layout of roads, and public spaces, i.e. city squares, but also the spaces between the buildings with a unique system of gardens and pathways. The historical, gradually increasing grid of streets is still kind of the essence of the urban layout of Żyrardów. Within the limits of the Polish listed monument, all the arteries were delineated during the period of formation and expansion of the Settlement. In the vicinity, historical streets also constitute the majority, here and there padded with new, complementary communication routes. The communication system is also important for understanding and documenting the production processes in the factory complex and showing its relations with the rest of the city. Squares, i.e., open spaces for public use on the scale of the city, are also an important testimony of the urban development and the concept of the “New Settlement”. In most cases, their function evolves, e.g. the marketplace – the Market Square (that is, opposition: trade space – representative space), places within the factory complex – once storage, manoeuvring and production areas, today – public utility sites or the subject matter of the market investment game. To preserve the memory of the old functions, important are not only the layouts of those roads and squares, but, for example, the historical surfaces and the alignment of sidewalks, or relations of the communication routes with the greenery.

HISTORICAL GREENERY COMPOSITION

Composed greenery plays an essential role in the formation of the attractiveness of the place. It always served recreation, though often in a limited, basic dimension (e.g. the Dittrich Park), as a piece of evidence of the social position of the host. A reflection of social structure



Fig. 67. Historical landscape. Photo by A. Siwek



Fig. 68. The historical, rail route of the industrial communication. Photo by A. Siwek



Fig. 69. The historical surface. Photo by A. Siwek



Fig. 70. A historical alley. Photo by A. Siwek

are not only the overall dimensions and architectural forms of the structures, but also the proportions of green areas used by the residents of each zone of the Settlement. Small gardens accompanying villas of executives and small vegetable gardens next to houses, surrounded by the workers' buildings. A separate aesthetic and functional role is played by alley trees along the communication routes that correspond to the tradition of planting trees next to roads, common in the 19th century. Greenery delineates the functional areas in the urban and landscape scales, and also constitutes an autonomous element of the historic fabric, subject to individual preservation protection. A specific example of evolution of the composition is today's Plac Jana Pawła II. Originally, it was a treeless marketplace that acted as an important feature in the city – factory. In the 20th century, along with gaining the representative function, it gained a green frame, which has been transformed several times, with periods of more and less attention paid to the ongoing care. In its current form, arrangement of greenery freely refers to the inter-war tradition, preserving the decorative forms of greenery highlighting the representative function of the main square in the city. Beyond protection remains the degraded, in terms of composition, greenery complex associated with the representative route of two avenues: Dittrich and Hille, connecting the New Settlement with the railway station (currently ul. Partyzantów and Wysockiego). An area of great importance for shaping the image of the city and arrangement of the space connecting the communication hub with the historical centre.

2.1.2 The scale of the development /architectural scale/

Similarly to the two-phase development of the urban layout, a dissection of the architectural fabric may be carried out. Within the limits of the settlement, expanded after 1857, remaining are elements of the earlier development. This applies both to the industrial part, as well as others. The specifics of architecture of both phases of the development of Żyrardów are noteworthy. The first is dominated by utilitarianism and the need of a quick launch of the planned undertaking. The first ad hoc-erected factory buildings are built, and modest houses of the factory settlement, dependent on the designs distributed in construction stencils of that time. Some of the residential buildings were the houses of weavers, where the workplace is connected with the home, with an individual, manual weaving workshop. Significant was employing a good architect such as Jan Jakub Gay, experienced in designing industrial and economic architecture (e.g. the paper manufacture in Konstancin-Jeziorna, warehouses of Huta Bankowa, the granary in Modlin and, according to K. Stefański, also the lateral wing of the Łódź Geyer factory), for construction of the weaving mill building.²¹ The central building of the factory complex in Żyrardów was given a monumental architectural form, towering over the rest of the development. The construction of the Old Spinning Mill decided on the directions of development and the composition and functional axes of the Settlement in both phases of development. In the second phase of development of the Settlement, we are dealing with a construction boom, which has been included in a uniform framework by the concept of patronage construction and referencing a finite range of architectural forms. K. Stefański characterized it like this: *... an interesting, although atypical, example may be Żyrardów, an industrial settlement that developed in the last quarter of the 19th century to the size of a small town. /.../ Since the '70s, the owners of the plant have been implementing a bold urban and architectural program. Housing districts, schools, hospital, shelter, the Folk's House and many other auxiliary objects were constructed. They presented the simple in its form brick architecture with Neo-Renaissance characteristics. Houses of officials, richer in their solutions, stood out, decorated in the French Renaissance style. The same style, in a richer version, was used in the Villa of the owner, Karol Dittrich, situated in a large park. The program of the settlement was enriched by two Neo-Gothic churches. Żyrardów's*

²¹ K. Stefański, *Architektura XIX wieku na ziemiach polskich*, Warsaw 2005, p. 85.



Fig. 71. Monumental architecture – parish church.
Photo by A. Siwek



Fig. 72. Industrial architecture. Photo by A. Siwek



Fig. 73. Residential architecture. Photo by A. Siwek



Fig. 74. Economic buildings. Photo by A. Siwek

undertaking can be compared to the Łódź complex of Karol Scheibler at Księży Młyn.²²

It should be added that the Żyrardów Settlement exceeded the undertaking at Księży Młyn in terms of quantity and quality of public utility buildings and the social and educational programme (shelters, day care, schools, hospital). As part of the complex created were:

- Monumental architecture. Interesting examples of monumental architecture, typical for the end of the 19th and beginning of the 20th centuries. These are representati-

ve and significant, in terms of artistic features, objects, highlighting at the same time the urban composition as its integral components. An additional value are the richly equipped interiors (representational and religious).

- Industrial architecture. A valuable factory complex, typical for the era, and important as evidence of the production processes, which determine the characteristics of Żyrardów's linen industry.
- Residential architecture. An important historical testimony, related to the history of the industry, the workers' movement and civilization changes in Europe in the 19th and 20th centuries. The repeatability of solutions anticipates the development of housing construction in the 20th century.

²² K. Stefański, op. cit., pp. 141-142.



Fig. 75. An industrial interior – today a weaving products store. Photo by A. Siwek

- Outbuildings. Functional completion of the residential development. An important element of the urban layout. A testimony of the phase of social and civilization transformation in the development of the city in the 19th and 20th centuries. An important historical and scientific value.

The architectural fabric fills the urban layout, is subordinated to the logic and hierarchy of the complex. It should also be mentioned that the city, treated as a homogeneous work, requires similar treatment as a single work of art. While in the case of individual works the subject matter of maintenance, restoration or reconstruction are the details, elements of the whole, the structure of the building or decoration, in the case of an urban complex, it is similar in principle and different with regard to the scale. For example, a restoration or reconstruction of buildings with a relatively low historic value, as an individual work, takes on meaning and value as part of a complex. Adding missing elements of the layout is like doing cosmetic adjustments on rich sculptures. In the evaluation system, we indicate, first of all, the care for preservation of the clarity of the complex, and only then the care for individual works of architecture. A historic monument (and a Polish listed monument) is the sum of elements of the urban layout, and individual objects are the fabric of that historic monument.

2.1.3 The asset's function /intangible values/

Historical conditioning, and in particular, connection of the specificity of the place with industrial tradition make the historical function of the asset an important factor of the value. The essence of protection of technological historic monuments should be presentation and documentation of the historical methods, production technologies and cycles. The context should be the material framework – the urban layout, development, movable property, such as machines and devices.²³ However, the subject matter of the presentation should be the historical technological know-how, the old production systems, technical skills. For decades, Żyrardów has developed and functioned “on linen” as the largest production centre of the European weaving industry, based on processing of flax. Economic changes of the end of the 20th century caused the industry here to lose its competitiveness and deteriorate. The machine parks, as well as all components used for production, including professionals in individual technological fields, were dispersed. However, for presentation of Żyrardów's cultural heritage, showing flax production systems and methods is necessary. That intangible value – the linen industry tradition – significantly complements the range of values of the place. In the changed economic conditions, it is necessary to preserve memory of the factory and its production in a museum form, thus the Linen Industry Museum is so significant for protection of the cultural heritage of Żyrardów.

A separate element of the intangible heritage, a historical value, is the problem of emergence, development and functioning of workers' movements in Żyrardów. The city, called “red”, played an important part in the history of strikes, social activity of women, protests and workers' organizations as one of the most important centres. The spoolers' strike or the events of 1905 are important examples of evolution and radicalization of social movements on a global scale. Therefore, next to the industrial tradition, the tradition of workers' movement belongs to the inherent and significant heritage of Żyrardów, and on an international scale.

23 W. Affelt, Technitas, Zabrze 2015.

2.2 Identified values of the asset

To sum up earlier findings and analyses, a list of values may be formed, that characterize the historic complex of the old factory settlement in Żyrardów. To systematize the argument, the values are organized in the following categories: historical values – peculiarities of the place, historical values – the functional context, urban and architectural values, and, as a synthetic conclusion, a supreme value category was created. The mentioned categories of values correspond to the areas of entries and analyses presented earlier in the article.

HISTORICAL VALUES – SPECIFICITY OF THE PLACE:

- Representativeness. An example of the typical for European industrialism of the 19th century development of an industrial plant, operating based on local raw material resources (flax), manpower and modern technology (de Girard's inventions).
- Urbanization. Żyrardów is a significant example of the city-building role of industry in the 19th century.
- Design concept. A significant link in the chain of references to the concept of the ideal city, to the trend of zoning urbanized areas: industrial, residential, representative-service-social zones, the greenery. The design concept in practice is ahead of the great urbanization concepts formulated in their advanced form by E. Howard – the city-garden (1898) and T. Garnier – *cité industrielle* (beginning of the 20th century).
- Social idea. An interesting example of the search for balance between the capitalist exploitation and the social protection of workers.
- Processes of civilization. The place of formation of the workers' movement in professional and political context, that is, the area where social processes occurred, deciding on the transformation of civilization of the world at the end of the 19th and in the 20th century.
- Economic processes. Europe's largest organic material – flax – processing plant. The marriage of an industrial project and agricultural activation, with the use of the plant typical for Central Europe.
- Multiculturalism. In Żyrardów created was a multi-national and multi-religious society (Catholics, Protestants, Jews, Poles, Germans, Czechs, Russians, the French) that was bonded together by the function of the city and involvement in economic processes.

HISTORICAL VALUES – FUNCTIONAL CONTEXT:

- Tradition. Żyrardów linen industry formed a part of the local tradition of acquisition and processing of

the raw material, enriched with technologies that were characteristic of the period of industrialization. The industry was characteristic of the moderate climate of this part of Europe.

- The scale. The scale of the project placed Żyrardów among the largest textile centres of Europe of that period. In the category of linen products, Żyrardów was, at the end of the 19th century, the largest centre of production in Europe.
- Continuation. Linen production lasted in Żyrardów continuously since the third decade of the 19th century, to the end of the 20th century (1997). Currently, it is active to a limited extent, as souvenir and museum production. The values of continuation of production is one of the most endangered intangible values of Żyrardów.

URBAN AND ARCHITECTURAL VALUES OF THE COMPLEX:

- Urban composition. Urban layout of the Settlement combines historical stratification with a comprehensive, 19th-century concept of a zonal organization of the urban-industrial complex, subordinated to the pursuit of functional-spatial rationalization, taking into account social ideas and references for the traditions of ideal cities. An important historical, artistic and scientific value.
- Composed greenery. An integral element of the urban layout, but also an autonomous component of historical stratification. The preserved complex of the several-phase compositions contributing to the character of the city-garden. An important historical, artistic and natural value.
- Water engineering, a complement of the functional industrial complex and, at the same time, the role of the watercourse in the urban cons
- Monumental architecture. Interesting examples of monumental architecture, typical for the end of the 19th and beginning of the 20th centuries. These are representative and significant, in terms of artistic features, objects, highlighting at the same time the urban composition as its integral components. An additional value are the richly equipped interiors (representational and sacred). Important historical and artistic value.
- Industrial architecture. A valuable factory complex, typical for the era, and important as evidence of the production processes, which determine the characteristics of Żyrardów's linen industry. An important historical and scientific value.
- Residential architecture. An important historical testimony, related to the history of the industry,



Fig. 76. Factory sector. Photo by A. Siwek

the workers' movement and civilization changes in Europe in the 19th and 20th centuries. The repeatability of solutions anticipates the development of housing construction in the 20th century. An important historical and scientific value.

- Outbuildings. Functional completion of the residential development. An important element of the urban layout. A testimony of the phase of social and civilization transformation in the development of the city in the 19th and 20th centuries. An important historical and scientific value.

THE SUPREME VALUE

Completeness, transparency and homogeneity of the urban complex, complementary character and interdependence of the industrial, residential and public utility elements. The Factory Settlement as a holistic testimony of important economic, social and civilization processes, essential for characterizing the 19th century and shaping development trends in the 20th century.

2.3. Specification of the asset's type and indication of the reference group representing a comparative context

According to the SMART Value method idea, evaluation needs a created value scale, and in the case of complex entities, such as the historic complexes, such scale may only be provided by comparison with other objects in a given category of historic monuments and sites. Therefore, determination of a typological group for a given asset is a necessary condition of completion of the asset evaluation analysis. In light of lack of established in the preservation practice evaluation systems and comparison of assets, we are referring to experiences from the area of world heritage, where the issue is a subject matter of an internal discussion and attempts to develop a system.²⁴

It must be mentioned that attempts to evaluate the historic complex of the Settlement have been made actually from the beginning of the scientific interest in Żyrardów as a cultural asset. Symptomatic in this context are statements made in the already cited SE MPW Study from 1976. The authors stated:

*The study is an attempt to evaluate the values of the preserved elements of the historical spatial layout of Żyrardów. The urban development of Żyrardów has not occurred by gradually adding new districts around the already existing historical centre, as it usually happened in cities with rich past. The development of Żyrardów was based on well-thought-through plans. **Due to the specific nature of the development of Żyrardów, difficulties emerged, related to the lack of a model of historical and urban study for this kind of factory settlements, and also to the fact that the industrial nature of Żyrardów, which dominated over other functions of the settlement /city/ significantly influenced the creation of specific spatial layouts and characteristic forms of the development.***²⁵

Despite the mentioned limitations, the Authors were able to define the values of the Settlement in such a convincing manner that their documentation became the basis for the entry into the register of historic monuments and sites of the urban layout – the Factory

Settlement in Żyrardów, under no. A-520, by the decision of 30 January 1979. Of course, the justification of the decision referred generally to the historical, artistic and scientific values, according to the statutory definition of a historic monument. The fact of evaluation and preservation protection is noteworthy, because in the 1970s, here in Poland, we were only beginning to take interest in architecture of historicism, technical historic monuments and industrial construction.²⁶ we can find an attempt to leave the settled evaluation frames in the City's application for recognition as a Polish listed monument. The justification highlighted the context of European ideal cities and stated, i.a.:

*The Factory Settlement, which, along with the historic post-industrial complex, constitutes an integral part of modern Żyrardów, is a unique, on a national scale, example of the idea of shaping an industrial city, similar in its functional program and spatial solutions to an ideal city of the 19th-century industrial Europe. While maintaining its original spatial composition, architecture of its objects and their function, it possesses priceless features, that distinguish it from other preserved 19th-century industrial centres.*²⁷

A document that shows Żyrardów's rank on an actual, albeit cursory, scale, is a "comparative study" titled *The International Context for Textile Sites*, prepared as part of works of the weaving section of the International Committee for the Conservation of the Industrial Heritage (TICCIH).²⁸ The document was prepared during a series of meetings of the Committee, from 2000 (London, Great Britain), through meetings in Barcelona (Spain, 2001), Euskirchen (Germany, 2003) and Sedan (France, 2007) and is still considered a draft. However, this document gives an idea of the scale and scope of the historical textile centres. Among them, Żyrardów appears several times as:

- one of the factories in the category of "the largest", as the only one representing the linen industry;

²⁴ *Wartościowanie w ochronie i konserwacji zabytków*, ed. B. Szmygin, Warsaw – Lublin 2012.

²⁵ Żyrardów. Dokumentacja konserwatorska urbanistyczno-architektoniczna, PP PKZ Warsaw 1976/Team compilation under the direction of J. Baranowski, academic supervision A. Rottermund, A. Znojkiwicz, historical documentation: A. Gryciuk, urban documentation: J. Kubiak, architectural documentation: T. Szyburska; photographic documentation: K. Kowalska, A. Stasiak, J. Szadkowski/ typescript in the Archives of the Mazowieckie Voivodeship Historic Monuments Inspector in Warsaw.

²⁶ Cf.: *Sztuka około 1900*. Materials from a session of the Association of Art Historians, Warsaw 1969.

²⁷ Application documentation for recognition of the Factory Settlement Complex in Żyrardów as a Polish listed monument, team ed. under the guidance of Andrzej Wilk, Żyrardów 2010, typescript in the archives of the Żyrardów City Hall.

²⁸ The International Context for Textile Sites, http://ticcih.org/wp-content/uploads/2013/04/the_international_context_for_textile_sites_ticcih.pdf

- one of the factories that meet the UNESCO criterion II, which is an asset exhibiting an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- as a “textile town”, a factory settlement, one of the many examples of the “weaving industry landscapes”, that is, towns (cities), in the landscape of which the memory of the historical textile industry is legible;

In the category of the “largest”, in the quoted document, listed are also:

- the largest in the world in 1800: struggling for primacy: Belper and New Lanark in the UK (cotton);
- the largest in Europe in 1910:
 - **cotton:** Kreenholm, Narva, Estonia (458,380 spindles, 2,500 looms in 1901) or Scheibler’s Factory in Łódź, Poland (11,000 workers),
 - **linen:** Żyrardów, Poland (9,000 workers),
 - **wool:** Dean Clough, Halifax, Great Britain (5,000 workers)
- the largest in the world in 1912: cotton: Amoskeag, Manchester, New Hampshire, USA (15,500 workers).²⁹

As regards compliance with criterion II, Żyrardów was commented in a somewhat surprising and misleading manner: *Żyrardów, Poland (linen factory, founded by the French, when the area was part of Russia, later in the possession of the Austrian and under the Scottish leadership)*.³⁰ The comment should be thoroughly considered not to be completely rejected as incompatible with our conception of history. In addition, the authors of the Study invoke while characterizing Żyrardów a web source: <http://www.zyrardow.pl/historia>, which makes the misleading character of the comment even more convincing. Despite a certain degree of generality and wording that leave a certain feeling of insufficiency, this is the first attempt to show Żyrardów in such a wide comparative formula worldwide. The draft nature of the document makes these statements “material”, without in-depth conclusions and, above all, without actual references to deeper analysis of individual sites.

In the context of the presented document, precisely indicating the actual reference group and clarifying the attributes of the place’s values have greater importance for evaluation of the asset.

DETERMINATION OF THE TYPOLOGICAL GROUP:

Referring to the typology applied to the world heritage assets, “Żyrardów – the 19th-century Factory Settlement”, is, pursuant to Article 1 of the Convention Concerning the Protection of the World Cultural and Natural Heritage, a cultural asset in the category of: “groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history (...);”

In relation to Żyrardów, it may be considered, as far as it corresponds to the criteria developed in the pragmatics of the world heritage, and in particular criterion II, which stipulates that the complex exhibits: “an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;”, criterion IV, which states that the complex is: “an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates a significant stage in human history; and criterion V, according to which the complex needs to be: “an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change.”

In the context of divisions developed for urban centres, Żyrardów is difficult to classify. Because, in respect of urban complexes, the World Heritage Committee has adopted detailed guidelines, dividing them into three main types:

- I. *cities that are no longer inhabited but that constitute unchanged archaeological testimony of the past. They usually meet the criteria of authenticity and their maintenance status can be relatively easily controlled;*
- II. *historical cities that are inhabited and that, by definition, developed and will develop under the influence of social and cultural changes. This is a situation that makes determination of authenticity more difficult, and the protection policy is more problematic;*
- III. *New cities from the 20th century that, paradoxically, have something in common with the two previous categories and while their original urban layout is very legible and their authenticity undeniable, the future is not clear, because their development is largely hard to control.*

Without a doubt, Żyrardów is not an uninhabited city (Group I), however, inevitable and irreversible changes in the scope of production and binding of the residential part with the factory complex make the city-build-

²⁹ Ibid.

³⁰ Ibid.

ing idea that accompanied the formation of Żyrardów, a thing of the past, and the development of the city froze at some point in history.

That condition makes Żyrardów different from historical cities of category II, which are inhabited and develop organically under the influence of constantly occurring socio-cultural changes.

Despite its 19th-century origin, Żyrardów is closer to the cities of the 20th century (category III), as the statement that “the original urban layout is very legible and their authenticity undeniable, the future is not clear, because their development is largely hard to control” refers largely to the facts.

This difficulty of categorization indicates that the case of Żyrardów should be considered within yet another group of references – a typological group. Referencing Żyrardów, as a cultural asset, to the group of technical historic monuments seems to be appropriate, since **the logic of the urban layout and historical stratifications is inextricably linked to industrial essence of the city’s development.** The specificity of Żyrardów may be properly understood and evaluated only by summing the analysis of the history of industry and the social and urban ideas, which, in relation to the industrial development were created in the civilized world of the 19th century.

To sum up, selection a group of monuments which constitute the reference group depends on the combination of the following elements:

AREA OF ANALYSIS:

- first of all, urban industrial centres and industrial landscapes of the Congress Poland (e.g. Łódź, Zgierz, Białogon);
- further, European industrial centres, with particular focus on weaving centres. E.g. the urban and industrial centres of Silesia: Zabrze, Katowice, Bielsko and of Europe, e.g.: Great Britain: New Lanark, Saltaire in Bradford, Derwent Valley in Cromford, Verdant in Dundee, Manchester; Germany: Delmenhorst Nordwolle; the Netherlands: Fabriekscomplex Jannink in Enschede; Italy: Crespi d’Adda in Lombardy.

PERIOD OF ESTABLISHMENT:

- 19th century (2nd-3rd quarter)

FUNCTIONAL DESCRIPTION OF THE HISTORIC MONUMENT:

- technological heritage
- industrial objects



Fig. 77. Crespi d’Adda in Lombardy, aerial photograph from the 1st quarter of the 20th century. <http://crespidaddaunesco.org/foto-del-passato/>

- textile industry
- urban planning
- ideal cities
- social trends in an industrial society
- workers’ and patronage districts
- technological processes /historical and continued/

EQUIPMENT ASSOCIATED WITH PRODUCTION

- equipment, machines, technology lines, etc.
- use of natural conditions, water network, communication network

RESOURCE CHARACTERISTIC OF THE HISTORIC MONUMENT:

- urban planning
- brick construction

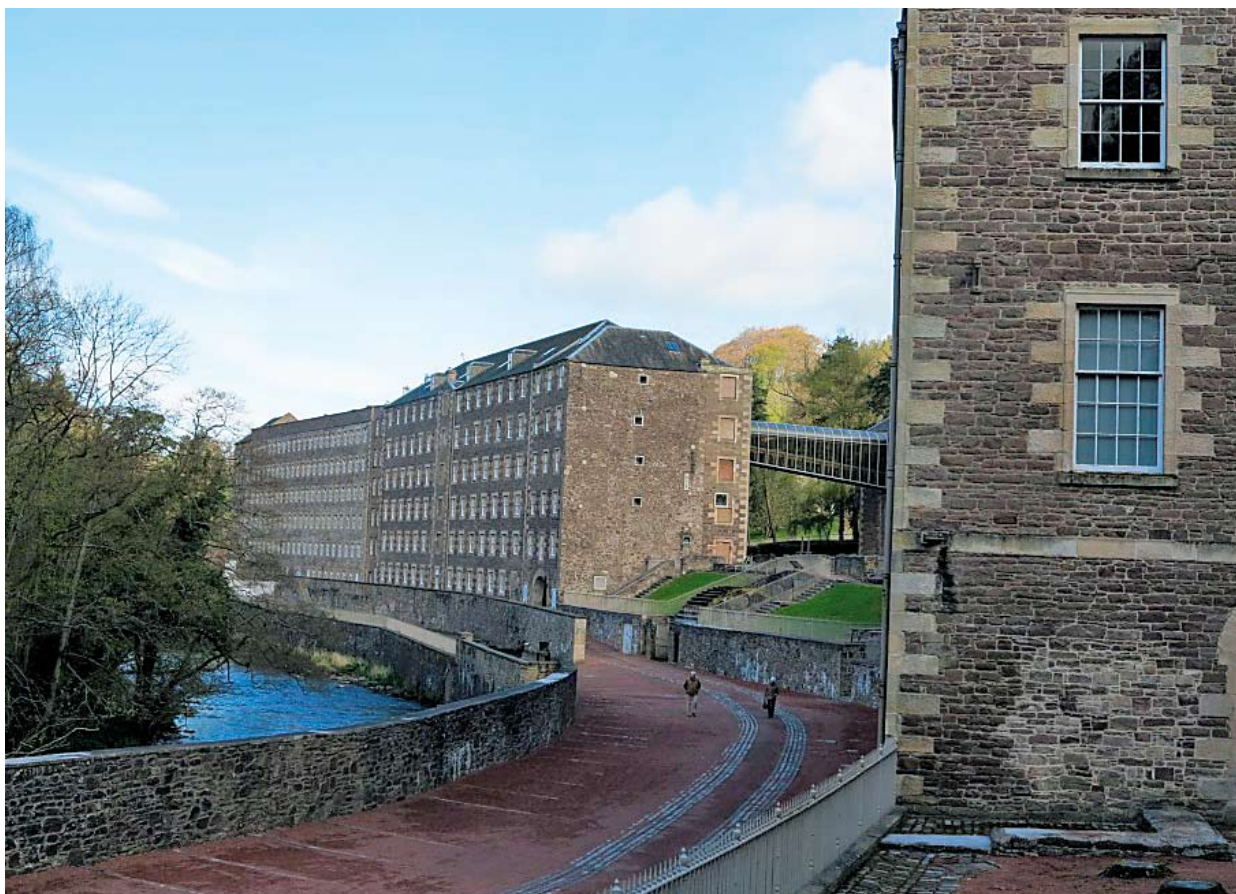
STYLISTIC FORMATION:

- historicism of the 19th century
- ancillary modernism of the 20th century
- engineering and industrial architecture

The reference group is a sum of the individual elements – they determine the areas and limits of interest.

THE REFERENCE GROUP:

factory and residential complexes (industrial cities and districts) /historical urban planning, including social and urban-planning utopias/the period of the industrial revolution/the weaving industry/continuity of production/Europe/historicism monuments of the 19th and the beginning of the 20th century/



Fot. 78 New Lanark. Industrial settlement. A place of UNESCO world heritage. Photo by A. Siwek



Fot. 79 New Lanark. Factory complex. Photo by A. Siwek

2.4. Specification of the evaluation criteria – verification of the characteristics defined as a basis for evaluation

General characteristic and analysis of the complex, as well as formulation of elements allowing to define the reference group, give a basis to indicate those features that decide on the values of a given asset. In the case of Żyrardów's Factory Settlement, such dominant, leading criteria for evaluation are, first of all:

- architectural detail (including wood- and ironwork)
- functional differentiation
- style differentiation
- differentiation on the scale of representative and monumental character, conditioned by the social structure of the factory society

THE FORM AND DESIGN OF THE COMPLEX:

- Urban layout
- Borders of the complex
- Grid of streets, squares and plots of land
- Functional disposition of the development
- Composition and functional relations in the development
- Composed greenery
- Presence of watercourses and water engineering works within the complex
- Architectural forms of the development
- Viewing axes
- Viewing relations

USE AND FUNCTION

- historical functions
- current functions
- division of function in historical context

LOCATION AND SURROUNDINGS

- settlement „in cruda radice”
- agricultural tradition
- industrial tradition
- communication and transport system
- association with natural conditions (landscape and technological system elements)

ARCHITECTURAL FORM OF THE COMPONENTS OF THE COMPLEX:

- overall dimensions, body, projection
- material and structure
- colours
- texture of the façade

INTANGIBLE VALUES

- historical
- industrial archaeology
- social

EVALUATION OF THE VALUES OF THE GOOD IN LIGHT OF THE SELECTED CRITERIA IN RELATION TO THE REFERENCE GROUP

CRITERIA	CHARACTERISTICS	COMPARATIVE EVALUATION	COMMENTS
FORM AND DESIGN OF THE COMPLEX	The leading value – a complete urban complex with functional and composition relations	high value	Not direct pattern found. The scale and consequence of the layout competes with the largest centres of its kind in Europe
– Urban layout	The regularity and homogeneity	high value	as above
– Borders of the complex	legibility	high value	Require adjustments in the practice of preservation and management
– Grid of streets, squares and plots of land	Regularity, conformity with the design	high value	as above

- Functional disposition of the development	Legibility of functions	high value	A highly endangered element in the context of functional adaptations
- Composition and functional relations in the development	Legibility of relations and dependencies	high value	- technical dependencies related to the industrial function - social dependencies related to the professional and property structure of the residents of Żyrardów
- Composed greenery	Legibility of the composition	medium value	Greenery only partly corresponds to the design's assumptions, partly degraded due to lack of ongoing care
- Architectural forms of the development	Harmony and authenticity	high value	Harmonious layering within the layout
- Viewing axes	Participation in the designed composition, modern legibility	medium value	Locally blurred
- Viewing relations	Character of architectural and landscape interiors	medium value	Locally disturbed
• Architectural form of the components of the complex	Originality and architectural quality of solutions	medium value	In architectural terms, the buildings of the Settlement are a rather typical than unique example of works of the period.
- overall dimensions, body, projection	Degree of advancement of the project	high value	High consequence within the layout
- material and structure	Degree of technical advancement	medium value	Solutions typical for the period
- colours	Aesthetic value	medium value	as above
- texture of the façade	Aesthetic value	medium value	as above
- architectural detail (including wood- and ironwork)	Aesthetic value	medium value	as above
- functional differentiation	Typological characteristic of the development	medium value	as above
- style differentiation	Artistic (style) characteristic	medium value	as above
- differentiation on the representative and monumental scale	Formal and functional diversity	high value	Reflected social and economic specificity of the Factory Settlement
• Use and function	Dominant value in historical context, currently endangered	endangered	Functional and economic transformations
- historical functions	Importance in the history of a specific industry, region, civilization changes	high value	Europe's largest linen industry centre, an important centre of the workers' movement,
- current functions	Cultural heritage as functional potential	endangered	Functional and economic transformations. An ongoing process.

- division of function in historical context	Industrial and social specificity of the place	high value	High legibility of records of the historical processes.
• Location and surroundings	Geographical conditions	high value	Landscape attractiveness
- settlement „in cruda radice”	Initiation of settlement and economic processes in the 19th century.	high value	An important example of founding of a settlement – town established in cruda radice, and not in the structure of an existing settlement organism.
- agricultural tradition	Economic conditions – pre-industrial and raw material-related	legible	Largely obscured by subsequent transformations
- industrial tradition	The essence of the cultural heritage of the place	high value	Competitiveness on a European scale
- communication and transport system	Legibility of the historical solutions	medium value	Typical, transformed solutions
- association with natural conditions (landscape and technological system elements)	Legibility of solutions and conditions	medium value	Locally transformed and blurred
• Intangible values	The essence of cultural identity of the place	high value	Historical and scientific values of supra-regional meaning
- historical	Historical conditions	high value	Historical and scientific values of supra-regional meaning
- industrial archaeology	Value in the scope of research on old industry	high value	Historical and scientific values of supra-regional meaning
- social	Value in the scope of research on historical social processes	high value	Historical and scientific values of supra-regional meaning

CONCLUSIONS

Comparative analysis of Żyrardów against the selected reference group requires deeper consideration, however, even from the initial analysis it appears that the Factory Settlement belongs to the group of important historical sites in its category on a global scale. The size of the undertaking, the scale of production, the sales range, the specifics of the raw materials, the uniformity of the urban concept (despite the two-phase character of the development), the saturation of representative architecture and social functions, multiculturalism, greenery composition, the preservation status of the complex and saturation with intangible values

with reference to the concept of an ideal city, social concepts (illustration of the social structure in urban and architectural fabric of the city) and the role of Żyrardów in shaping the workers' movement, including the professional and social activity of women, make this place important and unique on the scale of comparable complexes worldwide. It should be added that the specific and unique value of Żyrardów is decided by its development in the 2nd half of the 19th century. The first phase, however, is not without importance, since it gave rise to the evolution of the complex and is a deciding factor in determining the directions of development and the time frame of the undertaking.

LEVEL 2



3. ANALYSIS OF THE VALUES

3.1 ANALYSIS OF THE VALUES – DETERMINATION OF THE ATTRIBUTES OF THE VALUES AND ASSESSMENT OF THEIR AUTHENTICITY AND INTEGRITY

In the analysis of the values of the settlement in Żyrardów, specified were attributes – understood as the key features and elements of the asset, which are decisive for the assessment of the values of the historic monument. There were also attempts to determine how detailed and characterized attributes meet the requirement of authenticity and of integrity – so relevant in assessing the values of the historic monument. In the tabular statement of attributes presented is their structured list, starting with classifying attributes in several categories relating to: spatial scale, architectural scale, scale of movable objects and functional scale, and context of the intangible heritage. In each of these groups of attributes, individual attributes were selected, and sometimes their components (elements) and an evaluation of authenticity and integrity. In the characteristics

of the attributes indicated were the key issues that determine the specificity of the attribute or its element (more detailed descriptions are contained in the chapter: Level 1 – description and analysis of the asset).

In accordance with the assumptions of the SMART Value evaluation system, the proposed value analysis of the Factory Settlement complex aims primarily to disclose its diverse values, binding them with its material form, better understand the complexity, and systematized knowledge of the historic monument (from the point of view of factors important for its protection). An analysis of the values of the elements of the monument (by specifying attributes of the values) carried out in the above manner provides a basis for determination of its protection and the range of possible interference.³¹

31 Szmygin B., *System wartościowania Smart Value*, typescript

Table: dependencies of the extracted values and attributes

VALUES	ATTRIBUTES
HISTORICAL VALUES – SPECIFICITY OF THE PLACE:	FORM AND DESIGN OF THE COMPLEX
– Representativeness. An example of the typical for European industrialism of the 19th century development of an industrial plant, operating based on local raw material resources (flax), manpower and modern technology (de Girard's inventions).	– Urban layout – Borders of the complex – Grid of streets, squares and plots of land – Functional disposition of the development
– Urbanization. Żyrardów is a significant example of the city-built role of industry in the 19th century.	– Composition and functional relations in the development
– Design concept. A significant link in the chain of references to the concept of the ideal city, to the trend of zoning urbanized areas: industrial, residential, representative-service-social zones, the greenery.	– Composed greenery – Architectural forms of the development – Viewing axes – Viewing relations
– Social idea. An interesting example of the search for balance between the capitalist exploitation and the social protection of workers.	Composition and functional relations in the development
– Processes of civilization. The place of formation of the workers' movement in professional and political context, that is, the area where social processes occurred, deciding on the transformation of civilization of the world at the end of the 19th and in the 20th century.	The intangible sphere
– Economic processes. Europe's largest organic material – linen – processing plant. The marriage of an industrial project and agricultural activation, with the use of the plant typical for Central Europe.	Architectural forms of the development
– Multiculturalism. In Żyrardów created was a multi-national and multi-religious society (Catholics, Protestants, Jews, Russians) that was bonded together by the function of the city and involvement in economic processes.	Architectural forms of the development
HISTORICAL VALUES – FUNCTIONAL CONTEXT:	Architectural form of the components of the complex:
– Tradition. Żyrardów linen industry formed a part of the local tradition of acquisition and processing of the raw material, enriched with technologies that were characteristic of the period of industrialization. The industry was characteristic of the moderate climate of this part of Europe.	– overall dimensions, body, projection – material and structure – colours – texture of the façade – architectural detail (including wood- and ironwork) – functional differentiation – style differentiation – differentiation on the representative and monumental scale – technical equipment
– The scale. The scale of the project placed Żyrardów among the largest textile centres of Europe of that period. In the category of linen products, Żyrardów was, at the end of the 19th century, the largest centre of production in Europe.	– Urban layout – Borders of the complex
– Continuation. Linen production lasted in Żyrardów continuously since the third decade of the 19th century, to the end of the 20th century (1997). Currently, it is active in a limited extent as souvenir and museum production.	- the machine park - operating production lines

URBAN AND ARCHITECTURAL VALUES OF THE COMPLEX:	Use and function
– Urban composition. Urban layout of the Settlement combines historical stratification with a comprehensive, 19th-century concept of a zonal organization of the urban-industrial complex, subordinated to the pursuit of functional-spatial rationalization, taking into account social ideas and references for the traditions of ideal cities. Important historical, artistic and scientific value.	– Form and design of the complex – Urban layout – Borders of the complex – Grid of streets, squares and plots of land – Functional disposition of the development – Composition and functional relations in the development – Composed greenery – Architectural forms of the development – Viewing axes – Viewing relations
– Composed greenery. An integral element of the urban layout, but also an autonomous component of historical stratification. The preserved complex of the several-phase compositions contributing to the character of the city-garden. Important historical, artistic and natural value.	Composed greenery
– Monumental architecture. Interesting examples of monumental architecture, typical for the end of the 19th and beginning of the 20th centuries. These are representative and significant, in terms of artistic features, objects, highlighting at the same time the urban composition as its integral components. An additional value are the richly equipped interiors (representational and sacred). Important historical and artistic value.	Monumental architecture – overall dimensions, body, projection – material and structure – colours – texture of the façade – architectural detail (including wood- and ironwork) – functional differentiation – style differentiation
– Industrial architecture. A valuable factory complex, typical for the era, and important as evidence of the production processes, which determine the characteristics of Żyrardów's linen industry. An important historical and scientific value.	Industrial architecture – overall dimensions, body, projection – material and structure – colours – texture of the façade – architectural detail (including wood- and ironwork) – functional differentiation – style differentiation
– Residential architecture. An important historical testimony, related to the history of the industry, the workers' movement and civilization changes in Europe in the 19th and 20th centuries. The repeatability of solutions anticipates the development of housing construction in the 20th century. An important historical and scientific value.	Residential architecture – overall dimensions, body, projection – material and structure – colours – texture of the façade – architectural detail (including wood- and ironwork) – functional differentiation – style differentiation
– Outbuildings. Functional completion of the residential development. An important element of the urban layout. A testimony of the phase of social and civilization transformation in the development of the city in the 19th and 20th centuries. An important historical and scientific value.	Economic architecture – overall dimensions, body, projection – material and structure – colours – texture of the façade – architectural detail (including wood- and ironwork) – functional differentiation – style differentiation
SUPREME VALUE	
Completeness, transparency and homogeneity of the urban complex, complementary character and interdependence of the industrial, residential and public utility elements. The Factory Settlement as a holistic testimony of important economic, social and civilization processes, essential for characterizing the 19th century and shaping development trends in the 20th century.	– historical landscape – Urban layout – the scale and form of development – functions of objects and areas – intangible heritage of the industrial tradition and evolution of social ideas and workers' attitudes

Attribute category		Attribute		SPATIAL AND LANDSCAPE SCALE				
The neighbourhood		Landscape composition		Form and design of the complex				
The neighbourhood	The landscaped neighbourhood of the historic complex of the Settlement – relationship with other, partly historical, areas of the city.	The problem of relations of the quarter of buildings near the train station (a major node in a historical context), with the former Jewish quarter, the Evangelic colony relations with the parish cemetery and the Jewish cemetery. These historical parts once functionally related with the Settlement, form a kind of buffer zone between the Settlement and the contemporary city. Chaos and destruction of parts of these spaces may be a negative factor aggressively influencing the landscape values of the Settlement.	Authenticity of functional and viewing relations results from historical conditions. Although it does not concern an area with identified highest values, it influences it in a natural way on the scale of perception of the landscape.	The Settlement, as the functional and composition centre of historical city, should be seamlessly integrated with the outermost regions, which worked together in the functioning of the industrial centre.	Authenticity is expressed by the condition of the urban substance (buildings, small architecture, pavements, greenery) and high compatibility of the complex with the condition from cartographic sources from the peak period of development of the historical phase of around 1914 (World War I – subsequent transformations can be neutral, positive or negative in the context of authenticity, but the reference period, building the culmination value are years up to 1914).			
						Functional and technological links, legible in the landscape scale	Relevant to the specifics of the Factory Settlement as an industrial-residential-representative organism. Clearer than in the „classic”, multi-functional and multiphase urban units, links between the individual elements of the complex through the communication system, the scale of the development, the sequence of landscape interiors and historical technological lines.	
							The urban and landscape interiors	The sum of the urban and landscape interiors delineated by blocks of the residential development, industrial units, buildings surrounded by gardens, composed as integral units with various functions and scales as part of development of the urban layout of the Settlement.
							Viewing axes	Legible, composed viewing relations with strong ideal load, such as: the factory – Pl. Jana Pawła II – the parish church and local axes delineated by communication routes and the band layout of the development.
	Form and design of the complex	Composed greenery	Composed greenery, present in the urban layout in the form of private and public parks, greenery along the streets and between buildings, and small home gardens.	Integrity is co-created by the maintenance of the complex within clear historical limits and preservation of the repeatability and uniformity of the historic substance within the borders of the layout (the scale, size, facade divisions, detail, colours). The small degree of subsequent interference with the historic fabric of the Settlement is also important.				
		Communication axes and public spaces	Communication axes and squares along which the urban grid successively grew. A significant factor in the proportion of developed and open areas.					
		Borders of the complex	Clear separation of the historic complex within the city of the 20th and the 21st centuries.					
Urban layout		The industrial, residential, service and public utility development complex, layered with phases, settled after 1870, together with the communication system and the accompanying greenery.	Authenticity is expressed by the condition of the urban substance (buildings, small architecture, pavements, greenery) and high compatibility of the complex with the condition from cartographic sources from the peak period of development of the historical phase of around 1914 (World War I – subsequent transformations can be neutral, positive or negative in the context of authenticity, but the reference period, building the culmination value are years up to 1914).	A high degree of integrity. Preserved attribute components (sequences of views and interiors, their elements) fully reflect the historical composition layout.				
CHARACTERISTICS OF THE INDIVIDUAL ELEMENTS OF THE ATTRIBUTE		Authenticity of functional and viewing relations results from historical conditions. Although it does not concern an area with identified highest values, it influences it in a natural way on the scale of perception of the landscape.			The Settlement, as the functional and composition centre of historical city, should be seamlessly integrated with the outermost regions, which worked together in the functioning of the industrial centre.			
EVALUATION OF AUTHENTICITY								
EVALUATION OF INTEGRITY								

ARCHITECTURAL SCALE					
The outer architectural form of the buildings	The bodies	Sequences of repetitive or personalized bodies of the objects whose sizes and dimensions are associated closely with their function and location within the complex.	A high degree of authenticity – 95% of the historical architectural substance of the complex is preserved. Sphere threatened with transformations due to functional, technological changes and natural consumption of the substance, which was largely low-cost.	Integrity results from the completeness of preservation of the architectural substance, near to the historical condition. Interference with integrity are the material changes (e.g. PVC window joinery, or replacement of the substance of the service construction from wood to brick). An element supporting integrity on object and complex scales is a reference to the repeatability of individual solutions in the Settlement and maintaining the uniformity of solutions within a specific type of buildings.	
	Projections	Sequences of repetitive or individualized projections of objects whose complexity, size and form are associated closely with their function and location within the complex.			
	Material and structure	Sequences of repetitive or individualized material and construction solutions associated with the function and rank of the object within the complex.			
	Façades	Sequences of repetitive or individualized material, construction and decoration solutions associated with the function and rank of the object within the complex. Substantial uniformity of solutions within a given typological group.			
	Architectural decoration	An expression of individualization and highlighting the social rank of the users of a particular property. An important social „code“.			
	Colours and texture	The resultant of adopted material, construction and decoration solutions and the need to determine the rank of the object within the complex (repetitive, individual). An element of artistic expression and a clear expression of the era in which the object was created. The sum of influence of the planes of façades, roofing and architectural detail.			
	Other elements that create the form	Small architecture, benches, walkways, home gardens, outdoor signs and inscriptions associated with specific architectural objects, functionally and formally dependent on the nature, rank and creation period of the object.			
	Functional differentiation	Legible in the architectural forms, the functional orientation determining the nature of the Settlement as an industrial-residential-representative organism.			
	Spatial layout of residential buildings	Sequences of repetitive or individualized projections of objects whose complexity, size and form are associated closely with their function and location within the complex. These solutions translate directly to the character of the interiors, their comfort, civilizational sophistication and aesthetics.			
	Representative interiors equipment	Like the detail of the façades, the interior decoration distinguished individual buildings, depending on their function. An important factor in the hierarchy of development.			
Internal architectural form and equipment	Industrial interior equipment	Integrally connected with the function, elements of spatial layout, equipment, relations with communication routes or water courses, resulting from the technological needs of the linen industry.	Authenticity resulting from the substance's persistence, especially in public utility, religious and representative buildings. More vulnerable to degradation in residential (low quality of historical solutions) and industrial complexes (susceptibility to change along with technological and functional changes). In the scale of the Settlement understood as an urban and landscape complex – lower importance than of the external elements, but for the documentary value, just as important.	Integrity of the architecture and equipment preserved in part, especially in the more monumental and public projects. A factor difficult to comprehensively cover with surveillance and monitoring. Out of necessity requiring treatment in terms of representative typological examples as determinants of integrity of the complex.	

FUNCTIONAL SCALE	INTERNAL ARCHITECTURAL FORM AND EQUIPMENT	MOVABLE HISTORIC MONUMENTS	Function			
ARCHITECTURAL SCALE		Not structurally related to individual buildings movable works of art (equipment of the temples), inventories of movable property (residences, representative structures), residential interior equipment of the era, reflecting the nature and date of creation of the object.	Leading function. The development of the linen industry was the essence and grounds for the development of the Settlement. Any investment activities, including pro-social or representative activities, were subordinated to it.	Endangered authenticity. Breaking the tradition of production of the Settlement, is replaced, with difficulty, with incidental attempts to souvenir-oriented or artistic production. At the same time, the state of preservation of substances referred to above gives the ability to intellectually reconstruct the production cycle and confirms authenticity of the complex in the context of the substance and document of the era.	Integrity is created by the development of the complex, the maintained division of functional bands in the scale of the city and the historical memory of production. The lack of technical equipment and continuity of functioning of the industrial complex causes deterioration of the integrity of the complex.	
			Complementary and secondary functions towards the industrial function, however paramount for preservation of the character of the Settlement. Continued.	Full authenticity in use and management of most objects. In the majority of cases, passive continuation, whose successful duration cannot be counted on without conscious support with due regard for the specificity of the substance.	Integrity results from the preservation of basic functions of the residential and public utility buildings, where residents and users maintain the specificity and identity of the place.	
			The result of economic transformations, shifting of focus from the industrial sphere to heritage protection, adaptation to new functions related to the use of the cubage or a conscious desire to maintain the technical performance of historic objects.	Interference with the authenticity of the Settlement is, however, in many cases inevitable, and what's more, necessary to preserve parts of authenticity of the historical substance. The area of compromise and value bidding. Assuming that the cultural heritage is also a pro-development resource of the Settlement, prone to conflict to a small degree.	An element of building a „new identity” of the place. Benefiting from integrity and values. It should collaborate in the protection of the historical integrity of the complex.	
			Contemporary functions			

3.2. Formulation of preliminary restoration guidelines for the protection of the asset

RECOMMENDATIONS ABOUT THE WAY OF HANDLING THE OBJECT:

Values that should determine the actions related to the historic complex of the Factory Settlement in Żyrardów:

1. Historical – documentary values
2. Historical and functional values
3. Urban and architectural, and landscape values

The supreme value – Completeness, transparency and homogeneity of the urban complex, complementary character and interdependence of the industrial, residential and public utility elements. The Factory Settlement as a holistic testimony of important economic, social and civilization processes, essential for characterizing the 19th century and shaping development trends in the 20th century.

The attributes that should be preserved in order to maintain the values of the complex:

In relation to the separated and characterized attributes and their components, these are primarily:

- The spatial and landscape composition, maintenance the borders, layout and interconnections of the urban complex in an unchanged state;
- The external form – preservation of untransformed bodies, divisions and articulation of façades, architectural decoration, variation and repetition of specific solutions;
- The external form – due to the urban and landscape scale of the complex, interiors are of diversified significance. Absolute preservation is necessary in the representative interiors and the still existing industrial interiors. Maintenance of the residential interiors should be subordinated to maintaining the external character of the buildings.
- The function – a supreme preservation postulate is maintaining the legibility of the functional stratification of the Settlement complex and highlighting the leading role of the production function in shaping the historical character of the complex. To do this, we must maintain the preserved residential and public utility functions, keep trying to reactivate the textile operations and commemorate the historical character of the production complex.

The contemporary functions of individual objects, to the maximum possible extent, preserve the legibility of the historical functions of the transformed buildings and complexes.

The scope of allowed interference and transformations

- Creative adaptations of the industrial buildings subordinated to the directive of preservation of the substance and legibility of the historical function.
- Conservative adaptations of residential interiors while preserving the external forms of the buildings, preservation of the repeatability of the typical elements of equipment and details of the façades (e.g. woodwork).
- Re-composition and reconstruction of the composed greenery documented in the historical materials (iconography, cartography, descriptions).
- Creation of the presence of historical water courses and water bodies in modern arrangements of public spaces (preservation in the modern urban infrastructure of the contact of the city with the river and water bodies).
- Conservative and aesthetic preservation of interiors of public utility, worship and representative buildings.
- Technical and functional modernization of communication routes, taking into account their role in the landscape composition of the complex;
- Creation of functional and composition connections with the immediate surroundings of the Settlement, raising the quality of solutions in the “buffer zone”.

Recommendations on how to carry out preservation works

- Within the limits of protection, the law on protection of historic monuments and sites and pragmatics and high implementation standards must be strictly observed.
- It is necessary to precede, in each case, preservation and repair works with tests adequate to the scale of the potential interference or transformations. This should, on a basic level, concern at least documenting the state from before the works are commenced. In more complex projects, any activities should be preceded by making a list of historic elements with regard to the system of attributes of the asset's values.
- Looking more closely into archive inquiries and historical research is recommended for individual objects and architectural complexes, to confirm the degree of preservation of the historical substance.
- It is justified to perform an inventory of the composed greenery and the historical stand as the initial stage for the formulation of policies for the management of greenery and recomposing the lost green areas, including the reference proposals for small home gardens plans.

Recommendations on how to use the asset

- preservation activities and protection policy should correlate to the needs of the residents as the recipients of those activities. It is recommended to attempt to create the historical centre as a part of the city that is convenient to live in and to maintain the public utility functions that are important for the local community to preserve continuity and the character of *genius loci*, and not to create a tourism product for visitors.
- Pro-tourism activities should be supplementary, related to searching for new spheres of business activity for the local community.
- Decisions should be made taking into account the broadest spatial context and analysis of the effects in the scale of the entire historic complex.

Directional regulation:

- The issue of preservation, as well as spatial planning or functional adaptations of elements of the Settlement should be considered comprehensively, in the scale of the entire complex, or at least of specific urban and landscape interiors, since the supreme, protected value is the historical complex, subject to industrial tradition and contemporary use in new economic conditions.
- It is recommended to verify and expand the borders of protection of the – expressed and important for integrity of the place – values (e.g. the multiculturalism represented by the old Evangelical church and its surroundings).

3.3 Conclusions arising from the evaluation of the asset using the SMART Value method

Reflections on the evaluation have accompanied the protection of historic monuments and sites for a long time. They are basic considerations. It can be said that, in general, the phenomenon of protection of historic monuments derives from noticing and formulation of the values of the subject matter of protection. Alois Riegl contained those considerations in a system formula, his numerous continuators perfected that system. The issue of values had, from the start, essential meaning for answering the question of “what to protect?” – it was used to define the concept of a historic monument, and of “why protect?” – it also justified any restrictions and orders related to the protection of the common value. The SMART Value method grows out of that traditional area of analyses of historic monuments, but has progressed one step further. The essence of the method is the answer to the question: “how to protect?”. Evaluation is used to recognize the internal structure of the historic monument, indicate what is important in it in order to articulate protective directives. The example of analysis of Żyrardów’s historic values presents the specifics of the method. In accordance with the assumptions of the SMART Value method, evaluation of the Factory Settlement Complex in Żyrardów was carried out in two stages (levels of analysis). In the first stage, recognition and description of features of the asset, which make it interesting and are significant for determination of the reference group (comparative group), were carried out. Conclusions from the first stage allow to form an answer to the question “why protect?” because they present the asset in a comparative context, which allows to notice its originality. Based on this part of the study, it is possible to indicate the place of the historic monument in rela-

tion to other places of this type in Poland, Europe and in the world. What’s more, by indicating the attributes of the values, a possibility emerges to verify the findings in relation to other assets in terms of comparability of particular types of historic monuments and sites. At the same time, the conclusions lead to the separation of the attributes, i.e. the physical media of the values in the structure of the asset. It leads to answer to the question “how to protect?” because it connects the issues of values and material form of the asset.

In the context of creating protection strategies, crucial is second stage of the evaluation. At this stage of the evaluation of the Factory Settlement Complex in Żyrardów, the tangible and intangible attributes of the asset and their elements have been defined, described and assessed (in terms of preservation of their authenticity and integrity). This step of evaluation no longer refers to external contexts. It focuses on the structure of the asset and its analysis. In accordance with the principles of the SMART Value method, specifying the attributes of the values aims to determine these elements of the monument, which are key (indispensable) to maintain its overall value. The conclusions of this stage may be used for both building all kinds of plans and strategies for protection, and addressing the immediate dilemmas, making specific preservation decisions. The system of attributes of the asset and their description allow to notice structural protection dependencies in the subject matter of the protection itself and, thanks to hierarchy, give grounds for rationalization of choices and decisions. Evaluation using the SMART Value method, due to the extensive range of analyses, should first and foremost relate to historic complexes

with complex structure and those that are preliminarily identified as particularly valuable. Evaluative analysis allows to prove and document that theory or challenge it. In the case of Żyrardów evaluation confirmed that the asset is unique on a national scale, and relevant on the European and global scale. At the same time, the analysis allowed to clearly articulate, what that uniqueness consist of, on what tangible and intangible premises (attributes of the asset) it is based. The process of evaluation of the factory settlement complex in Żyrardów showed extraordinary values of the asset, which confirm and visually support the validity of its recognition is a Polish listed monument. Indication of the reference criteria and the comparative group in the supra-regional – European and global – context, is the basis for considerations of applying for the entry into the UNESCO World Heritage List. The carried-out analysis of the values allows to look more closely and more objectively into further comparisons, and to recognize the categories of potential partners. An additional advantage of the evaluation with the SMART Value method is identification of less recognized areas or those that require deeper analyses. Conclusions of the study, next to preservation guidelines, also apply to the needs of detailed tests needed to optimize the recognition of the asset and its values. In the case of use of the evaluation results, especially from the second stage (Level 2) to create protection strategies and management plans, we can obtain an indication of the types and areas of risks for the asset's values, which allows the formulation of conclusions and recommen-

dations for implementation of the management plan. Determination of the physical media (attributes) of the values is also a very convenient step in considerations about how to monitor the asset and its condition, as it indicates in what areas the monitoring indicators should be present.

In conclusion, it can be stated that the SMART Value analysis method allows to select factors that can be interpreted and assessed, which together form an objectified image of the values of the asset. Traditional evaluation systems presented an overall picture of the values of an asset, leading to conclusions historical, artistic and scientific values and giving an overall protection directive, i.e. answers to the questions "what and why to protect". The SMART Value method, thanks to referring to the values' attributes that express the asset's character, allows to document the conclusions on the location of a given asset in the hierarchy of historic monuments and sites in any geographical horizon and in a particular typological context (Level 1) and constitutes a basis for creation of an asset management system (Level 2), i.e. leads to the answer to the question "how to protect?", which in contemporary preservation practice is an essential issue. Therefore, the SMART Value method is a step toward the creation of a precise and, what's important, also objective to a large extent, asset management system in order to exercise effective protection of the same, what in the case of Żyrardów is expressed in the study of the management plan for the Polish listed monument.

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Fig. 80 Reduta. The painting decoration in the former ballroom. Photo by A. Siwek

ISBN 978-83-7947-290-1