

## REVIEW

Of the doctoral thesis by M.Sc. Eng. Arch. Magdalena Wałek  
titled: *Cultural landscape of the jurassic belt of defensive architecture – a digital model of representation in the process of heritage conservation and popularisation*

### Basis of the study

- Resolution of the Council of the Scientific Discipline, Architecture and Urban Planning of the Faculty of Architecture of the Silesian University of Technology dated November 20, 2023.
- Doctoral thesis by M.Sc. Eng. Arch. Magdalena Wałek titled: *Cultural landscape of the jurassic belt of defensive architecture - a digital model of representation in the process of heritage conservation and popularisation*, supervisor: prof. Magdalena Żmudzińska-Nowak, (Faculty of Architecture of the Silesian University of Technology), prof. Assunta Pelliccio (University of Cassino and Southern Lazio).

## DOCTORAL THESIS EVALUATION

### 1. Thesis description

Doctoral thesis by M.Sc. Eng. Arch. Magdalena Wałek titled: *Cultural landscape of the jurassic belt of defensive architecture - a digital model of representation in the process of heritage conservation and popularization* has 480 pages, 209 illustrations and 669 footnotes. It consists of six numbered chapters, a list of abbreviations, a bibliography, an index of illustrations and an index of tables. A separate section is a catalog of structures.

In the first chapter of 6 pages, the author discussed the rationale for taking up the topic, the objectives of the work, the thesis and research questions, the structure of the work and the research methods. The second chapter – 38 pages – became a presentation of the state of the research. The third chapter, 41 pages long, included a description of general issues related to defensive construction and forms of its conservation protection. The fourth chapter, extensive as it was 142 pages, was devoted by the doctoral student to the analysis of a selected group of castles. She discussed the following features: historical development, location, state of preservation. On this basis, she made a valorization of the buildings. In the final part of the work, there was the fifth chapter, of 52 pages, in which the author presented a method of digital documentation of castles, which she developed. The sixth chapter, of 8 pages, contained a summary and final conclusions.

The thesis was supplemented by three annexes. The first appendix included a catalog of 20 sites, while the second appendix included a list of technical parameters for flights over 11 castles. The third appendix contained a glossary of terms



## 2. Assessment of the title, subject matter and territorial scope of the thesis

The title of the doctoral thesis by M.Sc. Eng. Arch. Magdalena Wałek *Cultural landscape of the jurassic belt of defensive architecture - a digital model of representation in the process of heritage conservation and popularization*, which I interpret as: cultural landscape of the belt of defensive architecture in the Polish Jurassic Highland – a digital model as a presentation of the cultural heritage in the conservation and popularization process.

The temporal scope of the study is clearly formulated – it covers the period from the 13th century to the present. However, it is not clear from the text of the work what the subject scope is. The discrepancies in the given names and numbers of the analyzed objects are considerable. On p.7 we read that the study will cover castles of the Trail of the Eagles' Nests and the Eagles' Nests Landscape Park. Most of the studies to date include 12 sites in this route, others additionally include 5 including the Wawel Castle. M.Wałek's catalog lists 20 defensive complexes (without the Wawel Castle) and an additional 9 in the text. Information on the number of analyzed buildings is also provided by the map from p.7, repeated on p.123 with 30 objects are marked on it.

In defining the territorial scope, the author used a geographical criterion – the sites discussed are in the Kraków-Częstochowa Upland. The title does not include the full name of the territory, but only the term "Jurassic". This word, however, does not clearly define the Polish territory. The first association is the geological name of the second period of the Mesozoic era – Jura. The second association is the Jura mountains on the French-Swiss border, located northwest of the Alps. From the name of these mountains comes the aforementioned geological designation. The term *jurassic belt of defensive architecture*, can therefore mean castles on the French-Swiss borderland, e.g.: Büren an der Aare, Le Landeron, Neu-Falkenstein Castle, Château du Landskron etc.

In my opinion, it would have been better if the title of the dissertation had included the term used in the literature of the subject i.e. *the Polish Jurassic Highland*. Thus, the title could read as follows: *Cultural landscape of the belt of defensive architecture in the Polish Jurassic Highland – a digital model as a presentation of the cultural heritage in the conservation and popularization process*.

## 3. Assessment of research methods and techniques

I give a positive assessment of the research method used by the dissertation author, which is based on field research. Photographs were taken from ground level and with the help of a drone. These were used to document the current state of the sites and develop photogrammetric models. During some local visits, interviews were conducted with tourists, facility managers and nearby residents.

Equally positive is the desk research, which involved the use of various techniques. In addition to her own photographs, the dissertation author used LIDAR airborne laser scanning data available at [www.geoportal.gov.pl](http://www.geoportal.gov.pl). On this basis, she developed point clouds and created 3D models of selected objects.

In addition to the digital method, M.Wałek also used the classic historical research method. It consisted of discussion of sources, iconographic, cartographic, technical and project documentation, as well as analysis of the online photographic database.

## 4. Assessment of knowledge of the subject literature

The study of the state of research of individual sites, contained in the dissertation under review, can be evaluated positively. On the other hand, the dissertation is characterized by little knowledge of the Polish literature on the subject with regard to research methods and recent research on castles.



The history of Polish research projects using digital aerial photography and scanning dates back to the beginning of the 21st century and is developing dynamically<sup>1</sup>. The current interest of researchers in these methods can be evidenced by the series of ArchReSci (Architecture-Research-Science) conferences organized at the Faculty of Architecture of Wrocław University of Technology. It is intended to reflect on new methods and techniques of research (<http://archresci.pwr.edu.pl>).

A Polish paper from 2013 may be helpful in your search for publications on digital research. It discussed non-invasive methods in cultural heritage research and documentation. It included a list of literature, mostly Polish, with about 500 bibliographic addresses<sup>2</sup>.

Aerial photos and scans are also kept in Polish digital state registers. These include, among others: State Register of Geographical Names (PRNG), Database of Topographic Objects (BDOT500), Database of Topographic Objects (BDOT10k), database of aerial and satellite imagery, ortofotomap and digital terrain model (NMT i NMPT), database of general geographic objects (BDOO), EuroGlobal Map and EuroBoundaryMap, State register of borders and areas of territorial division (PRG) etc.

Polish universities dealing with photogrammetry, cartography, remote sensing, etc. include the AGH University of Science and Technology in Kraków, the Warsaw and Wrocław Universities of Technology and the University of Warsaw, Poznań and Wrocław, etc. At present, almost all Polish universities have people working on the latest digital methods.

In recent years, a number of academic labs and private companies have also sprung up for 3D scanning and modeling. One of the first was LabScan3D, which was established in 2008 at the Faculty of Architecture at Wrocław University of Technology. In addition to developing Polish sites, the team has scanned and studied the upper terrace of the Temple of Hatshepsut in Deir-el-Bahari<sup>3</sup> and the site of El Fuerte de Samajpata in Bolivia, a UNESCO World Heritage Site<sup>4</sup>.

Digital research methods were also presented in the *Dziedzictwo architektoniczne* series, published since 2017 by the Faculty of Architecture at Wrocław University of Science and Technology and available at the Lower Silesian Digital Library<sup>5</sup>. The Royal Castle Museum in Warsaw presented latest research (also digital) on castles in Poland in the *Colloquia Castrensia* series in 2017, 2019 and 2023<sup>6</sup>.

The 2019 issue of the Polish "Architectus" journal<sup>7</sup>, devoted to the topic of Silesian castles, included an article by Maria Legut-Pintal. This researcher in 2014 defended her PhD

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<sup>1</sup> The most well-known Polish scientific journals in this field are: the annual "Archiwum Fotogrametrii, Kartografii i Teledetekcji", published since 1994 and the "Rocznik Geomatyki" quarterly, the first issue of which was published in 2003.

<sup>2</sup> Rafał Zapłata, *Nieinwazyjne metody w badaniu i dokumentacji dziedzictwa kulturowego – aspekty skanowania laserowego w badaniach archeologicznych i architektonicznych*, Warsaw 2013.

<sup>3</sup> Kościuk Jacek, *Skanowanie górnego tarasu świątyni Hatshepsut w Deir-el-Bahari*, „Rapid Prototyping & Reverse Engineering”, Report, pp.21-24.

<sup>4</sup> An issue of the Polish scientific journal, published in English, "Architectus" 2(62)2020 was devoted to the measurements and studies of the El Fuerte de Samajpata site ([architectus.pwr.edu.pl/issues/62/](http://architectus.pwr.edu.pl/issues/62/)).

<sup>5</sup> Series: *Dziedzictwo architektoniczne*, ed. E. Łużyniecka, Wrocław. Volumes: *Badania podstawowe i ich dokumentowanie*, 2018, (<https://dbc.wroc.pl/dlibra/publication/86545/edition/53430>), *Badania oraz adaptacje budowli sakralnych i obronnych*, 2019.

<sup>6</sup> Series: *Colloquia Castrensia*, ed. A.Bocheńska, P.Mrozowski, Vol. I *Początki murowanych zamków w Polsce do połowy XIV wieku*, 2017, Vol. II *Wielkie murowanie. Zamki w Polsce za Kazimierza Wielkiego*, 2019, Vol. III, *Zamki w Polsce u progu nowych czasów. Transformacje i fundacje w XV w.*, 2023.

<sup>7</sup> "Architectus" 1(57)2019 ([architectus.pwr.edu.pl/issues/57/](http://architectus.pwr.edu.pl/issues/57/))



thesis at the Faculty of Architecture of the Wrocław University of Science and Technology, titled: *Zamki księstwa Nyskiego na tle przemian krajobrazu kulturowego w średniowieczu*. The work was published in print in 2017<sup>8</sup>. M. Legut-Pintal made inventories of castles based on airborne laser scanning (LIDAR, Airborne Laser Scanning) data made available by the Central Center for Geodetic and Cartographic Documentation. The data were obtained as part of the implementation of the ISOK – Computerized System for the Protection of the Country against Extraordinary Hazards. project. Thus, thematically and methodologically, M. Legut-Pintal's dissertation was very similar to Magdalena Wałek's reviewed doctoral thesis.

Similar digital methods are also used in the *Katalog zamków i dworów obronnych Śląska* (Catalogue of Silesian castles and defensive mansions), which is being developed under the direction of Prof. Małgorzata Chorowska of the Faculty of Architecture at Wrocław University of Science and Technology. The catalog has been available since 2021 (<https://zamki.pwr.edu.pl>) and is successively supplemented. Scans, photogrammetries, chronological stratifications and attempts to date selected objects and their digital reconstructions are posted. The catalog currently counts 240 objects, with the whole thing expected to be ready in 2025.

### **5. Assessment of the thesis' structure**

The structure of the dissertation of M.Sc. Eng. Arch. M. Wałek is clear. Two main parts of the dissertation have been separated: the analytical and conclusion part and the catalog part. In the first part, a consistently applied problem system is evident. Correctly applied is the system of footnotes, which do not dominate the basic text.

On the other hand, the catalog is illegibly developed. The localities should be presented in alphabetical order.

### **6. Editorial assesment**

The editorial work of M.Sc. Eng. Arch. M. Wałek is characterized by an appropriate typological arrangement. Among the strengths of the editing of the dissertation can be counted the editing of the bibliography, which was compiled correctly and refers to the patterns used in this type of studies. The chapters with illustrations were also skillfully edited. They are characterized by consistency and balance in the similar treatment of individual problems. The principle adopted in the catalog, in which each castle is developed according to a similar pattern, is also correct.

### **7. Assessment of terminology**

The dissertation of M.Sc. Eng. Arch. M. Wałek is written in simple language, the terms are well defined, and the argument is clear. The terms in the dissertation come from scientific readings, from general studies to works on the history of architecture, etc. The author also demonstrates proficiency with regard to the use of terms related to the methodology used.

### **8. Assessment of the graphic material**

The graphic material of the entire dissertation can be evaluated positively. It is logically selected and diverse. It complements the text and in places is a separate, equal narrative form. Particularly noteworthy are the author's photographs taken from a drone and the 3D models developed by the author.

### **9. Substantive assessment**

The dissertation is an original work, corresponding to the direction of the dissertation author's scientific interests. As in most studies of this type, the initial introductory chapters of

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<sup>8</sup> Maria Legut-Pintal, *Zamki księstwa nyskiego na tle przemian krajobrazu kulturowego w średniowieczu*, Wrocławskie Wydawnictwo Oświatowe, Wrocław 2017.



the work were mainly based on previous studies. A much greater contribution of the author can be noted in the main chapters, concerning the architecture of castles of the Polish Jurassic Highland.

#### **10. Assessment of topicality and practical potential**

The information presented in the dissertation was known to varying degrees in the existing literature. The author of the dissertation collected them in a readable way, added the results of her own digital research. Thus, she created a study that is up-to-date, interesting and broadens the knowledge of the architect's research methods.

The dissertation can also be treated not only in terms of scientific knowledge, but also as a transfer of practical knowledge – the solutions included in the work can be an inspiration in the development of conservation work.

The dissertation also has significant pragmatic potential for formal applications – it provides a systematic approach and method of analysis that enable informed design decisions when designing new forms that refer to defensive buildings.

#### **11. Assessment of originality**

The dissertation is an original work, based mostly on own research. Both field and cabinet work were done independently. Most of the illustrations were developed directly by the author. Archival figures and photographs by other authors were taken mainly from the Internet.

#### **12. Assessment of educational value**

The social value of the dissertation related to the popularization aspect also deserves a positive evaluation. Significant parts of the dissertation can be easily digested by a non-professional audience and have a chance to reach the consciousness of wide social groups. The dissertation can also be used in the publication of tourist guides and information books; the illustrations contained in the dissertation can complement, for example, thematic exhibitions in museums, etc.

## **CONCLUSION**

The doctoral dissertation of M.Sc. Eng. Arch. Magdalena Wałek is a reflection of her interests and evidence of the benefits of reaching for new techniques in contemporary architectural research. Personal predisposition has made the doctoral student a researcher of great sensitivity. In the future, she can consistently expand her knowledge not only of Polish defensive architecture, but also of research techniques. And there are more challenges ahead for architecture researchers like artificial intelligence and virtual reality.

Having analyzed the individual features of the dissertation of M.Sc. Eng. Arch. Magdalena Wałek, I positively assesses its substantive level. I also hope that in the future the doctoral student will begin her work with a thorough study of the state of research. Only such a course of action allows the researcher to make a reasonably objective assessment of her own contribution to the expansion of knowledge on the topic under development.

To summarize my review, I conclude that the thesis by M.Sc. Eng. Arch. Magdalena Wałek titled: *Cultural landscape of the jurassic belt of defensive architecture - a digital model of representation in the process of heritage conservation and popularization* **meets the requirements for doctoral dissertations and I therefore request that it be admitted to the further procedural stages.**

