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**DIGITAL NUMISMATICS OF ANCIENT ROME:
THE CURRENT STATE AND PROSPECTS
FOR THE DEVELOPMENT OF ONLINE DATABASES**

ABSTRACT The article is devoted to the study of the latest research methods of archaeological coin finds from the era of Ancient Rome. The paper reviews the online databases of large-scale projects that were created over the past few years with the assistance of the American Numismatic Association and are devoted to the study of coins and coin-hoards of the Roman Empire.

The main goal of the research was to create a general overview and description of the information content of open databases, which can allow a digital analysis of Roman numismatics. The conducted review helps to determine the prospects for the use of digital tools in numismatic research and contributes to the deepening of knowledge about the cultural heritage of the Roman Empire.

A content analysis of information resources was carried out, aimed at an objective description of the textual, graphic and multimedia content of the material that contains the resource using the same methods and approaches that are similar to the analysis of textual and graphic materials.

Key words: digital numismatics, numismatic databases, ancient numismatics, numismatics of the Roman Empire

ABSTRAKT Artykuł poświęcony jest najnowszej metodyce badań archeologicznych znalezisk monet z epoki starożytnego Rzymu. W artykule dokonano przeglądu internetowych baz danych dużych projektów, które powstały na przestrzeni ostatnich kilku lat przy wsparciu Amerykańskiego Stowarzyszenia Numizmatycznego i są poświęcone badaniu monet i skarbów monet Cesarstwa Rzymskiego.

Głównym celem badań było stworzenie ogólnego przeglądu i opisu zawartości otwartych baz danych, co umożliwi cyfrową analizę numizmatyki rzymskiej. Przeprowadzony przegląd pozwala określić perspektywy wykorzystania narzędzi cyfrowych w badaniach numizmatycznych i przyczynia się do pogłębienia wiedzy o dziedzictwie kulturowym Cesarstwa Rzymskiego.

Przeprowadzono analizę zasobów informacyjnych, mającą na celu obiektywny opis zawartości tekstowej, graficznej i multimedialnej materiału, przy użyciu tych samych metod, które są wykorzystywane do analizy materiałów tekstowych i graficznych.

Formulation of the problem

Since the end of the second half of the 20th century, with the appearance of the first computers and the Internet, informatization and digital transformations began their development and today have become an integral part of our way forward.

After information became available to the masses and the boundaries of communication were expanded, digital technologies changed our daily existence and quickly entered various areas of our lives: personal, cultural, economic, educational and professional.

It had a special impact on the development of all branches of science. This influence opened

up opportunities for us to modernize scientific research, develop new directions, expand boundaries and constantly introduce innovations into all research processes. And the humanities, in this sense, were not left out.

They gained access to data and information that facilitates global collaboration and knowledge sharing among scientists, as well as the ability to implement modern digital methodologies and tools for processing and analyzing large volumes of textual and visual information used in scientific research.

During this period, a number of electronic resources, electronic versions of books, scientific articles, document archives, information resources

and online databases were created and continuously increased.

The use of the latter can greatly facilitate the conduct of research in various fields, providing researchers with the opportunity to quickly access large volumes of relevant information that can be used for analysis and obtaining new knowledge, which has become a rather important step and achievement in conducting research. Also, such powerful search tools, automatic processing and filtering of a large amount of data, and the possibility of sharing them, creating joint research using common resources.

All this contributed to the birth of digital humanitarian disciplines, such as, for example, “Digital Humanities”, which became a field of research that was able to combine information technologies and the humanities¹ in order to preserve the cultural heritage of humanity. The scope of its research includes the use of digitized and digital materials, computer programs, machine methods of information analysis and structuring, the application of the concept of Open research data and work with Big Data, combining all this with the methodologies of humanities, which include history, archaeology and numismatics.

Presenting main material

Over the past two decades, a vast number of digital numismatic projects and information resources have been created. Their existence made a significant contribution to the conduct of many historical, archaeological and numismatic studies, which provided an opportunity to transfer these sciences and their fields to another level.

The European Coin Find Network (ECFN),² FLAME Project,³ The Portable Antiquities Scheme,⁴ ERC Silver,⁵ Pondera Online⁶ and Nomisma.org,⁷ which is in the works of many researchers of numismatic science, such as Mark Pyzhik,⁸ Charles Doyen,⁹ Richard Gurney,¹⁰

Kyrylo Myzgin,¹¹ Viktor Kotsur, Svitlana Orlyk and Oleksandr Bondarenko,¹² Olena Shvets¹³ and others.

It is to the databases dedicated to the study of Roman coins, created with the assistance of the Numisma.org project, that special attention is given in this article. Nomisma.org is a project of the American Numismatic Society (ANS)¹⁴ founded in 2010. Aimed at “providing a stable identity for numismatic concepts or a *common platform for digital numismatics*”, it became one of the largest projects to digitize numismatic data from the ancient period and was listed among the six Linked Datasets with the highest number of requests per day.¹⁵

Everyone who is at least a little tangential to historical research knows very well how great and significant a legacy the ancient period of history (from 800 BC to 600 AD) has left for world civilization. Greek and Roman numismatics are the oldest and most extensive groups in numismatics. The information associated with the coins of the period from the emergence of the first ancient Greek states to the fall of the Western Roman Empire and the conquest of Rome by barbarian tribes is of great importance for the study and understanding of the circulation and use of coins, as well as the economy as a whole.

In the article by K. Myzgin which is devoted to a review of the resource “RGCBOnline: Roman Gold Coins from Barbaricum”¹⁶ (its development was carried out with the assistance of M. Wilkiwski, an employee of the Laboratory of Digital Humanities of the University of Warsaw) has already noted that Roman numismatics today occupies a leading position in the creation of dozens of websites dedicated to Roman coins of various periods, online catalogs of Roman coins, online databases of collections and auction houses, digitized collections of world’s museums, as well as databases of coin finds, also mentioning the significant contribution of Numisma.org, and its subsidiary projects in the study of this field. Their list was also presented in the joint article of Kotsur V., Orlyk S. and Bondarenko O. “Digitization” and “digitalization” in numismatics: theoretical, methodological and source studies aspects.¹⁷

¹ Yaroshenko 2023: 169-170.

² The official page of the ECFN project.

³ The official page of the FLAME project.

⁴ The official page of the The Portable Antiquities Scheme project.

⁵ The official page of the ERC Silver project.

⁶ The official page of the Pondera Online project.

⁷ The official page of the Nomisma.org project.

⁸ Pyzyk 2021: 197-210; 2023: 277-278.

⁹ Doyen 2018.

¹⁰ Henry 2020: 36-55.

¹¹ Myzgin 2018: 38-42.

¹² Kotsur, Orlyk, & Bondarenko 2023: 258-276.

¹³ Shvets 2023a: 137-154; Shvets 2023b: 288-306.

¹⁴ Official page of ANS.

¹⁵ Kotsur, Orlyk, & Bondarenko 2023: 262.

¹⁶ Myzgin 2018: 39, 41.

¹⁷ Kotsur, Orlyk, & Bondarenko 2023: 262.

The problems of finding reliable historical information on the Internet, which would be useful in conducting scientific research, still exist and remain quite tangible.¹⁸ The reasons for these problems include the peculiarities of ranking information based on search queries, the correct construction of SEO strategies of the resource, as well as the possibility of translating content and description into several languages, because in the countries of Eastern Europe the language barrier still remains one of the key problems among researchers.

A general or in-depth review of any information resource is actually a content analysis of the textual, graphic, and multimedia content that the resource contains. This is done in order to understand the purpose and usefulness of the resource, its characteristics, periodicity, localization and highlighting the main trends in comparison with other resources.

That is why conducting and forming a general overview of already existing resources and databases, with high-quality content and an extensive amount of information about ancient objects of numismatic research, remains relevant, and here we will review the following 5 projects about Roman coins:

1. Online Coins of the Roman Empire (OCRE)
2. Coinage of the Roman Republic Online (CRRO)
3. Coin Hoards of the Roman Republic (CHRR)
4. Coin Hoards of the Roman Empire (CHRE)
5. Roman Provincial Coinage online (RPC)

The database of project Online Coins of the Roman Empire (OCRE) is quite revolutionary in its nature, a project containing fixations of all published types of Roman imperial coins from Augustus in 31 BC, until the death of Zeno in 491 AD, and its purpose is to assist in the identification, research and cataloging of coins minted in the Roman Empire.

Today, the database of the resource shows 41,703 registered and published objects. It provides the ability to filter and search by such characteristics as: date range, emperor, deity, denomination, issuer, production, material, mint, subject type, portrait, region, symbol depicted on the coin and its type number.

The description of the object specified in the database of the project contains a photograph of the object, information about the periodical, denomination and mint (with reference to the map), the assigned number of the object and the hoard, as

well as separate textual descriptions of the obverse and reverse of the coin.

OCRE is a joint project of the American Numismatic Society and New York University's Institute for the Study of the Ancient World. It is led by Dr. Andrew Meadows, Prof. Roger Bagnall and Dr. Gilles Bransbourg. Currently, the participants of the project are ANS, the Coin Cabinet of the Berlin State Museum, the Roman Germanic Commission of German Archaeological Institute and the Academia Romana.¹⁹

Coinage of the Roman Republic Online (CRRO) is a database of Coins of the Roman Republic, which aims to create an online version of the main typology for the identification of types of Roman Republican coins in the framework of the publication "Roman Republican Coinage" by Michael Crawford.²⁰

The database contains 1,747 objects with the same search and filtering capabilities as in ORCE, but with the addition of object state characteristics. The descriptions of these coins are based on the typology set out in the RRC but have been modified to conform to the standards of the British Museum's collection management system.

The project was created in collaboration with the ANS, the British Museum and the Coin Cabinet of the Berlin Museum and has more than 60 partners, which include the largest numismatic organizations and world universities.

As of November 2020, CRRO has been working on expanding the functionality of their database by integrating the matrix connections established by Richard Schaefer in The Roman Republican Die Project (RRDP).²¹ New examples from private collections and auction catalogs are becoming available, helping to increase coverage to approximately 300,000 Roman Republican coins.²²

The database of project Coin Hoards of the Roman Republic (CHRR) is dedicated to the treasury of the Roman republican government during the period 155 BC to 2 AD.

The database currently contains descriptions of 694 hoards and over 100,000 well-identified coins. The search and filtering of hoards is carried out according to the characteristics of the periodization of the hoard, place and its type, reference, as well as its standard content, to which the following filters are added, coin type, dynasty and state.

¹⁸ Zhdanovich 2006: 187-203.

¹⁹ The official page of the OCRE project.

²⁰ Crawford 1974.

²¹ The official page of the RRDP project.

²² The official page of the CRRO project.

Information about the hoard is provided about the topography on a map, a description of the type and number of coins, a link to the source, and a link to the objects of the treasure with photos and a general description of the coins of the treasure, information about their weight, axis, diameter, and quantitative analysis.

Coin Hoards of the Roman Republic is a joint project between Kris Lockyer of the Institute of Archaeology at University College London and the American Numismatic Society, which created its web version. Since As analyzes of different aspects of the hoards are still being completed, the database updates on a regular basis.²³ A thorough analysis of this database can be found in the work of Kris Lockyear “The Coin Hoards of the Roman Republic Database”.²⁴

The database of project Coin Hoards of the Roman Empire (CHRE) contains information on coin hoards that were found throughout the entire geographical area of the former Roman Empire.

The aim of the project is to provide a basis for a systematic study of hoarding across the empire and to facilitate the integration of numismatic data into wider studies of the Roman economy and to fill the gap in digital coverage of the coin hoards of the ancient Roman Empire between 30 BC and 400 AD.

The content of the database currently consists of 7,400 hoards and 2.5 million imperial, iron age and Roman provincial coins in circulation during the period. The database contains detailed information on the contents, date and context of each hoard and a very advanced search engine for all the necessary characteristics of both the hoard and each individual coin, with accompanying images when available and accompanying analytical and cartographic tools.

The project was founded by Baron Lorne Thiessen is a collaboration of the Ashmolean Museum and the Oxford Roman Economy Project. It is managed by Prof. Christopher Howgego and Prof. Andrew Wilson.²⁵

The database of project Roman Provincial Coinage online (RPC), the content of which is devoted to coins that were minted in the provinces of the Roman Empire, as an integral part of the coins that were minted during the time of the Roman emperors. The purpose of this major research project is to implement a new concept of Roman coinage

and create a standard typology of provincial coinage of the Roman Empire. To meet the needs of numismatists and historians, epigraphists, archaeologists, and other researchers of the Roman Empire, the database includes an extensive general search engine, an interactive map, and a detailed standard description with a photograph of each listed provincial Roman coin.

This project represents the first systematic treatment of provincial coinage. It is currently managed by Jerome Mairat of the Ashmolean Museum of Oxford University, where its online resource is based.²⁶ Links to each database are listed in the article’s list of electronic resources.

All of these projects suit the American Numismatic Society’s initiatives to create a digital catalog of Greek Coin Hoards (IGCH) and Roman Republic Coin Hoards on the Internet and are made possible by the stable numismatic identifiers and associated open data methodologies created by the Nomisma.org project and the Numishare platform, which was developed by Ethan Gruber as a tool based on stable numismatic identifications established by the Nomisma.org project, which in 2014 was officially recognized as the best knowledge organization system for numismatics and became one of the leaders in the application of linked open data Linked Open Data (LOD).²⁷

The conclusions and perspectives of the research is that highlighting and popularizing such projects can help to increase knowledge and access to important open information about ancient Roman coin finds to a wider range of people, The American Numismatic Society made a huge contribution in this direction.

Digital numismatics opens up new possibilities and the perspective of using graphical and textual information from internet resources for scientific research in numismatics for a deeper understanding of the coin heritage.

The monitoring of Internet resources and the use of modern online databases, which allow for in-depth analysis of Roman coins, is an important process today, which, thanks to the digital format, takes numismatic research to a new level and opens up new horizons for scientists to study numismatic finds. That is why it is important to create methodological approaches to the collection and analysis of content containing numismatic Internet resources, and to emphasize the importance of further scientific research, due to the significant development

²³ The official page of the CHRR project.

²⁴ Lockyear 2016: 159-184.

²⁵ The official page of the CHRE project.

²⁶ Official page of RPC.

²⁷ Kotsur, Orlyk, & Bondarenko 2023: 262

of trends in the use of software, electronic resources and even neural networks in the conduct of numismatic research.

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Electronic resources

- ANS. URL: <https://numismatics.org/>
- CHRE. URL: <https://chre.ashmus.ox.ac.uk/>
- CHRR. URL: <https://numismatics.org/chrr/>
- CRRO. URL: <https://numismatics.org/crro/>
- ECFN. URL: <https://fundmuenzen.org/>
- ERC Silver. URL: <https://silver.knowledge.wiki/SILVER>
- FLAME Project. URL: <https://coinage.princeton.edu/>
- Nomisma.org. URL: <https://nomisma.org/>
- OCRE. URL: <https://numismatics.org/ocre/>
- Pondera Online. URL: <https://pondera.uclouvain.be/>
- RPC. URL: <https://rpc.ashmus.ox.ac.uk/>
- RRDP. URL: <https://numismatics.org/rrdp/>
- The Portable Antiquities Scheme. URL: <https://finds.org.uk/>

Links to databases

- Database ORCE. URL: <https://numismatics.org/ocre/results>
- Database CRRO. URL: <https://numismatics.org/crro/results>
- Database CHRR. URL: <https://numismatics.org/chrr/results>
- Database CHRE URL: <https://chre.ashmus.ox.ac.uk/search/#tabs-1>
- Database RPC. URL: https://rpc.ashmus.ox.ac.uk/search/browse?volume_id=3

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