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Contents

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Front cover photography: The image shows part of the cartouche of the map *Ducatus Carnioliae tabula chorographica* by Janez Dizma Florjančič from 1744. The personified Carniola is surrounded by the coats of arms of noble families and a mountainous landscape showing the entrance to a mine, a waterfall, a river gorge, and people on stilts (Geographical Museum GIAM ZRC SAZU).
Fotografija na naslovnici: Na sliki je predstavljen del kartuše zemljevida *Ducatus Carnioliae tabula chorographica* Janeza Dizme Florjančiča iz leta 1744. Personificirano Kranjsko obdajajo grbi plemiških rodbin in gorska pokrajina, kjer so upodobljeni vhod v rudnik, slap, rečna soteska in osebi na hoduljah (Zemljepisni muzej GIAM ZRC SAZU).

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CARTOGRAPHIC TIME TRAVEL: REFLECTING THE PAST, DEFINING THE PRESENT, AND CHALLENGING THE FUTURE USING OLD MAPS

Blaž Komac, Primož Gašperič

CHERRY BLOSSOM, SHUTTERSTOCK

Old maps are an important basis for how we perceive the modern world.

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Blaž Komac[1], Primož Gašperič[1]

Cartographic time travel: Reflecting the past, defining the present, and challenging the future using old maps

ABSTRACT: This introductory article of the special issue of *Acta geographica Slovenica* on old maps examines the importance of old maps as the foundation and culmination of geographical research. Maps, one of the earliest languages of communication, have guided exploration and become reference documents. Old maps reveal history, values, and contexts of geographical regions and geographical science. They serve as a special form of text, making possible communication across centuries. Old maps have inspired fantasy maps that depict fictional landscapes and create a cultural phenomenon. This special issue contains articles that analyze the cartographic elements of old maps, the semiotics of old maps, their use in education, and their historical significance, as well as an article on the first Slovenian atlas. Old maps challenge geographic knowledge and representation, and they are shaping the digital future.

KEY WORDS: geography, cartography, old maps, semiotics, education, Slovenia

Kartografsko potovanje skozi čas: odsevanje preteklosti, opredeljevanje sedanjosti in izzivanje prihodnosti z uporabo starih zemljevidov

POVZETEK: Uvodni članek v posebni številki revije *Acta geographica Slovenica* obravnava pomen starih zemljevidov kot temelj in vrhunec geografskih raziskav. Zemljevidi, ki so eden najzgodnejših komunikacijskih jezikov, so usmerjali raziskovanje in postali referenčni dokumenti. Stari zemljevidi razkrivajo zgodovino, vrednote in kontekste geografskih regij in geografske znanosti. Služijo kot posebna oblika besedila, ki omogoča komunikacijo skozi stoletja. Stari zemljevidi so navdihnili domišljijske zemljevide, ki prikazujejo izmišljene pokrajine in ustvarjajo kulturni fenomen. Ta številka vsebuje članke, ki analizirajo kartografske elemente in semiotiko starih zemljevidov, njihovo uporabo v izobraževanju in zgodovinski pomen ter članek o prvem slovenskem atlasu. Stari zemljevidi izzivajo geografsko znanje in predstave ter oblikujejo digitalno prihodnost.

KLJUČNE BESEDE: geografija, kartografija, stari zemljevidi, semiotika, izobraževanje, Slovenija

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1 Introduction

This special edition of volume 63 of *Acta geographica Slovenica* explores the importance of old maps, which are both the basis for and the result of geographical research. Maps are one of the oldest languages of communication (Harley and Woodward 1987) and have long been a prominent – and the initially preferred–written language of geography (Harley 1992). The International Cartographic Association (https://icaci.org/mission) defines a map as »a symbolized representation of geographical reality, representing selected features or characteristics, resulting from the creative effort of its author's execution of choices, and is designed for use when spatial relationships are of primary relevance«. Visualizing spatial phenomena at an appropriate scale allowed or facilitated people's exploration of uncharted territories. Immediately after their creation, they became a guidepost and later a reference document for future travelers and explorers. The first known maps were created in prehistoric times using simple methods and natural materials. With the improvement of technical methods, especially the invention of paper and printing, they became increasingly precise and technically sophisticated documents, and from the sixteenth century onward they offered two answers to the problem of interpreting the space-time continuum. *Kairos* refers to eternity; maps of the *mappa mundi* type thus show the position of man in the universe as it exists eternally. The other aspect, *chronos*, reflects the encounter with the mundane and thus the mutable, and it is anchored to the Earth by geographic coordinates. Modern cartography is based on the *chronos* approach, which has also allowed it to evolve continuously due to the constant flow of time (Dickason 2011).

Old maps do more than bring the world of the time into the present. Because they include several technical, contextual, and other levels, they offer something more. They are a »geographical more« (Mlekuž 2008) because they explain the history and the present of a place and time (Urbanc et al. 2006). The authors of the maps did more than transfer their knowledge of the landscape of the time into the graphic and textual (i.e., linguistic) content of the maps. By choosing or not choosing cartographic elements, they also conveyed the thinking and values of themselves and the social group they belonged to. Even empty space has meaning because »there is no such thing as empty space on a map« (Harley 1988b, 71). Because maps have a rather clear and also certain technical (Gašperič 2010; 2023), hierarchical, and symbolic structure (Gašperič and Babič 2023), which allows even »textually illiterates« to communicate across centuries, we classify them as (bookless, graphic) texts. They have an additional communicative value because, as historical documents, they »reveal the political and cultural picture of the eras in which they were created, the state of technological development, and the knowledge and ideas of the author« (Fridl and Urbanc 2006, 55). Old maps offer unique insights into history and human perceptions of the world, but they are not infallible records of the real past landscape. As with any historical source, critical analysis and cross-referencing with other evidence are crucial to gain a deeper understanding of the past.

2 The odyssey of old maps: From cartographic treasures to geographic insights

2.1 Old maps are defined by the past

The cartographic definition that maps are simply a representation of space and time is flawed. Even modern topographic maps are sometimes imaginative works because cartographers arbitrarily decide what to depict on a map, revealing psychological, educational, historical, and cultural backgrounds (Akerman and Karrow 2007). Rather, old maps reflect the dynamic relationship between the geography of the real world at the time of their creation and an imaginative geography (Gašperič and Komac 2020) that, like a mental image (Smrekar 2006), reflects the perception of the real world by patrons, cartographers, and map users in different historical periods.

Old maps serve as a two-dimensional window, revealing a four-dimensional perspective on the evolution of historical space–time perception. They help us understand how the world was understood and imagined or, to put it literally, visualized, in the past (Urbanc, Gašperič and Kozina 2015), when boundaries were simultaneously discovered and overcome through maps (Dorling and Fairbairn 1997; Cosgrove 1999).

Western cartography is a complex knowledge system with a half-millennium history as »a form of knowledge and a form of power« (Harley 1988a) that both created and interpreted an emerging social, economic, and political spatial structure that was initially imperial (Eurocentric or Northcentric), later national, and eventually global (Sutton 2015; Corujo Hernández 2019). The maps that are now »old« have helped constitute and sustain relationships between different worldviews over the centuries, which conceived of the world first locally and superficially, then increasingly broadly, and finally as a planet. Through them, readers were told where the political and economic centers of the world lay, and which language was the *lingua franca* of a map in addition to the cartographic one. It is well known that colonial maps did not include indigenous place names, and even Google Maps maintained cartographic silence (Quinn 2020) when it avoided showing favelas in the city of Rio de Janeiro (Novaes 2014). The choice of projection, selection, and limitation of the area shown on the map contributed (un)willingly to this. The choice of geographic names and the language of their notation is also critical to understanding maps and creating meanings, culminating in exonyms with the Springtime of Nations (Kladnik, Geršič and Perko 2020) and decolonial cartography in the modern era (McGurk and Caquard 2020).

The time and place of the creation of old maps influenced other map elements. In this special issue, we present a study that was used to identify and classify cartographic elements on old maps. In addition to today's standardized elements such as title and scale (Gašperič 2023), they also contain written or visual information about journeys, such as that of the Argonauts (Figure 1), who are said to have traveled through Slovenian territory along the Sava and Ljubljanica rivers, or include information about unknown, unexplored areas, such as the phrase »Here be dragons« with some information inadvertently or intentionally omitted. Thus we know of a label and inscriptions indicating the existence of an unknown southern continent, *Terra Incognita Australis*, which became a fantastic locale invoked in fantasy maps and literature, such as Gulliver's Travels. Some old maps, such as those by Mercator and Ortelius, entered the world of »modern fantasy maps« when they sparked the Tartary theory. This revolves around the idea that there was once a vast, powerful, and highly advanced civilization called *Tartaria* that supposedly existed in the region of present-day Russia, Central Asia, and parts of Europe (River 2022).

One article of the special issue is thus devoted to the emergence and development of the »language of cartographic symbols,« which has become a true graphic Esperanto not only because of its standardization, but especially because of its semiotic symbolic structure (Gašperič and Babič 2023) and its universality.

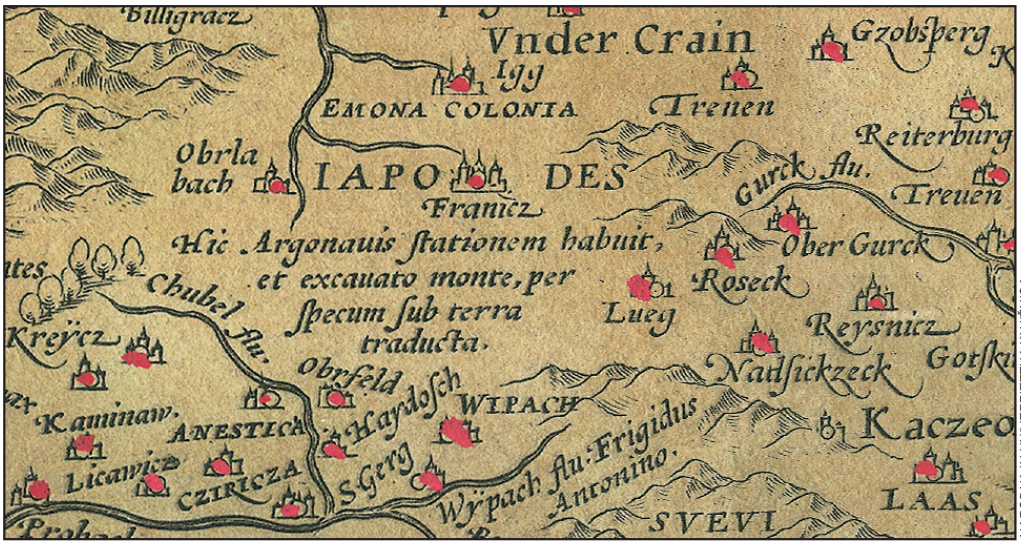

Figure 1: Part of Wolfgang Lazius's map from Ortelius's atlas of 1573 with a label about the Argonauts: *Hic Argonauis stationem habuit, et excauato monte, per specum sub terra traducta* (Here the ship *Argo* came to a halt, and, because the mountain had been hollowed out, was brought through a(n underground) cave; Shaw and Macqueen 1998, 381).

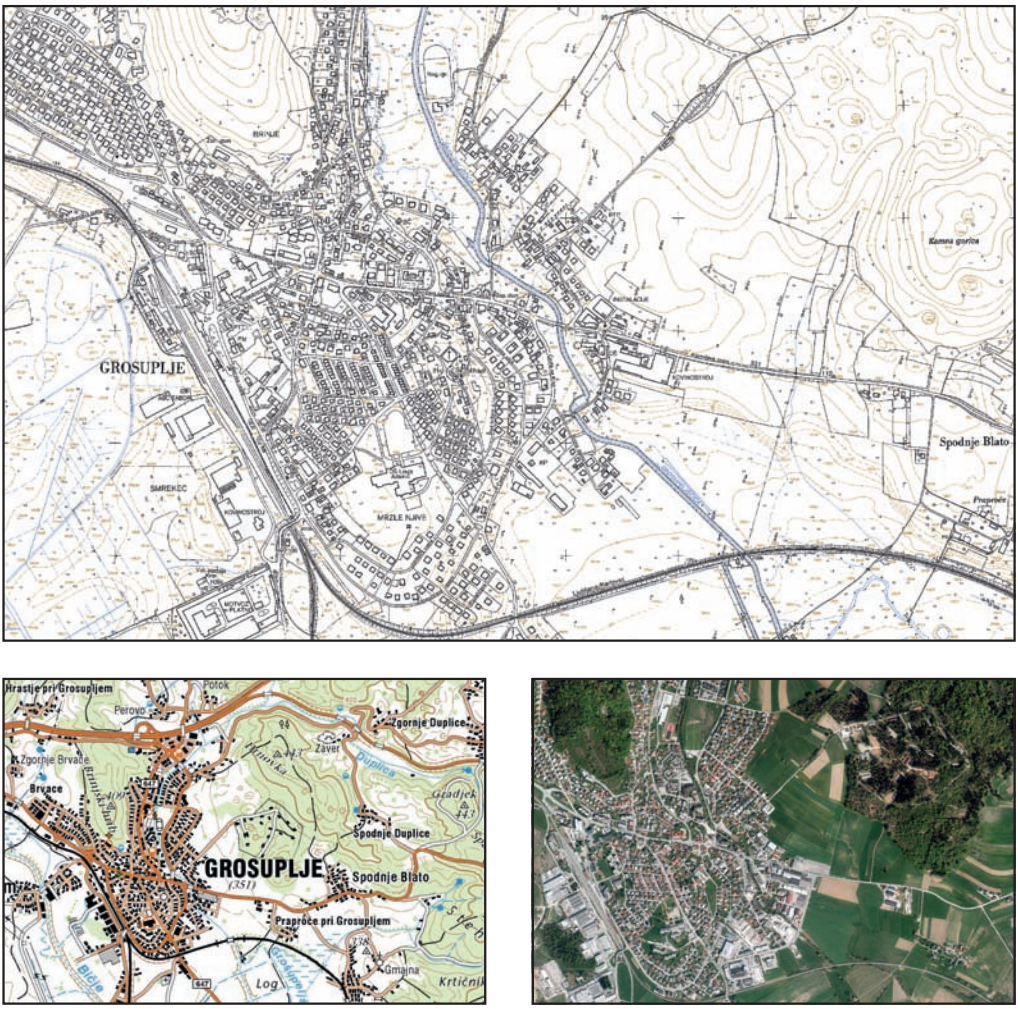

Figure 2: Biased cartographic representation, or cartographic silence, on the basic 1:5,000 topographic map of Slovenia (top) from the time of Yugoslavia without the military installations that can be seen on the newer map above the name of the settlement (*Grosuplje*) and on the digital orthophoto (source: Surveying and Mapping Authority of the Republic of Slovenia).

2.2 Old maps define modernity

Old maps (which were not »old« at the time they were created), along with advances in navigation and orientation technology, helped accelerate the spread of the Western *ecumene* and way of life. They contributed to the development of the economy, to the exchange of ideas and cultures, and, through the establishment of trade routes, to the marches of war. At the same time, they made possible and enhanced visual perception and interpretation of the world's landscapes, and they profoundly changed the understanding of the world.

Even today, histories tell us more about the world of the time, the relationships between natural and social elements, and political and economic systems, than their creators may have wanted or been able to know (Crampton and Krygier 2015). Censors were not as attentive to maps as they were to other texts, with the possible exception of information about military capabilities (Figure 2). The rule is confirmed by exceptions, such as Kosler's Map of the Slovenian Land and Regions in the Austrian Empire, which could

not be distributed for several years after its publication in 1852 (Gašperič 2007) because it had the characteristics of a national propaganda map (Fridl and Urbanc 2006).

We cannot be certain that old maps have improved our perception of the world. After all, it was the appearance of old maps in European culture at the time of the discoveries that contributed to the limited and one-sided view of the realities of the Earth at that time. The changing perception of their importance can be seen in the shift of focus of the prime meridian through centuries, as well as in the different ways in which maps were graphically focused. In antiquity Jerusalem was the focus, in medieval Islamic cartography Mecca, and even today we know of maps that focus on one part of the world (e.g., Australia; Harley and Woodward 1987). In every age and in every part of the world, the dominant perspective of maps has also reflected the dominance of certain countries or cultures, while neglecting or even distorting the images of others. Today's state of global culture is characterized by digital maps oriented in every direction and accessible to everyone through electronic devices connected to the global navigation satellite systems (such as GPS).

Old maps are not so much an accurate representation of the real world, but a representation of the reality that they co-create (Pickles 2004). Contemporary readings of old maps depend on knowledge, insight, experience, social and cultural background, personal opinions, and other circumstances (Fridl and Urbanc 2006). Old maps are a representation of the real world but also a representation of reality as perceived at a particular point in time, and they co-create that reality (Pickles 2004). Therefore, maps are a valuable source of information about historical political-geographical and spatial relationships and a source of information about the culture, society, and values of the past – and the present. Although old maps show the configuration of the Earth's surface in the past, they can help us understand how people understood the world at that time, which in turn helps us understand the present. Old maps thus provide a justification for the values and identities of contemporary societies and are important for the study of history, sociology, and geography (Wood 1992; Fridl and Urbanc 2006).

2.3 Old maps as the root of fantasy maps

Old maps shape the past or its image, but, on the other hand, they also obscure the past in which they were created. They are like a palimpsest (Komac 2009), on which only the upper layer of the map is always visible to the reader as a text or image. The choice of the territory represented, the division of territories into units, the cartographic symbols used, the language and geographical names used, and the absence of some cartographic elements, create a limited picture of the terrestrial reality of a historical period. The content is presented by the client and the cartographer in a unidirectional and limited manner. Therefore, old maps would be classified as »informing« on Arnstein's (1969) scale, which is only the third of eight levels of participation (Nared and Bole 2020).

On the other hand, it is the limitations of the image, the obscuring or non-appearance of certain elements, that open the view to new worlds. They have made it possible to move away from the map of the actual surface of the Earth in a historical era, which is itself a sort of a fantasy map, a map of imagined worlds that are not real, because of limited perception and knowledge. Old maps may have awakened the desire to explore distant places, and the imagination and curiosity to explore imaginary landscapes, already at the time they were created.

It is no coincidence that the image of formal old maps, some of which are true works of art with their artistic components, has become the characteristic image of fantasy maps (Gašperič and Komac 2020). From today's perspective, the old maps are flawed, often distorted and inaccurate. They contain generalized cartographic symbols (e.g., molehills for hills, deciduous trees for forest, and images of buildings for settlements) that are illustrative, easy to read, and visually pleasing (compared to more modern conventional cartographic symbols). Because they do not include all the details of the territory depicted, they awaken the reader's emotions and imagination (Gašperič and Babič 2023).

Fantasy maps show lands that exist only in the imagination. They seem to be an addition to imaginative stories, although they are also an important part of them; this can be seen, for example, in Tolkein's works (Padrón 2007). They show fictional, imagined landscapes (Cooper and Gregory 2010; Daniels 2011), but they have all the qualities of real maps: location, locale, and a sense of place (Bushell 2016). Old maps were originally associated with art rather than science (Rees 1980; Ferdinand 2019), and they then became technicized and reapproximated to art through imaginary maps as »map art« (Wood 2006).

Old maps have become »imaginary« – or, in other words, imaginary maps have become the pinnacle of historicism in mapmaking. The lands depicted do not exist in the real world but are imagined as »Neverland.« This makes it easier to understand why old maps have helped (re)construct imaginary landscapes in the totality of their space and time. Maps are of-the-moment, bursting into being through practices (embodied, social, technical), *always* re-made every time they are engaged with. Maps are transitory and fleeting, being contingent, relational and context-dependent (Kitchin, Gleeson and Dodge 2012).

Because of this, landscapes are marked with realistic cartographic symbols, which makes it easier for the reader to establish spatial contact and follow the story. Fantasy maps add an important dimension to stories by giving the appearance of reality (Ekman 2013). Old maps, which represent a distinct visual language, have evolved from an originally technical commodity to the basis for language-based word creations. In this way, they anchor fantasies in the real world (Sundmark 2014). This cultural phenomenon also transcends languages and has a universal meaning as it recreates and represents landscapes (Harmon 2004).

2.4 Old maps as a challenge for the future

In the modern, digital age, old maps offer unprecedented opportunities for discovering different levels of meaning in terms of content, technology, and symbolism. Geographic information systems (GIS) make it possible to bridge the gap between historical and traditional cartography and the cartography of the future, which is limited to a digital replica of planet Earth (Gao and Cao 2021; Novak and Ostash 2022). The evolution of cartographic representations can be traced from 1) maps and atlases that have a specific scale and projection to 2) globes, which allow one to view the hemisphere from different perspectives but not change the scale, and 3) GIS and geoportals, which allow one to choose the scale and the projection, to 4) a multi-resolution and three-dimensional digital Earth (Gore 1998), where we are not constrained by projection or scale (Eremchenko 2020), and 5) a historical digital Earth showing changes in the past to the as yet unknown 6) AI-driven digital Earth, digital Earth with near-live and live data presentation. Like the crystal ball from Bulgakov's novel The Master and Margarita, it has all the elements of a digital Earth: it shows live action in color, it shows the whole or part (zoom), it allows us to see the future (modeling), but it does not yet contain sound (Siepmann, Edler and Kühne 2021):

> Near Woland was a strange globe, lit from one side, which seemed **almost alive** . . . . My globe is much more convenient, especially as I need exact information. Do you see that **little speck of land**, for instance, **washed by the sea** on one side? Look, it's **just** bursting into flames. War has broken out there. **If you look closer, you'll see it in detail**. Margarita leaned towards the globe and saw that the little square of land was growing bigger, emerging in natural colours and turning into a kind of **relief map.** Then she saw a **river** and a **village** beside it. A **house** the size of a pea **grew until it was as large** as a matchbox . . . . »What are you looking at?« asked Berlioz. »**I'm looking at your future**,« said the man. (Bulgakov 1967)

Old maps provide insight into the past and allow interpretation of the social, political, and economic conditions of the time. Their digitization makes it possible to preserve their images and use them in GIS and digital environments (Li 2019). Despite the relatively low accuracy of some old maps, this allows for a dynamic visual representation of the evolution of a landscape over time (Lafreniere and Rivet 2010), down to deep time (Zahirovic et al. 2019). Digitized historical maps also make analytical research possible: by overlaying and integrating old maps with other data layers (Madry 2006), all kinds of analyses of relationships with natural and social landscape features can be conducted at different spatial scales. Together with the temporal dynamics, this allows the detection and analysis of landscape patterns that would otherwise be invisible and unknown. Old maps thus gain contextual depth, and their utility is extended through digitization (Capolupo et al. 2020). Virtual and augmented reality, and artificial intelligence will allow their use in real time – live *in situ* (Figure 3), as already suggested in fantasy films, such as Narnia: The Voyage of the Dawn Treader.

In the digital age, old maps become important for cartography, geography, and their auxiliary sciences, such as history and archeology. They make it possible to analyze changes in land use, the development of routes and settlements, and changes in coastlines and watercourses (Lelo 2014; Nobajas 2014; Polczynski and Polczynski 2021), all of which are landscape elements that are also depicted with specific symbols on

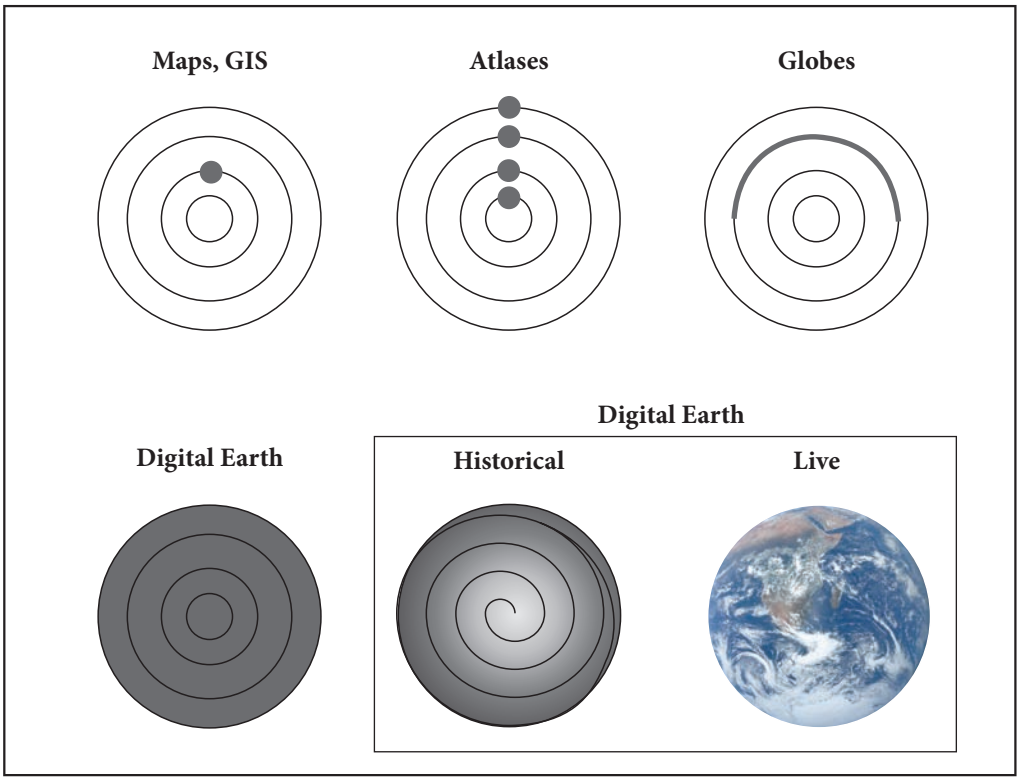

Figure 3: The transition from old maps to a digital Earth with spatial and temporal resolution (Eremchenko 2020, 5; NASA Johnson Space Center Gateway to Astronaut Photography of Earth, Visible Earth).

old maps. Thus, this special issue offers an analysis of cartographic elements (Gašperič 2023), which is an important first step toward further steps of digitization of old maps and their analysis. Digital historical maps will add a temporal dimension to the emerging multiresolution and three-dimensional »digital Earth« (Baturin, Eremchenko and Zakharova 2019), which is not a map but an unsigned (with non-signs) representation with dynamically integrated visual (images, video, 3D-models), auditory (music, audio), and abstract (text, numbers, symbols) information (Table 1).

The digital age also brings uncertainties: the maps produced today are available on the internet, which has the character of impermanence. In Slovenia, there is the case of a portal for territorial maps, whose updating was stopped due to a shift in the focus of the company. Prints are rare, but this is the form in which old maps have survived over the centuries. With digital maps, we do not even have the experience of decades of archiving, and the file format is constantly changing. Another challenge is that the digital Earth will reduce the need for cartographic symbols. We will have to rethink cartography because the digitization of maps and geographic environments may cause cartographic symbols to become obsolete or disappear. Paradoxically, this will unexpectedly dramatically increase the information content of the network-centered digital Earth compared to earlier print and digital maps. This new way of representing the global environment will provide previously unimaginable detail and can be called a geospatial revolution (Eremchenko 2022). Old maps in the era of T-O maps exhibited a remarkable degree of generalization, which was not due to a low level of understanding, but to the idea of separating the four essential elements (the circle of the Oikumene, surrounded by the sea-ocean, into Europe, Africa and Asia) from the multitude of others (Eremchenko 2016). The maps later became spatially and visually precise and formed the basis for modern cartography. In the new digital era, old maps become an important part of the scale-free, holistic geospatial environment in which geography can play a leading role.

Table 1: Characteristics of map types in typical cartographic eras.

	Old maps	Modern standard maps	Future maps (digital Earth)
Descriptive factors			
Historical period	Up to nineteenth century	Nineteenth century onward	Twenty-first century
Development period	Imperial era	Era of states	Global era
Use and participation	Navigation, military, non-participatory	Transportation, travel, tourism, urban planning, environmental protection, limited participation	Navigation, augmented reality, full participation
Time	Historical landscape	Contemporary landscape	Future landscape (predictive modeling)
Author, copyright	Individual/restricted use	National institution/use through digitization	Global enterprise, everyone/private property, permitted use
Resource	Observation, travel itineraries, navigation	Measured cartographic data, remote sensing	Remote sensing (UAVs, microsatellites) and grid data, Bigdata, enriched with AI
Types	Topographic	Topographic and thematic	Thematic: any
Technological factors			
Production technology	Drawing, woodcut, copper engraving	Copper engraving, lithography, metal type printing, digital printing	Non-map
Display technique	2D (plan)	2D (area) and 3D (space)	4D (space and time)
Use of colors	Black and white (sometimes colorized)	Color	Color
Interactivity	Manual use	Manual and digital use	Enriched reality: augmented reality and virtual reality applications in usage based on AI-powered actual space and time, personalized actual data integration, and 4D visualization, incorporating changes over time
Cartographic factors			
Type of cartography	Static (printed map)	Static (printed) and hierarchical (digital map)	Dynamic, network-centered
Cartographic symbols	Nonexistent, then limited, start of use	Standardized elements or symbols	Non-symbols
Scale	Regional and global	All scales separately	All scales at once/no scale
Projection	None, basic	Standardized and precise, but different scales	Arbitrary, valid in all criteria and dimensions
Geographical names	Imperial languages	National languages	Local languages, AI-generated speech/language, automatic translations
Voids	Filled with graphic elements	Blank	Zero-sign

3 Articles in the special issue

This special issue is dedicated to historical cartography. It sheds light on the meaning, use, and creation of old maps of Slovenian territory, which accompany us as individuals and as a nation in parallel with our history.

Cartographic elements define the characteristics of a map and are its basic building blocks. They are represented on the map in the form of cartographic symbols. Therefore, we have taken them as the basis for the study in the first two articles of this issue. The first article, »A new standardized methodology for analyzing cartographic information on old maps« by Gašperič (2023), presents a new methodology for analyzing old maps to identify and interpret their cartographic symbols. It analyzes fifty-eight maps, dating from the sixteenth to nineteenth centuries, showing the territory of Slovenia at scales ranging from 1:200,000 to 1:900,000. For each map, about eighty entries were made, and several thousand pieces of data were collected, which required a uniform and systematic study of all cartographic symbols on the selected maps. Before the nineteenth century, changes were most evident in the symbols for vegetation, relief, and transport networks. The article concludes with an indication of the reliability of the new method for studying maps and to determine the causal relationship between cartographic elements and map content. The overall design of the survey and the data obtained are unique in historical cartography.

The second article, »The semiotics of cartographic symbols on old maps« by Gašperič and Babič (2023), analyzes selected cartographic symbols on five old maps depicting the territory of Slovenia from the sixteenth to the nineteenth century. A semiotic approach was applied to establish connections between cartographic symbols on old maps and the characteristics of society at the time the maps were created. This semiotic approach was used to discuss the impact of the interpretation of four symbolic cartographic elements, their iconic basis, and the reading of the five maps analyzed. It was found that cartographic symbols changed in line with the development of cartography and the society at the time. Old maps were presented as the primary source for the study of history and environmental phenomena. Due to the development and demands of a changing society, cartographic symbols have gradually transformed into symbolic signs (in the semiotic sense), including the quality of map representation.

The third and fourth articles focus on important cartographic works and their authors that influenced Slovenian geography and cartography in the second half of the nineteenth century. The article »Traditional and modern cartographic materials for geography teaching: From Blaž Kocen to the present« by Gašperič and Bratec Mrvar (2023) presents cartographic teaching materials used in two different periods: the second half of the nineteenth century and the beginning of the 2020s. During the first period examined, the works of Blaž Kocen (also Blasius Kozenn) laid the foundations of school cartography in the Habsburg Monarchy. The most highly valued among them in central Europe were his atlases, which have the longest tradition of publishing in the world. In the second period, technological development and the COVID-19 pandemic laid the foundations for a faster transition to digital approaches to teaching. This article examines the use of maps, atlases, and textbooks by Slovenian geography teachers to determine whether modern (digital) teaching materials have replaced or will replace traditional (paper) ones. It was established that the use of printed cartographic materials continues to predominate in geography teaching, which indirectly preserves the importance of Kocen's pioneering and visionary work.

The last article, by Perko (2023) is about »The first world atlas in Slovenian in the history of world atlases and Slovenia's present territory in some of them«. It was published between 1869 and 1877, when the vast majority of Slovenians lived in Austria-Hungary. *Atlant* was edited by the lawyer and linguist Matej Cigale (1819–1889). The atlas was published between 1869 and 1877, and eighteen maps were published in six volumes. Because the atlas was never bound into a book, a facsimile was published in 2005 under the name *Atlant*, which also includes a companion book. Matej Cigale performed pioneering work in the Slovenianization of geographical names and the preservation of Slovenian exonyms. This cartographic achievement influenced later world atlases and is an important part of Slovenian cultural heritage.

4 Conclusion

This special issue of volume 63 of *Acta geographica Slovenica* emphasizes the role of old maps, which are both the basis and the result of geographical research. These maps are not only one of the first languages of communication (Casti 2000), but also an outstanding written and visual language of geography. They

are a valuable source of information about historical, political-geographical, and spatial relations in history, and they are also bearers of cultural values and the identity of contemporary societies, and thus an important element of cultural heritage (Gašperič and Zorn 2020). Cartography is the science and technique of producing maps and map-related products as digital or analog models of (virtual) reality. The discipline focuses on 1) map graphics (semiotics as the language of cartography), 2) epistemological aspects: modeling and object relations in space and time (ontology), and 3) spatiotemporal communication (Kainz 2020).

Old maps were a landmark and reference document in the discovery of the world, and they contributed to the spread of Western ecumenism and later to the exchange of cultures. They showed and communicated where the boundaries of the corresponding »civilized« world, the *ecumene*, lay. Just as they are defined on the one hand by the world at the time of their creation, they are also important for contemporary perceptions of the past. They help us better understand how people in the past understood the world, and thus better understand the present – and, with the help of digital (geographic) information systems and modeling, the future.

Old maps have become the inspiration for imaginary maps, depicting lands that exist only in the imagination but feature real cartographic symbols that complement the stories and create a cultural phenomenon that crosses linguistic and cultural boundaries.

The articles in this special issue present an original method for cartographic analysis of maps, the semiotics of cartographic symbols on old maps, the use of cartographic methods in education, and the first world atlas in Slovenian. This special issue of *Acta geographica Slovenica* highlights the importance and impact of old maps on social development, art, and geography, raises new questions, and lays the foundation for new research in this field. The definition of informatics, now identified with signs, must be redefined, increasing the role of scientific visualization. The transformation of maps to the digital Earth and of signs into non-signs or zero signs presents a rich research area and challenges us to rethink fundamental aspects of geographical knowledge and representation.

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