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Gerardo Vidal Gonçalves
Dina Borges Pereira
Martin Gomez-Ullate



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Coordinators

Gerardo Vidal Gonçalves

(AHAS)

Dina Borges Pereira

(AHAS)

Martin Gomez-Ullate

(UNEX)

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Resources for heritage education and interpretation on bells

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WS for digitizing historical documents: open-source tool

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RIO: A living laboratory for the generation of new data, tools and methods to better understand european rurality

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Cultural and Natural Heritage: two dots

Europe is a rich tapestry of cultural and environmental heritage, characterized by a vast history that intertwines traditions, artistic expressions, and diverse natural landscapes. From the fjords of Norway to the sun-soaked vineyards of southern France, the continent boasts a myriad of cultural narratives that speak to its complexity and richness. This exploration aims to delve into various themes related to heritage education and interpretation, focusing on elements such as bells, music education, acoustics, archaeological practices, historical mapping, digitization, and rural studies. By examining these interconnected topics, we gain a deeper understanding of the complex relationships between culture, environment, and heritage across Europe, revealing the intricate web that binds the past with the present.

One of the most intriguing aspects of European cultural heritage is the significance of bells. These remarkable instruments have played a pivotal role in society for centuries, serving not only as tools of musical expression but also as profound symbols of community and tradition. The research conducted by Martín Gómez-Ullate, Pilar Barrios Manzano, and Javier Barra Sanz sheds light on the resources available for heritage education and interpretation surrounding bells, illustrating their importance in educational contexts. Their work emphasizes how bells can serve as powerful tools for understanding history, art, and sound, ultimately enriching our appreciation for the unique cultures that inhabit the continent.

Bells have been integral to the social fabric of European societies, marking the passage of time, announcing significant events, and signaling community gatherings. They represent a rich variety of cultural and religious traditions, from the solemn chimes of church bells that call worshippers to prayer to the joyful peals of celebratory bells used during festivals. Understanding the historical significance of these instruments is crucial for heritage education, as it provides essential context for their use and relevance across different cultures.

To facilitate a deeper understanding of bells in the context of heritage education, Gómez-Ullate, Barrios Manzano, and Barra Sanz propose a range of educational resources aimed at teachers, students, and heritage professionals. These resources include interactive workshops and seminars that allow participants to learn about bell-making techniques, ringing methods, and the historical context of bells in various cultures. Furthermore, the development of digital archives and databases serves to create online platforms that host collections of bell-related artifacts, recordings, and historical documents. These resources can greatly enhance remote learning opportunities, broadening access to the rich heritage associated with bells.

Community engagement programs also play a crucial role in fostering a sense of ownership and pride in local cultural heritage. Initiatives designed to involve local communities in bell-related heritage activities encourage participation and connection to the past. By integrating bells into various educational strategies, such

as storytelling, soundscapes, and multisensory exhibits, educators can create engaging experiences that resonate with audiences of all ages.

Moreover, the integration of bells into music education offers a unique opportunity to explore cultural heritage through sound. Mary Stakelum examines the significance of bells within music education, highlighting their potential as both educational tools and cultural symbols. Bells can serve as effective instruments in teaching music due to their distinctive sounds and rich historical context, making them an engaging topic for students. Stakelum outlines several ways in which bells can be integrated into music curricula, promoting hands-on learning experiences that connect students with the physicality of music-making.

The interdisciplinary nature of bells allows for cross-curricular connections between various subjects, including history, geography, and art. This holistic approach enriches students' learning experiences and fosters a broader understanding of cultural heritage. Understanding the cultural significance of bells is essential in music education, as it enables students to appreciate their role in different societies, from religious practices to celebratory events. Through such explorations, students gain insight into the broader implications of music and sound within cultural expressions.

However, integrating bells into music education presents challenges that educators must navigate. Stakelum identifies potential obstacles, such as limited access to bell instruments and a lack of trained educators in this specialized area. Nevertheless, she suggests that these challenges can be addressed through community partnerships, online resources, and teacher training programs aimed at fostering a deeper understanding of bell heritage in educational settings.

The intersection of bells and music education highlights the richness of cultural heritage and its relevance in contemporary learning environments. By embracing bells as educational tools, music educators can nurture a deeper appreciation for the diverse sounds that shape European culture, ensuring that this unique aspect of heritage continues to resonate through generations.

Another vital dimension to understanding bells lies in the study of acoustics. Vinçenc Debut explores the scientific principles behind bell acoustics, illuminating the relationship between sound, heritage, and community identity. Bell acoustics encompasses the study of sound waves and their interactions with the environment, and Debut explains fundamental principles, including harmonics, resonance, and sound propagation.

Harmonics are essential to understanding the complex range of frequencies produced by bells, contributing to their distinctive sound. The materials used in bell construction, such as bronze or brass, significantly influence their resonance and overall tonal quality. Additionally, sound propagation—the way sound travels through different environments—affects how bell sounds are perceived by listeners.

Understanding acoustics is crucial in appreciating the cultural significance of bells, as their unique sounds often serve as auditory markers of community identity. By studying bell acoustics, researchers can gain insights into historical practices, social interactions, and cultural values embedded in the sounds that define a community. Debut emphasizes that the principles of bell acoustics can be effectively applied in educational and interpretative contexts, encouraging sound experiments that engage students in hands-on exploration of sound production and acoustical properties.

Moreover, incorporating sound experiences into heritage exhibits can create immersive environments that deepen visitors' appreciation for bell heritage. The exploration of bell acoustics not only reveals the intricate connections between sound, culture, and heritage but also underscores the potential for educators and interpreters to create engaging learning experiences that resonate with diverse audiences.

The practice of bell ringing is an ancient tradition that has evolved over time, embodying the changing dynamics of community engagement. Francesc Llop addresses the shifting landscape of bell ringing, highlighting generational changes in practices, attitudes, and community involvement. Historically, bell ringing has been a communal activity, often involving skilled artisans and local communities. Llop notes that bell ringers have played vital roles in cultural events, religious ceremonies, and celebrations. However, this cherished tradition faces contemporary challenges, including declining participation and a lack of awareness among younger generations.

To revitalize bell ringing, Llop advocates for a renewed vision that embraces innovation and inclusivity. Key strategies for this renewal include developing programs aimed at attracting young people to bell ringing, fostering a new generation of ringers who can carry on this storied tradition. Additionally, collaboration with schools can introduce bell ringing into educational curricula, promoting awareness and participation among students.

Embracing technology also plays a crucial role in enhancing the bell ringing experience. Digital tools such as virtual ringing platforms and online tutorials can help modernize the practice and attract new enthusiasts. Llop emphasizes the importance of preserving traditions while also fostering new methods of engagement. By embracing change and cultivating a culture of innovation, bell ringing can remain relevant and vibrant in contemporary society, ensuring that this cherished practice continues to thrive for future generations.

Beyond bells, the rich archaeological heritage of regions like Istria in Croatia reflects a complex history of cultural influences. Martina Barada examines the role of archaeology in preserving and interpreting Istrian heritage, emphasizing the importance of community involvement. Istria's archaeological sites offer valuable insights into the region's past, revealing evidence of Roman, Venetian, and Slavic influences that have shaped its identity.

Barada underscores the significance of community engagement in archaeological practices, advocating for the inclusion of local residents in heritage preservation efforts. By encouraging participation through volunteering opportunities, educational programs, and public exhibitions, archaeologists can foster a sense of ownership and pride in local cultural heritage. While challenges persist in the field of archaeology, such as funding constraints and political issues, Barada believes that collaborative efforts and community engagement can address these challenges, creating a shared understanding of the region's history.

Furthermore, the interplay between historical mapping, Geographic Information Systems (GIS), and multidimensional digitization highlights the significance of technology in understanding cultural landscapes. The Alto Douro Wine Region in Portugal, renowned for its rich agricultural heritage and stunning landscapes, serves as an exemplary case study in this context. Gerardo Vidal Gonçalves examines the utilization of historical maps and GIS in the multidimensional digitization of water anthropization, revealing how technology can enhance our understanding of the interaction between humans and their environment.

The incorporation of GIS technology into heritage studies allows for a nuanced understanding of spatial relationships and historical developments. By mapping historical water management practices, researchers can uncover patterns that illustrate the evolution of agricultural practices in the region. Such insights contribute to our comprehension of the socio-economic dynamics that have shaped cultural landscapes over time.

Through the integration of historical mapping and digital tools, scholars can facilitate more robust heritage education and interpretation, enriching the experiences of students, researchers, and local communities. As technology continues to evolve, the potential for enhanced understanding and engagement with cultural heritage expands, enabling new narratives to emerge from the rich tapestry of European history.

In conclusion, the exploration of bells, music education, acoustics, archaeological practices, historical mapping, digitization, and rural studies offers a multifaceted perspective on European cultural heritage. Each element contributes to a deeper understanding of the complex relationships between culture, environment, and heritage, revealing the intricate connections that define the continent's identity. By embracing innovative educational strategies and fostering community engagement, we can ensure that the rich tapestry of European heritage continues to resonate through generations, preserving the legacies of the past while inspiring future explorations. Through collaborative efforts, technological advancements, and a commitment to inclusivity, we can forge a path toward a more profound appreciation of the diverse cultural narratives that shape Europe today.

Gerardo Vidal Gonçalves

Resources for heritage education and interpretation on bells

Martín Gómez-Ullate

Pilar Barrios Manzano

Javier Barra Sanz

This text recounts the introduction by Lito Prado, one of the hosts of a congress, who talks about his responsibilities during the event, providing support to participants, especially those coming from outside the region. He mentions the slight delay in starting the activities and notes that two important figures, the mayor of San Juan de Río and the mayor of Tribes, could not attend due to a provincial event, the Ensan Awards, which would honor Adolfo Domínguez, a famous Spanish designer.

Lito begins with a personal story, recalling his grandfather, who was a great listener. From this memory, he reflects on how the sound of bells (campanas) used to transmit important information to rural communities, such as the birth of a child or the death of a neighbor. He also talks about local carnival traditions, where large bells, known as "chocas," announced the arrival of festivals and social gatherings. These memories serve as a symbolic introduction to the congress, which will be filled with discussions about cultural and environmental heritage.

The event takes place in Tribes, Galicia, and is part of the International Learning Villages Network, funded by the European program "Citizens, European Rights, and Values." The network is composed of villages from different parts of Europe that face demographic challenges and share a commitment to rural development and heritage preservation.

Martín Gómez Ullate, a professor at the University of Extremadura and the main organizer of the congress, emphasizes the importance of heritage and environmental education. He highlights that the learning villages network provides accessible solutions for citizens interested in preserving their cultural and natural heritage. Examples of these solutions include using technology, such as drones, to scan monuments, allowing the creation of detailed virtual models for study and restoration.

Another key focus of the congress is the importance of turning village inhabitants into "ambassadors of their heritage." This means empowering them to know and value local heritage, enabling them to share these cultural treasures with visitors and future generations. The digitization of archives and the preservation of traditions are presented as essential ways to keep the history of these villages alive, especially in rural areas suffering from aging populations and depopulation.

A central element of the congress is the importance of bells, whose cultural significance is defended by various experts present. The bell-ringing tradition is seen as something that connects the past and future of communities. Martín recalls a striking phrase from a previous conversation with a bell expert: "Bells are not the

past of villages; they are the future." This perspective reflects the belief that traditions should not be seen as dead or obsolete but as a vital and relevant force for the development of communities.

In addition to bells, the congress also addresses natural heritage, particularly the viticultural heritage, with a focus on the recovery of nearly extinct grape varieties in the region and the use of innovative techniques in wine production. Sustainability and innovation are central themes of the event, which seeks to show how the preservation of traditions can be allied with modernity and technology.

The congress brings together various professionals and academics from different parts of Europe, all involved in cultural preservation and revitalization projects. Martín emphasizes that the work carried out so far, within the framework of programs like Erasmus+, has been a gratifying and productive experience, involving the collaboration of many partners over the years.

Martín concludes by reaffirming the learning villages' network's commitment to addressing the contemporary challenges faced by rural European areas, such as abandonment and loss of both material and immaterial heritage. He stresses that there are viable and accessible solutions to revitalize these communities, and that working together, with the support of technology and international programs, can yield great results.

Bells have held a profound place in human culture for centuries, their distinctive sound bridging the realms of the sacred and the mundane. Across time and continents, bells have been symbols of communication, community, and even resistance. The complex relationship between humans and bells spans religious practices, civic life, music, and even literature, illustrating their multidimensional significance. This essay explores how bells have functioned as vital instruments of human expression, deeply embedded in the social fabric of communities, especially in Europe and the Americas, where their legacy continues to resonate today.

Bells have been known by various names across cultures. In Latin, the bell was referred to as *nola* or *signum*, which interestingly echoes in modern Portuguese, where the word *sino* also refers to a bell. This linguistic connection reveals the long-standing influence of Latin on bell terminology, a small but significant testament to the historical roots of bells in Western culture.

The first recorded use of bells in Christian contexts dates back to the 5th century in the Catholic diocese of Nola, located in the Campania region of Italy. However, in the Iberian Peninsula, bells were largely absent during the Islamic period, only to re-emerge with the Christian Reconquista. This shift in usage highlights how bells became markers of Christian identity, signaling the triumph of a religious culture. In this regard, bells not only announced the time for prayer but also symbolized the broader cultural and political changes taking place, particularly in the context of Christian-Muslim relations.

By the 13th century, bells were well-established in European Christian practices. A notable instance occurred in 1238, when a chronicler described how the sound of church bells had begun to replace the Islamic call to prayer in reconquered territories. This moment underscores the role of bells as instruments of cultural dominance, used to announce the arrival of a new religious order. Similarly, when the Spanish and Portuguese brought Christianity to the Americas, they carried with them not only the tools of war but also the instruments of faith, including bells. Bells thus became part of the colonial project, calling new converts to prayer and asserting the presence of the Church in distant lands.

Throughout history, bells have been more than just inanimate objects; they have been part of intimate human relationships. Bell founders, or *fundidores*, and bell-ringers, known as *campaneros*, develop a profound connection with these objects. This bond is not only professional but often deeply personal, passed down through generations. The example of Gabriel, a young bell founder from a family with six generations of experience, illustrates the enduring nature of this craft.

Campaneros, in particular, play a crucial role in shaping the soundscape of their communities. The grammar of bell-ringing is complex and regionally distinct, with different communities developing unique patterns of bell-ringing to convey specific messages. For example, different rings might signal the death of a woman, a man, or a child, or announce a particular moment in a funeral. This nuanced form of communication, once passed orally from one *campanero* to the next, forms an essential part of a community's cultural heritage.

Interestingly, the names given to bells often mirror the names of people, further emphasizing their place within the community. *Campaneros* affectionately call their bells by names like María, Florina, or Petra, sometimes even referring to them poetically as “Latina” or “Latón.” In this way, bells become almost human-like in their role within society, representing communal values, memories, and histories.

Bells have also served as communal symbols, reflecting the collective identity of a town or village. In many cases, when a bell is cast or recast, members of the community contribute personal items such as jewelry to be melted down and incorporated into the new bell. This practice symbolizes the merging of individual and communal identities, as the bell becomes a physical embodiment of the people's spirit.

Moreover, bells often serve as a focal point during significant rites of passage, particularly in rural villages. These rituals, which may once have been markers of masculinity or community transition, today often serve a different purpose: preserving tradition. As societies modernize, the function of many traditional practices shifts from practical necessity to heritage conservation, ensuring that these time-honored customs are not lost to future generations.

Interestingly, bells have also been objects of dispute and even theft. There are stories from Galicia, Spain, where rival villages would steal each other's bells in a form of symbolic conquest. In such cases, the return of the bell would often require

negotiations or even a form of ransom, underscoring the importance of bells as powerful symbols of local pride.

Beyond their immediate cultural significance, bells have found their way into the broader realms of art and literature. They feature prominently in classical and modern works, serving as metaphors for time, death, or spiritual awakening. One famous literary example is the poem "*La canción de la campana*" by the German poet Friedrich Schiller, which reflects on the passage of time and the human condition. Similarly, in the poetry of Rosalía de Castro, bells are imbued with a sense of melancholy and longing, as seen in her famous work "*Las campanas de Bastavales*."

In music, bells have often been used to add dramatic effect, their resonant sound evoking everything from spiritual reverence to foreboding tension. Tchaikovsky's 1812 *Overture* famously calls for actual church bells to be used in performances, while more modern pieces like Mike Oldfield's *Tubular Bells* bring the sound of bells into the world of progressive rock. Even in pop culture, bells have left their mark, as evidenced by songs like "Mil campanas" by Alaska y Dinarama, which uses the metaphor of bells ringing in the heart to convey deep emotions.

In many communities, bells are still used to mark important moments in the agricultural calendar, signaling the arrival of a storm or calling people to safety during natural disasters. For centuries, bells have been believed to have the power to disperse storms or drive away evil spirits, a belief that persists in some rural areas to this day.

More recently, bells have been used in solemn memorials, as seen in the tribute to the victims of the 2016 Orlando nightclub shooting. In this haunting musical tribute, each victim was commemorated with the corresponding number of bell tolls according to their age, blending the personal and the collective in a moving auditory memorial.

The history of bells is as much a history of people as it is of sound. From the early Christian churches of Europe to the towns and villages of modern-day Spain and Latin America, bells have served as a vital link between individuals and their communities. Their sound has echoed across battlefields, celebrated victories, mourned the dead, and marked the passage of time. As a living heritage, bells continue to hold a unique place in the cultural landscapes of many societies, their rich symbolism ensuring that they will remain relevant for generations to come.

Bells, in their many forms, remind us of the importance of sound in shaping human experience. Whether used in ritual, as a call to action, or simply as a reminder of the passage of time, the sound of a bell connects us to our past, our present, and our future.

Ultimately, the congress serves as a space for exchanging ideas and experiences among experts and local community members, with the aim of creating sustainable strategies for heritage preservation and rural development.

Bells' heritage & music education

Mary Stakelum

The text "Bells' Heritage & Music Education," written by Mary Stakelum, discusses the importance of valuing and studying church bells, linking this practice to heritage and music education. The author argues that bells, often underestimated, hold significant cultural value, and studying them can be an effective way to connect people to their cultural and historical heritage.

Stakelum explores how traditional bell-ringing, a practice rich in tradition, can be integrated into educational practices, both in the field of music education and heritage preservation. She suggests that music education can go beyond technical teaching to include cultural and historical aspects, enriching students' experiences and strengthening their connection to communities and traditions.

The author proposes that studying bells in schools and communities offers a unique opportunity to combine music with heritage education. This interdisciplinary approach helps students not only to understand music itself but also to grasp the historical and social context in which it was and still is produced. By ringing and studying bells, students learn about tuning, rhythm, and the structure of the rings, while also developing a deeper understanding of their importance in local history.

In the context of music education, Stakelum emphasizes the need for a more inclusive and partnership-based pedagogy so that less conventional musical traditions, like bell-ringing, can be valued and taught in schools. She argues that this inclusion broadens students' musical repertoire and fosters a wider understanding of the concept of music, going beyond formal Western traditions.

The author also discusses how technology can be used to promote inclusive interaction with these musical traditions, making access and learning easier for all students, regardless of their previous musical skills. Thus, technology is seen as a way to democratize music education and connect students with traditional cultural practices in a modern and accessible way.

Mary Stakelum's work stands out for its interdisciplinary focus, addressing not only the development of musical skills but also building cultural and historical awareness through music. She suggests that teaching bell-ringing in schools and communities can promote a richer, more diverse music education while also strengthening the preservation of cultural heritage.

Stakelum is a leading educator and researcher in music education, with experience at renowned institutions such as Bath Spa University, the University of Reading, and the University of Limerick. Her work is widely recognized in areas like inclusive pedagogy and interdisciplinary practices in music education. In addition, she has an extensive list of publications reflecting her commitment to research and the development of music education, with a focus on themes such as children's musical worlds, music literacy, and the inclusion of technology in music teaching.

Among her research interests, Stakelum is also developing the concept of "rewilding" music education, an approach that seeks to reintegrate cultural and natural practices into music teaching, promoting sustainable music education. She is involved in various international organizations dedicated to music education, such as the European Association for Music in Schools and the Teacher Education Academy for Music.

With a career dedicated to advancing music education, Stakelum promotes dialogue between tradition and innovation, always with a focus on inclusion and cultural sustainability.

The acoustics of bells

Vinçenc Debut

Here, Vincent Debu, a researcher in musical acoustics, provides a detailed explanation of the physical process related to the production of bell sounds. After an introduction about his background, he shares his interest in bells, which he has been studying for over ten years, even though he initially had no connection to this field. Sound is produced by pressure variations in the air caused by the vibration of objects. The clapper of the bell causes the bell's structure to vibrate, which creates sound waves.

The vibrations of a structure can propagate through the air as sound, which we perceive with our ears. This phenomenon has been described by physicists for a long time, and bells have attracted the attention of many prominent scientists. A bell produces a sound rich in frequencies, which creates a particular timbre, not just a single note but a chord. This phenomenon is linked to the presence of several vibration frequencies (called partials), each of which has a different lifespan.

The phenomenon of amplitude modulation in sound, the "wah-wah-wah" sound, known as warble or beating in English, is caused by the slight frequency difference between neighboring vibration modes due to the small asymmetry in the bell.

The bell has natural modes of vibration, with each mode corresponding to a specific resonant frequency. By combining these different modes, the distinctive sound of a bell is produced. Vincent explains that by analyzing these modes, we can understand how the bell vibrates. A bell is never perfectly symmetrical after casting, which causes a slight frequency difference between two closely related modes, generating the characteristic beats in the bell's sound. The more symmetrical a bell is, the fewer audible beats there will be. Thus, the number of beats can be used to evaluate the quality of the bell and the precision of the bell maker.

The point where the bell is struck is very important in determining the sound produced. Vincent demonstrates, through numerical simulations, the influence of the strike location on the bell's vibrations. In summary, Vincent illustrates how the physics of vibrations helps us understand the behavior of bells and the richness of their sound, while also highlighting practical applications in preserving the cultural heritage associated with bells.

This presentation focuses on the study of bells, particularly their natural vibration modes and their relationship with manufacturing, tuning, and sound perception. It begins with an explanation of the specific frequencies and beats produced by bells. Due to the axial symmetry of bells, two vibration modes close in frequency can interact and create a phenomenon called "beating," characterized by a noticeable sound oscillation (the "wah-wah" sound we hear). This phenomenon is related to imperfections in the symmetry of bells, resulting from their manufacturing process.

The variations in the sounds produced by a bell also depend on where it is struck. Numerical simulations show that striking in different places generates distinct vibrations and sounds.

Bell tuning, a difficult technique discovered by the Hemony brothers in the 17th century, allows bells to be adjusted to produce precise frequency ratios, such as minor or major thirds. This is primarily done by removing material from specific spots on the bell, a delicate operation as it alters the entire set of vibration modes.

Modern techniques, such as finite element modeling and 3D scanning, allow the precise study of old bells' characteristics, including their thickness, shape, and vibrational modes. For example, studies have been conducted on the bells of the Mafra carillon, revealing tuning differences between the bells in the two towers. Analyses have also made it possible to recover old tuning forks and musical temperaments used at the time.

A fascinating example is the reconstruction of the sound of a broken 13th-century bell found in Coruche. Thanks to mathematics and simulations, it was possible to virtually recreate the sound of this bell, even though the original is incomplete and unable to sound properly. This project has led to a "virtual resurrection" of the sound, allowing museum visitors to hear the bell as it originally sounded.

Finally, the speaker mentions an innovative technique for tuning historical bells without altering them intrusively. Adding small weights at specific points on the bell can adjust the partial frequencies, thus improving the sound while preserving the integrity of the object.

Vincent Debu, a researcher in musical acoustics, presents an in-depth study of the production of bell sounds, which he has been studying for over ten years. He explains that sound is caused by vibrations propagating through the air, generated by the clapper striking the bell. These vibrations create sound waves perceived by the human ear.

Bell sounds are complex, made up of multiple frequencies (called partials) forming a chord rather than a simple note. The variations in sound amplitude create a "wah-wah" phenomenon (warble), caused by slight frequency differences between neighboring vibrational modes due to the bell's asymmetry.

Bells have natural vibration modes, each with a specific frequency. The combination of these modes generates the characteristic sound of a bell. The asymmetry caused by the manufacturing process leads to sound beats, which allow for evaluating the quality of the bell maker's work.

The location where the bell is struck influences the sound produced, and numerical simulations show how the impact site alters the vibrations.

Vincent illustrates the use of vibration physics to preserve the cultural heritage related to bells. Modern techniques, such as finite element modeling and 3D scanning, allow the restoration of historical bells and the recreation of their original

sound. A notable example is the virtual reconstruction of the sound of a 13th-century bell, now broken, enabling museum visitors to hear its original tone.

Finally, he mentions an innovative technique for adjusting the frequencies of historical bells without altering them by adding weights to precise points to improve the sound while respecting the integrity of the bells.

Old bell ringers, new bell ringers: a change of vision with a future

Francesc Llop

This evening, Fran, an anthropologist, gave a brief but profound presentation at a congress focused on bells, their cultural significance, and the role of bell ringers. Fran studied under the same faculty as his mentor, who had a deep connection to the world of bells. His own journey into anthropology was spurred by an overwhelming experience with bells, which revealed their symbolic and cultural significance. Bells, as Fran sees them, are a means of understanding the world—a form of communication that conveys the emotions and values of a community. His speech emphasized the importance of safeguarding the tradition of manual bell ringing, a practice that transcends simple sound and becomes a vital expression of community identity.

The core of Fran's message focused on the need for real protection, rather than mere recognition, of the art of bell ringing. Although bells have gained some recognition—for instance, in 2017, Catalonia declared bells a national festive element, and in 2021, UNESCO included Spanish manual bell ringing in its list of representative cultural practices—Fran argued that such declarations are insufficient. From his perspective, these recognitions do not guarantee the survival of the tradition, as bells are still often perceived as noise rather than music. This misconception is the biggest threat to the tradition today. In many Spanish regions, only a few groups of bell ringers are protected under cultural heritage laws. For instance, there are four groups in Valencia and one in Castilla-La Mancha, which means that most bell-ringing traditions are left vulnerable.

Bells are far more than mere noise; they are the "high music" of communities, capable of transmitting emotions in ways that no other instrument can. Fran expressed frustration that the old knowledge and techniques of bell ringing are at risk of being lost to automation and modern regulations. For example, in Valencia, the city's noise regulations allow bell ringing only between 8 a.m. and 10 p.m., except for the monumental cathedral, where bells are still recognized as part of its heritage. However, even in cases like this, the recognition often focuses on the building rather than the practice of manual bell ringing itself.

Fran delved into the differences between old and new bell ringers, using vivid examples to illustrate the contrast. He shared memories from the 1960s, a time when bell ringing was still a human-powered activity, deeply embedded in community life. He recalled a specific day in 1969, the same day humans landed on the moon, when the bells of the Church of the Holy Cross in Valencia rang for the last time before being automated. At the time, automation was seen as a positive advancement, a sign of modernity. The bell ringers, who had once been integral to the fabric of religious and community life, became obsolete overnight. Fran pointed out that these bell ringers had not only mastered the skill of ringing the bells but also had

deep knowledge of liturgy, time, and space. They were professionals who followed strict rules to organize the rhythms of daily life.

However, by the time automation arrived, the tradition had already begun to degrade. These old bell ringers were the last of their kind, carrying with them knowledge that had been passed down for generations. Fran's fascination with this disappearing world led him to anthropology, where he has spent his career trying to understand and document the cultural significance of these practices. In his research, Fran observed that not only were the techniques and skills of the old bell ringers being lost, but so too was the very rhythm of life that bells had once regulated. Automated bells no longer rang according to the needs of the community; instead, they rang only when programmed.

Fran explained that, contrary to popular belief, bells were not rung the same way across Spain. Different regions had distinct ringing styles, and the recent trend of bell swinging—where the bells are rotated fully—was a relatively modern phenomenon. He provided a historical overview, showing that in many parts of Spain, such as Galicia, Asturias, and Castilla y León, bells were traditionally fixed and did not swing. In other regions, like parts of Catalonia and the Balearic Islands, bell swinging was more common. Fran highlighted that this diversity in bell-ringing traditions reflected the unique cultural identities of each region.

Fran's presentation included various video clips of both old and new bell ringers in action, allowing the audience to see the differences firsthand. One of the clips showed a traditional bell ringer from the 1950s, who followed the old rules and rhythms. Another clip, from just a few weeks ago, depicted modern bell ringers manually ringing the same bells in the same tower, but with a different technique and a different sense of timing. Fran reflected on these differences, noting that while the bells themselves were the same, the people ringing them had changed, and with them, the meaning of the practice had evolved.

In one particularly poignant clip, Fran shared footage from his fieldwork in the early 1980s, when he and his colleague Mari documented the last of the old bell ringers. These men were true musicians, not in the sense of creating melodies, but in their ability to communicate emotions through the bells. One of the key principles they followed was that the bell ringer should never be bored or boring. If the ringer became bored, the audience would lose interest as well. Therefore, the bell ringers introduced subtle variations in their ringing to keep the community engaged, but these variations had to be balanced so as not to disrupt the communication.

Fran's presentation also touched on the global connections of bell ringing, noting that bell traditions in Mexico, for example, share similarities with those in parts of Spain, particularly in areas where the bells are fixed and only the smaller ones are swung. He showed how the act of ringing bells differs across Europe as well, with some traditions focusing on the swinging of the bells and others on the more subtle movement of fixed bells. In France, for example, it is common for the clapper to strike the bell as it swings upward, creating a unique sound that is highly valued in that culture.

Toward the end of his presentation, Fran demonstrated the complexity of traditional bell ringing by showing examples of bell towers with multiple bells, each one producing a different sound. In some cases, bell ringers would use as many as four strings, each connected to a different bell, to create a rich, layered sound. He explained that these complex ringing techniques were used to accompany important events, such as processions or religious ceremonies, rather than simply calling people to mass.

One of the key takeaways from Fran's talk was that bells were not just used for religious purposes. In fact, only about 5% of traditional bell ringing was for calling people to church. The majority of the time, bells were used to mark other significant events in the life of the community, such as funerals, festivals, or even to signal the arrival of important guests. The structure of these ringing patterns was flexible, allowing the bell ringer to extend or shorten the ringing depending on the length of the event. This flexibility was a hallmark of the old bell-ringing traditions, which prioritized communication over strict adherence to a set rhythm or melody.

As Fran concluded his presentation, he returned to the theme of the differences between old and new bell ringers. He noted that new bell ringers, while enthusiastic and skilled, lacked the deep connection to the past that the old bell ringers had. The old bell ringers were part of a living tradition, handed down through generations, while the new bell ringers were reviving a practice that had been largely forgotten. Fran stressed the importance of preserving not only the techniques of bell ringing but also the cultural context in which these techniques were developed. Without this context, the bells lose their meaning and become mere noise once again.

Fran's closing remarks were a call to action: if we do not actively protect and preserve the tradition of manual bell ringing, it will be lost forever. Recognition by UNESCO and other organizations is a step in the right direction, but it is not enough. The real work lies in ensuring that these traditions are passed down to future generations, not just as a technical skill but as a living expression of community identity. Only then can the bells continue to ring, not as noise, but as the music of the people.

The text you shared offers a deep reflection on the changing practice and mentality of bell ringers over time, highlighting the key differences between the "old" and "new" bell ringers. Here is a summary of the main points:

Old vs. New Bell Ringers: The old bell ringers were professional workers who were paid for ringing the bells, and if they weren't paid, they wouldn't ring. Their focus was purely on the job, without deep reflection on cultural identity or the soundscape. In contrast, the new bell ringers are mostly volunteers who ring for free, motivated by the preservation of culture, community, and sound heritage.

Organization of New Bell Ringers: Unlike the old bell ringers, the new ones are organized into cultural associations to promote the conservation of bells and traditional bell ringing. Examples include the first association in Mataró (1900) and others that emerged in the 1980s.

Competitions and Bell Ringers' Gatherings: Over the years, bell-ringing competitions have been held, though they were not always successful because there was usually only one winner, which caused tensions. Later, annual gatherings were established in places like Villaviciosa de Balaguer and Amurrio, where bell ringers meet to play, share experiences, and build community bonds.

The New Educational Approach: Old bell ringers learned by watching and practicing for years before being allowed to ring. Nowadays, formal courses are organized, where apprentices not only learn how to ring but are also taught about the history, liturgy, conservation, and proper techniques. This promotes a deeper and more structured understanding of the tradition.

Restoration and Heritage Management: The new groups of bell ringers not only focus on ringing but also promote the restoration and conservation of bells as cultural heritage. For example, in Agüero, a group of bell ringers raised funds to restore their bells without help from the parish or local government.

The Role of the Internet and Technology: Since 1996, the Internet has played a significant role in sharing and exchanging information about bells and bell ringing. The website "campanas.com" has been key in documenting over 20,000 bells and nearly 300,000 photographs, creating a valuable database for researchers and bell ringers.

The Fundamental Difference: The main contrast between the old and new bell ringers is that the old ones rang for financial necessity, while the new ones do it out of love for tradition and a desire to keep the bell-ringing culture alive. Moreover, the old bell ringers didn't reflect on the cultural or emotional impact of their work, while the new ones are deeply involved in the identity and soundscape of their communities.

Heritage as Legacy: The text criticizes the tourist perception of heritage and emphasizes that heritage should be seen as something that enhances quality of life and should be passed on to future generations. The current bell ringers are aware that their mission is not just to preserve the bells but also to return the knowledge to the community so that it can take pride in its heritage.

In summary, the text emphasizes the evolution of the role of bell ringers, from being simple workers to becoming guardians and promoters of valuable cultural heritage that goes beyond the material and is an essential part of community identity.

Archeology and heritage in istria, croatia

Martina Barada

The realm of archaeology and cultural heritage is a vibrant tapestry that narrates the stories of our past, especially in regions steeped in history like Istria in Croatia. Martina Barada, representing the History and Archaeology Association of Sabrosa, Portugal, delves into this rich narrative, particularly focusing on the municipality of Kanfanar. This area exemplifies the wealth of cultural heritage in Istria, showcasing a blend of historical influences, archaeological significance, and preservation efforts.

Istria, located in the northwest of Croatia, is a picturesque peninsula bordered by Italy, Slovenia, and the Adriatic Sea. Many people often confuse Croatia with neighboring countries, like Ukraine, but Croatia is distinctly different, lying just a stone's throw away from these regions. The geographical positioning of Istria has played a pivotal role in shaping its cultural and historical landscape, influenced by various civilizations over centuries. The region's historical ties to the Roman Empire and later to the Venetian Republic contribute to its rich cultural heritage.

Kanfanar, a small municipality situated in central Istria, comprises around 22 villages with a population of approximately 1,500 residents. It thrives on agriculture and rural tourism, making it an idyllic destination for those interested in exploring its archaeological sites and historical monuments. This municipality is particularly noteworthy due to its commitment to preserving intangible cultural heritage, including traditional singing, which has gained UNESCO recognition, as well as revitalizing local livestock breeds. Martina's presentation highlighted several key sites in Kanfanar that encapsulate its historical and archaeological significance:

Dating back to the 10th century, the Church of Saint Agatha is a prime example of Romanesque architecture, featuring a single nave and a polygonal exterior. Inside, visitors can admire medieval frescoes that depict religious iconography, including scenes of Christ and various saints. Restoration efforts have been made to preserve both the church and its artwork, underscoring the community's dedication to heritage conservation.

This simple yet charming 14th-century church is set in the countryside and boasts well-preserved frescoes. The artwork, attributed to a 15th-century master known for his vibrant use of color, showcases significant biblical narratives. The church serves as a testament to the artistic heritage of the region, highlighting the unique styles and influences of different periods.

This Gothic church features elaborate frescoes from the late 15th century. The iconography within the church is rich and diverse, with depictions of saints and scenes from the lives of the Virgin Mary and Jesus. The wooden sculpture of the Virgin and Child is a notable work of art from the Renaissance era, illustrating the high quality of craftsmanship prevalent during this period.

Dvigrad is perhaps the most significant archaeological site in the region, once a flourishing medieval town. Its ruins sit atop a hill, offering panoramic views of the surrounding landscape. Dvigrad was abandoned in the 17th century, but it remains a focal point for archaeological studies. The site reflects the complexities of urban life during the Middle Ages and is the subject of ongoing research and preservation efforts.

One of the key themes of Martina's presentation was the importance of preserving cultural heritage in Istria. This involves not only protecting physical structures but also revitalizing and maintaining intangible traditions, such as local music and craftsmanship. The community's involvement in heritage projects is vital for fostering a sense of identity and continuity among residents.

Each year, archaeologists conduct excavations in the Istrian region of Croatia, uncovering layers of history that date back thousands of years. The archaeological site in focus is a settlement with continuous habitation since the 10th century BCE, linked to a group known as the Histri. The name of the region, Istria, is derived from this ancient people. This presentation, led by Martina Barada, highlights significant archaeological findings and the broader cultural heritage of Istria.

The arrival of the Histri in the Istrian peninsula marked a substantial cultural shift. This period coincided with the onset of the Iron Age, which is characterized by advancements in metallurgy and changes in social structures. Archaeological evidence indicates that this era began in Istria around the 10th century BCE. The artifacts and structures unearthed from this period provide insight into the daily lives, beliefs, and societal organization of the Histri.

The archaeological site encompasses a well-preserved ancient town with a complex layout featuring two rows of walls—an outer and an inner wall—along with three towers and three gates that allow access to the town's center. The town's structure indicates strategic planning and reflects the societal dynamics of the time. The layout suggests not only defensive capabilities but also the importance of public and communal spaces.

The defensive walls, remnants from various periods ranging from the 11th to the 15th century, showcase architectural techniques and military strategies. Each gate serves as an entry point into the urban center, symbolizing the town's historical significance.

Excavations have revealed remnants of the town's municipal building, located in the western part of the central square. This structure includes a storage area, illustrating the administrative and economic activities that took place within the town.

The Church of Santa Sofia has undergone several phases of construction, with the oldest dating back to the late 5th century and the most recent to the 14th century. This church represents the religious and architectural evolution of the area. Its design, primarily Romanesque, reflects the spiritual life of the inhabitants.

The interior of the church is adorned with a pulpit, which was originally located in the Church of Santa Sofia but has been relocated to the parish church of Kanfanar. This pulpit, a high-quality artifact from the late 14th century, features intricate representations of Santa Sofia, who is the patron saint of the town.

Another significant finding includes the remains of a public mill, equipped with a communal oven. This discovery illustrates the communal lifestyle and agricultural practices of the people living in this region. The mill represents not just a means of food production but also a social gathering place for residents.

Despite the rich archaeological findings, the site faces challenges. While the state owns the land and supports excavation projects financially, there is a lack of proper management and oversight. The site is open to the public, which, while promoting access, also poses risks of damage and degradation due to uncontrolled visitor access.

Martina emphasized the need for a formal agreement between the municipality and the state to ensure better management and preservation of the archaeological site. Such an arrangement could involve creating a scientific center that brings together experts from various fields—archaeology, history, architecture, and conservation—to collaborate on preservation efforts and further research.

In addition to its archaeological significance, Istria is rich in intangible cultural heritage. One of the key traditions is the region's unique musical scale, which consists of six tones rather than the standard eight-tone scale commonly used in Western music. This distinctive musical tradition is characterized by two-part singing accompanied by traditional instruments, creating a unique sound reflective of Istrian culture.

Traditional instruments like the rog (a type of horn) and mig (similar to a bagpipe) are integral to Istrian music. These instruments have historical roots in the region and are often depicted in frescoes, linking the musical tradition to the visual arts of the area.

Another vital aspect of Istrian cultural heritage is the revival of the Boskarin, a traditional breed of oxen that was on the brink of extinction. The Boskarin has significant cultural and practical importance, having historically been used for labor and as a food source. With support from the municipality and various projects, efforts have been made to revitalize this breed, which is now recognized as a symbol of Istrian culture.

The Boskarin can grow to an impressive size, reaching heights of up to one meter and weighing around one ton. The municipality of Kanfanar organizes fairs that celebrate this breed, showcasing traditional methods of working with the Boskarin and promoting the cultural practices associated with its husbandry.

Martina expressed hope for future collaborative projects, including a conference that would bring together various stakeholders to discuss and promote the region's

archaeological and cultural heritage. Such initiatives could foster a greater understanding and appreciation of Istrian heritage, both locally and internationally.

Moreover, the importance of community engagement in preserving cultural traditions cannot be overstated. By involving local residents in heritage projects, there is potential to strengthen community identity and pride, ensuring that these traditions are passed down to future generations.

The archaeological excavations and cultural heritage initiatives in Istria, particularly in the municipality of Kanfanar, represent a significant intersection of history, community, and identity. The discoveries at the site, from ancient walls and municipal buildings to the Church of Santa Sofia, provide invaluable insights into the region's past. Additionally, the preservation of intangible cultural heritage, such as traditional music and livestock, highlights the richness of Istrian culture.

As the region continues to navigate the challenges of heritage preservation, the collaborative efforts of archaeologists, historians, local communities, and government entities will be crucial in ensuring that the stories of Istria are not only remembered but celebrated for generations to come. By investing in both the tangible and intangible aspects of heritage, Istria can sustain its cultural legacy and foster a deeper connection to its historical roots.

Historical maps, gis and multidimensional digitization of water anthropization in the Alto Douro Wine Region

Gerardo Vidal Gonçalves

Dina Borges Pereira

The presentation discusses the vital role of water in daily life and its relationship with climate change, global warming, fishing, and river management. The speaker emphasizes that the significance of water is inversely proportional to the investment in studying human interactions with it. While water is essential for life and the environment, comprehensive studies about its management and historical significance, such as the construction of aqueducts, wells, and water mills, are lacking.

The discussion points to the lack of relevant cartographic data on water resources and hydraulic heritage in Portugal. Historical records from the 6th century, particularly the Paroquial Sueborum, are used to establish territorial divisions that relate to water management. The area of focus is Sabrosa and Alijó, marked by rivers such as the Douro, Corgo, Pinhão, and Tua.

The speaker outlines the rich mineral resources of the region but emphasizes that the central theme is water. The importance of creating maps that document historical water structures is highlighted, showing a historical reliance on water sources. Techniques used in military mapping are referenced, along with the necessity of geographic information systems (GIS) to assess and digitize historical cartography accurately.

As the speaker continues, the discussion moves toward modern methods like LiDAR (Light Detection and Ranging), which can penetrate dense vegetation to provide detailed topographic data. This technology could aid in identifying historical water features that may no longer be visible.

In summary, the text underscores the need for a systematic study of historical water resources, emphasizing their importance in heritage and environmental management.

Water is an elemental force, both sustaining life and shaping civilizations. Its importance extends beyond the simple act of drinking; it threads through the fabric of our history, governance, and cultural heritage. Yet, as we march into an era marked by climate change and environmental crisis, the significance of this precious resource has never been more poignant. This chronicle will explore how our understanding of water management has evolved, especially in regions like Sabrosa and Alijó in Portugal.

Water is not just a natural resource; it is the lifeblood of any civilization. Its role in agriculture, industry, and daily sustenance cannot be overstated. From ancient times, communities have been drawn to bodies of water, establishing settlements that would evolve into thriving cities. The rivers and streams flowing through

Sabrosa and Alijó are no exception, serving as vital arteries for trade and sustenance for the populations that have lived alongside them.

However, this relationship with water is complex. As the speaker points out, the significance of water is often overshadowed by our neglect in studying its history and management. A deep-rooted connection exists between humanity and water, yet we frequently fail to recognize this connection's historical depth. This neglect highlights a paradox: the more critical water is to our existence, the less we seem to invest in understanding its heritage.

One of the challenges faced in appreciating the historical significance of water management is the scarcity of relevant cartographic resources. The absence of comprehensive studies documenting water structures—like aqueducts, wells, and watermills—makes it difficult to grasp the full scope of human ingenuity in managing water.

The Paroquial Sueborum, a 6th-century document, serves as a crucial historical record. It details territorial divisions established during the time of the Suevi, a Germanic tribe that settled in the region. This document, which categorizes areas into parishes and ecclesiastical jurisdictions, reflects an early understanding of water management's importance in governance and community organization.

Regions like Sabrosa and Alijó are marked by significant rivers: the Douro, Corgo, Pinhão, and Tua. Each river has its story, shaping the landscape and lives of those who inhabit it. Historical mapping of these waterways reveals not just their geographical significance but also their role in trade, agriculture, and community cohesion.

While the discussion of water is central, the region's mineral wealth—comprising lead, silver, tin, and tungsten—adds another layer to this narrative. Mining has been a critical aspect of the local economy, with historical explorations revealing a rich tapestry of natural resources. Tungsten, in particular, has played a notorious role in the manufacturing of munitions, linking the region's resources to the darker chapters of global conflict.

The complexity of this region is illustrated not just in its geology but also in how these resources intertwine with water management. The extraction of minerals has often come at the cost of environmental degradation, highlighting the need for sustainable practices. As we reflect on these practices, we must consider how historical water management practices can inform contemporary solutions to resource management.

To further understand and document the historical significance of water, we must embrace modern technologies. Geographic Information Systems (GIS) offer powerful tools for mapping and analyzing spatial data. Coupled with historical cartography, GIS can uncover patterns and relationships previously obscured by time.

The advent of LiDAR technology is particularly promising. This method uses laser scanning to produce high-resolution topographic maps, penetrating vegetation to reveal what lies beneath. In regions like Sabrosa and Alijó, where historical water structures may be buried under the earth, LiDAR can unearth these hidden treasures, allowing us to reconstruct a more complete picture of our heritage.

Through GIS and LiDAR, we can create a new narrative around water management. Mapping historical water sources and structures allows us to recognize their significance in sustaining communities. This process of rediscovery not only preserves our heritage but also informs future water management practices in an era of climate uncertainty.

As we reflect on the journey of water through history, we must acknowledge our collective responsibility in managing this precious resource. The importance of water extends beyond the immediate needs of our communities; it is intertwined with our cultural heritage and environmental sustainability.

The work done in regions like Sabrosa and Alijó serves as a reminder that our understanding of water management is not static. It evolves with our growing awareness of environmental challenges and our commitment to preserving heritage. Each well, aqueduct, and riverbank carries a story, a lesson from the past that can guide us toward a sustainable future.

In conclusion, the journey of water is a testament to human ingenuity, resilience, and responsibility. It binds us to our history while guiding us into the future. As we stand at the crossroads of climate change and environmental crisis, let us heed the lessons of our past and commit to a future where water is cherished, studied, and managed sustainably.

This chronicle encapsulates the essence of the original text, exploring the critical themes surrounding water management, historical heritage, and the interplay between human activity and natural resources. It highlights the importance of understanding our relationship with water as we navigate the complexities of modern environmental challenges.

This text appears to be a transcription of a conversation or presentation regarding the preservation and mapping of historical water-related heritage in Vila Real, Portugal. It discusses the importance of maintaining structures like ancient wells, watermills, and bridges, highlighting the need for proper documentation and restoration efforts.

The speaker emphasizes the significance of an old tower in Vila Real, which has a small windmill connected to a water pump. This structure reflects technology from the Industrial Revolution and is seen as a valuable piece of heritage.

There is concern about the deterioration of these historical structures and the importance of taking care of them before they collapse.

The discussion also mentions the use of old maps, military cartography, and how they can be integrated with modern Geographic Information Systems (GIS) to enhance the understanding of the region's historical landscape and water heritage.

Various water structures, including wells and watermills, are noted for their historical significance and agricultural importance, with references to Roman-era wells still being relevant today. The conversation touches on the challenges of georeferencing old maps and the discrepancies that can arise due to the evolution of the landscape over centuries. The text concludes with a mention of ongoing work and the importance of field visits to verify the existence of historical water structures, with an acknowledgment of the potential loss of some sites.

Vila Real, a picturesque town nestled in Portugal's northern landscape, stands as a living testament to the passage of time, where history intertwines with modernity. Among its treasures, one structure captivates the attention of historians and enthusiasts alike—a century-old tower, a remnant of the Industrial Revolution, which still stands proud, adorned with a small windmill that once harnessed the power of nature to pump water from the depths below.

In an era marked by rapid urbanization and technological advancements, the tower's survival is a poignant reminder of the ingenuity of the past. The speaker—a passionate advocate for heritage preservation—shares their hope that the tower will not succumb to the ravages of time. Their voice carries an underlying urgency, echoing the sentiments of many who recognize the importance of safeguarding these historical artifacts before they fade into oblivion.

"Every structure tells a story," they explain, drawing attention to the significance of this ancient tower and its connection to the community's history. It is not merely a relic of bygone days; it is a symbol of the town's resilience and a testament to its agricultural heritage, a heritage intimately linked to the water that flows beneath the surface.

Yet, as the conversation unfolds, it becomes clear that the tower is just one piece of a larger puzzle. The discussion shifts to other water-related heritage structures: wells, bridges, and watermills. Each of these artifacts carries its own narrative, intertwined with the lives of those who relied on them for sustenance and prosperity. The speaker emphasizes the need for thorough documentation and study, particularly regarding the numerous wells that were established during Roman times, many of which still exist today, albeit obscured by the passage of time.

"We must not only preserve these structures but also understand their context," they assert, highlighting the critical role of historical maps in this endeavor. The integration of old cartographic materials with modern Geographic Information Systems (GIS) can illuminate the landscape's transformation over centuries. "Mapping isn't just about locations; it's about uncovering stories," the speaker continues, illustrating how georeferencing old military maps from the 16th and 18th centuries can reveal vital information about the region's historical layout.

However, the process is not without its challenges. As they navigate the complexities of aligning historical data with contemporary geographic coordinates, discrepancies emerge. The speaker acknowledges the distortions inherent in older maps, noting that the precision of military cartography was remarkable for its time, yet the evolution of the land complicates the task at hand. "We may face challenges, but every error is a chance to learn," they conclude, advocating for a meticulous approach to mapping that honors both the past and present.

In the midst of this discussion, the topic of investment in preserving these heritage sites arises. The speaker notes that the restoration of watermills and other structures is crucial for understanding how water was utilized throughout history. Each point on a historical map becomes a node of opportunity, revealing how water was harnessed for agriculture and industry. The conversation reflects a shared commitment to not only documenting these sites but also actively engaging with them, ensuring they remain relevant in contemporary society.

As the dialogue progresses, the significance of fieldwork emerges as a vital aspect of this undertaking. The speaker reflects on their experiences visiting various sites, examining wells and other structures firsthand. "We must verify what exists," they emphasize, recognizing that not all points of interest may still be visible above ground. Some wells may be buried under layers of history, their stories waiting to be uncovered.

The importance of collaboration and community involvement becomes increasingly apparent. As the speaker engages with local historians and enthusiasts, it is evident that the preservation of heritage is a collective responsibility. "We cannot do this alone," they assert, inviting others to join in the effort to safeguard Vila Real's water heritage for future generations. The conversation becomes a rallying cry, calling for action and awareness in a time when so much history is at risk of being forgotten.

In the final moments of the discussion, a sense of hope prevails. The speaker reflects on the progress made thus far and the potential that lies ahead. "We are at the forefront of a movement to reclaim our history," they declare, inspiring a renewed sense of purpose in all those present. The preservation of water heritage in Vila Real is not merely an academic exercise; it is a vital link to the community's identity, an opportunity to honor the past while forging a path toward a sustainable future.

As the meeting concludes, participants are left with a profound understanding of the importance of historical preservation. The ancient tower, the wells, and the watermills are more than just structures; they are vessels of memory, holding the stories of generations past. The commitment to preserving this legacy resonates deeply, a reminder that history is not merely a series of events but a tapestry of lives, intricately woven into the fabric of the present.

In Vila Real, the journey of mapping and preserving water heritage continues, fueled by a shared passion for history and a dedication to ensuring that the past remains alive in the hearts and minds of future generations. As the speaker aptly sums up, "Heritage is not just what we inherit; it's what we choose to preserve." And in this

choice lies the power to connect with the past, honor its lessons, and inspire future generations to carry the torch of heritage forward.

Museology of archives

Miguel Gómez García de Marina

In the heart of Spain, within the autonomous community of Castilla-La Mancha, lies a small yet historically significant town known as Torralba de Calatrava. Situated in the northern part of the Campo de Calatrava and in proximity to the city of Calatrava la Nueva, the town is enveloped by a deep sense of history, shaped by its long-standing connection to the Order of Calatrava. The town's roots and its ongoing narrative are preserved and reflected in the contents of its archives, a treasure trove of historical documents that offer insight into centuries of life, politics, and cultural shifts.

Torralba de Calatrava's location is crucial to understanding its past. It is a place that played a pivotal role during the frontier wars between Christian and Muslim kingdoms during the medieval period. The town was part of the frontier territories between the Christian kingdoms in the north and the Muslim realms to the south, a dynamic that left an indelible mark on the area's development. A key feature of Torralba's historical significance is its connection to the Order of Calatrava, a military order founded in the 12th century under the patronage of King Sancho III of Castile. The Order was central to the Christian Reconquista and held sway over large swathes of territory in the region.

The historical archives of Torralba de Calatrava, while containing documents that stretch far back into the town's history, became formalized during the late Middle Ages, specifically in the 15th century. The origins of these archives were humble, consisting of documents stored in linen bags kept in the homes of scribes and local officials. By the end of the 15th century, these documents began to be organized more formally, stored in wooden chests known as "arcas," which would become a cornerstone of local governance and record-keeping.

Torralba's archives do more than merely store documents; they offer an intimate glimpse into the lives of the town's inhabitants and the broader historical forces that shaped the rural landscapes of Spain. The archive serves as a comprehensive collection of council records, capturing the administrative and political decisions that defined the town's existence. It also reflects the evolving relationship between Torralba and larger political entities, including the kingdom of Castile, the crown, and the church.

This rural dimension is particularly important when we consider modern challenges facing towns like Torralba, namely depopulation. Spain's rural areas have seen a marked decrease in population in recent decades, a trend that threatens the survival of many small towns. In this context, the town's archives are not merely a record of the past but a potential key to its future. By preserving the identity and history of Torralba de Calatrava, the archive becomes a tool for fostering a sense of belonging and connection to the land, which may encourage inhabitants to remain and preserve the town's legacy.

The relationship between Torralba's inhabitants and their archive is critical to understanding the town's cultural continuity. The archive acts as both a repository of memory and an institution that fosters local identity. By making the archive accessible and engaging, local authorities aim to strengthen the bonds between the people and their history. This is not a simple task, especially when archives are often perceived as dark, distant institutions filled with old, obscure documents that seem irrelevant to contemporary life.

However, since the promulgation of Spain's 1978 Constitution, which in Article 44 encourages public institutions to promote access to culture, there has been a growing emphasis on making archives more visible and accessible to the general public. This shift represents a broader trend in Spanish cultural policy towards democratizing access to cultural heritage. The Constitution mandates that public authorities take steps to preserve and promote culture, which has resulted in a reimagining of how institutions like archives function in modern society.

One of the most innovative and creative ways that Torralba's archive has embraced this modern mandate is through the process of "musicalization." This approach, relatively rare in archival practice, seeks to bring the archive to life through the integration of music and other creative forms. But why introduce music into a space typically associated with silence, dusty manuscripts, and quiet contemplation?

The answer lies in the desire to present the archive in a way that is more appealing and engaging to the public. By introducing music, exhibitions, and creative presentations, the archive transforms from a repository of documents into a dynamic cultural space where history, art, and identity can interact. This process of musicalization is designed to make the archive more approachable and to dispel the notion that it is an esoteric institution removed from everyday life.

Torralba's efforts are not an isolated case. Across Spain, other significant archives, such as the Archive of the Indies, the Archive of the Crown of Aragon, and the Archive of Nobility, have also adopted new methods of engagement, including exhibitions and interactive displays. These initiatives are supported by a growing body of literature focused on museum practices and their application to archival collections.

While the musicalization of Torralba's archive is a local initiative, it fits within a broader national movement aimed at redefining the role of archives in modern society. By highlighting the cultural significance of archival documents and promoting their role in shaping local identities, archives become more than just places of preservation; they evolve into spaces for cultural reflection and community engagement.

Preserving and displaying historical documents present significant challenges, especially when it comes to maintaining the balance between public accessibility and conservation. Unlike fine art, which is often displayed in galleries where the focus is on the visual experience, archival documents require a more careful approach due to their fragility. Ensuring that these documents are accessible to the

public without compromising their preservation is a key concern for those managing the archives.

Archival materials are sensitive to environmental factors such as light, humidity, and temperature. In order to protect the documents, curators must take into account a number of technical considerations, such as ensuring that light exposure does not exceed 50 lux and that documents are not displayed for more than three months at a time to prevent damage. Additionally, exhibition cases must be designed with conservation in mind, often using conservation-grade materials like specially treated cardboard for mounting and support.

Despite these challenges, the importance of making archives accessible to the public cannot be overstated. For the residents of Torralba and surrounding areas, the archive represents a vital link to their past. It is through the careful curation and presentation of these documents that the community can engage with its own history in meaningful ways.

The archives of Torralba de Calatrava house a variety of documents that provide a window into the town's past. These include council records, legal documents, and judicial proceedings that capture the day-to-day life of the town's inhabitants. Among the more visually striking documents are those that include illustrations, such as drawings of weapons confiscated during conflicts or detailed sketches of town plans and parish constructions.

One example of a significant document is the architectural plans of the Parish of La Trinidad, drawn by Enrique Egas, one of the most prominent architects in 16th-century Castilla. His signature on the plans adds an additional layer of historical value, linking the town's history with the broader architectural movements of Renaissance Spain.

Additionally, the archive contains richly decorated manuscripts that showcase the artistic talents of the scribes who produced them. These documents, with their ornate calligraphy and intricate designs, serve not only as records of legal or administrative matters but also as works of art in their own right.

In modern times, archives like the one in Torralba serve an increasingly important role in maintaining local identity, especially in rural areas facing depopulation. By fostering a connection between the residents and their heritage, the archive helps to sustain a sense of continuity and belonging that might otherwise be lost as younger generations leave in search of opportunities elsewhere.

The documentation of events such as the near extinction of wolves in the area, recorded in town council records, illustrates how the archive captures both the mundane and the extraordinary aspects of local history. These records allow current residents to understand not only their town's distant past but also its recent changes, offering a sense of place and continuity.

The Torralba de Calatrava archive is more than just a repository of documents; it is a living institution that reflects the ongoing story of a community. Through

innovative approaches like musicalization and careful preservation, the archive becomes a space where history and culture intersect, offering a bridge between the past and the present. As Spain continues to explore ways to make its cultural institutions more accessible, the role of local archives in preserving and promoting regional identities will only grow in importance. For small towns like Torralba, archives are not just places of memory—they are vital tools for sustaining the identity and future of the community.

WS for digitizing historical documents: open-source tools

Gerardo Vidal Gonçalves

Dina Borges Pereira

The presentation addresses the application of digital humanities to preserve historical documentation, using as an example documents related to the community of miners from Sabrosa, in the district of Vila Real, Portugal. Although the documents presented are not extremely old, they have great historical, social, and cultural value for the study of local history, demography, sociology, and labor history. Additionally, the preservation process also includes collecting interviews with members of this community of workers.

Miners faced extremely harsh working conditions, particularly in underground mining. While the focus is on the preserved documentation, there is also recognition of the human stories associated with this profession, which are a vital part of the collective memory of communities like Sabrosa.

Digitizing historical documents is a process that involves converting analog materials into digital formats, thus ensuring their preservation and accessibility. The act of digitizing documents is not new; it has been done for decades, but with technological advances, the process has become more efficient and accessible. Modern digitization tools allow high-resolution images of documents, slides, films, and even monuments to be preserved digitally. Today, with the use of metadata, the search for digitized documents becomes more efficient, allowing information to be quickly and accurately retrieved.

Metadata are invisible descriptions included in digital files that facilitate searching and organizing information. For example, when digitizing a miner's file, such as that of João Fernandes Vaz, the metadata associated with the image (name, age, profession, etc.) make this information searchable online. This makes the research process much faster and more accessible, especially when dealing with large volumes of documents. In the case of the example presented, searching through 3,500 miner records would be very time-consuming without this tool, but with metadata, access to the information is immediate.

The digitization of historical documents also has important implications for the physical preservation of these documents. Documents, such as the miners' records, can deteriorate over time and through constant handling. By digitizing them, access to the information can be made without compromising the physical documents. The original files can be safely stored, and the digitized documents are available for online consultation.

An interesting example of digital preservation is the case of an archive discovered in an old lamp shop in Porto, which was about to be discarded. This archive contained orders and invoices dating from the mid-20th century, documents that provide an overview of Porto's economic and social history at that time. After the Directorate-General for Heritage declined to receive the archive due to lack of space,

researchers decided to digitize the material to ensure its preservation. This example illustrates the importance of digital humanities in saving documents that would otherwise be lost.

The digitization of documents also allows for the creation of virtual exhibitions, using technologies such as augmented reality and holograms to present historical documents in an interactive and engaging way. This approach is particularly effective for attracting younger audiences, who may not have the same interest in physical documents but are drawn to more dynamic digital experiences. Digitization also makes it possible to create real-time graphs, as in the case of the miners' records, where it is possible to generate graphs of age, place of origin, and other statistics without having to resort to spreadsheets like Excel.

Scanning technology has evolved significantly, allowing even smartphones to capture images and documents with sufficient quality for research and preservation. However, for larger projects, specialized equipment such as high-resolution scanners is preferable. These devices can digitize thousands of documents in an hour, making the process highly efficient in terms of time and effort.

Another relevant aspect discussed is the use of optical character recognition (OCR) software, which transforms scanned texts into editable text. This type of software is useful for converting large volumes of printed text into editable digital documents, eliminating the need to manually rewrite everything. "Tesseract," a free OCR software developed by HP, is an example of this. It can be used to convert texts from scanned documents into editable formats, such as Word files. However, handwriting recognition still presents greater challenges, though it has also improved in recent years.

Finally, the issue of copyright and the legal limitations associated with the use of digitized historical documents was discussed. Depending on the type of document and its creation date, there may be restrictions on its reproduction and use in academic or public works.

In conclusion, digital humanities, through tools such as document digitization and the use of metadata, have transformed the way we preserve and access historical documentation. They facilitate research, preserve cultural heritage, and make history accessible to a wider audience, all while ensuring that valuable documents are protected from physical deterioration. Moreover, they open new possibilities for interdisciplinary study, such as the demographic and sociological analysis of historical communities. This is a growing field that combines the importance of historical memory with the advantages of modern technologies, promoting a richer and more accessible interaction with the past.

The excerpt describes a document digitization process using software that allows files to be exported in various formats, such as PDF, JPEG, and Word. The main advantage mentioned is the ability to frame and digitize documents practically, facilitating their use in exhibitions or for other purposes.

The user explains that it is possible to export digitized documents with or without text recognition, and that this process can also be carried out using ultraviolet light to identify alterations or corrections in old documents. Additionally, it mentions the option to upload files to Google Drive and edit the content in Google Docs, with the ability to automatically recognize text and organize it into fields, which facilitates handling in programs like Excel.

There is also an experiment of trying to digitize a contract written in cursive and checking if the software can recognize the signature and other details. The goal is to demonstrate the efficiency of the digitization process, even with complex and old documents, such as miners' work contracts.

Finally, the excerpt highlights the efficiency of the software, even though there may be small errors, and the speed of digitizing large volumes of documents by photographing them and organizing them into editable text.

RIO: A living laboratory for the generation of new data, tools and methods to better understand european rurality

Maria Isabel Doval

Breixo Martíns

The project described in the text highlights an interdisciplinary effort coordinated by the University of Vigo, Spain, to promote the development of the rural environment in the province of Ourense, in collaboration with various other institutions and countries. This project is part of a large European initiative called “Granular,” which aims to gather new data and solutions for revitalizing rural areas across Europe. The text emphasizes the importance of initiatives like this, particularly at a time when most public policies and development efforts are focused on urban areas, while rural regions struggle with depopulation, an aging population, and neglect.

The Granular project began to take shape in 2019 when the University of Vigo and the provincial government of Ourense signed the Santo de Sil Manifesto. This document aims to align the policies of the two most important public institutions in the province, creating a synergy to strengthen rural development. The main goal is to transform the province of Ourense into a “laboratory for experimentation,” where various pilots and innovative projects can be tested with the aim of improving the lives of people and the environment in rural areas.

The central idea of this effort is that by turning Ourense into a laboratory for rural development, best practices that emerge can be replicated in other rural regions of Europe facing similar challenges. Thus, the project seeks not only to improve conditions in the province but also to provide concrete examples of solutions that can be applied to other European rural areas.

According to the text, 80% of Europe’s territory is made up of rural areas, where about 30% of the population lives. However, public policies and strategic plans within the European Union have been largely focused on urban areas. This means that over the years, the specific needs of rural regions have been overlooked or inadequately addressed by adapting urban models that do not consider the unique characteristics of rural areas.

For example, the urban agenda has been well established for many years, but the rural agenda is still in its early stages. Meanwhile, the 2030 Agenda, with its Sustainable Development Goals (SDGs), was clearly designed for large urban centers, with little clear guidance for small and isolated rural areas. This gap in public policy has left rural areas without the necessary tools to tackle demographic, environmental, and social challenges that are unique to these regions.

The COVID-19 pandemic represented a turning point for rural areas. On one hand, the crisis exposed the fragility of these regions, both in terms of public services and infrastructure. On the other hand, the pandemic created an opportunity to reassess

the value of rural areas, as many people sought refuge there due to the low population density and the perception that they were safer than large cities.

However, the text warns that this opportunity needs to be well utilized. If not properly leveraged, rural regions could suffer even more, running the risk of losing even more population and resources. Therefore, it is essential that public policies are implemented that collaborate with rural inhabitants so that these territories can revitalize and thrive.

The Granular project, funded by the European Union, aims to obtain detailed data on the different types of rurality that make up the European continent. The term “rurality” refers to the diversity of rural contexts across Europe, which vary in terms of geography, culture, economy, and environment. The project is coordinated by an agricultural research institute in Montpellier, France, and involves researchers and professionals from 11 countries, including Spain, France, the UK, Italy, Poland, Sweden, and others.

Data collection in the project is a crucial part. The goal is to gather precise and granular—highly detailed—information about what is happening in these rural areas. Instead of simply adapting existing urban data to the rural context, the project seeks to create a new set of indicators and measurement tools specifically geared toward the needs and characteristics of rural areas.

Granular adopts a multidimensional approach to measuring quality of life in rural areas, taking into account the SDGs and their goals and subgoals. This includes assessing indicators that go beyond traditional ones like GDP or population density. The project also employs innovative and participatory methodologies such as focus groups, human libraries, and tracking maps, in addition to more traditional data collection techniques.

One of the most important components of the project is the creation of a European Rural Observatory. This observatory will serve as a public database, gathering essential information about rural areas in Europe. The collected data will be available to public administrations, businesses, and other interested stakeholders, allowing for the formulation of public policies based on scientific evidence.

The observatory aims to provide data specifically collected in rural areas, rather than adaptations of urban data. This will ensure that the policies developed based on this data are more appropriate and effective for rural areas. The role of artificial intelligence in analyzing large amounts of data is also highlighted in the project, contributing to the extraction of valuable and detailed information.

Within the Granular project, the province of Ourense has been chosen as one of the “Living Labs.” A Living Lab is a space where different actors—researchers, civil society, local agents, and policymakers—work together to test solutions and innovate. Ourense was selected for being considered a strategic territory for Europe, a mirror of what could happen in much of the European rural territory in the coming decades.

The province faces several challenges: one of the largest demographic crises in Europe, with one of the lowest birth rates in Spain, as well as a highly aging population, many of whom are ultracentenarians. The concentration of people over 100 years old in the province is comparable to regions in Japan and India, known as “blue zones,” where longevity is particularly high. However, in Ourense, many of these elderly individuals are exceptionally self-sufficient, giving the province a unique characteristic and resilience capacity.

Beyond demographics, the project also addresses critical issues like megafire fires, which are one of the region’s main problems. The lack of detailed forest mapping and the absence of a complete characterization of biomass make Ourense vulnerable to devastating fires, especially in a context of climate change. Another focus of the Living Lab is the development of digital administration tools adapted to rural needs, such as e-government and e-health, which can play an important role in modernizing rural areas.

One of the main challenges of the project is collecting granular data, meaning highly specific and detailed data. The project aims to go beyond traditional methods like questionnaires and surveys, adopting a more participatory approach. For example, using techniques such as “photo voice” (where the rural inhabitants themselves capture images that illustrate their realities) and tracking maps based on personal conversations allows for a richer collection of qualitative data.

Moreover, the project uses a combination of quantitative and qualitative methodologies, ranging from Big Data analysis to methods more focused on citizen science. This combined approach is necessary to capture the complexity of rural areas and their many dimensions, which are often not adequately represented in traditional statistical data.

The data collected in Ourense and other Living Labs across Europe will be compared and replicated in different “Replication Labs” in countries such as Albania, Finland, Greece, Lithuania, Moldova, and Serbia, among others. This will allow for cross-validation of the solutions tested, ensuring that the best practices developed in one region can be applied to other areas with similar characteristics.

The Granular project has a projected duration of four years, and by the end of that period, it is expected to have produced not only valuable scientific data but also concrete solutions for the challenges faced by European rural areas. The main goal is to contribute to a European rural agenda that, until now, has received less attention than urban issues but is crucial for the future of much of Europe’s territory and population.

The Granular project represents an ambitious and innovative initiative to address the challenges of Europe’s rural environment. By focusing on areas such as demographics, digital administration, and the environment, and by using participatory and citizen science methodologies, it aims to create a new set of tools and public policies tailored to rural realities. The selection of the province of Ourense as one of the Living Labs is a clear example of how territories with unique

characteristics can serve as laboratories for innovation, generating solutions that can be replicated in other parts of Europe.