

FROM THE ARCHAEOLOGICAL MAP OF ITALY TO THE NATIONAL GEOGRAPHICAL ARCHAEOLOGICAL INFORMATION SYSTEM. THE SARDINIAN EXPERIENCE

1. INTRODUCTION

The Office for the Archaeological Map of Italy was established by Royal Decree in 1889. The precious documents collected in those years, which remained unpublished for the failure of the initiative, yet demonstrated a solid methodological approach. In 1926, as an ideal continuation of the Archaeological Map of Italy, Giuseppe Lugli published the first volume of the *Forma Italiae*, the management of which in 1965 passed on to Ferdinando Castagnoli. Subsequently, under the guidance of Paolo Sommella and with the advent of information technology and satellite observing systems (GPS) a “new era” of archaeological mapping began, adjusting the *Forma Italiae* to the latest technological developments and making up the first archaeological Territorial Information System (SIT) in Italy.

By inheriting the methodology of the Archaeological Map of Italy and the experiences within the *Forma Italiae*, and benefitting from the latest technological and computerized innovations, we present, in this context, the creation of the Sardinian “node” of the national computer network dedicated to the collective construction of the Italian archaeological heritage webGIS.

It should be pointed out that this is not the proposal for the creation of another archaeological information system, but a project for the creation of a tool for basic data sharing and identification of the archaeological heritage property directed to institutions and professionals but also dedicated to the general public for the enjoyment of national heritage. The project aims to be a reference point, permanent and continuously updated, for the exchange of information on archaeological heritage, at different levels of detail and on a national and international scale.

2. THE HISTORICAL ORIGINS OF THE ARCHAEOLOGICAL MAP OF ITALY

The need to locate and exhibit monuments has been at the heart of archaeological discipline since its origins. The first humanist “antiquarians” attempted to perform the reproduction of ancient buildings, memory of a time gone by (that hereinafter will be referred to as a “landscape of ruins”: CASTAGNOLI 1993, 5-6).

These first attempts date back to the Fifteenth century and to the interest and sensibilities of scholars such as Poggio Bracciolini and Biondo Flavio, who

applied autopsy criteria to the study of ancient monuments (CASTAGNOLI 1993, 7-13). At the beginning of the Sixteenth century Pope Leo X commissioned a “map of Ancient Rome” from an “illustrious” curator: Raffaello (named *Prefect of Antiquities* in 1515), who was not able to complete this endeavour before his untimely death in 1520 (CASTAGNOLI 1993, 15-44).

Aside from some other attempts, which were for the most part naive, or in any case, disappointing in their final results (such as the work of Fabio Calvo in 1527, *Antiquae Urbis Romae cum regionibus simulachrum*), or unintentionally “archaeological” (such as the *Mappa della Campagna romana al tempo di Paolo III* by Eufrosino della Volpaia in 1547), in Italy it was not until the Eighteenth century and the advent of progress in cartography technique that it was possible to engage in a serious debate about archaeological cartography (CASTAGNOLI 1993, 13-14).

In the middle of the 19th century there was the flourishing of the first truly systematic attempts at archaeological cartography, as found in the work of H. Kiepert (*Formae orbis antiqui*, published in the years 1894-1914) or of A. Nibby and W. Gell (map of *Latium Vetus et regiones conterminae*, 1837-1846). Among the Italian attempts worth of notice is the archaeological map of *Latium* made by Pietro Rosa, in scale 1:20.000, drawn up in the years 1850-1870 and published just a century thereafter (GATTI 1971, 143-145).

The Unification of Italy, and, moreover, the building euphoria resulting from Rome being named capital of Italy, gave renewed impetus to the production of archaeology-themed cartography and already in 1875 the Minister of Public Education Ruggero Bonghi called for the drafting of the *Italian Archaeological Map*. As a result, the Office for the Archaeological Map was established by Royal Decree in 1889. The substantial bulk of material recorded in scale 1:50.000 from 1881 to 1897, carried out by G.F. Gamurrini, A. Cozza, A. Pasqui and R. Mengarelli, was however to remain unpublished until 1972 (AZZENA 2011, 29-31).

In the same years Rodolfo Lanciani – “father” of the *Forma Urbis Romae* (published between 1892 and 1901) – was active, and it was in the years 1878-1885 that the first chair of “Roman Topography” at the Sapienza University of Rome was established (CASTAGNOLI 1993, 55-58). In 1922, as an ideal continuation of the Archaeological Map of Italy, *Terracina e il Circeo* was published by Giuseppe Lugli, who also published in 1926, at last, the first volume of the map *Anxur-Terracina*. Starting from this year, the project took the name *Forma Italiae* (CASTAGNOLI 1993, 75-81). In the years 1926-1965, under the direction of Lugli and in spite of the promising beginnings, only two of the seven volumes of *Forma Italiae* were published.

Starting in 1965, the administration was taken over by Castagnoli, who led the project up until his death in 1987, and it was in these years that twenty-five volumes of the *Forma* were published. Under the direction of Sommella

(1988-1995) and with the advent of computers and satellite imaging (GPS), a “new era” in archaeological cartography had begun. In less than a decade, five additional volumes of the map were to be published.

An overview of the studies, guided by Paola Moscati, at the end of the 1990s (MOSCATI 1998) offers a glance at what had been developed in Italy in terms of computer applications in the field of archaeology and, especially, in the field of archaeological cartography. The large number of projects and experiments that have arisen in the last twenty years has contributed, on the one hand, to the growth of knowledge of the territory and to the development of dedicated computer tools; on the other, it has generated a multitude of “standards”, languages, vocabulary, words and filing apparatuses that are more often than not afflicted with an incurable incompatibility (AZZENA 2009, 169-177).

Nowadays, a census would therefore require a remarkable amount of time and resources, as the projects and research relevant to GIS applications and geospatial archaeology have proliferated greatly among departments and government agencies for the conservation and protection of national heritage. This is, however, an important asset that makes it possible to achieve a truly homogenization of data and a systematic coverage of archaeological cartography along the peninsula.

F.N.

3. FROM INTER-MINISTERIAL COMMITTEES TO SITAN (TERRITORIAL INFORMATION SYSTEM OF NATIONAL ARCHAEOLOGICAL HERITAGE)

In the wake of the complexity highlighted in the previous paragraphs, the Ministry of Cultural Heritage and Activities (MiBAC) and the Ministry of Education, University and Research (MIUR) inquired into the necessity of homogenizing, standardizing and thus fostering dialogue between previous and current systems (or, rather, those currently operating) (SASSATELLI 2011, 99-101). Starting in 2007, two interministerial Committees and a permanent working group were established, and, going above and beyond institutional partitions, they shared the aim of creating a territorial information system that includes the entire archaeological heritage of Italy (AZZENA *et al.* 2013, 41-45).

The “Joint Committee for the Creation of an Archaeological Information System of Italian Cities and their Territories”, instituted pursuant to D.M. (Ministerial Decree) of 16 March 2007 and presided over by Andrea Carandini, has drawn up a final summary (CARANDINI 2008, 199-207) calling for a dual-pronged operational approach: on the one hand, the «adoption of a technological instrument for networking that makes the activities of the committee visible and permanent through the publication of the actions of the territorial offices with regards to research, conservation, management and use of Italian archaeological heritage on a webGIS portal», and, on the

other, «the drawing up of a document containing inter-operational standards between systems, so as to identify the essential requisites of GIS within the context of archaeology, thus fostering conservation and increased knowledge» (CARANDINI 2008, 200).

The second Committee (“Joint Committee for the Development and Drawing up of a Project for the Creation of a Territory Information System of Italian Archaeological Heritage”, instituted by D.M. 22 December 2009), completed its activities in the first months of 2011; publication of the ministry document disclosing standardized guidelines for production and circulation of archaeological cartography is awaited with great hopes (SASSATELLI 2011, 99-101).

On 30 November 2011, the General Director for Antiquities of MiBACT, Luigi Malnati, convened the “Permanent Joint Committee for the creation of National GIS for Archaeological Heritage”, with the specific task of experimenting with the potentialities of the general SITAN project and its practical application.

In this regard, as a positive outcome the Autonomous Region of Sardinia, through funds set aside by L.R. (Regional Law) of August 7 2007 (“Promotion of Scientific Research and Technological Innovation in Sardinia”), has financed a three-year research project entitled “Creation and activation of the Sardinian node of the national information network for the collective building of webGIS of Italian archaeological heritage”, coordinated by the Chair of Ancient Topography in the Department of Architecture, Design and Urban Planning (DADU) at the University of Sassari (AZZENA, NURRA, PETRUZZI 2013, 53).

F.N.

4. THE SARDINIAN “NODE” OF THE NATIONAL INFORMATION SYSTEM

Sardinia, inasmuch as it is a homogeneous area with specific, yet at the same time, common characteristics in comparison with the national territory, and in virtue of its most recent history of planning, represents a particularly favorable context for the assessment of complex systems, such as SITAN. The early adoption of the Regional Landscape Plan (L.R. 8 of 25 November 2004), the first in Italy to conform to the guidelines of the European Landscape Convention and to the Code of Cultural Heritage, has turned the Sardinia territory into an “experimental case” par excellence. Actually, as concerns coordination among subjects involved in landscape planning and in the conservation of archaeological heritage and standardization and communication of archaeological georeferenced data also on the island we see the same “fragmentation of information” that is all too common throughout the national territory (NURRA, PETRUZZI 2013a).

General Directorates of MiBACT, Superintendences, regions, local entities, universities, and large industries have developed different storage and management systems, structured in GIS with different aims and varying levels of efficiency, but often unable to mutually translate and utilize languages and contents.

The Sardinian “node” of the national SIT network¹ is the logical integration of the national project “WebGIS portal of research, conservation, management and fruition of Italian archaeological heritage”, which prefigures the creation of a network designed to carry out research, conservation, infrastructural planning and design dedicated to national archaeological heritage (GOTTARELLI 2011, 103-105), and aims to become a permanent and continuously updated point of reference for the exchange of information on archaeological property heritage, with multiple layers of detail and on a national and international scale.

The experimentation is focused on the generalization and unification of basic archaeological information through the creation of SITAN, in collaboration with other subjects that make up the Network². It must be highlighted that this is not a proposal for the creation of yet another archaeological GIS, but of a data sharing instrument for identifying the archaeological properties and for the fruition of the archaeological heritage.

Experimental phase began by carrying out a census of the “big producers of archaeological data”. Currently the adjustment of SITAN parameters for archaeological records is going ahead through the analysis of the GIS and data produced in Sardinia according to regional planning policies. Protocols of understanding that are called for and which in some cases have already been activated will make it possible to acquire, standardize and add pre-existing data to the system, so as to experimentally fill up the GIS (Fig. 1).

Experimental phase calls also for the direct verification on the ground of a sample of heterogeneous information and significant elements. The publication of the webGIS will allow stakeholders (governing bodies for the conservation of archaeological heritage, universities, regions, provinces and municipalities) to actually share the results of all previous, present and future actions, through the remote access to databases produced as part of the regional planning.

E.P.

¹ Financed with funds from L.R. 7/07 of the Autonomous Region of Sardinia “Promotion of scientific research and innovation in Sardinia”, call for tender “Call for proposals for basic research projects or for research in high priority sectors” - year 2009.

² The Sardinian “node” – along the lines laid down by directive of the Joint National Committee for the Development and Creation of a Project for the Realization of Territory Information System of Italian Archaeological Heritage (D.M. 22/12/2009; SASSATELLI 2011, 99-101), and in the Committee itself – has developed the system of standardization, concretely experimenting with implementation possibilities.

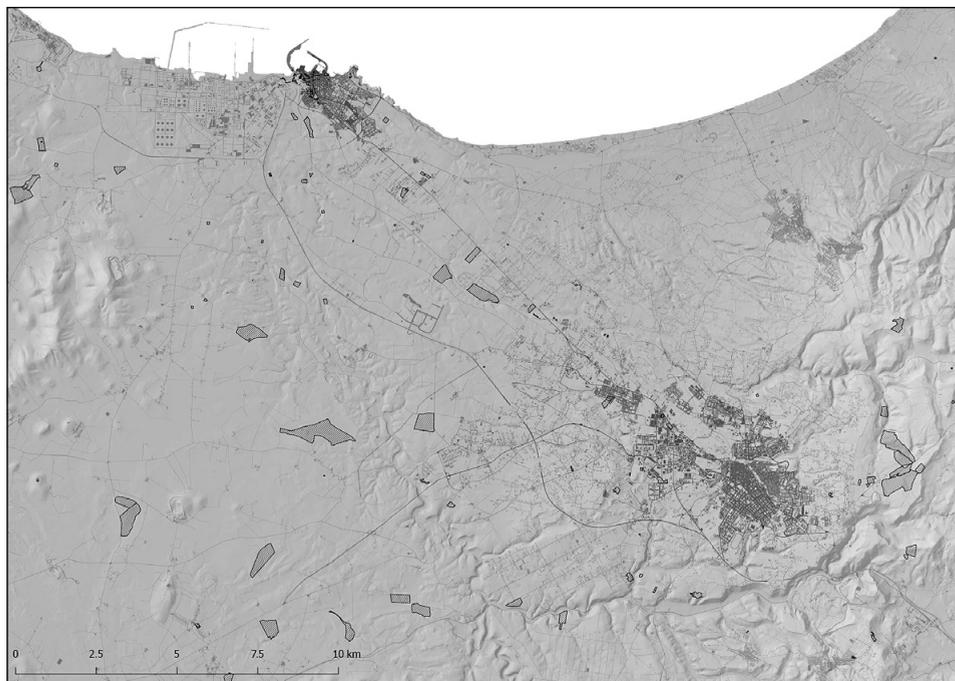


Fig. 1 – Sardinia. Municipalities of Sassari and Porto Torres. Representation of the archaeological constraints on a DEM taken from the SITAN geodatabase (SAR).

5. THE STRUCTURE OF DATA³

The key of the system is the Unique Identifying Code or “CUI”, a self-generating independent code that may be related to all of the possible developments of the platform to which alpha-numeric information, as well as the geometrical apparatus, are associated. Information are represented by a minimum set of obligatory values defined by the “Alphanumeric Label”, i.e. the grade zero of the information extended to all categories and based on the items called for in the Information Module (MODI) as defined by the Italian Istituto Centrale per il Catalogo e la Documentazione (ICCD), and thus the connecting link between SITAN and the MiBACT system of cataloguing and designation of cultural heritage.

Each data set is linked to a metadata apparatus, a sort of an ID card for material extenders of the datum and functional reference in the exploration

³ The structure of the system, which is currently being experimented, was processed by the “Sassatelli Committee” and illustrated in the “Final Committee Report”, in which G. Azzena took part as responsible party for the “Sardinian node”.

of information of each element present in the system. We propose a detailed description of categories of data that will flow into the system:

- Areas of investigation (or Identifiers) are the systems of *identification/primary description*, exclusively area-specific geographical and topographical references that are the minimum level of knowledge, defined as the “Maximum Common Divisor” by the Sassatelli Committee and divided into five categories.
- Generic investigation area (Productive/Unproductive): investigations, dissertations and all kind of research that do not include an archaeological excavation. It is a geometric minimum that may be positive or unproductive.
- Excavation (Productive/Unproductive): all research works including an archaeological excavation. There could be two-dimensional or three-dimensional elements as well as metric values. Those including heights must be expressed as geometric entities⁴.
- Direct/Indirect limits: direct archaeological limitation use designates archaeological areas and parks (cfr. in particular point 81 of the CNIPA-National Computer Center for Public Administration repertoire). Following a protocol of understanding between Archaeological conservation agency of Sardinia and DADU, we proceeded with the experimental data input of the database so as to contribute to the validation of the system.
- Area subject to other limitations: this is a category similar to the previous one, differentiated only by the type of producer of limitation datum. Data processed by territorial planning instruments are to be included in this category.
- Extended sediment: the overlapping of the described levels leads to a complex network of archaeological phenomena and relations among identifiers. A synthesis has been achieved through the “Extended sediment area”.

Within these areas, through a traditional approach to archaeological cartography with discernible topographical elements, the category of archaeological sites – i.e. the minimum unit of archaeological evidence uncovered in the area through autopsy verification or of which there has been bibliographical trace – was entered in the unpublished documentation or in the historical cartography by the Sassatelli Committee.

The Sardinian experiment calls for this level of detail on a regional scale, but we hasten to clarify that, thanks to the work undertaken in collaboration with the government department responsible for Porto Torres monuments and other heritage features, we have a basis of information that allows for the representation of the datum up to the single stratigraphic unit (GOTTARELLI 2011, 103-105) (Fig. 2).

E.P.

⁴ The Areas of Excavation heretofore defined have been found in the urban area of Porto Torres, starting with a previous project: NURRA, PETRUZZI 2013b.

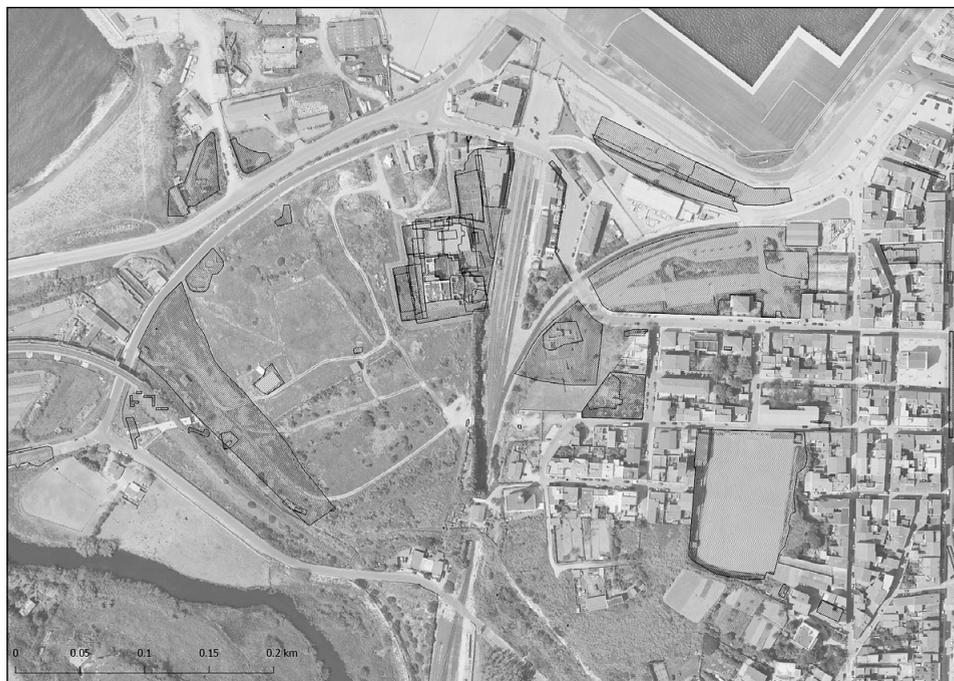


Fig. 2 – Urban area of Porto Torres. Complexity and overlapping of archaeological investigations taken from the SITAN geodatabase.

6. THE BIG PRODUCERS OF DATA AND THE AGREEMENTS

The development of an effective synergy between research entities and conservation entities, the identification through the census of “data producers” in the island and the subsequent activation of protocols of understanding for the exchange of information is a passage of vital importance for the effectiveness of the “Infrastructure of Territorial Data”. The Sardinian Department of Archaeological Heritage and DADU have signed a framework agreement, which outlines in a systematic and organic way the fundamental action guidelines for the fulfillment of the above-mentioned aims, constituting the underpinning document for the involvement of potential institutional, economic and social actors.

The ratification of a common path of understanding between the University of Sassari and the Sardinian Department of Archaeological Heritage, structured for the sharing of methods and instruments for the maintenance and use of archaeological data, is a passage of enormous importance in the prospect of a truly functional journey to the knowledge and conservation of



Fig. 3 – Roman aqueduct in a peripheral area of Sassari - Sardinia. Pressure of craft area on the archaeological constraint. Aerial photography 1968, 1977 and 2008.

Italian archaeological heritage. The details of the agreement, which lays down duties, responsibilities and the legitimate ownership of studies, constitutes an example of best practices of the unification and standardization principles of active experiences on the national territory, through the identification of minimum requisites, vocabulary and codices, to be extended to the greatest number of subjects possible.

The dialogue underway in Sardinia is to be framed as an example and basic platform to start from for setting up operational instruments that are increasingly functional for all entities and administrations involved. The archaeological constraints represent the first category of data with which we started working on, both for the most urgent and practical needs of the archaeological Superintendence and for the complexity of the subject and the great potential of experimentation that this matter allows as related to both technical and administrative aspects of territory management: possibilities for expansion and sharing of knowledge of archaeological heritage, heterogeneity of knowledge at the source of the information, awareness and privacy of data, complexity of legal questions, transformation of land and territory properties (cfr. *infra* § 7).

The strive to achieve European directives regarding digital infrastructures, the adoption of Open Source and Open Format tools, as well as the creation of databases are fundamental parts of the Framework agreement.

The objective, too long put off, for the creation of the Italian Archaeological Map (CASTAGNOLI 1993, 5-81; AZZENA 2001), the first and necessary basis for any activity within the field of archaeological heritage, will be achieved only through the breaking down of all the barriers that until now have caged in the ownership of knowledge, areas of influence and fortresses of competencies, from time to time redefined in more or less tacit strategies whose only victim has been, and continues to be, the Italian national heritage (AZZENA 2004, 191-195) (Fig. 3).

E.P.

7. PROTECTION. COMMUNICATION. RIGHTS

As a tool for the sharing of archaeological data, the SITAN undertakes the serious commitment to spread information, as much as necessary in light of a mono-disciplinary drift of acquirement and management of archaeological data (AZZENA 2004, 195; cfr. also GUZZO 2002, 87 and AZZENA 2009), often oriented to the maintenance of shared memories, but in any case perceived as still and unmovable for the sake of conservation and enhancement.

The ethical goal of the project, aside from the unification and simplification of archaeological information at a national scale (cfr. *supra* § 5), is the sphere of daily life and the heretofore unresolved issues linked to the knowledge of historical processes that have led to the current shape of the places, in comparison to the past, and to the new modes of use of current resources. In the constant contrast between the need to safeguard, keep up and conserve the ancient urban and territorial planning, the SITAN is a great and never-before-seen chance through which the fruits of various studies may be gathered organically within the practices of territorial planning.

Safeguarding, upkeep and conservation seem to be the simple catch-all expression⁵, as well as the alibi of an iron-clad legislation⁶, which continues to be in open and harsh contrast with the logic of profit linked to the exploitation of land, which contributes, as concerns communication, to a

⁵ Starting from the definition supplied by article 2, paragraph 2 of the Code of Cultural and Landscape Heritage, «Cultural heritage are moveable and unmovable properties, that, (...) are of artistic, historical, archaeological, ethno- and anthropologic, archival and bibliographical interest, as well as other things as designated by the law or on the basis of the law such testimonies of value of civilization», until reaching the *rhetoric of the ruin*. For this, cfr. CHOAY 1995; AUGÉ 2004, and SCARROCCIA 2011.

⁶ For the relation between current legislation on archaeological conservation policies cfr. AZZENA 2007 and ULISSE 2009; cfr. also SETTIS 2007, 2010.

marked incomprehensibility of the archaeological datum, thus damaging the very same heritage being protected (AZZENA 2004, 187).

In the specific interpretation of a single monument compared to an area, an archaeological area (Law 431/85) leads immediately to various theoretical and practical uncertainties, especially in relation to the geometry delimiting the area to be safeguarded. The same entity that should preserve things that are almost always functionally dead, whose limit is not a mere cluster of points that draw a line, but, as suggested by Piero ZANINI (1997, 12), “a place where opposing forces face off, often clashing, at times meeting together [...] A band, a frayed area, as large as the relations that surround it from one part to the other”.

Precisely in light of this, the Sardinian “node” attempts to align with the strategic objectives of the regional planning of Sardinia, as an “experimental case” par excellence (AZZENA, NURRA, PETRUZZI 2013, 53). A large – and heretofore unseen – opportunity to unify and standardize specific data, as it has in any case been called for by the very same principles of the Regional Landscape Plan, «identification of the different kinds of typologies, shapes and countless points of view of the Sardinia landscape, represents the key to understand the interaction between naturalness, history and culture of local populations, and has to be considered a fundamental element for development» (PPR, art. 1, Part 1, Title 1).

The Committee has outlined some guidelines for the adoption of communicative, technological and operative strategies of a networking⁷ infrastructure. It has become necessary to have an accurate reflection, currently being analyzed and developed, that imposes particular attention to the technological and operational standards.

Beyond the purely technological aspects, a great deal of attention must be paid to the possibilities and modalities of publication of materials in a network of data. Among the various objectives of SITAN that we propose, there is the actual sharing of data with the interested public stakeholders (conservation entities, universities, regions, provinces, and municipalities) of the results of all the activities aiming to enhance historical knowledge of landscape, published through the upkeep and editing of the webGIS portal.

Furthermore, with an eye to the widest possible diffusion of data and the willingness to be a collector for heterogeneous data formats, we are experimenting with the potentialities of web mapping, through development platforms prepared by large-scale providers, such as Google map engines. This would allow us to give access to geographical historical and archaeological

⁷ Cfr. the final report (yet to be published) of the Joint Committee for the Drawing up of the Project for the Creation of a Territorial Information System of Italian Archaeological Heritage (D.M. 22 December 2009), Chapter 3.

knowledge to an audience as wide as possible using the user friendly feeling now common to most.

The choice to publish some specific kind of data, and their subsequent distribution, will necessarily need to take into consideration current legislation regarding copyright⁸ and *Regulation regarding personal data protection* (D.Lgs. 30 June 2003, n. 196). A reference to some articles of the Italian Code on Privacy with regards to publication, management and distribution of personal data would seem advisable⁹. The wide range of types of writings to be taken into consideration also involves norms regarding protection of author's copyright, which could – in the abstract – limit the possibility of the system and its distribution.

These issues, arising from regulations on copyright and management of personal data, are somehow reflected in the Italian Code of Cultural and Landscape Heritage¹⁰, which, pursuant to articles 106 and 107 (D.Lgs. 22 January 2004, n. 42, Art. 107), imposes specific restrictions on the reproduction and subsequent distribution of national heritage. To this end the operational objectives listed in the agreement between the Entities for the Conservation of Archaeological Heritage in the Province of Sassari, Nuoro, Cagliari and Oristano, appear especially timely and precise.¹¹

The tangible willingness to collaborate, share knowledge and involve each other in the creation of truly interdisciplinary training paths useful for the safeguarding of the territory, seems to be the right road to follow, one that has already been entered into, though with the full awareness that knowledge acquisition is only at the beginning. The simplicity of the entire system in the drawing up and publication of a datum could represent an interpretive step, useful also for involving other specialized competencies, opportunely developed and coordinated (AZZENA 2004, 194). The inherent challenge of

⁸ Law of 22 April 1941, n. 633 “Protezione del diritto d'autore e di altri diritti connessi al suo esercizio” (*Protection of copyright and rights related to its exercise*), with the text of the articles of the law regulating the protection of original works of an artistic nature that belong to the realms of literature, fine arts, architecture, theatre and cinematography, regardless of the ways and means of expression. Again article 1, paragraph 2, regulates the protection of literary works pursuant to the Bern Convention on the protection of literary and artistic works, made executive by the law of 20 June 1978, n. 399, as well as databases that, either for the choice or availability of the material, constitute an intellectual creation of the author.

⁹ In particular, article 4, paragraph 1, letter B: «A personal datum is any information relative to an identifiable or unidentifiable physical person, even indirectly, through reference to any other information, including a personal identification number».

¹⁰ D.Lgs. 22 January 2004, n. 42, Italian Code for Cultural and Landscape Heritage. It is useful to mention the original text of the Code that was amended with decisive and substantial modifications by the proposed amendments of the “New Code” (D.Lgs. 26 March 2008, n. 63).

¹¹ «Realization, putting on line, web administrator and activation of the local publishing office of the portal (technological Web Server GIS) of the Information System of the activities of the territorial centers of research, conservation, management and enjoyment of Sardinian archaeological heritage (“review of census”)...» (cfr. *supra* § 6.).

the SITAN project represents thus an opportunity to give a new reading of the archaeological monument that has been somehow re-absorbed into the project of the territory and become a tool for conservation making possible the utilization of places, as a primary source of development.

R.B.

8. CONCLUSIONS

It would seem evident that the best, not to mention the most urgent, prospects for true advancement along this line of research regards almost any attempt to standardize the enormous amount of data obtained up to the present day owing to a centuries' old tradition of historical and archaeological studies carried out in Italy. The developments of the network, the webGIS, the decentralized implementation, data sharing used for conservation, etc., seems to provide solid support of this option. Widespread and homogeneous knowledge, extended into the national territory, albeit reduced to a mere basic information apparatus linked to a precise geographic location (the famous "archaeological register" that has been sought after since 1875), is, in this sense, an undoubtedly solid basis, which can be used in various directions and with multiple functions.

To mention the most recent – and most debated – turning point with regards to conservation, we cannot help but point out that, also in relation to the procedures of preventive archaeology¹², it is possible to have a knowledge basis upon which to build the necessary detailed research, which is most certainly an important starting point. If, then, we attempt to look also beyond that, so as to be able to see the possibility that each study, each excavation, each urban plan, each census, each individual research project continuously draw from a basis of shared and common knowledge, then we are able to have a positive outlook, which, today, seems neither utopian nor so far off in the future.

G.A.

GIOVANNI AZZENA, ROBERTO BUSONERA, FEDERICO NURRA, ENRICO PETRUZZI

Dipartimento di Architettura, Design e Urbanistica (DADU)

Università degli Studi di Sassari

azzena@uniss.it, rbusonera@uniss.it, fnurra@uniss.it, epetruzzi@uniss.it

¹² D.Lgs. 12 April 2006, n. 163 *Code of public contracts for the supply of services for the implementation for the directives 2004/17/CE and 2004/18/CE*. For further information MALNATI 2005; cfr. also CAMPEOL, PIZZINATO 2007, 273-292.

REFERENCES

- AUGÉ M. 2004, *Rovine e macerie. Il senso del tempo*, Torino, Bollati Boringhieri.
- AZZENA G. 2001, *L'indagine topografica e la cartografia archeologica*, in *Il Mondo dell'Archeologia*, Roma, Istituto della Enciclopedia Italiana Treccani, 149-152.
- AZZENA G. 2004, *Tancas serradas a muros. Tracce di incomunicabilità nel "linguaggio" dell'archeologia, tra tutela, archeologia del paesaggio, e pianificazione territoriale*, in P. MOSCATI (ed.), *New Frontiers of Archaeological Research. Languages, Communication, Information Technology*, «Archeologia e Calcolatori», 15, 185-197.
- AZZENA G. 2007, *Proposte per un glossario: quattro lemmi e un neologismo per l'ambito storico*, «Eddyburg» (<http://archivio.eddyburg.it/article/articleview/9885/0/280/>).
- AZZENA G. 2009, *Punto di non-ritorno (cartografia numerica, sistemi informativi territoriali, analisi spaziale)*, in P. MOSCATI (ed.), *La nascita dell'informatica archeologica. Atti del Convegno internazionale (Roma 2008)*, «Archeologia e Calcolatori», 20, 169-177.
- AZZENA G. 2011, *Una logica prospettiva*, in M. SERLORENZI (ed.), *SITAR Sistema Informativo Territoriale Archeologico di Roma. Atti del I Convegno (Roma 2010)*, Roma, Iuno, 29-39.
- AZZENA G., CAMPANA S., CARAFA P., GOTTARELLI A. 2013, *Il Sistema Informativo Territoriale Archeologico Nazionale – SITAN*, in M. SERLORENZI, I. JOVINE (eds.), *SITAR. Sistema Informativo Territoriale Archeologico di Roma. Potenziale archeologico, pianificazione territoriale e rappresentazione pubblica dei dati. Atti del II Convegno (Roma 2011)*, Roma, Iuno, 41-45.
- AZZENA G., NURRA F., PETRUZZI E. 2013, *Creation and implementation of the Sardinian 'pole' of the National Information Network for the collective construction of WebGIS of Italian Archaeological heritage*, in F. ANICHINI et al. (eds.), *MapPapers 4-2013*, Roma, Edizioni Nuova Cultura, 53.
- CAMPEOL G., PIZZINATO C. 2007, *Metodologia per la valutazione dell'impatto archeologico*, «Archeologia e Calcolatori», 18, 273-292.
- CARANDINI A. 2008, *Archeologia Classica. Vedere il tempo antico con gli occhi del 2000*, Torino, Einaudi.
- CASTAGNOLI F. 1993, *Topografia Antica: un metodo di studio*, Vol. I, Roma, Istituto Poligrafico e Zecca dello Stato.
- CHOAY F. 1995, *L'allegoria del patrimonio*, Roma, Officina.
- GATTI E. 1971, *Il ritrovamento della carta archeologica del Lazio di Pietro Rosa*, «Bullettino della Commissione Archeologica Comunale», 82, 143-145.
- GOTTARELLI A. 2011, *Il progetto Network della ricerca archeologica*, in M. SERLORENZI (ed.), *SITAR Sistema Informativo Archeologico di Roma. Atti del I Convegno (Roma 2010)*, Roma, Iuno, 103-105.
- GUZZO P.G. 2002, *Natura e storia nel territorio e nel paesaggio*, Roma, L'Erma di Bretschneider.
- MALNATI L. 2005, *La verifica preventiva dell'interesse archeologico*, «Aedon. Rivista di arti e diritto on line», 3.
- MOSCATI P. 1998, *GIS applications in Italian archaeology*, in P. MOSCATI (ed.), *Methodological Trends and Future Perspectives in the Application of GIS in Archaeology*, «Archeologia e Calcolatori», 9, 191-263.
- NURRA F., PETRUZZI E. 2013a, *Applicazioni geo-informatiche per la tutela, gestione e valorizzazione del patrimonio archeologico e della storia nel paesaggio*, in *Atti della XVI Conferenza Nazionale della Società Italiana degli Urbanisti (Napoli 2013)*, «Planum, The Journal of Urbanism», 27, 2 (http://www.planum.net/download/atti_xvi_conferenza_nazionale_siu_atelier_3_full_papers).
- NURRA F., PETRUZZI E. 2013b, *Passaggi di scala. Dal contesto urbano al territorio. Geo-informatica per l'individuazione e la tutela del paesaggio storico*, in G. GALEOTTI, M. PAPERINI (eds.), *Città e Territorio, tutela e valorizzazione del paesaggio culturale*, 1, Livorno, Debate, 205-209.

- SASSATELLI G. 2011, *La Seconda Commissione ministeriale per la formazione di un Sistema Informativo Territoriale Archeologico Nazionale*, in M. SERLORENZI (ed.), *SITAR Sistema Informativo Territoriale Archeologico di Roma. Atti del I Convegno (Roma 2010)*, Roma, Iuno, 99-102.
- SCARROCCIA S. (ed.) 2011, *Alois Riegl. Il culto moderno dei monumenti, il suo carattere e i suoi inizi*, Milano, Abscondita.
- SETTIS S. 2007, *Italia S.p.A. L'assalto del patrimonio culturale*, Torino, Einaudi.
- SETTIS S. 2010, *Paesaggio costituzione cemento. La battaglia per l'ambiente contro il degrado civile*, Torino, Einaudi.
- ULISSE F. 2009, *Tutela della cultura e cultura della tutela. Cartografia archeologica e legislazione sui beni culturali in Italia e in Europa*, Bologna, Ante Quem.
- ZANINI P. 1997, *Significati del confine. I limiti naturali, storici, mentali*, Milano, Mondadori.

ABSTRACT

The Office for the Archaeological Map of Italy was established by Royal Decree in 1889. In 1926, as an ideal continuation of the Archaeological Map, the first volume of the *Forma Italiae* was published. Subsequently, with the advent of information technology, a “new era” of archaeological mapping began, adjusting the *Forma Italiae* to the latest technological developments. Inheriting this solid methodological basis, and benefitting from the latest digital innovations, we present the Sardinian “node” of the national archaeological computer network. This is not the proposal for the creation of yet another archaeological information system, but a project for the creation of a tool aimed at data sharing and identification of archaeological heritage property. The project intends to be a point of reference for data exchange on a national and international scale and at different levels of detail.

