What to do with Data?

The application of an Information system for the collection of anthropological and funerary data from archaeological sites.

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Abstract: The General Directorate of Cultural Heritage (DGPC) central administration service with responsibilities of management, salvage, rescue and valorization of cultural heritage assets, has the underlining obligation of maintaining an up to date inventory of archaeological materials. As such the DGPC develops and updates an archaeological heritage information system – Endovélico, ensuring the recommendations upheld by the La Valletta Convention (Malta, 1992). Thus, besides constituting an inventory of heritage records based on archaeological field reports, it works as well as an integrated system, indispensable for the development of national politics for heritage defense and value. Given the high quantity of archaeological reports (from both salvage and research) containing biological and funerary data, a specific recording model was developed as a means to manage and potentiate this information. This way the systematization of this data intends to enable their access to researchers and professionals assuming that the biological heritage is an important resource for the knowledge of Past Populations, their socio-cultural contexts as well as national idiosyncrasies and Humanity itself. This communication aims to present the database along with some associated issues and future strategies for development

Keywords: Bioanthropological data; archaeological populations, Database; Endovélico, Heritage management

Introduction - A state of the art of registry and regulation of archaeological practice

The General-Directorate of Cultural Heritage (DGPC) is a Government service with powers to promote the management, protection and conservation of Portuguese cultural heritage.

In its field of competence, and in accordance with the decree-law 115/2012 of 25[t]h of May, it is within responsibility of the DGPC the implementation and development of an inventory of cultural heritage, as well as the management of existing geo-referenced databases of cultural heritage on national territory.

As an authority responsible for the identification, preservation and transmission of cultural heritage, the DGPC maintains, develops and updates an archaeological heritage database, which not only acts as a national inventory of archaeological sites and occurrences, but also constitutes itself as an important tool for the enforcement of heritage protection and development policies.

This policy has been developed in Portugal since the late '90s of the 20th century, reflecting the recommendations stated in the European Conventions of Heritage Protection and development, i.e. La Valetta Convention, specially focused on Archaeological Heritage, of which Portugal is a member state, ratified by the Portuguese State on the 9th of October of 1997. Further specific legislation was developed

and published, first with the publication of the decree-law n. º 270/99, 15th of July - Regulation of Archaeological Work, now updated by the decree-law n.º 164/2014, of 4th November, and by the Law n. º 107/2001 of 8th September – Basic Law of Cultural Heritage. On the latter, 3 articles refer to the importance of inventory as an instrument of protection and development of cultural assets.

Thus the inventory of archaeological Heritage constitutes itself as one of the first and foremost effective mean of protection of this Heritage, since it operates at the level of prevention in heritage protection.

The Endovélico database was developed in the midst of the auspicious context of heritage policies experienced in Portugal during the late '90s, that resulted from the contagious European spirit of heritage awareness, and also of the impact that the Côa Valley Rock Art site had in Europe and around the world, which brought Portuguese archaeology to the forefront of newspapers worldwide.

The creation of specific legislation enables the mandatory execution of archaeological fieldwork prior to development works of building and construction, infrastructure implementation, large public or private projects, as well as, rural land use or other minor private works that are within areas of archeological sensitivity, and thus are perceived to have a damaging impact on the surrounding heritage, developing a policy of prevention and safeguard through the identification and recording of occurrences. In this aspect the protection of archaeological heritage is based on the principle of registry through identification and recording, as well as on field recording of archaeological work.

Since 1997 archaeological fieldwork in the Portuguese territory has multiplied, consequentially increasing the amount of reporting information (grey literature) that is produced. This can be seen by the number of archaeological works undertaken since 2000 amounts to 19000, of which the most part corresponds to interventions pertaining to heritage rescue and salvage projects.

As such, a great number of information, in the form of reports written by archaeologist, is submitted to the DGPC, which is archived and inputted in the database. The archive of Portuguese archaeology, ran by the DGPC, constitutes the main documental archive of this sort of heritage, containing information dating to the beginning of the 20th century, with the oldest report dated May 1939. The archive has more than 262000 documents, consisting of a majority of field reports, inspections, and technical information, that, in addition to being stored in the database, are also available for consultation at DGPC (fig. 1).

Fig. 1 – DGPC Archives

The Portuguese Archaeological Database: an ever-evolving database and the potential for the recording of anthropological data

For many years, human skeletons had a marginal role in archaeology - (CUNHA, 2002:263)

Endovélico, as the Portuguese national archaeological database, specially developed to gather information on nationwide archaeological records, is optimized and permanently updated at the General-Directorate for Portuguese Cultural Heritage (DGPC)

It works as an efficient and integrated system, ensuring the protection of the archaeological heritage through their recording of inventory and it's association to a GIS software (geographical information system), that is licensed by ESRI, and provides important information, necessary for the strategic planning of land use, for the implementation of mitigating measures, investigation, research, promotion and conservation.

The Endovélico application was developed based on a Oracle Database Server (version 9), an application server and a windows application. This application was developed using Chi Toolkit, a package developed by a Portuguese IT Company Truewind-Chiron, Sistemas de Informação, Lda, that allows for browsing and interaction with the database. The access is given to several users within the DGPC staff and granted in different levels of access, depending on the tasks of each user. The data is organized in digital forms to which an inventory number is assigned and is related to the archaeological site. The database supports the edition of pdf, jpeg and tiff files, as well as the manual input of alphabetic and numeric data.

Of the several optimizations done in Endovélico, special relevance has been given to the data from bioarchaeology, considering that human remains constitute an endless source of scientific and historical knowledge, as well as, an additional complexity in the development and implementation of cultural heritage projects (MACIAS, 2011), with regards to its exhumation, study, preservation, conservation and protection. Up until the late '90s of the 20th century collaboration between archaeologist and anthropologist were sporadic (UMBELINO e SANTOS, 2011; CUNHA 1989). However since Portugal was influenced by the concepts and principles of Field Anthropology and Archaeothanatology of Henri Duday (2006), both of which stress the importance of onsite recovery of information (fig. 2), this collaboration has become increasingly more evident, a fact that is reflected on the current legislation, that upholds that the on field record of human remains, is of utmost importance, regardless of the project or rescue (commercial) archaeology (BRICKLEY,2004).

Currently in Portugal, there isn't of yet a standardized method for the registration in the field, neither at the structure of the form in which the registry is made, nor in terms of the content that is to be recorded – what type of information should be recorded. The diversity of contexts is one of the reasons for the existence of different types of recording forms, which should take into account the nature of the remains (UMBELINO e SANTOS, 2011; CUNHA 1989). This leads to the existence of several types of recording forms, most of which were developed either for a given site/context or for a specific research Project, and also mindful of cost effectiveness (BRICKLEY, 2004). And so, the selection of recording forms to be used on field by the anthropologist has been up to the professional's choice and, only recently, must have the approval of the DGPC. Which has contributed to a great, albeit somewhat controlled, variability in data collection.

Fig. 2 – The Mercado do Peixe site, Torres Novas - the importance on site recovery of information

The Anthropological Module

The main purpose of the Bioanthropology is module is to compile bioarchaeological information that can be used as a source of information for researchers and professionals, stemming from the exhumation, stabilization of conservation and preliminary analyses of the human remains recorded in reports. This information corresponds to a first stage of acknowledgment, with the possibility to be altered, adapted and further developed on the basis of subsequent investigation projects. In this way it becomes possible to aid the research and management of human osteological material from excavation and archaeological contexts thus promoting and enabling their scientific potential.

This is of particular importance since the reburial of human remains from archaeological excavations is practically non-existent, and, as such, it is possible to access the osteological remains at a later date for new

studies according to specific research interests and on the other hand, to spare them from excessive handling or unnecessary manipulation.

Another purpose of this module is to provide both, professionals and heritage management institutions, with auxiliary tool for the identification, preservation and planning of interventions, in projects of urban and territorial planning with an impact on heritage, potentiating the efficiency of cultural heritage management.

The Bioanthropology module is characterized by the ability to record and identify descriptive elements and aspects of funerary behavior, as well as, to record morphological and biological features of the skeletonized remains or other human remains (e.g. cremations) exhumed from archaeological contexts. Thus, for it's development an exhaustive analysis of the data present in the reports has been undertaken, with the intent to insert in the database the information provided concerning field and laboratory work.

The structure of the Bianthropology takes into account three main aspects - the necropolis, the surrounding funerary structures and the human remains themselves. As such, the following data is recorded (figures 3 and 4):

- Chronological scope of the necropolis;
- Description of the necropolis and of funerary context;
- Description of the graves and burial spaces – typology, structure, construction materials;
- Description of mortuary treatment/ funerary ritual –i.e.: position of the inhumation
- Grave goods associated with the burial;
- Location of the deposit or storage;
- Osteobiographic analysis concerning sex and age at death;
- Paleodemography of archaeological populations
- Cardinal orientation of burial depositions
- Additional notes – the is the possibility to include additional remarks of interest, which may fall out of the scope of the above mentioned categories

Some of the key advantages of the Bioanthropological module and its integration within the Endovélico database are:

- The association of the records to their respective archaeological sites, as well as all technical information related to the site e.g.- administrative region, GIS references, associated projects and reports, bibliography, location of deposit, protection status and other information that will allow for an integrated treatment of data;
- The possibility to compare information between different necropolis or sites with important funerary contexts thus enabling comparative studies and analysis;
- The uploading of data is systematically and exhaustively done by an experienced and specialized team at DGPC.

Fig. 3 – Endovelico register form for Bioantrrhropological data

Sitio	CNS	Concelho	Desig. Sepultura	Esqueleto	Sexo	Grupo Etário	Periodos	Elemento Datação
Serra de Carnaxide - Via F	32324	Amadora	sepultura 6 UE 97	Indivíduo 6 UE 101	Masculino	Adulto	Alta Idade Média	Radiocarbono
Pinhel - Travessa/Largo de São M	24606	Pinhel	UE 409	UE 409 Indivíduo 14	sem informação	Adulto	Baixa Idade Média	Espólio associado
Faro - Santa Casa da Misericórdia	33727	Faro	UE:375	Indivíduo 64	Indeterminado	recem-nascido	Indeterminado	Espólio associado
Coimbra - Cemitério Sousa Bastos	18040	Coimbra	Esqueleto 1 (Quadrícula 1,	Esqueleto 1	Feminino	Adulto	Medieval Cristão	Radiocarbono
Coimbra - Cemitério Sousa Bastos	18040	Coimbra	Esqueleto 41 e ossario ass	Esqueleto 41	Masculino	Idoso	Medieval Cristão	Radiocarbono
Mosteiro de Alcobaça	11655	Alcobaça	Enterramento 2	Enterramento 2	Indeterminado	1ª infancia (1 a 6	Medieval Cristão	
Coimbra - Cemitério Sousa Bastos	18040	Coimbra	Esqueleto 44 (Quadricula 2	Esqueleto 44	Masculino	Adulto	Medieval Cristão	Radiocarbono
Almada - Igreja da Misericórdia	2986	Almada	Sepultura 1[78]	Indivíduo 16/[77]	Feminino	Adulto	Moderno	Espólio associado
Ermida do Espírito Santo	21404	Alcobaça	Sondagem 1 UE:012	Indivíduo 3 UE: 012	Indeterminado	2ª infancia (7 a 1	Moderno	Espólio associado
Ermida do Espírito Santo	21404	Alcobaça	Sondagem 2 UE:026	Indivíduo 7 UE:025	Feminino	Idoso	Moderno	Espólio associado
Ermida do Espírito Santo	21404	Alcobaça	Sondagem 1 UE:022	Indivíduo 5 UE:021	Indeterminado	1ª infancia (1 a 6	Moderno	Espólio associado
Minas Romanas de Tresminas	3623	Vila Pouca	Sondagem E	Sondagem E	Indeterminado	Adulto	Romano	Espólio associado
Sitio da Torre	17816	Tavira	Sepultura	Sepultura 1, esqueleto	Masculino	Adulto jovem		

Fig. 4 – An example of search results listing human remains data and corresponding archaeological sites

Since the development of the module, due to existing practical constraints, the input of data has not been systematic and, only in 2014 has there been the possibility to upload data more consistently. At the moment there is information pertaining to 89 necropolis, 1012 burials, 1146 skeletons, corresponding to 111 reports, and more are soon to follow.

At the present moment, despite the module's correspondence to a relatively standardized and uniform structure, the information required by the DGPC for the acceptance of fieldwork reports, is not intended to impose or alter the way professionals and entities register and record information for their own projects and research. Furthermore, it is not the DGPC's aim to, neither diminish or neglect, the importance of additional data, nor to replace completely the fieldwork reports.

Future Perspectives

The development of the database has been on par with the development of both fields, Archaeology and Anthropology, and also with the evolution of Information Technologies (IT), and attempts to balance these areas, as to obtain an effective and efficient recording tool, optimizing search and results, without compromising scientific acumen and accuracy, as well as respecting the specific characteristic of all of them with regards to their specific methods of recording and forms of dissemination.

As such, alongside the uploading of data, a structure analyses, a revision of the module, as well as, the type of information to be recorded is being developed, which aims to answer the following:

- The great diversity of this Heritage, both in chronology and geography;
- The multiplicity of types of recording and treatment of the information, as well as the diverse and often confusing terminology present in the database;
- The dispersion of the location of deposits at a national level;
- The availability of the database and types of access to be granted;
- The selection of information/ What type of information should be collected?– e.g. pathology, morphometric data, field measures;
- The treatment and recording of data from older reports.

Another ongoing project is the creation of a national repository of field and anthropological reports, which presently are not accessible online, to be stored in a ftp server and the link to their location is being added to the oracle database, taking into account, the digital preservation of information ensuring the durability and preventing technological obsolescence, and providing access to a wider number of researchers and professionals.

We envision that all this information will be made available through a web interface, associated with DGPC's website, and as such, may serve a broader community.

Alongside the development of the bioanthropological module, in order to increase the overall efficiency of the anthropological practice in Portugal, there is a project in course for creating guide lines of best practices and recommendations to be used in field work and registry in the anthropological field. Already a first normative document has been produced setting rules and requirements (Circular DGPC n.º 1/2014). Consequently, the application of these new procedures will also affect the type of data that will be inputted in database, which will make the information more objective, concise and scientific, and thus increasing the effectiveness of the database.

In what concerns terminology, project for the creation of a glossary of terms and concepts is also being developed, in partnership with Dr.ª Cristina Cruz, to act as a reference for the recording of data, both in the field and in the database, , which is still in an initial stage of development.

Acknowledgements

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