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Towards a Bureaucratic History of Archaeology. A Preliminary Essay

Summary

This paper shows that the protocols for observing and recording employed by different bureaucratic departments of state administration were fortuitously incorporated into the practices of several disciplines, including archaeology. Circulars or questionnaires, inventories and records, the French model for post-mortem medical examinations, and the protocols used by topographers, pilots, and military engineers moved from bureaucracy to scientific practice. Thus, objects were brought into collections having been formatted by procedures inherited from diverse traditions of state administration, construction, or commercial procedures.

Keywords: Post-mortem medical examinations; archaeological recording; military engineers; instructions; Spanish monarchy; bureaucracy; political curiosity.

Der Aufsatz zeigt, dass in staatlichen Administrationen angewendete Verfahren der Beobachtung und der Aufzeichnung auf zufällige Weise in die Forschungspraktiken verschiedener Wissenschaften eingingen, so auch in die Archäologie. Rundschreiben oder Fragebögen, Bestandslisten und Berichte, das französische Modell medizinischer Post-mortem-Untersuchungen sowie Verfahren, die Topographen, Piloten und Militäringenieure verwendeten, gingen aus der bürokratischen in die wissenschaftliche Praxis über. Die archäologischen Objekte, die in die Sammlungen kamen, waren somit (wissenschaftlich) aufbereitet mittels Verfahren, die ursprünglich für die staatliche Verwaltung, die Konstruktionstechnik oder die Wirtschaft entwickelt worden waren.

Keywords: Medizinische Post-mortem-Untersuchungen; archäologische Aufzeichnung; Militäringenieure; Anleitungen; spanische Monarchie.

This paper originated in the debates resulting from the Workshop "New historiographical approaches to archaeological research" held in Berlin in September 2010. It was also discussed at the workshop "Materiality and Cultural Transfer" (TU-Dresden) and in the framework of the Internationales Kolleg für Kulturtechnikforschung und Medienphilosophie

1 Introduction

In the early 1950s, André Leroi-Gourhan described prehistory as practiced by three kinds of prehistorians: the professionals (*préhistoriens de métier*), the *grands amateurs*, and the *petits amateurs*, the latter being the most abundant group, composed of priests, physicians, university professionals, teachers, workers, boy and girl-scouts, students, and young people in general. Leroi-Gourhan concluded: "Notre milieu de préhistoriens est donc un milieu foncièrement composé d'amateurs dont la formation scientifique est très variable."[1] According to him, professionals and vocational scientists should work together following the instructions set by metropolitan institutions or professional archaeologists. And indeed, Leroi-Gourhan published his seminal work *Les Fouilles préhistoriques* with the explicit goal of providing such a set of instructions. However, as Courbin remarked: "À Pincevent même, A. Leroi-Gourhan a commencé par utiliser les coupes résultant de l'ancienne exploitation de la sablière."[2] Thus, excavation techniques and procedures used in the operation of a quarry have determined what archaeologists could observe and how they were observing, a situation that, far from being unique, can be found in many episodes of the history of archaeology. Subtle drifts, unexpected transfers, and contingencies shape scientific practices.[3] This is one of the reasons that have led historians of science to look for unexpected articulations as a way to understand scientific change.[4] In this framework, the history of procedures and protocols has assumed a central role in a historiography that examines the forces that shape knowledge through technical media and the repetition (or emergence) of the programmed gestures.[5]

Whereas the attempts to standardize scientific observation by instructions has been the subject of research in fields such as botany or anthropology,[6] less attention was paid

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1 Leroi-Gourdan 1950, 1.

2 Courbin 1987, 328, referring to the year 1964.

3 Cf. Coye 1997; Rowley-Conwy 2007.

4 Cf. Rheinberger 1997; Galison 1997.

5 Kittler 1985, see also Blair 2010.

6 Bourguet 1997; Kury 1998; Puccini 1995.

to the impact that the existing expertise, material conditions or the training that 'amateurs' received in other disciplines had on archaeological practices. Far from being "uneducated people," many of them, as Leroi-Gourhan admitted, were actually trained in how to organize facts and data in other fields. Thus, Patrick McCray argues that amateurs or vocational scientist cannot be treated as merely passive collectors of data.[7] Undoubtedly, instructions shaped the way in which they organized data and objects. However, the way in which these instructions related to the collectors' former training and, more importantly, how this training and the existing order of information shaped the professional practices of modern archaeology, if at all, still deserves further research.

Around 1900 archaeologists addressed the crucial role of record keeping as "the absolute dividing line between plundering and scientific work, between a dealer and a scholar."[8] In that sense, objects had to be properly recorded, collected, stored, linked to those recorded facts that give them historical and scientific value; if not, museums would simply be houses of "murdered evidence".[9] In modern archaeology, creating data became a procedure for grouping and locating objects, both in the fabric of excavation and in the repository of artifacts. However, this linkage of things took place 'on the move.'[10] Antiquities and fossils, for instance, were traded and introduced into the circulation of goods by several agents: physicians, priests, military engineers, bureaucrats, consuls, quacks as well as local and traveling experts. All of them, for ordering what they collected, automatically appealed to what they had learnt to do as part of their everyday practices. This commerce shaped the ways of collecting, storing, and classifying objects as well as a new remote scientific space where scientists depended on personal networks that included many local people engaged in other activities, such as colonial bureaucracy, the Church, or medicine. Thus, physicians described objects following their medical observational protocols; military engineers and field workers used theirs to give sense to things or objects not described before.

While for many years this was happening in a contingent but quite performative way,[11] by the late-nineteenth century the bureaucratic system of recording was incorporated into archaeological practices defining the essence of archaeological method.[12] Excavation and recording began to be taught in universities and systematized in handbooks for students and professionals. Around 1900, several handbooks were published presenting the field as a space to be controlled by the archaeologist, who was defined as the ever-present excavation supervisor. Once archaeologists started organizing the professional teaching of field practices, they considered themselves responsible for a task that required an "engineering training of mind and senses" and the "combination of

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7 McCray 2006, 636, see notes 5 and 6 for specific literature on archaeology.

8 Petrie 1904, 48.

9 Cf. Podgorny 2008.

10 Cf. Appadurai 1986.

11 In the sense of Tanner 2008.

12 Petrie 1904.

the scholar and the engineer, the man of languages and the man of physics and mathematics".[13] This was not expressed as an outlook, but reflected something that was already happening: the systematization of the techniques for recording and grouping facts and objects. Archaeological recording combined the descriptive skills of the scholar with the protocols of surveying and legal medicine as well with the methods of book-keeping and accounting, including listing, inventories, and catalogues.[14] Thus, protocols of observation, grouping, and the description of 'what is before the eye' actually originated in state or private administration. Along with these techniques, archaeological data collection methods appear to be connected with the bureaucratic (colonial) system and its instructions on what and how to observe. In order to analyze the emergence of this fundamental relationship between objects and recording, this essay, inspired by the work of Spanish historians of science from the last thirty years and German media historians Wolfgang Schäffner,[15] Bernhard Siegert,[16] and Arndt Brendecke,[17] will first refer to the role of management of information and bureaucracy in the Spanish Empire.[18] Subsequently, three paradigmatic procedures will be taken into consideration in order to show a constellation where bureaucratic practices and manual expertise contributed to make visible new objects from the South American past: 1. military engineering and 2. post-mortem medical examination and 3. land administration and transportation of antiquities.

2 Bureaucracy and media history

Whereas Harold Cook has been analyzing the Dutch experience to study the connections between the rise of global commerce and the development of global science,[19] German media historians Wolfgang Schäffner and Bernhard Siegert have proposed to look at the *Casa de Contratación* (established in Seville in 1503) and the Council of the Indies (1520) as two of the institutions connected with the emergence of modern knowledge and the reliable gathering of "experience" and data.[20] Far from the 'protestant values' and Puritan ethos, beyond the social origins of the members of the Royal Society,[21] Schäffner and Siegert analyzed how bureaucrats and bureaucratic devices that emerged in the Spanish Monarchy shaped a new way of both assessing what reality was and governing what the king would never see with his own eyes. This kind of 'telemathic rep-

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13 Petrie 1904, 3 and 33.

14 See, among others, te Heesen 2005.

15 Schäffner 1999; Schäffner 2001; Schäffner 2002.

16 Siegert 2000; Siegert 2003; Siegert 2006; see also Siegert and Vogl 2003.

17 Brendecke 2009a; Brendecke 2009b; Brendecke 2009c; Brendecke 2010; Brendecke 2011; Brendecke

2012.

18 López Piñero 1979; Pimentel 2003.

19 Cook 2007.

20 Schäffner 2001; Siegert 2003, in particular Part 1, 'Die Große Bürokratie', ch. 'Bürokratie und Kosmographie in Spanien 1569–1600'.

21 Cf. Shapin and Schaffer 1985.

resentation, based on bureaucratic media of transmitting data from the New World to Spain, created new kinds of evidence.[22] Inspired by media philosopher Friedrich Kittler and by the seminal work of the Spanish historian of science, José María López Piñero,[23] Schäffner und Siegert turn functionaries and devices of the *Casa* and the Council – maps, reports, instructions, memoranda – into key actors in the making of modern Europe. Paraphrasing Bernhard Siegert, whereas until the sixteenth century, governance was possible only by the presence of the king, in Spanish America, information media from the Casa de Contratación, namely a space controlling bureaucracy, took the place of the Sovereign.[24] Furthermore, Arndt Brendecke has focused on the Spanish Monarchy in order to understand the crucial relationship between "Empirie-Gebrauch und kolonialer Herrschaft".[25] Thus, in current historiography the rise of modern knowledge is primarily a result of the development of modern commerce as well as the Spanish colonial administration with their procedures and protocols. Brendecke's investigation is founded on two basic premises:

> First, we assume that the process of European expansion had a formative influence on the emergence of the modern European culture of empirical knowledge. Colonial rule intensified the need to produce reliable descriptions of remote realities, hence, to systematically acquire empirical knowledge, to legitimize it by means of standard methods or authorities and to arrange it in such a way that decisions could be made on that basis in Europe. At first this task was performed not by scientists but, in the case of Spain in particular, by royal officials – "bureaucrats," if you will. This leads us to the second assumption, which is that significant elements of the modern culture of empirical knowledge can only be understood in relation to the practices of dominion and administration that took shape during the period of expansion and colonization.[26]

The Casa and the Council, on the other hand, are deeply connected with the expansion of (rag) paper as the reliable medium for recording, transmitting, archiving, and finally

22 Schäffner 1999; Schäffner 2001; Mundy 2000.
23 López Piñero 1979.
24 Siegert 2003, 67–68.
25 Brendecke 2009a.
26 Brendecke 2009a, 12. – Translation by the author. Originally: "Erstens wird davon ausgegangen, dass der Vorgang der europäischen Expansion die Entstehung der modernen empirischen Wissenskultur Europas prägte. Kolonialherrschaft verschärfte die Notwendigkeit, verlässliche Beschreibungen entfernter Wirklichkeiten zu produzieren, also Empirie systematisch zu erfassen, durch feste Methoden oder Instanzen zu autorisieren und so aufzubereiten, dass man auf dieser Basis in Europa Entscheidungen treffen konnte. Diese Aufgaben wurden zunächst nicht von Wissenschaftlern erledigt, sondern, gerade im Falle Spaniens, von königlichen Amtsträgern, von 'Bürokraten', wenn so man will. Es wird deshalb zweitens angenommen, dass signifikante Elemente der modernen empirischen Wissenskultur nur dann zu verstehen sind, wenn man sie in Bezug zu den Herrschafts- und Verwaltungspraktiken stellt, die sich in der Expansions-und Kolonialzeit herausbildeten."

governing of data.[27] In a recent lecture, James Secord has recalled that the history of paper manufacture is generally seen to belong to the mundane history of everyday technology, an approach that diminishes the fact that the circulation of the raw materials of literary production are potentially important elements in achieving knowledge.[28] If knowledge and 'paperwork' went together,[29] this connection was particularly relevant in the realms of the Spanish Monarchy, where paper was established as a medium of distant administration.[30] Knowing and governing was linked to ways of remote witnessing, the creation of reliable forms of transmission of data and experience, and its accumulation and processing in Seville/Cádiz, for many years not only the most important Spanish administrative centers but also the relays of the commerce with the Indies and Genoa, the Atlantic, the Mediterranean, and the Pacific.[31]

In particular, the systematic collecting as well as the making knowledge available to the court and the Council began in the early 1570s, with the creation of the position of the Major Cosmographer-Chronicler of Indies and an ordinance decreeing that every functionary of the Crown in the Americas was committed to the permanent description of those territories.[32] But Brendecke states:

> In structural terms, though, one can say that in an expansive empire, such as that of Spain, knowledge at the center failed to keep pace with the empire's growth. On the contrary: that portion about which the sovereign had immediate and personal information grew ever smaller, the number of mediation processes ever greater. Thus the importance of mediality increased, i. e., of processes of mediation on the part of human agents (officials, visitadores, viceroys) and media (reports, witness statements, geographical maps). In their different ways, they promised to provide access to that which was remote, but they also produced a particular 'mediacy' that cut the sovereign off from direct knowledge of his empire.[33]

27 On the history of expansion of paper in Europe and in the Americas, see Balmaceda 2004; Burns 1981; Calegari 1986; McCrank 1993; Giry 1925; Thiel 1932; also Siegert 2003; Siegert 2006.

28 See Jim Secord, „Darwin on Paper: From Rags to Wood-pulp", Institute's Colloquium, Max Planck Institute for the History of Science (Berlin) on March 18 2014, also in Uppsala on May 25, 2014: http://www.vethist.idehist.uu.se/index.php/seminars/page/60/eng/ (visited on 07/07/2015).

29 Latour 1990.

30 Schäffner 2002; Siegert 2003; Brendecke 2009c.

31 H. Chaunu and P. Chaunu 1955–1960; García Fuentes 1980; García Baquero 1976; Otte 1996; Pike 1962.

32 See Vila Villar, Acosta Rodríguez, and González Ro-

dríguez 2004; Siegert 2003, 85–91.

33 Brendecke 2009a, 17–18. – Translation by the author. Originally: "Strukturell lässt sich aber sagen, dass in einem expansiven Reich, wie dem spanischen, die Kenntnis des Zentrums dem Wachstum des Reiches nicht hinterherkam. Im Gegenteil: Der Anteil, über den der Herrscher unmittelbar und persönlich Bescheid wusste, wurde immer kleiner, die Zahl der Vermittlungsprozesse immer größer. Es gewann also 'Medialität' an Bedeutung, d. h. Verfahren der Vermittlung durch dazwischentretende Personen (Amtsleute, Visitatoren, Vizekönige) und Medien (Gutachten, Zeugenaussagen, Landkarten). Sie versprachen auf je eigene Weise, das Ferne verfügbar zu machen, produzierten aber auch eine

The history of "political curiosity", says Brendecke,

> is full of promises to provide the sovereign with omnividence, a panoptic over-
> view, and to place useful helpers, selfless advisors and perfect media at his dis-
> posal. That it always turns out differently though, that the ruler and his thirst for
> knowledge can never extricate themselves from the political fabric surrounding
> them, is worthy of great attention.[34]

Because the sovereign's contemporaries are aware of the opportunities to bring their
own interests into play: "Already the many intermediaries, the agents of the sovereign's
curiosity, ensure that the king is not fed with information alone but, essentially always,
with interests as well."[35]

What is called "a bureaucratic history of knowledge" here, is a history of the media
that resulted from the intersection of political curiosity and the interest of curious indi-
viduals. It is a history of displacements, a constant back and forth between administrative
practices and bottom-up initiatives; it is a history of encountering the automatisms of
filling out forms with both curiosity and new facts.

This essay refers to a constellation from the Spanish domains after the Bourbon
Reforms of the eighteenth century[36] and to the administrative structures adopted and
transformed after their independence in the early nineteenth century.[37] Whereas the
new independent republics had to create a new administration apparatus, bureaucrats,
bureaucratic writing and forms survive political changes.[38] Bureaucrats continued do-
ing what they used to do, paper forms continue being used until they cease to exist. In
doing so, agents and paper forward these forms they contain or they are used to corre-
spond not only to the new political structures but also to new fields of expertise: former
colonial functionaries or state employees were involved – by chance, duty, or private in-
terest – in the collection of antiquities and fossils. Confronted with unknown realities
– such as the ruins of an ancient city in Chiapas, or the skeleton of an unknown animal

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eigentümliche ‚Mittelbarkeit', die den Herrscher von
unmittelbarer Kenntnis seines Reiches abschnitt."

34 Brendecke 2009a, 18. – Translation by the author.
Originally: "… ist voller Versprechungen, dem
Herrscher Allsicht, einen panoptischen Überblick
zu verschaffen und ihm nützliche Helfer, selbst-
lose Ratgeber und vollkommene Medien an die
Seite zu stellen. Dass es dann dennoch immer an-
ders kommt, dass sich der Herrscher und seine
Wissbegier nie aus dem Gefüge des Politischen,
das sie umgibt, herauslösen können, verdient hohe
Aufmerksamkeit."

35 Brendecke 2009a, 19. – Translation by the author.

Originally: "Schon die vielen Vermittler, die Agen-
ten herrschaftlicher Neugier, sorgten dafür, dass
der König niemals bloß mit Information, sondern
im Grunde immer auch mit Interessen beschickt
wurde."

36 See, for instance, Capel Sáez 1983.

37 The Bourbon Reforms attempted to change the
complex administrative system introduced by the
Habsburgs in Spanish America.

38 See Kafka 2012 on bureaucracy and writing; So-
colow 1987 and Podgorny 2011b on the bureaucrats
in the Rio de la Plata Provinces.

in the Pampas – they did what they were used to doing: they filled or generated descriptions that followed the protocols set in the realm of "political curiosity".[39] In doing so, they introduced forms from state administration to disciplines that were in the making. However, it is worth remarking that far from 'instructions' set by the State, learned societies, or professional bodies, what is at stake here is the problem of how to deal with the unknown and the contingent encounter of forms, media, particular individuals.

3 Military engineering

In the Spanish domains, the ruins of ancient cities were approached in two different ways: as a work of art, to be described by the antiquarians, and as an engineering problem. Engineers were an essential part of the Spanish bureaucratic system. They were also in charge of recording and describing the ruins according to the procedures set by the central administration in Madrid and in the viceroyalties. They used the same matrix and tool for this observation that they did to describe the environment and social life in the Americas:[40] A number of engineers, pilots and officials of the Royal Navy (*Real Armada*) destined for Naples, California, the Chiapas jungle or Asunción in Paraguay, even without 'instructions' knew how to organise the historical and contemporaneous narratives of the territory and its inhabitants according to a matrix incorporated into the work of the Royal Corps. The description of the topographic, physical and moral conditions included an overview of the history of the occupation of the territories of the Americas, the boundaries of the provinces, the layout and quality of the land, climate and winds, waters and rivers, minerals, plants, birds and land mammals, insects and reptiles, inhabitants and a statistical profile of the population. The practices of antiquarians, mathematicians, lawmakers and surveyors came together in those reports, which was useful both for governance and settlement strategies. The visit to the archives – available for consultation only by permission of the king – was combined with field measurements and coordination of local data. A political essay was a summation of practices for collecting and processing data, including details of plants and animals. Their job of analyzing materials from antiquity was no different from their tasks as reporters on contemporary life in the New World. Methods on how to dig, register, draw up plans, and take measurements were problems left to the engineers and surveyors and were not reflected in the antiquarians' publications.

Military engineers in Spain were employed as technicians for military and civil works, which required the skills of drawing façades and ground plans, of measuring elevations as well as knowing arithmetic and practical geometry. In the Academy of

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39 *Sensu* Brendecke 2009a.

40 Podgorny 2007.

Barcelona, for example, engineers were trained in general arithmetic, practical and speculative geometry, calculus of the size of plane figures and bodies, theory of plane table and leveling, drawing, and plotting of plans and profiles.[41] In the Spanish Empire – both in Europe and America – the military engineers, architects and professionals were educated in mathematics and drawing in the military academies and were often called upon to observe and work in the technical description and recovery of ancient ruins. Because of their work in construction, they were also engaged in the discovery of buried antiquities.[42]

The work done in Pompeii, Herculaneum and Stabiae by the military engineers Pierre Bardet (1742–1744), Karl Weber (1750–1763), and Francisco de La Vega (1764–1804) reflects the development of excavation methods from a mere search for antiquities to a process that included the design of plans and interest in architecture.[43] As Parslow has shown, Weber proposed excavating Herculaneum following the lines of the streets and actively pursued investigations of the urban fabric as a whole. His interests extended to both public and private architecture and he showed a concern for the context of his discoveries. He was interested in where the objects were displayed and how they had been meant to be viewed in antiquity, how individual spaces worked, and what architectural clues could be read to determine how architectural units functioned.[44] However, as Mora underlined, one cannot describe the Bourbon excavations as the emergence of a new technique for the study of antiquity.[45] These excavations were not the method for a new archaeological science; they were the common techniques and practices of engineers, architects, topographers, and mining experts.

The military engineers' vision was also determined by 'architectural iconography' and by their training in the rules for ordering and grouping things on maps and in reports. Military and civil engineers, as it is well known, were central to the French expeditions to Egypt and Morea, and also to the new field of prehistory.[46] Although the large-scale excavations of the Vesuvian cities of Pompeii and Herculaneum did not forge a method to be applied to other cities, the survey techniques used there by engineers and surveyors created a parallel history to the philological tradition for the study of antiquity. Engineers, following their contemporary procedures and protocols of description, created a corpus of documents, which referred to the cultural history and life of ancient cities. Hidden by a tradition rooted in the work of Johann Joachim Winckelmann or in philology, the engineers have been as invisible as the remains that were discovered.

41 Capel Sáez 1983, 124.

42 Mora 1998, 90.

43 Parslow 1995; Podgorny 2007.

44 Parslow 1995, 4.

45 Mora 1998, 60.

46 Bourguet et al. 1998; Coye 1997.

4 Post-mortem medical examinations

Among the many agents involved or interested in excavations and the study of ancient human bodies, unrolling of mummies, and prehistoric remains were also physicians and surgeons. Histories of archaeologies and archaeological societies are full of titled medical doctors. However, not much attention has been paid to the practices in dissection and the protocols of post-mortem medical examinations and their connection with the history of archaeological observation. Post-mortem medical examinations and the relationship between doctors and surgeons and the bodies found in public places or the corpses of people who died suddenly, violently, or due to poison or errors in medication has a long history.

The legislation of the French Revolution and the Napoleonic initiatives systematized the knowledge that came from translations of different languages and medical traditions. In this framework, a series of works was published that systematized the procedures for opening cadavers during judicial medical examinations. Out of this grew a fundamental difference between the examination of the corpse's exterior and the general anatomical dissection. The initial examination was no longer limited to just a body lying on a table, but also included the location where the corpse had been found, its proximity to other places, the prints or marks found on the ground, the machines or instruments that could be found there, etc. Thus, the field examination of the corpse began to include the context around it. The record of this examination, from which new judicial evidence would be constructed, included the anatomical description of the body, the relationship between the body parts, measurements, height, birthmarks, size, age, sex, weight, clothing and any other information deemed to be useful. The special dissection of the body parts was preceded by a very detailed observation of the skin, the position of the feet and the state of the hands, with the aim of understanding the situation or attitude in which the subject had died. The general examination of the body was followed by one of the head and a detailed documentation of the ear canals, nasal cavity, neck, thorax, and abdomen.[47]

The principal idea was to omit nothing, avoiding any error that could condemn or free another individual and to get as close as possible to an all-encompassing observation.[48] Unlike the examinations of those who died of illness, where repetition of examination was possible because the causes repeated themselves, the observation of a person who died of violent causes created a unique situation where the circumstances of death were different with each victim and, in a poorly conducted autopsy, one risked removing the traces accidentally. The corpse of a person that had died by unnatural causes was transformed into irreplaceable evidence that would only reveal itself once to the

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47 Chaussier 1816.   48 Chauvaud 2000; Menentau 2004.

observer as an act created by man and with special characteristics in every case. In this sense, judicial observation adopts a similar character to those observations done during a voyage of exploration, precisely because of the experience's unrepeatable nature.

At the same time, the judicial autopsy makes the crime a peculiar, profoundly historical event. The protocols try to document evidence and that, at the same time, will disappear in the very act of observation, which is an unavoidable step in finally authorizing the body's burial. By doing so, the evidence will be contained in the media in which it is documented.[49]

The systematization of the medical observation reports was framed, precisely in this dynamic, as the examinations destroyed the evidence through the visual inspection and the need to register information in order to present the complete evidence to the judge. In the early nineteenth century, a "rapport" was the document written by one or more doctors at the request of the appropriate authority about a particular fact. It aimed to document the evidence together with its context allowing the required conclusions to be drawn by the judiciary or the administration. Given that the life of the citizens depended upon it, the rapport required absolute clarity and discretion. Moreover, the author had to be understood by the magistrates who were unfamiliar with the technical terminology of medicine. When examining a corpse, it was recommended that special attention be paid to the clothing and the location of any objects around the body. If it was necessary to describe the trajectory of a wound caused by a pointed or sharp instrument, attention should be paid to the distribution and relationship between the elements that constituted the evidence.[50]

The protocols for post-mortem medical examinations created the matrix that was used to group details registered in a context of the deposition of corpses, again as part of the judicial evidence. In countries affected by the Napoleonic reforms, such as the nineteenth-century Spanish-American republics, surgeons and physicians were appointed as external experts for the police. These surgeons not only analyzed murdered people: they learned how to register facts that could be connected to the crime or enlighten observers on the circumstances in which it had occurred. As analyzed elsewhere, these judicial archives can help us understand the protocols for describing ruins and fossils that were emerging in the first part of the nineteenth century in the parallels between the practices and routines of medicine and the new prehistoric research.[51] As Jakob Tanner points out, bureaucratic routines and administrative measures had a performing power.[52] Surgeons and physicians used to fill out protocols and reports to describe corpses using the same standards automatically incorporating these

49 Podgorny 2003.

50 Moreau 1827, 455–456: "Rapport".

51 Podgorny 2011a.

52 Tanner 2008.

bureaucratic routines into other domains and including the description of remains from the distant past.

5 Fossils, garbage and mosaics

After their independence, the governments of the new republics from Spanish America recruited various individuals in Europe to compose new technical corps that, upon arrival, found a different situation from what was promised, a circumstance that was to be repeated indefinitely. In the 1820s and 1830s another actor appeared on stage: the consuls of the countries that recognized the existence of the new republics. Great Britain, France, the United States of America and the Kingdom of Sardinia, Savoy and Piedmont sent or appointed their representatives to promote and protect the commercial interests of their countries. The consuls actively collected objects, maps and documents from these territories and rapidly constructed chains of information, linking educated people, in particular compatriot physicians and merchants, who could collect new data from different parts of the territory. All these actors exchanged data and objects in the form of commercial transactions, complimentary gifts or diplomatic gestures. The corpus of documents produced by the Spanish military engineers or the Jesuits' manuscripts, kept as confidential information of the colonial administration would lose this feature in the aftermath of the independence due to the instability of the new governments and the inability to control them. Paradoxically, they would be deemed new discoveries and used as evidence of Spain's veiled intentions for its colonies. The copies of maps and manuscripts were then transformed into a commodity, which, depending on their originality and rarity, could command a high monetary value in Europe. Under these circumstances, the manuscripts were introduced in scholarly circles, in private collections or on editors' tables. The publication, circulation and dissemination of these reports awakened an unusual 'fever' for collecting fossil skeletons, antiquities, and colonial documents that display how scientific and commercial value fed into one another.

For instance, in the Río de la Plata provinces news of these fossils emerged thanks to the chain of information that linked the field with the Buenos Aires landowners ('estancieros'): the dry season revealed a considerable number of skeletons, and the farm labourers reported the remains of dead animals, following instructions regarding hygiene in these rural areas. In 1819, Juan Manuel de Rosas, owner of one of the estancias where huge bones were being found, compiled a series of instructions for the administrators of his extensive estate in the pampas. These instructions defined a hierarchy of observers and emphasized the need for constant observation and the recording of even small events. Every man on the estancia who was able to read and write kept pen and paper at hand to register observations that would be forwarded to his superiors. Even in

the private domain, administration had adopted the forms of remote ruling. Years later, Rosas, as governor of the province between 1829 and 1832, would have an excellent relationship with the British consul, who benefited indirectly from the instructions Rosas gave to estancia administrators to keep an eye on the bones of dead livestock in order to maintain the ranches in clean and proper order.

> Garbage must be deposited in the place selected to dispose of it. In no way should there be scattered bones […] Men should not live surrounded by rubbish. I insist: it is unacceptable for bones and little bones to be scattered everywhere, everything must go to the rubbish dump […] Skeletons of every kind of animal, regardless of their quality, must be gathered in a place devoted to this end. Therefore, there must be no skeletons in the field, all must be collected and brought together for the branding of livestock.[53]

In one of the moves that characterized the configuration of knowledge, procedures relating to the hygiene of rural establishments were fortuitously incorporated into comparative anatomy. In this case, thanks to the diplomatic skills of the British consul in Buenos Aires, the giant bones were transferred from the garbage pit into the anatomists' hands.

With some of these bones, in the late 1830s and after long controversies, Richard Owen in London created the genus *Glyptodon* for an armoured fossil mammal from South America, roughly the same size as a small car.[54] For many years, reports on the fragments of what seemed to be the carapace of a gigantic armadillo had been sent to the collections in Buenos Aires, London, Montevideo, Paris, Rio de Janeiro, and Berlin. When *Glyptodon* was defined as a giant cataphracted mammal in late 1838, no single complete carapace of this animal had been seen in Europe: the shells had been well preserved as a whole while in the earth, but once they were exposed to the air they broke into pieces. Therefore, the new genus was created on the basis of a tooth and a sketch sent in a letter from Buenos Aires[55] and the carapace would only arrive in London several years later as a result of a commercial transaction between a local collector and the Royal College of Surgeons in London. The details of the first successful attempt to ship a shell to Europe display the intricacies of such enterprises and the combinations of skills and knowledge required to ship fossils abroad.

The local provider of bones was Pedro de Angelis (1784–1859), a Neapolitan antiquary, collector of colonial documents, dealer in bones and other vestiges from the South American past.[56] Aware of the interest that fossil bones had for European anatomists, de Angelis invested in fossil collections in order to resell them at good price. He employed local people to search for bones in different localities of Buenos Aires and

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53 Rosas 1908, 28 and 31.
54 Rupke 1994.

55 Podgorny 2013.
56 See Sabor 1995.

bought books from London and Paris. He learnt how to classify what he was gathering in his collections. Furthermore, he developed a technique for preventing the cracking of the glyptodont's carapaces: the moment it was drawn out of the earth, he applied a coat of pitch, resin, and plaster from Paris to the inside of it to prevent its crumbling into pieces and then protected them with sheepskins and ponchos. As he explained, four specimens had to be sacrificed to transmit one and a half and he had to send a great quantity of so called tesserae taken from other individuals for completing a single shell. De Angelis remarked: "The restoration can be affected as is done in the case of separate ancient mosaics. The thickest disks belong to the upper part of the Shell where the rosettes are most marked. They gradually diminish at the edge of the Carapace"[57]. The principal parts were numbered and it sufficed to place the numbers next to each other to re-compose the armor.

The comparison with ancient mosaics was not just a metaphor:[58] it was a clear indication about how to proceed and also of the knowledge and skills employed to preserve the shell. Pedro de Angelis, a former preceptor of Joachim Murat's family in the court of Naples, was well acquainted with the works done in Pompeii, Stabiae and Herculaneum. Murat, as King of Naples, in 1808 had ordered that the floors of the Naples Royal Society be paved with some of the mosaics extracted from the ruins.[59] The transportation of the mosaics to the Accademia Ercolanese and the museums of Portici and Borbonico, had required not only a great deal of work but also to study the ancient techniques employed in mosaic pavements and the creation of devices to remove the mosaics from the ruins. Thus, antiquarians and engineers in charge of this transportation analyzed the mortar and the cement that were used to keep the tiles or square tesserae together by direct observation and by studying the ancient sources. Following Pliny's descriptions, the nineteenth century constructors made use of rubbish, charcoal, sand, and lime well mixed with small cinders. Observations of broken mosaic pavements showed that the natural soil had been filled up with materials such as plaster (in which the tesserae were set), stone pitching, ashes, and residues of burnt matter.[60] At the same time, the reconstruction of the mosaics was done based on the depictions and plans of military engineers in the eighteenth century and those that the Napoleonic commissioners could find in the archives of Naples.[61]

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57 Pedro de Angelis to William Clift, Buenos Aires, August 12 1841, Translation of a letter respecting the *Glyptodon* and *Mylodon* by R. Owen, received November 1841, Natural History Museum Archives, London, LMSS C11 BRN 31229.

58 Whereas a glyptodont's carapace is composed by about 1000 osteoderms, the mosaics discovered in Pompeii in the 1830s had about 7000 pieces per palmo quadrato (around 100,000 per square meter). – Niccolini 1832; Burmeister 1870–1874. I am thankful to Juan Fernícola for his insight on glyptodonts' osteoderms.

59 Milanese 1998.

60 Clarke 1832, 10.

61 Pisapia 2002, 111.

As Maria Stella Pisapia noted, in the 1810s the use of ancient marbles and mosaics to pave modern floors followed not the desire of restoration but the contemporary taste, namely the adaptation of ancient objects to a practical end, i. e. they were recomposed according to the spaces to be paved by adding tesserae from other mosaics or sources of stone tiles.[62] In this very same sense, Pedro de Angelis was trying not to obtain an animal from the past but a "museum specimen," the object that the British museums were urging him to ship. For removing and transporting the carapace he resorted to the same procedures, materials, and techniques used to reconstruct mosaic pavements. In doing so, he made up a new object that brought together the tesserae of different specimens, the skills that artisans used for paving, and the expertise acquired in Naples to transport ancient mosaic patterns from the field to the museum. Furthermore, he translated the Plinian vocabulary that antiquarians used for the mosaic tiles to name the pieces that formed the carapace of the new animal: tesserae. When the bones arrived in London in late 1841, the reconstruction could only be done with the help of those instructions explaining which fragment went with what in order to reconstruct the whole pattern of the bone tesserae.

Many authors have noted the importance of the eighteenth century Bourbon excavations of Pompeii for understanding the kind of questions posed by Spanish and Spanish-American antiquarians.[63] What is less commonly known is the impact that Pompeii had on the creation of South American fossil mammals. Martin Rudwick, however, has noted, the impact of Pompeii on natural history and on Cuvier's research program.[64] Cuvier, in fact, wanted to render his reconstructions of extinct animals authoritative and "to 'revive' these strange animals in the mind's eye – just as the antiquarians tried to bring Pompeii back to life." Rudwick also compared the work of antiquarians with the methods of comparative anatomists by underlining Cuvier's appeal to naturalists to imitate antiquarians methods.[65] Pedro de Angelis had not only met Cuvier when he lived in Paris, he was also aware of Cuvier's research program and, before Cuvier died in 1832, de Angelis corresponded with him and offered to Paris the bones he collected in Buenos Aires. But in the case of de Angelis' transactions, it is clear that the impact of Pompeii on the practices of comparative anatomy followed more complicated pathways and do not directly reflect Cuvier's ideas. As mentioned before, the excavations and survey of Pompeii, rather than transforming the practices of antiquarians, created a constellation that associated the military engineers' bureaucratic procedures with the study of antiquities. In this frame, the archaeological object was connected to the bureaucratic system of colonial administration, shaped by instructions on what and how to observe. Plans, drawings, and measurements made and used by the engineers created

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62 Pisapia 2002.

63 Alcina Franch 1995, Cañizares Esguerra 2002.

64 Rudwick 1997, 34.

65 Rudwick 1997, 35–41; Rudwick 2005, 370.

'portable antiquities' that shaped the coming into being of the archaeological object. In the case of de Angelis and his reconstructions of fossil skeletons, one could say that the animals 'emerged' from engineering recording practices and the artisanal expertise to reconstruct a mosaic pavement.

6 Concluding remarks

In the Río de la Plata Provinces, as throughout the Spanish Empire, the former officials had introduced a system of providing data according to the instructions handed down from the Iberian Peninsula. The bureaucratic practices of the artillerymen, the draughtsmen, scribes, clergymen or surgeons of unknown biography and the papers from transatlantic communications would be responsible for shaping the world governed from Seville, Cádiz and Madrid. Once the colonial tie was broken, a collector's sociability, driven now by private interests, continued working on the basis set by distant administration.

This paper argued that the protocols for observing and recording employed by different bureaucratic departments of state administration contributed to the creation of a matrix that would be fortuitously incorporated into the practices of several disciplines, including archaeology. Circulars or questionnaires, inventories and records, the French model for post-mortem medical examinations, and the protocols used by topographers, pilots, and military engineers would move from bureaucracy to scientific practice. Thus, objects were brought into collections having been formatted by procedures inherited from diverse traditions of state administration, construction, or commercial procedures.

Scientific practices are shaped by the articulation of different agents and cultural spheres. Practices, protocols and procedures used in one field drift into another with such an unperceivable pace that they normally go unnoticed in the routines of everyday scientific life. Public notaries witnessing facts and signatures, surgeons recording post-mortem examinations, military engineers drawing plans, surveyors measuring the landscape, officials answering questionnaires, clerical officers arranging inventories, priests compiling data from their parishes, and traders preparing their catalogues all contributed in some way with their expertise to shape the practices of modern archaeology. In that context, the archaeological object was connected to the bureaucratic system of administration, that moved to archaeology without intention of the actors. These drifts not only traversed disciplines, they also crossed time and space, traditions, and linguistic barriers. In that sense, working on the genesis of these practices requires openness to cross contemporary disciplinary borders and to rethink the geography of knowledge.

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