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Archaeology of Thermalism. New studies on healing waters

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Archaeology of Thermalism. New studies on healing waters

edited by
Maddalena Bassani and Jacopo Tabolli

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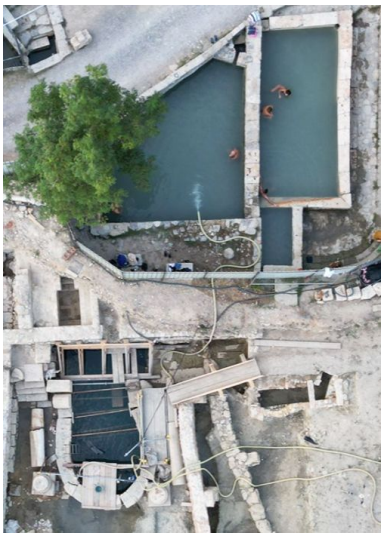
Archaeology of Thermalism. New Studies on Healing Waters

Editorial of Engramma no. 214

Maddalena Bassani and Jacopo Tabolli



Engramma 214 presents the results of a new season of studies focused on the archaeology of thermal sites. Our aim is to promote a polyphonic dialogue between scholars and disciplines, breaking past borders and boundaries. Although the study of ancient thermalism through the last twenty years resulted in an impressive number of monographs, edited volumes and papers published in international peer reviewed journals, we are still missing a consistent update on the various ongoing activities. Therefore, one of the goals is to ensure an annual monographic issue of Engramma dedicated to natural thermalism and in general to the topic of settlement and devotional dynamics related to water between ancient and modern times. Volumes will include the results of specific research, as well as updates on research projects, exhibitions and initiatives aimed at promoting the knowledge on the use, both ancient and contemporary, of this extraordinary natural resource.

The narrative of this first volume merges ancient votive religion with thermal medicine in context and follows a chronological and spatial order. Different papers address the preliminary results of the excavation at Bagno Grande in San Casciano dei Bagni (Italy) (Jean Turfa; Emanuele Mariotti; Edoardo Vanni; Mattia Bischeri). This case study becomes an input to revise past and forgotten excavations in Tuscany (Jacopo Tabolli, Debora Barbagli, Cesare Felici; Marco Pacifici) and to reconsider the votive role of bodies in ancient sanctuaries (Olivier de Cazanove). From Etruscan to Roman, papers discuss places, objects and written evidence (Maddalena Bassani), with a focus on the Euganean area both under the perspective of archaeologists and architects (Maddalena Bassani, Maria Elena De Venanzi) and biologists and medical doctors (Fabrizio Caldara, Antonio Chiappetta, Pietro Scimemi). The article by Silvia González-Soutelo and Laura García-Juan proposes a broad methodological approach to the study of thermo-mineral sites between Antiquity and the present day. In this paper future research developed by the Universidad Autónoma de Madrid is outlined. Back to San Casciano dei Bagni, the last part of the volume presents the encountering of the

thermo-mineral spring of Bagno Grande in the design of the exhibition at the Archaeological National Museum of Naples (Massimo Osanna, Jacopo Tabolli).

From a methodological point of view and integrated approaches to the study and analysis of the thermal phenomenon through the centuries, this special issue was inspired by the three-day workshop that took place on 25-27 September 2023 in Siena, Chianciano Terme and San Casciano dei Bagni, entitled "Etruscologia_Medicina_Terme". This workshop was intended to create a platform of dialogue between archaeology and thermal medicine, as well as among Academic Institutions (University for Foreigners of Siena), Authority for Archaeology (Superintendence of Archaeology, Fine Arts and Landscape for the provinces of Siena, Grosseto and Arezzo), Municipalities (Siena, Chianciano Terme, San Casciano dei Bagni), National Groups (Italian Federation of Spas, Federterme), and Private Associations (Fonteverde Lifestyle and Thermal Retreat and Ebiterme - National Bilateral Body of Spas). Moving beyond the recent archaeological discoveries in the area of Siena, where numerous ancient places of worship have been identified close to the thermal-mineral springs since the Etruscan era, which were also and above all places of medical care and practice, international scholars have presented the results of their research to current medical doctors who are active in the area. The scientific programme promoted by the University for Foreigners of Siena (Unistrasi) has granted funding from the PNRR project "THE - Tuscany Health Ecosystem" Spoke 5: Implementing innovation for healthcare and well-being".

The theme of wellbeing and healing can be primarily physical but can also extend to the spiritual dimension, as it is in fact one of the most significant aspects of the relationship that mankind entered into with water. Water was certainly necessary for daily life and had to be therefore easily available (fountains and public baths were some of the most significant hallmarks of Greek and Roman architecture), but especially when characterised by specific properties, such as curative ones, it had to be reached through long journeys and wanderings. Some of these aspects constituted the core of issue 204 of Engramma in 2023, and from reading the contributions in the new issue of this journal it is possible to foreshadow further areas of investigation for future research. Among these, the practical management of water in public and private contexts appears one of the most important aspects, i.e. the ways in which water use is ensured for sanitary, utilitarian or recreational purposes. Furthermore, it will be interesting to focus on the access routes to the curative springs along secondary routes to the main routes, which remained in use from Antiquity to the Middle Ages and often still in Modern times, to meet the needs of pilgrims and the sick who undertook long or very long journeys of hope, leaving traces of their devotion once they reached their destination. Finally, the study of the settlements around the curative springs will enable us to deepen our knowledge both on strictly medical and therapeutic aspects, also thanks to a comparison between contexts that differ in time and space, and on non-curative aspects, such as the multiplication of productive activities at the service of spa-users throughout the centuries.

Abstract

Engramma 214 presents the results of a new season of studies focused on the archaeology of thermal sites. The narrative of this first volume merges ancient votive religion with thermal medicine in context and follows a chronological and spatial order. Different papers address the preliminary results of the excavation at Bagno Grande in San Casciano dei Bagni (Italy) (Jean Turfa; Emanuele Mariotti; Edoardo Vanni; Mattia Bischeri). This case study becomes an input to revise past and forgotten excavations in Tuscany (Jacopo Tabolli, Debora Barbagli, Cesare Felici; Marco Pacifici) and to reconsider the votive role of bodies in ancient sanctuaries (Olivier de Cazanove). From Etruscan to Roman, papers discuss places, objects and written evidence (Maddalena Bassani), with a focus on the Euganean area both under the perspective of archaeologists and architects (Maddalena Bassani, Maria Elena De Venanzi) and biologists and medical doctors (Fabrizio Caldara, Antonio Chiappetta, Pietro Scimemi). The article by Silvia González-Soutelo and Laura García-Juan proposes a broad methodological approach to the study of thermo-mineral sites between Antiquity and the present day. Back to San Casciano dei Bagni, the last part of the volume presents the encountering of the thermo-mineral spring of Bagno Grande in the design of the exhibition at the Archaeological National Museum of Naples (Massimo Osanna, Jacopo Tabolli).

keywords | Thermalism; San Casciano dei Bagni; Montegrotto Terme; Ancient and Modern Medicine; Greek and Roman Architecture.

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Etruscan Parallels for 'Modern' Medicine?

Jean MacIntosh Turfa

Archaeological, literary and circumstantial evidence of the first millennium BC shows that Etruscan civilization should be credited with distinct advances in many fields, including urbanization, agronomy and technology, and perhaps even pharmacology. At San Casciano dei Bagni the votive sculptures and other objects deposited in the Bagno Grande demonstrate some Etruscan parallels to Roman and modern perceptions of medicine. Some of the attitudes and understanding expressed in the ancient votive contexts betray interests similar to those of modern society. The term "healing cults" is sometimes questioned when it is applied to ancient Italic religion, but the presence of hot springs as well as anatomical votive models surely illustrates the context of health and healing for perhaps 200 or more sites (Turfa 2006). Offerings and inscriptions make it clear that Italic worshippers spent some time here in hopes of healing for physical problems; rich votive deposits demonstrate successful cures in many cases.

With the amazing finds from San Casciano dei Bagni in mind, I offer a few examples from my research into Etruscan health, medicine and worship, to illustrate some seemingly "modern" aspects of the healing cults of the first millennium BC. These include examples of ancient perceptions of particular phenomena, of pathology and environmental influence, and of specific modes of diagnosis and response to medical, occupational or environmental issues.

The juncture of health concerns and daily life can be illustrated by such things as "foot trouble", or the use of dentures. Metallurgy benefited from technological development but this also brought on industrial pollution. The association of human health with environmental factors such as weather would always have been at the fore of perception of the human condition. As society confronted disease and landscape-based treatments like thermal spas, specialized knowledge burgeoned in fields like gynecology and obstretics, and even surgery.

Hazards for the Fashionable: The *Capys* Phenomenon?

Fashion and pop culture today often impinge (whether for good or ill) on health and hygiene, and we see forerunners of the phenomenon in stray remarks preserved by the Greek and Latin authors.

In Antiquity, anomalies of anatomy in animals or humans were to be read as messages from the gods. The Etruscan glosses, a collection of terms noted by Greek and Latin authors, in-

clude some Etruscan versions of the names of birds or beasts. These words were passed down because their subjects were considered vital to the practice of divination.

Some glosses are actually Greek or Latin, not Etruscan, but others are quite genuine. One such curiosity is the word *capys*: "falcon". It was preserved in the poetry of Virgil (*Aeneid* 10.145) and noted by the commentator Servius:

> constat tamen eam a Tuscis conditam de viso falconis augurio, qui Tusca lingua capys dicitur: unde est Capua nominata. Tuscos autem aliquando omnem Italiam subiugasse manifestum est. alii a Tuscis quidem retentam et prius Vulturnum vocatam: Tuscos a Samnitibus exactos Capuam vocasse ob hoc quod hanc quidam Falco condidisset, cui pollices pedum curvi fuerunt quem ad modum falcones aves habent, quos viros Tusci capyas vocarunt.

After presenting some fantastic word-derivations, Servius noted that "Etruscans called *capys* men who had the thumbs of their feet curved, in the manner of falcon birds" (Bonfante, Bonfante 2002, 188 no. 821; Pallottino 1968, 103 no. 821; Cordano 2012, 457-461; Minoja 2012, 463-482). *Capys* is thus the Etruscan term for a man with malformed feet that look like a falcon's curving talons; they are still depicted this way in modern texts on pathological anatomy. No ancient models represent the actual deformity although the condition must have been common knowledge to have inspired the Etruscan terminology.

In regions where people go barefoot, deformities of this type are caused by the use of improper shoes. The striking array of beautiful shoes and boots worn by Etruscan men and women was well known to ancient observers, and is still evident in surviving works of art. The famous Etruscan *tyrrhenika sandalia* – wooden platform – sole sandals with bronze-hinged insteps and iron hobnails – were probably the most hazardous design, yet both genuine versions and knock-offs were popular in Macedonia and throughout Italy (Touloupa 1973; Turfa 2005, 163-165 no. 143 from Vulci). The large quantities of terracotta and bronze model feet in Etruscan and Italic votive deposits from the 4th through 1st centuries BC might indicate a familiarity in those regions with diagnosis and possibly treatment of foot conditions such as this.

Anatomical votive models, intended as thank-offerings after healing, very rarely deliberately depict pathological conditions but instead commemorate healing already achieved. Several sanctuaries have furnished examples of feet, however, that were modeled with bunions, another result of wearing shoes that do not fit correctly (for instance Turfa 2005, 247 no. 275, 3rd-2nd century BC). In the case of bunions, though, we cannot prove that donors intended the models to allude to their own condition: since the molds for the feet were often drawn from living humans many of whom probably lived with bunions and took them for granted.

Dental Appliances: More Fashion Than Medicine

Another fashion that touches on medical conditions is that of women wearing gold-band dental appliances to replace lost or extracted front teeth. It foreshadows traditions in modern dentistry such as "Grillz" popular with rock stars and sports teams and shows that Etruscan

social phenomena could affect health and even drive the development of technology, in this case, metallurgy. Gold bands anchoring replacement front teeth were rare but over 21 examples are known, from the 7th century to late 1st century BC (Turfa, Becker 2019). They were made by goldsmiths, not dentists, however. Virtually all known examples belonged to women and seem to be associated with fashion rather than medicine. I have suggested that, like the prostheses now made for African immigrants to Europe and the UK, they were intended to restore dentition that had been ritually excised or knocked out in the wearer's homeland (Becker, Turfa 2017, 101-110, 134-137). Perhaps some of the prostheses found in Etruscan tombs were worn by wives who had been raised in cultures other than Etruscan, where customs of ritual tooth eversion were practiced for puberty, mourning or other events. In central Italy the tradition of gold-band appliances stimulated metallurgy: the bands are of much purer gold than contemporary jewelry or other objects – the metal had to be softer to be fitted in the woman's mouth. Two examples in the World Museum, Liverpool have been analyzed and found to be nearly 98-99% pure gold – too pure for regular jewelry, and difficult to refine to such a high standard (Becker, Turfa 2017, 210-223 nos. 13-14; Turfa, Muskett 2017, 152-156 nos. J29-J30). The use of gold, of course, would have helped to avoid infection or irritation of the gums, although it may not have been explained in a medical context.

Divination, Health and Safety

The practice of divination is also linked to concepts of health and healing: suffering physically was interpreted as a message from the gods, and the treatment or removal of the affliction was a sign of a suppliant's return to the gods' good graces. Haruspicy, examination of the liver of sacrificed sheep, was another quintessential Etruscan activity. In some instances it offered correct – and useful – predictions about the health of individuals and communities (Turfa, Gettys 2009). There is a good reason why haruspicy worked – scrutinizing the entrails of a slaughtered lamb really can indicate the future health of humans in that area. The parasitic liver fluke, *Fasciola hepatica*, endemic in much of the world, infects sheep by tunneling through their alimentary tract to reach the liver. An infected lamb will for a time look clean and healthy externally, but internally its liver is filled with lesions. Humans who eat the lamb, or eat contaminated plants from infected areas will take several weeks longer to sicken because our upright bipedal posture means the flukes have a longer trip to reach a *human* liver.

Adrian Harrison and E.M. Bartel (Harrison, Bartel 2006) have noted that vermifuges such as chamomile and wormwood are named in some Etruscan literary glosses. Etruria was famous in antiquity as a source of drugs and healing herbs, noted by Theophrastus and Aeschylus. Many of these plants are studied today as potential *materia medica*, including feverfew, gentian, henbane, pimpernel, thyme, valerian and more. The fact that specific Etruscan names for *materia medica* are preserved in Greek or Latin texts may attest to a prior, Etruscan familiarity and formal organization in the use of such knowledge for healing. And the sudden abandonment of habitation sites in some cases might be the result of this sort of divination, as implied by Vitruvius (Vitr. 1.4.9), for istance:

> Maiores enim pecoribus immolatis, quae pascebantur in is locis, quibus aut oppida aut castra stativa constituebantur, inspiciebant iocinera, et si erant livida et vitiosa primo alia immolabant dubitantes utrum morbo an pabuli vitio laesa essent. Cum pluribus experti erant et probaverant integram et solidam naturam iocinerum ex aqua et pabulo, ibi constituebant munitiones; si autem vitiosa inveniebant, iudicio transferebant idem in humanis corporibus pestilentem futuram nascentem in his locis aquae cibique copiam, et ita transmigrabant et mutabant regiones quaerentes omnibus rebus salubritatem.
>
> Our ancestors used to sacrifice some sheep pastured in the area where they wanted to establish towns or military camps, and examine their livers. If these were discolored and defective, first they would sacrifice more sheep, wondering whether the original victims might have been ravaged by disease or spoiled feed. Once they had scrutinized several victims and decided that the local water and fodder had produced perfect, solid livers, there they would lay their fortifications; if, on the other hand, they discovered the livers to be defective, they would decide that the supply of food and water produced in such a locale would prove just as pernicious to human bodies. Thus they moved onward, changing regions in the search for an environment healthful in every respect (Translation, Rowland, Howe 1999, 27).

The miners' village at Lago dell'Accesa, near Massa Marittima, was abruptly abandoned, yet residents had time to salvage valuable possessions (Harrison, Cattani, Turfa 2009; Camporeale 1997; Camporeale, Giuntoli 2000). There is clear evidence of pollution from the metals industry that operated on-site from the late eighth into the sixth century BC, with mines and smelting nearby. Groundwater during storms actually flushed slag, heavy metals and sulfur compounds over oil or wine presses and house thresholds. The region is today receiving mitigation for Etruscan archaic industrial pollution.

A Rare Document

Environmental effects also figure in the *Brontoscopic Calendar*, an Etruscan document preserved only in (ancient) translation (Turfa 2012). A set of omens linked to the occurrence of thunder in central Italy were originally recorded in Etruscan and later translated into Latin by *Publius Nigidius Figulus*, a friend of *Cicero*. His work survives in a Byzantine Greek translation by John the Lydian (6th century AD). Omens are presented in calendar order, each day providing one or more predictions of good or bad situations that are likely to occur if thunder is heard on that date. Many entries deal with agriculture, foodstuffs, famine, or war. Some others hint at class struggles in the cities: I have suggested that the document was recorded in the early 7th century BC, during the era of the founding of the cities in central Italy. This was just when some situations, like that listed at August 19, would have been possible: "If in any way it should thunder, the women and the slaves will dare to carry out assassinations". But most entries are quite mundane: "wet weather and ruin of the grain", "plentiful fodder for the flocks", "a plenty of fish" etc.

Just once, at December 29, thunder is said to signify "the most healthful leanness for bodies" (Turfa 2012, 182 and fig. 3). While this sounds like the modern, athletic ideal, one very distinctive votive form of the late fourth century and later seems to depict extremely attenuated

figurines in bronze, with drawn out bodies and normal heads and feet. Without texts we cannot be certain of interpretation, however.

Many dates offer omens on infectious diseases, ranging from "plague, but not life-threatening" to skin-lesions (July 27, Oct 22, Dec 5, Feb 18, 26). This was not bubonic plague, but serious diseases like Brucellosis have been identified in ancient Italy and could account for "recurring fevers" and the like (see Turfa 2012, 164-203.) Another zoonosis appears at February 23: "if it thunders, it threatens deformity for men, but destruction for birds". This is the time of year when mumps often occurs in human populations, and a related paramyxovirus, lethal Newcastle disease infects birds (see Hippokratic *Epidemics* 1.1). At October 26, "spotted diseases" might describe cutaneous anthrax, in a population heavily invested in sheep-herding. Other skin problems also may have been noted – we might expect these to be treated with certain kinds of thermal waters.

The linking of health with electrical storms is of interest in the modern field of Biometeorology. For instance, the calendar notes "good deliveries for women" at June 2 and February 11, where the low pressure before a thunder-storm might have an effect on inception of labor. Electrical storms have also been associated with asthmatic attacks. Mesopotamian omen literature, from which the Etruscan text was in part adapted, does have some links between weather and health, but the Etruscan document is never a slavish copy and is always tied to conditions of life in Italy. The discovery of a carefully placed bronze "thunderbolt" talisman in the Bagno Grande deposit must also reflect the association of weather and environment with human health [Fig. 1].

The Widespread Tradition of Anatomical Votive Models

The anatomical votive models in terracotta or bronze suggest ways of approaching ailments, especially those afflicting specific categories of people:

While Greeks did produce votive models depicting human organs, Etruscan and Italic sanctuaries had a greater variety of such objects. Greek temple inventories do mention models of some internal organs, in valuable materials, but silver objects, for instance, are seldom preserved in the archaeological record, and it appears, from the high quantities of various model types, that Italy saw a much greater focus on internal organs than did other cultures.

The design of some rationalized anatomical models, especially internal organs, often uteri or polyvisceral plaques depicting several different organs, often shows specific styles that can be attributed to regional artistic preferences. The cities of Caere, Tarquinia, Veii and Vulci in particular seem to have produced distinctive regional styles, perhaps associated with individual coroplastic workshops (see Turfa 2004 *passim*). The organs are usually recognizable, but never at the level of modern medical illustrations. While this level of anatomical understanding could have been developed from treatment of combat injuries, such interest in male and female organs indicates, for the many persons visiting healing sanctuaries, genuine familiarity with medical practice.



1 | Bronze model thunderbolt, San Casciano Bagno Grande, (photo by C. Petrini; courtesy of ABAP-SI and Municipality of San Casciano dei Bagni).



2 | Bronze polyvisceral plaque and display base, San Casciano Bagno Grande, (photo by C. Petrini; courtesy of ABAP-SI and Municipality of San Casciano dei Bagni).

New anatomical model types are still being discovered. One very odd design, recovered in 2012 by the Guardia di Finanza, was produced by a workshop supplying multiple votive partial-heads for a sanctuary in the vicinity of *Lanuvium*: neck and lower jaw are rendered without the facial features or the crown of the head (Attenni 2013; Attenni, Ghini 2016). This is so unusual that we surely must assume that the type represents healing vows for some distinctive yet uncommon affliction of the throat or lower jaw. Such extreme focus on one anatomical feature implies a shared understanding of anatomy and physiology, presumably cultivated in or very near to the Pantanacci sanctuary.

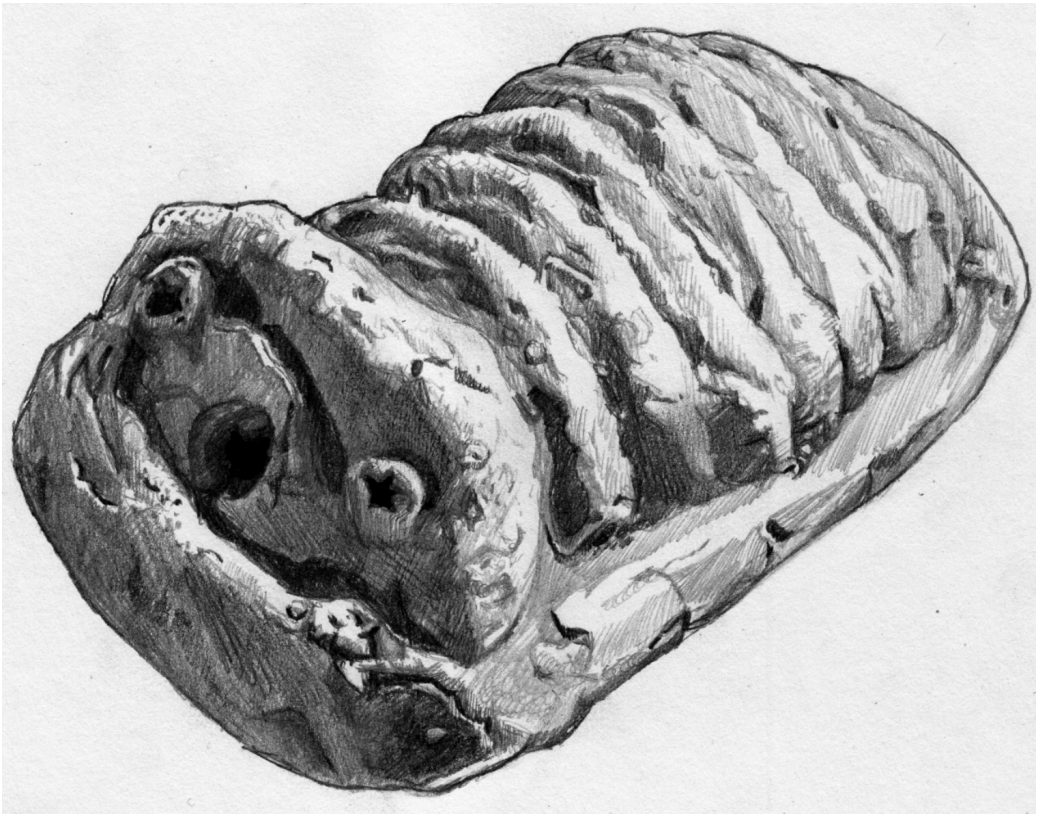
Most polyviscerals and internal organs (except uteri) were made in terracotta, but two polyvisceral plaques in bronze excavated from the Bagno Grande at San Casciano show a later, modified version of the type [Fig. 2]. They further illustrate a close association of votive religion with medical practice of some sort (Tabolli 2023, 239-244). At least one plaque was probably kept accessible many years after its manufacture in the late 2nd century BC, and re-set in a bronze base for further display. When the votives were buried, the two plaques were placed in the *vasca* with figures of swaddled infants (at sites all over central Italy, obvious models of medical interest (like excised organs) were handled in the same way as simpler sculptures like swaddled babies or clothed men and women).

Gynecological and Obstetric Specialties

Women as a social group are cited by the *Brontoscopic Calendar*, and tantalizing references to gynecological or obstetric specialties are occasionally mentioned in ancient sources. One reference is in the text of "Metrodora," a female doctor of the Byzantine era (6th century AD): an "Etruscan wax" to be used to aid conception (Turfa 2016, 799).

Fertility, fecundity, parturition, and perhaps selection of the sex of an infant, were represented in special types of votive uteri, such as those x-rayed at *Lucus Feroniae* (Baggieri 1999, 99-100 figs. 21, 22, 24). Some are hollow and contain one or more clay pellets. In analogy with prehistoric Greek ethnographic parallels (Talalay 1993, 40-44) worshippers may have participated in the making of the models and intended the pellets as symbols of the infant to be conceived. Note that the wished-for product, a swaddled infant, is familiar again today, as the tradition of swaddling is being revived in modern pediatrics.

Some models offered at Gravisca in the territory of Tarquinia have stylized fibroid tumors. Other terracotta uteri offered at various sanctuaries were made *bicorporate* or *bicornis* – we cannot know if these models were intended to show pathological or unusual conditions, but they and a few other curiosities must indicate some specialized knowledge of human anatomy. Only primates have this type of uterus, and the archaic Roman *Lex regia de mortuo inferendo* offers a means of understanding the importance of such models: this law, believed to derive from an Etruscan predecessor, required the attempt at retrieval of an infant if a mother died in childbirth or while pregnant. The special features of the models are greatly rationalized and stylized, but surely a few artists saw such conditions or heard them described in detail (Turfa 1994).



3 | Votive model uterus with part of urinary tract modeled by hand. Terracotta, 3rd-1st century BC, Manchester Museum, inv. 35152. Drawing by Paul Butler.

In the Manchester Museum (UK) is a terracotta model of Veientine type drawn from a worn mold for an oval uterus with wavy ridges that indicate third stage labor contractions. It was finished with hand-modeled ureters [Fig. 3] (Turfa 1994, 229, fig. 20.5; Turfa 2016, 799-803). Such carefully worked additions must have been intended to indicate specialized knowledge – and treatment – of the female urinary tract (presumably for complications due to childbirth). It probably took weeks to produce such models due to preparation of the clay, molding and tooling, firing, cooling and finishing. And for the process to begin, someone had to order the model, and describe the specialized anatomical geography.

Matthias Recke (2013, 1078-1079, figs. 59.15-16) has called our attention to rare anatomical models in terracotta that not only display the exposed viscera, but seem to indicate the presence of sutures along the "incision" – as if we are looking at a medical teaching model, as in an example in Ingolstadt (Deutsches Medizinhistorisches Museum). This issue has been reopened with the discovery of the surgical instrument, a gouge, [Fig. 4] carefully offered at San



4 | Bronze surgical gouge, San Casciano Bagno Grande, (photo by C. Petrini; courtesy of ABAP-SI and Municipality of San Casciano dei Bagni).

Casciano in the same location as votive sculptures etc., an even surer token of knowledge of the body on display.

The unexpected finds at San Casciano are beginning to reveal attitudes that more closely resemble a modern appreciation of medical practice, linking religious observance (attested by votive cult and inscriptions) with basic medical techniques such as observation (votive figures that display pathological conditions) and treatment procedures (like surgery, attested by offerings of instruments). The rare portrayal of deformity, in the already-famous bronze statuette of a youth (*L. Marcius Grabillo*) with attenuated limbs accentuated by his pose (Bagno Grande, inv. Z130_1, Papini 2023, 127-129), is another aspect of a different atmosphere or character in this cult – perhaps the difference is due to the hot springs that characterize it. The deliberate display of human anatomical subjects, whether anomalous or generalized (e.g. uterine variations or simplified hands, feet, etc.), further attests to a clientele and officials who are well aware of the medicine of their day and its possibilities.

It appears, from evidence such as haruspicy and brontoscopy that worshippers in central Italy were always strongly aware of the environmental factors surrounding them. Society also had an effect, stimulating medical specialization by observing specific groups, for instance women, as we see in the hundreds of models that express knowledge of internal anatomy and the variety of the human body. The archaeological evidence when linked to ancient literary data and interpreted with reference to modern medical literature will show parallels to Biometeorology, perceptions of industrial pollution, surgical practice and special fields for treatment in fields such as pharmacology, gynecology and obstetrics. The site at San Casciano promises more such surprises.

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Abstract

The finds of votives, sculptures and inscriptions at San Casciano reveal attitudes that resemble a modern appreciation of medical practice, linking religious observance with basic medical techniques such as observation (votive figures that display pathological conditions) and treatment procedures (like surgery, attested by offerings of instruments). The deliberate display of human anatomical subjects, whether anomalous or generalized (e.g. uterine variations or simplified hands, feet, etc.) further attests to a clientele and officials who are well aware of the medicine of their day and its possibilities. It appears, from evidence such as haruspicy and brontoscopy that worshippers in central Italy were always strongly aware of the environmental factors surrounding them. The archaeological evidence when linked to ancient literary data and interpreted with reference to modern medical literature will show parallels to Biometeorology, perceptions of industrial pollution, surgical practice and more.

keywords | Anatomical votive models; Biometeorology; Etruscan inscriptions; Thermalism.

questo numero di Engramma è a invito: la revisione dei saggi è stata affidata al comitato editoriale e all'international advisory board della rivista

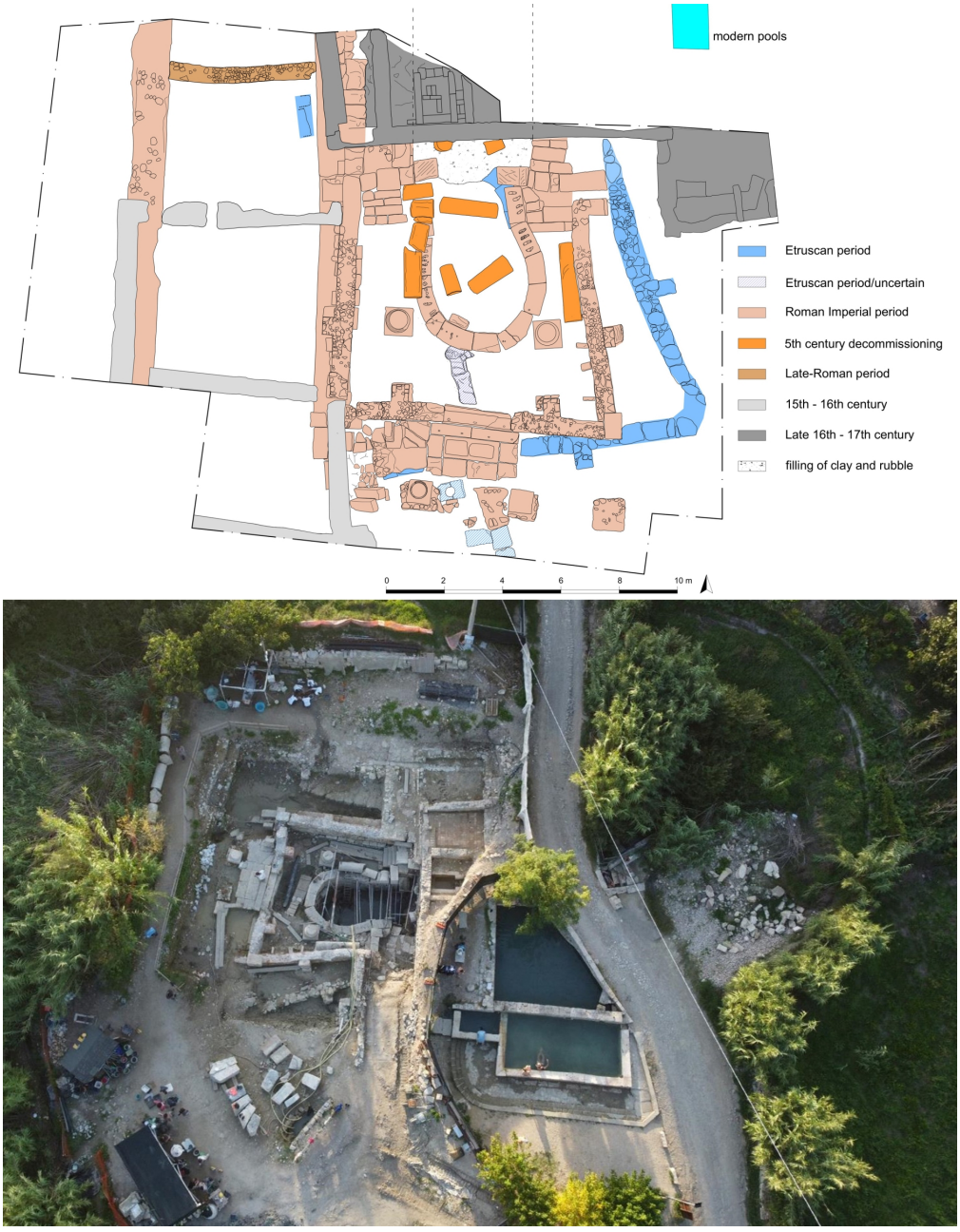
Healing Perception and Ritual Practice through the Metal Gifts in the Hot Water at San Casciano dei Bagni

Mattia Bischeri

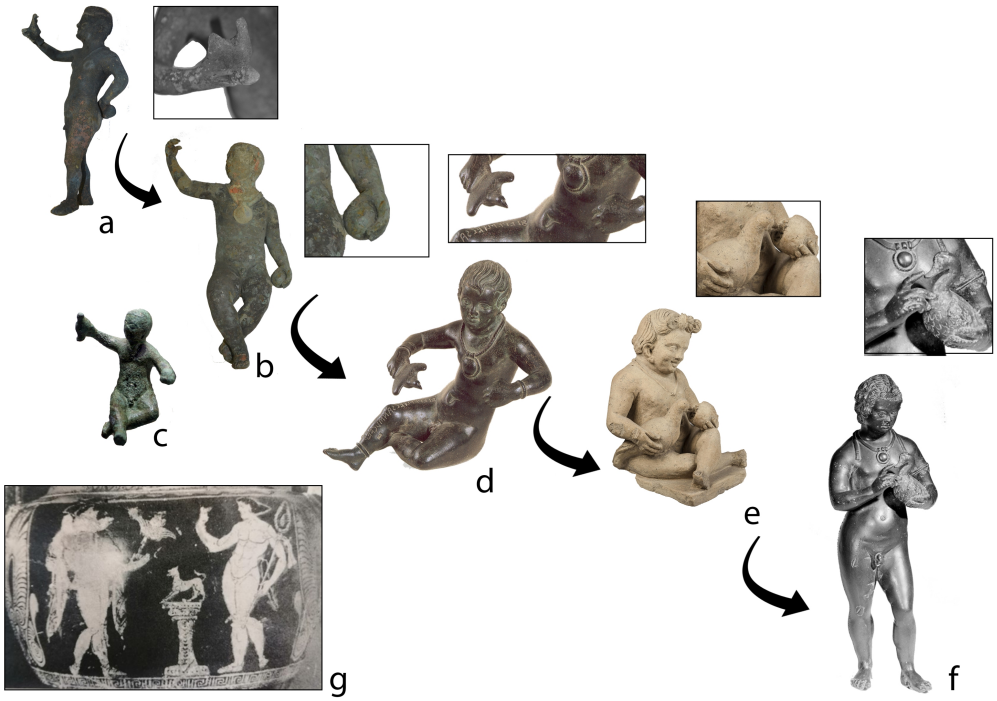
The thermo-mineral sanctuary at Bagno Grande, in San Casciano dei Bagni, offers an extraordinary amount of data for the analysis of the healing cults and thermal medicine (Tabolli 2023, 9-11; Tabolli 2023a), in the context of multicultural interaction among Etruscans and Romans (Tabolli 2023, 6-8). In ancient societies, ritual healing practices and practical medicine, including the thermal medicine and balneotherapy, are strictly entangled. The votive record of Bagno Grande allows us to explore some issues of ancient medical practices, in particular, those regarding the experiential dynamics of the healing cult and the implications from a cognitive perspective. In the last few years, the study of the religious experience of the past, especially by the 'Lived Ancient Religion' approach (Gasparini et *alii* 2020; Graham 2021), has concerned the interplay between sensory, cognitive and socio-cultural aspects, as well as the negotiation between the individual and group agents. Furthermore, the cognitive perspective in archaeology, influenced by neuro-science and evolutionary psychology, has explored the forms of dependence between social and cultural behaviour and things (Hodder [2012] 2014). In this paper, adopting a cognitive approach and following the perspectives of Medical Anthropology, I aim to untangle the aspects of the worshipper's perception of healing through the materiality of the votive gifts in the sanctuary at Bagno Grande.

Archaeological context and cult practices

The ongoing excavations at Bagno Grande, immediately below the Medici's thermal structure, continue to illuminate the extent of building during the Etruscan and Roman phases, focused on a narrow structure with a monumental central pool and its intact votive deposit within [Fig. 1]. The structure saw a period of continuity and change over at least 700 years between the 3rd century BC and the 4th century AD, when the sanctuary was intentionally dismantled, perhaps after the Edict of Theodosius against the pagan religion. The portion discovered thus far is to be considered the core of a vaster spring sanctuary, with a monumental architecture meant to protect and sacralise the hot spring of Montesanto, that continues to flow at a rate of 25 liters of water per second at over 40 degrees C. Before the decommission of the sanctuary in the Late Antique phase, the building and the central pool had been restored many times. Underneath the Roman phase, is coming to light the Etruscan one, represented by a rectangular enclosure in travertine and an earlier pool, partially conserved with an oval shape. A turning point in the stratigraphical sequence is marked by a glimpse of the Tiberian age,



1 | Map of mayor building phases and the view on the thermo-mineral sanctuary at Bagno Grande, San Casciano dei Bagni (edited by E. Mariotti).



2 | Series of bronze statues depicting divinatory gestures 3rd – 1st centurt BC: a. Bagno Grande (San Casciano dei Bagni); b. Bagno Grande (San Casciano dei Bagni); c. San Faustino (Museo Archeologico Nazionale di Perugia); d. 'Putto Graziani' (Museo Gregoriano Etrusco); e. Vulci, Porta Nord (Museo Nazionale Etrusco di Villa Giulia); f. Putto from Montecchio, Cortona (Rijksmuseum van Oudheden); g. Kelebe from Perugia (Maggiani 2002).

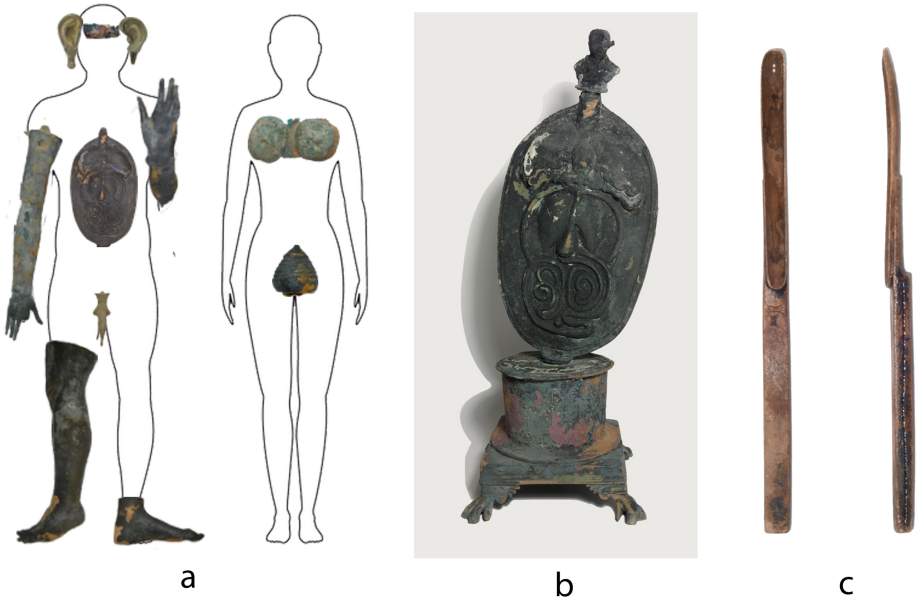
when the deepest Etruscan oval pool was ritually closed and abandoned. All the statues exhibited in the sanctuary, belonging to late Etruscan and early Roman phases, were collected and buried in the pool below a thick layer of roof tiles. A bronze thunderbolt among the tiles, put in as a seal, together with two prehistoric flint arrowheads, suggest that the rite operated was a *fulmen condere* (MacIntosh Turfa 2012, 59-60). After this event and the new monumental phase, the pool received new votive offerings, including thousands of coins, that continued several centuries beyond the Severan age (Mariotti 2023; Mariotti, Carpentiero 2023; Tabolli 2023b; Tabolli 2023, 1-6).

The principal votive gifts are represented by large bronze statues (Papini 2023), figurines of human or animal shape (Salvi 2023; Bischeri 2023; Arbeid 2023), anatomical ex-votos (De Lucia Brolli 2023; Pacifici 2023) – sometimes bearing Etruscan or Roman inscriptions (Maggiani 2023; Gregori 2023) –, coins (Pardini 2023), stone altars (Gregori 2022), and vegetal offerings (Buonincontri 2023). Beyond the main deities that were protecting the spring, connected to the power of healing – Fortuna Primigenia and Apollo, Asclepius, Hygea and Isis –

an additional god/goddess, directly referred to the Nymph of the same thermo-mineral hot spring, is attested in two different languages: *Flere of Havens* (the goddess of the spring or the hot spring), the Etruscan name (Maggiani 2023), and *Fons caldus* (the hot spring), in Latin (Gregori 2023). An exceptional stone base-altar bearing a bilingual inscription confirms the sanctuary's multicultural framework, which includes Etruscans and Romans together (Tabolli 2024).

Despite the transformations through the centuries, the cult always focused on the hot spring as an element of prediction and healing benefits simultaneously. The archaeological evidence suggests that the practice of thermal medicine was related to the divinatory art concerning the natural elements (Tabolli 2023a). In fact, the natural phenomenon of the spring represents a pivotal element at Bagno Grande. The spring of Montesanto is characterised by specific physico-chemical characteristics, empirically perceived, such as the high temperatures, and the emission of vapor and bubbles. Natural events can influence the perceived characteristics of the water at any time, changing the level and temperature, as is demonstrated by the ongoing hydrogeological analysis of the spring (Tabolli 2023a, 235 notes 1-2; Tabolli 2023, 8). The reading of natural evidence and subtle related changes to the environment could be interpreted as predictable signs of divine will (*auspicium*) in the perception of the ancient priest; this facet of divinatory practice is a key feature of Etruscan religion (*ThesCRA* III; De Grummond, Simon 2006; MacIntosh Turfa 2012; Capdeville 2016). The divinatory art, particularly that which is connected to the observation of birds, is emphasised by some bronze statues depicting youths raising a small bird with the right hand, and holding a fruit with the left hand. These statues belong to a broad type of Etruscan bronzes dated between the 3rd and 1st century BC, which depicts youths and babies in different moments of the completion of a rite, step by step, from the observation of the flight, to the request of *augurium* or to gain *auspicium*, and, finally, to the acquisition of a response [Fig. 2]. This gesture is interpreted as augural or divinatory, according to the Etruscan-origin interpretation practice of the observation of a bird's flight and appetite (Bischeri 2023, 159). It's a matter of fact that the bird's behaviour, in particular feeding, could be influenced by changes in barometric pressure and weather (Tuck 2020). Additionally, the statues' attributes of the bird and fruit, could be connected to the rites of passage from infancy to personhood (Turchetti *et alii* 2023, 119-120).

The practice of thermal medicine, related to the healing cult of *sanatio* (Comella 1981; Comella, Mele 2005; Fabbri 2019), is attested by a long series of ex-votos, particularly the anatomical types [Fig. 3]. The hot water, enriched by mineral sulfates, used for bathing but not for drinking, can produce physiological benefits for the health of the body, with anti-inflammatory and disinfectant effects. The anatomical ex-votos, in fact, depict limbs and external organs, such as arms, legs, feet, ears, eyes, and breasts (De Lucia Brolli 2023; Pacifici 2023). Beyond these specimens, there are also some internal organs, and in particular, two exceptional bronze plaques with polyvisceral reliefs. One of them has been assembled on a base that bears a dedicatory inscription in Latin of a healing request for a Roman woman, Sulpicia Triaria, to Fortuna Primigenia.



3 | From Bagno Grande: a. Anatomical ex-votos; b. Polyvisceral relief; c. Bronze gouge (after Mariotti, Salvi, Tabolli 2023, edited by M. Bischeri).

The reliefs display viscera as they would appear in a human torso opened with a laparotomic cut. A medical instrument, a bronze gouge, was also collected in the votive deposit. These specimens of polyvisceral reliefs, which, until now, we have only seen in pottery replicas, testify to a very advanced knowledge of medical practices, as well as to the presence of doctors who likely performed operations and other surgical interventions at the site (Tabolli 2023a).

Theoretical issues in perception and practice of the healing cults

In traditional societies, practical medicine and ritual healing practices are firmly connected, and found the perfect synthesis in thermal sanctuaries, where water simultaneously could be a tool of healing and an object of cult (Facchinetti 2010). The religious phenomenon of healing cults is shared in the gamut of global religious experiences beyond religious belief. It is based on similar perceptive, psychological and sociological dynamics throughout time. Behind the perspective of the devotees, the main cognitive and psychological aspect can be considered the 'faith-healing', namely the faith in the therapeutic efficacy of the cult felt by the individual worshipper, as theorized by J.-M. Charcot at the end of 19th century (Charcot [1892] 2019). The sociological aspect concerns the 'sense of communitas', namely the general perception by the community of worshippers and the sense of belonging to a religious phenomenon, that



a



b



c

4 | Christian healing cults: a. Sanctuary of Romituzzo at Poggibonsi, Siena; b. Sanctuary of Madonna del Bagno at Deruta, Perugia; c. Sanctuary of Madonna della Quercia at Viterbo (edited by M. Bischeri).

originates the rules of performative actions and the pilgrimage toward a sacred place as pointed out by V. Turner (Turner 1969).

The action on the mind is considered a pivotal aspect of the functioning of the healing cults, beyond any 'miraculous' belief. In the field of Medical Anthropology, it is understood that the body, with practical interventions and physiological reactions, and the mind, with cognitive interventions and psychological reactions, are entangled in the process of healing. After the French scholars Maurice Merleau-Ponty and Pierre Bordieu figured out the concepts of 'Perception' (Merleau-Ponty [1945] 2021) and 'Practice' (Bordieu [1972] 2003), American anthropologist Thomas Csordas founded his paradigms of 'Embodiment', in which the body is considered the "existential ground of culture and self" (Csordas 1994; Id. 1999). In several studies focusing on the ritual healing and meaning of the Charismatic cult, Csordas overcomes the Cartesian paradigm that is stuck between the 'body' and 'mind' dichotomy; instead, he adopts a holistic perspective that better parallels traditional curing systems (Csordas 2002). Under this perspective, the religious phenomenon takes place in the body together with its sensorial abilities and corporeal cognition; the body and its functions encompass the goods and needs that the gods are made for. "Illnesses and malfunctions of the body are recurring reasons for addressing the gods, but are also a means by which humans can come closer to their deities" (Rieger 2020, 202-203; Gasparini 2023, 386-388). In ritual curing and healing systems, the state of illness is not limited to purely biological processes, as is conceived by modern biomedicine, but spiritual and social factors are also important causes of it. Overcoming the state of illness occurs through practices that are both empirically and symbolically effective: technical interventions (i.e. the use of drugs and surgical intervention) cure the body, and symbolic rites (i.e. rites and prayers) heal the mind (Lionetti 1988; Young [1982] 2006; Cozzi 2012). Supporting the ritual efficacy idea, Claude Levi-Strauss has introduced the concept of 'symbolic efficacy' of rituals (Lévi-Strauss [1949] 2015, 210-230), which can be related to the concept of 'meaning response' of Daniel Moerman (Moerman 2002). The agency of symbols behind the mythic form performed by the rituals, transforms the mind on an unconscious level creating a comprehension of the situation and a concrete experience of healing (Langdon 2007). The performative aspect of ritual in some traditional curing systems, based on dedications of particularly meaningful objects in a sacred place, represents the material support of the healing process. The sacred gifts can activate cognitive and emotional processes that result in actual physiological reactions. In psychoneuroimmunology, these physiological reactions are related to the production of endorphins that commonly have analgesic, euphoric, and amnesic effects helpful for managing sickness and disease (Lupo 2012, 148-155). From this point of view, the ex-votos, as ritual objects dedicated before a healing request or as thanks for the healing received, play a concrete role in constructing a collective perception of therapeutic efficacy (Graham, Draycott 2017), and represent instruments of religious knowledge (Graham 2020, 211). If humans depend on things, the symbolic agency behind sacred objects can feed the mind and shape how social actors see, feel, and think about the sacred being (Fabietti 2014).

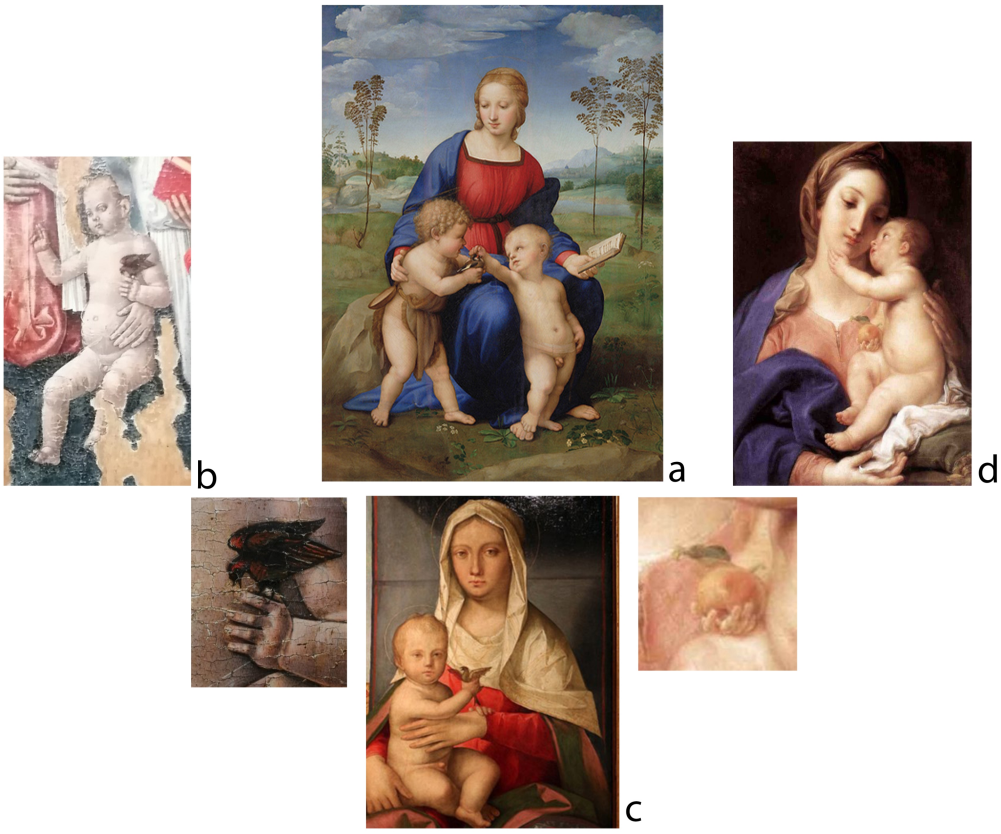
Similar dynamics are evidenced by Catholic Marian cults which generally encompass faith healing. The symbolic efficacy of the cult is fed and improved by a community of pilgrims offering votive gifts after a healing request [Fig. 4]. Significant examples in Italy include the Sanctuary of Romituzzo at Poggibonsi near Siena (Valdelsa 2000, 95-96), the Sanctuary of Madonna del Bagno at Deruta near Perugia (Santantoni Menichelli 2010), and the Sanctuary of Madonna della Quercia at Viterbo (Carosi, Ciprini 1992). Water and mineral springs often are pivotal aspects, as exemplified also by the famous Lourdes ritual bath. These types of traditional Catholic cults, particularly their rituals and beliefs, are rooted in long-standing pagan cults, as is demonstrated for instance by the galactophoric cults ranging from the Egyptian Isis 'Mother of God' to the iconography of *Maria lactans* (Basta 2023). Regarding this particular aspect, further examples include some natural caves in Italy which were the setting of ancient cults. In the Grotta Lattaia at Cetona, late Etruscan pottery ex-votos of breasts and statues of infants testify to the enduring belief in the beneficial properties of breastfeeding expressed by drinking the water dripping from natural stalactites.

The continuity of the cult, still venerated in the Christian era, is demonstrated also by the veneration of motherhood related to the *Madonna lactans* as depicted in the sanctuary of Santa Maria in Belverde (Turchetti et *alii* 2023). When constructing cult efficacy, iconographic and symbolic patterns also play a key-role. Christian symbols and allegories sometimes retain pagan iconographic style and can preserve traces of their symbolic efficacy, adapting syncretistically to different visual cultures (Elsner 2003, 117-118). As seen before for the iconography of the Isis 'Mother of God' and *Maria lactans*, the thousands of depictions of Mary and Jesus are relevant too [Fig. 5], where the baby Jesus often holds a bird in one hand and a fruit in other, as in the most famous, Raffaello's model of the Madonna del Cardellino (Amato 1988; Torchio 2023, 55). The model of a baby with that particular gesture of presenting a fruit to a bird already appears in ancient sacred iconography across the Mediterranean, from the tradition of the crouching children and 'temple boys' (Hadzisteliou-Price 1969) and classical Greek reliefs (Comella 2002, 144, fig. 146), to Roman depictions (Conticello 1993, 294-296, n. 227), to several Coptic funerary *stelae* (Wessel 1969, 103; Morehouse 2024, 121-134). Arguably, the iconography of the Etruscan votive babies of the 3rd-1st c. BC seen above, as a depiction of a divinatory gesture of *augurium* or *auspicium*, might recall the acquisition of the Holy Spirit in Christian belief, symbolically depicted as a bird.

Materiality and perception of healing at Bagno Grande

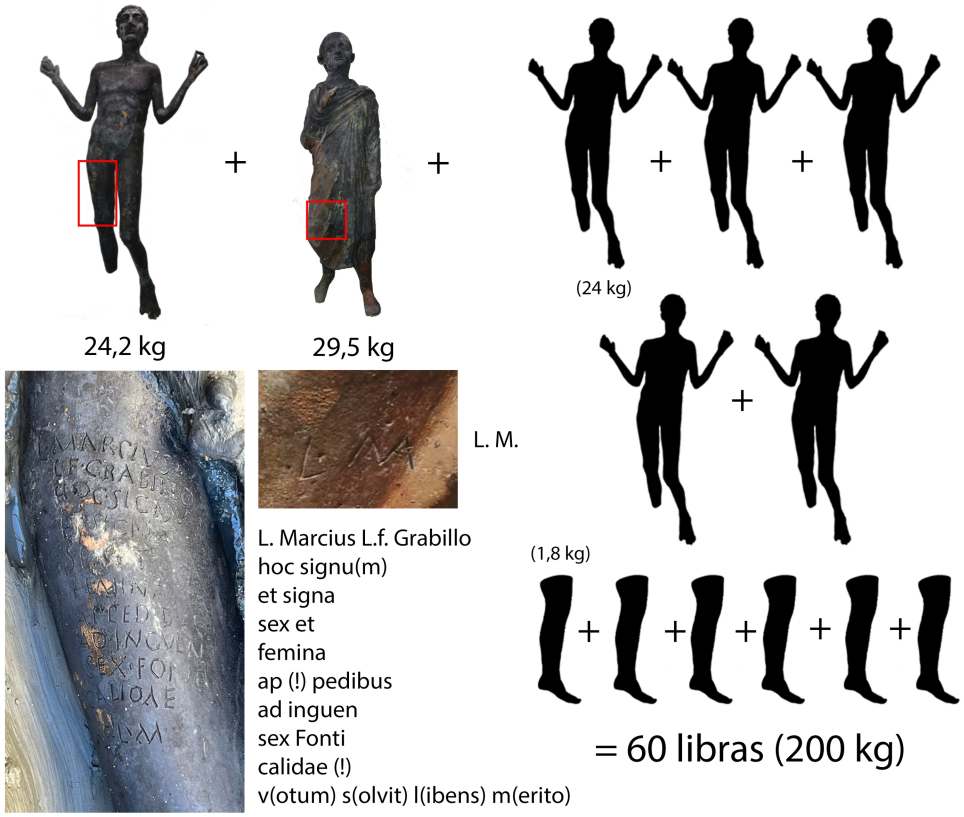
The persistent continuity of worship at Bagno Grande coupled with the monumentality of the sanctuary and the quality of its votive offerings, represents significant elements of analysis that suggest how the community of worshippers may have perceived a high level of therapeutic effectiveness (physiological and psychological) within the cult of the hot spring.

The materiality of the offerings, as sacred objects able to activate a positive symbolic agency in the mind of the devotees, is connected to the raw materials from which the ex-votos are made. Concerning the broad examples of figural bronzes, the healing perception behind the



5 | Sacred depictions with Mary and Baby Jesus: a. Raffaello Sanzio, Madonna del Cardellino, oil on canvas, 1506, Galleria degli Uffizi, Florence; b. Girolamo di Benvenuto, Madonna con bambino in trono tra i Santi Giacomo e Andrea, XVI c., tempera on canvas, Museo dell'Opera della Cattedrale di Chiusi; c. Boccaccio Boccaccino, Madonna col Bambino, oil on canvas, 1525, Pinacoteca Egidio-Martini, Venice; d. Pompeo Batoni, Madonna e Bambino, oil on canvas, 1742, Galleria Borghese, Rome (edited by M. Bischeri).

dedication of the ex-votos and their symbolic values were undoubtedly entangled with the economic value of the metal itself (Bischeri 2023). Sampling the size and weight of the bronzes from a metrological perspective, we can see some impressive correlations between their heights and the multiples and submultiples of the Roman foot, as well as their weights and the Roman *libra*. The scale of the offering's heights includes figurines that range from 7 to 30 cm, and larger statues that measure up to 90 cm. Ninety cm corresponds to 3 Roman feet, the measure indicated by the Latin writers as *mensura honorata*, namely the correct measurement for statues dedicated in the Roman forum. Furthermore, the ponderal values of the statues correspond with the monetary system that was in use between the 3rd and 1st centuries BC. Based on the request for healing and the gift of a suitable measure of metal, the bidding system of the thermal sanctuary of Bagno Grande appears to have been a genuine



6 | Bronze nude statue dedicated by M. Grabillo and togato statue, San Casciano dei Bagni, with hypothesis of the amount of bronze dedicated by himself according to the Latin inscription (after Mariotti, Salvi, Tabolli 2023, edited by M. Bischeri).

economic hub, with bronze offerings placed under divine protection, functioning as a trading contract between humans and deities. In the Roman phase, in fact, the offerings of varied metal gifts were eventually replaced by offerings of coins.

The bronze statues represent the support on which the worshipper's identity is inscribed too. Despite the heroic nudity typical of ancient statuary, the bronze body can materialise the state of the worshipper's disease. One statue, in fact, depicts a male with a malformed body: the chest is gaunt, the abdomen is rounded, the shoulders are asymmetric and so on. The representation of the devotee's health condition is intentional [Fig. 6].

Along the left leg runs a Latin inscription that mentions the name of dedicant, Marcius Grabillo, and the spring's goddess, *Fons calidae*. Requesting healing, Grabillo fulfilled his vow (*votum solvit*), by dedicating a bronze image of himself of about 24 kg of bronze. The inscrip-



a

«On behalf of Nufre, of the Nufrzna family, son of Ar(nth), the Perugian
to the Deity of the Fountain, it is placed, for (a vow) to be fulfilled»



«Aule Scarpe, son of Aule and of a Velimnei,
(donated) as a sacred thing to the Numen of the Fountain»



b

7 | Bronze votive head dedicated by Nufre and female bronze statue dedicated by Aule Scarpe, San Casciano dei Bagni (after Mariotti, Salvi, Tabolli 2023, edited by M. Bischeri).

tion also mentions the entirety of Grabillo's gift to the god: beyond this statue, he dedicated six statues (*signa*) and six lower limbs (*femina appedibus ad inguem*), perhaps anatomical ex-votos. Suppose we imagine the other offerings were similar in scale to the extant specimens: in that case, we can calculate the amount of bronze at approximately 60 Roman *libra*s (200 kg) dedicated by Grabillo to the hot spring.

In the Etruscan and Roman dedication formulas on the ex-votos, a fundamental aspect seems to be the indication of the worshipper's origin and family name [Fig. 7]. The expression of the individual identity could play a primary role in the collective perception of the healing cult. For instance, the bronze portrait with an Etruscan inscription that includes the name of the man making the offering, *Nufre of the Nufrzna* family, comes from the Etruscan city-state of Perusia, about 50 km from Clusium, as suggested by the ethnic adjective *Persac* ('the Perusian'). The bronze female statue, wearing a crown in the form of a turreted diadem with a snake rolled up on the arm, probably depicts the goddess of the spring, as the inscription dedicated

to *Flere* of *Havens* suggests. The dedicator of this statue, *Aule Scarpe*, is kindred with the Velimna family, one of the most powerful families in Perusia between the 3rd and 1st century BC (Maggiani 2023, 182-189).

Additionally, a non-secondary perceptive element would be represented also by the fame of the *Fontes clusini* in the ancient times, well-known by Etruscans and Romans for their therapeutic properties to cure head and stomach diseases, as mentioned by the Latin writer Horace (*Hor*. ep. I, 15). The echo of the fame perhaps generated a further rhetoric of persuasion around the curative efficacy of the *Aquae clusinae*, with a growth of a positive response to receive the healing in the individual's perception, as well as a collective resonance in the community of the worshippers activating a flow of different peoples toward the clusine area.

The votive offerings must be understood as tangible signs that the worshippers entrusted a part of themselves to the care of the divine, and believed that the divine had the power to offer healing or that the divine reciprocated. The materiality of the vow seems to play a pivotal role in the cognitive perception of healing, especially in a sacred place where the symbols related to the materiality of ritual gifts, shaping human minds, work together with empirically effective medical practices, shaping the bodies. Let us imagine the sanctuary at Bagno Grande before the Tiberian restoration and the ritual burial of the votive offerings within the pool, how the sacred landscape around the natural hot spring, enriched by hundreds of sacred bronze gifts offered by illustrious Latin and Etruscan worshippers, such as Grabillo or Nufre, together contributed to the empowerment of the healing properties of the hot spring deity with a visual confrontation with the body of the combined religious community (Graham 2017, 53-54), making the sanctuary at Bagno Grande one of the most attractive healing sanctuaries in central Italy.

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Abstract

The thermo-mineral sanctuary at Bagno Grande in San Casciano dei Bagni (province of Siena, central Italy) offers extraordinary data for the analysis of healing cults and thermal medicine in the context of multicultural interaction among Etruscans and Romans. The core of the sanctuary is a sacred pool meant to protect and sacralise a hot spring, which contains an intact votive deposit stratified by several phases of large statues, bronze figurines, anatomical ex-votos, thousands of coins, stone altars, and vegetal offerings. Throughout time, from at least the 3rd century BC to the 4th century AD the cult associated with the sacred pool has maintained its focus on the hot spring recognizing it as a pivotal natural element of prediction and healing simultaneously. In this paper, adopting a cognitive approach and the perspectives of Medical Anthropology, I seek to focus on the agency of the votive offerings on the perception of the worshippers.

keywords | Thermal sanctuary; ex-votos; Medical anthropology; cognitive approach.

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From DEM to Reconstruction of the Ancient Thermal Landscape

Worship Spaces and Public Areas in the Context of the Bagno Grande in San Casciano dei Bagni

Emanuele Mariotti



1 | Aerial view of Bagno Grande area from south-west, San Casciano dei Bagni (photo by E. Mariotti). Black circle: Bagno Grande spring and baths.

This paper aims to offer a preliminary reading of the archaeological topography of the Bagno Grande, analyzing the morphology of the terrain in combination with the results of geophysical

prospecting, around the main spring of the Cassianense thermal system: the Bagno Grande area [Fig. 1].

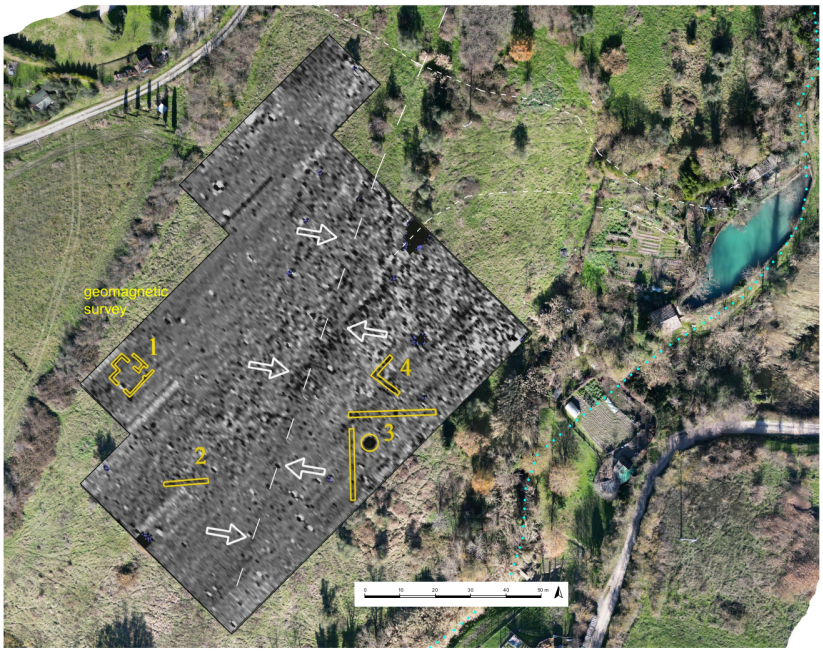
The area of Bagno Grande, located at an average altitude of 510-512 m a.s.l., is characterized by a jagged, irregular soil conformation, with numerous jumps in elevation due as much to the original orography of the area as to the numerous anthropic interventions, linked both to the exploitation of the thermal waters and to the intensive agro-pastoral use that lasted for centuries without interruption. The hill of "Monte Santo" dominates the beginning of the Valley of the Elvella, the stream that flows at the foot of the present village of San Casciano dei Bagni, collecting along its course all the thermal manifestations of the territory (except for a spring located north of the Borgo) (Tabolli, Mariotti 2021, 109). Just from "Monte Santo", where clays and travertines meet, the terrain descends irregularly south and southeast, forming a series of apparent terraces that set the Bagno Grande spring and its twin about 30 m further south (Tabolli, Mariotti 2021, 110-11), until it descends to the "gora", a basin a little further downstream that served the old mill and remains of uncertain age. Toward the west, on the other hand, the present elevation of the suface is higher than the springing of the waters, forming a plateau that "encloses" the buildings of the Bagno Grande, ancient and modern (Fortini *et alii* 2023) in this direction, and then also descends more regularly toward the south and east. In this complex orography, marked and punctuated also by what remains of wine-growing crops, abandoned olive groves and reed beds, fit the surface archaeological outcrops: remains of structures still visible as fragments of walls, elements of ancient canalizations (not in their original position), dispersions of materials (Pocobelli 2021), as well as the structures that emerged from the excavation (Mariotti 2021; Mariotti 2023).

Such notes on the "exterior" appearance of the "landscape" around the Great Bath complex are not superfluous, but constitute the first step toward a reading of the terrain, in this case "not superficial". All the vegetal, historical, anthropical and morphological elements, and related to the natural orography of the context, determine and have determined the current appearance of the place, as well as the surface on which the archaeologist walks and carries out his investigations. The "shape of the land", far from being just a topographical representation, or a more or less accurate contour map in which to place archaeological evidence, itself becomes an archaeological source, even when this shape does not present striking elements of clarity. In the case of the Bagno Grande, it is the complex result of natural and anthropogenic factors, according to a basic typology already discussed for other contexts (Mariotti 2010; Mariotti 2012). One must assume an original conformation descending from the Monte Santo hill towards to the south, most likely more regular than it is today, and in line with the flow of spring waters along the fault line already mentioned (Tabolli, Mariotti 2021). Ancient anthropic activities (Etruscan and Roman periods for what excavation and research data currently tell us) would then take place on this base, certainly adapting to the soil surface and, at the same time, modifying it for the realization of those more or less complex structures aimed at the use of thermal waters (Mariotti, Tabolli 2021; Mariotti, Salvi, Tabolli 2023; Osanna, Tabolli 2023; Osanna, Tabolli 2024). The ancient period was followed by further activities in



2 | Aerial view from east of the overlapping of ancient and modern structures of Bagno Grande (yellow area, photo by E. Mariotti).

the medieval, Renaissance and post-Renaissance periods, although the archaeological traces are so far faint (Chellini 2002, 13-14; Mariotti *et alii* 2024). They further modified the morphology of the terrain, overlapping the ancient structures and creating further unevenness, carryovers of materials [Fig. 02], most likely raising the water-level of the previous period. The agropastoral activities of the last two centuries, when the thermal *acmé* of San Casciano dei Bagni had waned (Morelli 2021; Fortini *et alii* 2023; Tabolli 2023) did nothing more than obliterate and regularize an archaeological surface that had largely interacted with the geological substratum. The snapshot obtained by using a DEM (Digital Elevation Model or DTM, Digital Terrain Model), as with any geophysical or remote sensing survey in general (Boschi 2020), is that of a synchronic image of a diachronic process, of which we see "only" the surface with its ultimate form, determined by the superposition of phases and periods, and something below it, with all the cautions and verifications that are necessary with respect to possible interpretations. Nevertheless, an attempt at an integrated reading between the DEM, geophysical prospections, and the planimetry of visible structures is all the more necessary (Forte, Williams 2003; Summers 2003; Summers 2008; Mariotti 2008; Mariotti 2010; Materazzi *et alii* 2024), when such a perspective is completely or nearly lacking in ancient thermal contexts, as areas dedicated to sacred and healing thermo-mineral waters (for a comprehensive summary Chellini 2002; Giontella 2006; Giontella 2012; Bassani *et alii* 2019).



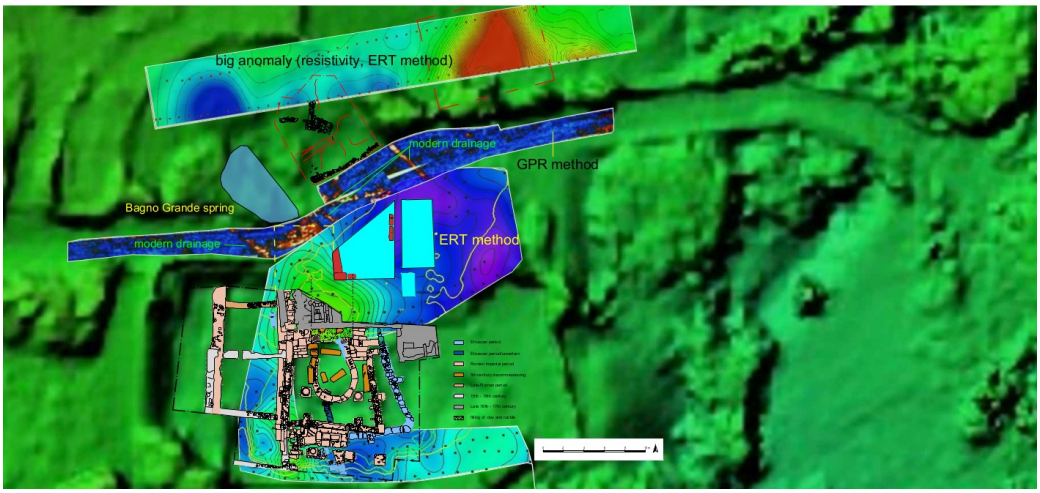
3 | Bagno Grande, southern-west area: geomagnetic survey (Felici, Morelli 2021, graphic processing and aerial photo by E. Mariotti).

Even in this type of reading, the topographical and archaeological focal point remains the Bagno Grande spring with its two springs, main and secondary. On them and on the use of their waters, depends the whole context set up with buildings, appropriate spaces and canalizations in Roman times and before that in Etruscan times, albeit with traces that are still barely visible (Mariotti *et alii* 2024).

Geophysics

The area covered by the non-invasive investigations, including the current excavation of the Bagno Grande, is about 3.5 hectares, but the extent of the sanctuary area could be greater, if the other sorrounding springs, named Bagno Bossolo, Fonte di Santa Lucia and Acqua Passante, all located within 300 m, are included.

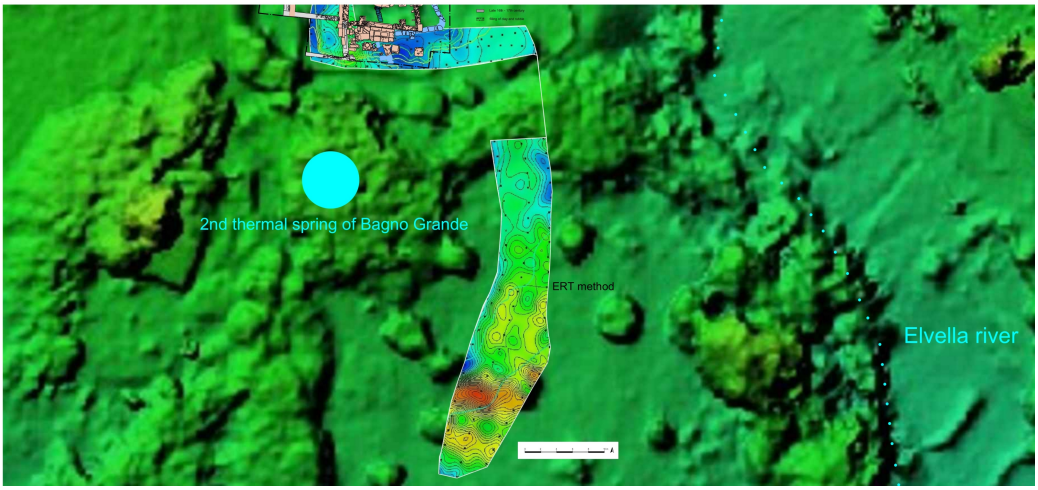
Archaeological survey activities took place in 2017, with the intention of mapping the evidence on the ground and concentrations of materials in relation to the archival record (Morelli 2014; Fortini *et alii* 2023, 80-83; Pocobelli 2021). To this phase should be ascribed the identification of some certainly Roman building elements, such as the structure immediately above the spring (Pocobelli 2021; Carpentiero, Felici 2021, 137-138) to which we will return later.



4 | Bagno Grande: different geophysics survey and strong anomalies in the archaeological/baths area (Felici, Morelli 2021, graphic processing and interpretation by E. Mariotti).

Following this intervention, the first geophysical investigations (magnetometry) were carried out in a large area located about 150 m south of the source of the Bagno Grande [Fig. 03]: the area was chosen because of the conspicuous presence of materials on the surface and because of its location, close to land already placed under archaeological and landscape constraints in 1992 (Carpentiero, Felici 2021, 132). The results, some of which have already been discussed elsewhere, show the presence of numerous anomalies, albeit confusing ones, mainly a sign of a wide dispersion of construction materials, traceable and outcropping even on the ground surface. The greatest concentration of geomagnetic evidence corresponds to the pottery scatters reported by the ground survey itself, although no clear topographical arrangement of the underlying buildings had emerged from either activity. The evidence is located mainly in the eastern part of the investigated area [Fig. 03], along an ideal direction that proceeds southward from the source of the Bagno Grande, following the ground contour: this portion of the area, extending about 1 hectare, is bordered to the east by the Elvella creek, to the north by the area of the springs and adjoining buildings, and to the south again by the river Elvella, although the anomalies are more blurred in this area by virtue of a more clayey subsoil. A sharp demarcation with the western part of the area and slope is evident, as will be seen below.

Further geophysical surveys were carried out between 2019 and 2021, focusing, in particular, around the source of the Bagno Grande (2019 surveys), as indicated by antiquarian sources (Morelli 2014) as rich in archaeological finds, as well as by topographical continuity with respect to the structures emerging from the excavation (2021 surveys). In 2019, two different types of prospecting were carried out, one along the Fontaccia road between the Bossolo Bath



5 | Bagno Grande, southern area: geophysics survey by ERT method and strong red anomaly (Felici, Morelli 2021, graphic processing and interpretation by E. Mariotti).

and the Bagno Grande, and one in the field immediately east of the spring itself (Carpentiero, Felici 2021, 132-138).

The first saw the use of a georadar, or multi-sensor drag GPR (Ground Penetrating radar), given the regular surface (road), the low amplitude and the instrument's ability to accurately "read" this type of terrain; the second instead used a resistivity meter (ERT, Electric Tomography Resistivity, with electrodes placed on two-dimensional lines), both because of the composition of the soil, in this case clayey, wet (Francese *et alii* 2018) and subject to agricultural activities, and also because of the course of the same, irregular at the surface and invaded by vegetation. The results can now be read in light of new excavation data that have seen clarification, at least in part, of the architectural development of ancient structures, particularly from the Roman period (Mariotti 2023; Carpentiero, Mariotti 2023; Mariotti *et alii* 2024). The georadar survey along the road shows, at Bagno Grande, a number of marked anomalies. Some are easily identifiable as hot-water adduction and drainage channels between the spring and the modern pools, already known and visible in their catchment and outlet points [Fig. 04]. Other anomalies, read in the light of subsequent excavations in the adjoining area to the south, are to be identified as the northern part of the recently emerged sacred building: they are located between the present spring and the northern limit of the excavation area, reconnecting planimetrically both with the Roman structures brought to light and with the results of the prospections carried out in 2021, which already indicated unequivocally the extension of the Roman building and its sacred basin toward the spring (Felici, Morelli 2023). The narrow space between the present spring and the Roman building is of fundamental importance for understanding its topographical development, its relationship to the spring itself, as well as the water catchment/adduction systems. The last point is decisive

not only from the point of view of historical reconstruction and archaeological or architectural understanding of the structures related to the spring, but also for the management of forthcoming research and excavation activities, where its multi-layering concerns not only the ancient and modern "thermal buildings" (Mariotti 2023b; Tabolli 2023), but also and especially its waters through the hydraulic works of the different periods.

Further insights into the general topography of the area come from the area immediately east of the spring, where, also in 2019, the second prospecting was carried out. The purpose of the survey was to map the possible area of the first exploratory excavation trench, in any case to be located near the spring. The result clearly shows the presence of a major structure in the plateau west of the spring, about 25 m away, perhaps to be read as a podium or basement of some kind, given the width, thickness and homogeneity of the resistive anomaly [Fig. 04]. The evidence remains unknown (an excavation could not be carried out due to the lack of permission from the landowner), but together with the Roman concrete structure now reused as a barnyard animal shelter located immediately upstream of the Bagno Grande (Carpentiero, Felici 2021; Pocobelli 2021), it could be part of the complex topographic mosaic gravitating around the source of the Bagno Grande. These structures remain of uncertain purpose, given also their elevation and location that apparently do not allow for direct use of the waters coming from the Bagno Grande.

Building on the evidence that emerged with the 2020 and 2021 excavation campaigns, additional geophysical surveys were conducted (September 2021), mentioned in part just above. In this case they were concentrated in the excavation area and around the modern pools, with the aim of mapping the extent of Roman structures below the post-Renaissance buildings. The results have been extensively described in recent works (Felici, Morelli 2023; Mariotti 2023a; Carpentiero, Mariotti 2023), as well as having been confirmed by excavation data that see with certainty the continuation of the sacred basin and related structures toward the spring. But what is of interest here is the southern part of these investigations, conducted, again, with ERT (Resistivity Electrical Tomography), a method found to be particularly effective in this context. The southward extension of the geophysics for a stretch of about 50 m [Fig. 05] revealed another rather pronounced resistive anomaly, probably part of a structure. It is not possible to be more precise but a plausible hypothesis is that this evidence is related to the "twin" source of the Bagno Grande, located immediately south of the excavation area, between it and the geophysical anomaly. In this area, the ground slopes steadily southward, making this hypothesis plausible. Canalization works, or additional water management/use basins, also cannot be ruled out, as in other sites of the Roman world (Tölle-Kastenbein 1990; Yegul 1992; Carneiro 2016; González Soutelo, Matilla Séiquer 2017; Bassani et alii 2019; Kušan Špalj D. 2020).

Topography and DEM: the analysis of the ancient thermal landscape through terrain morphology

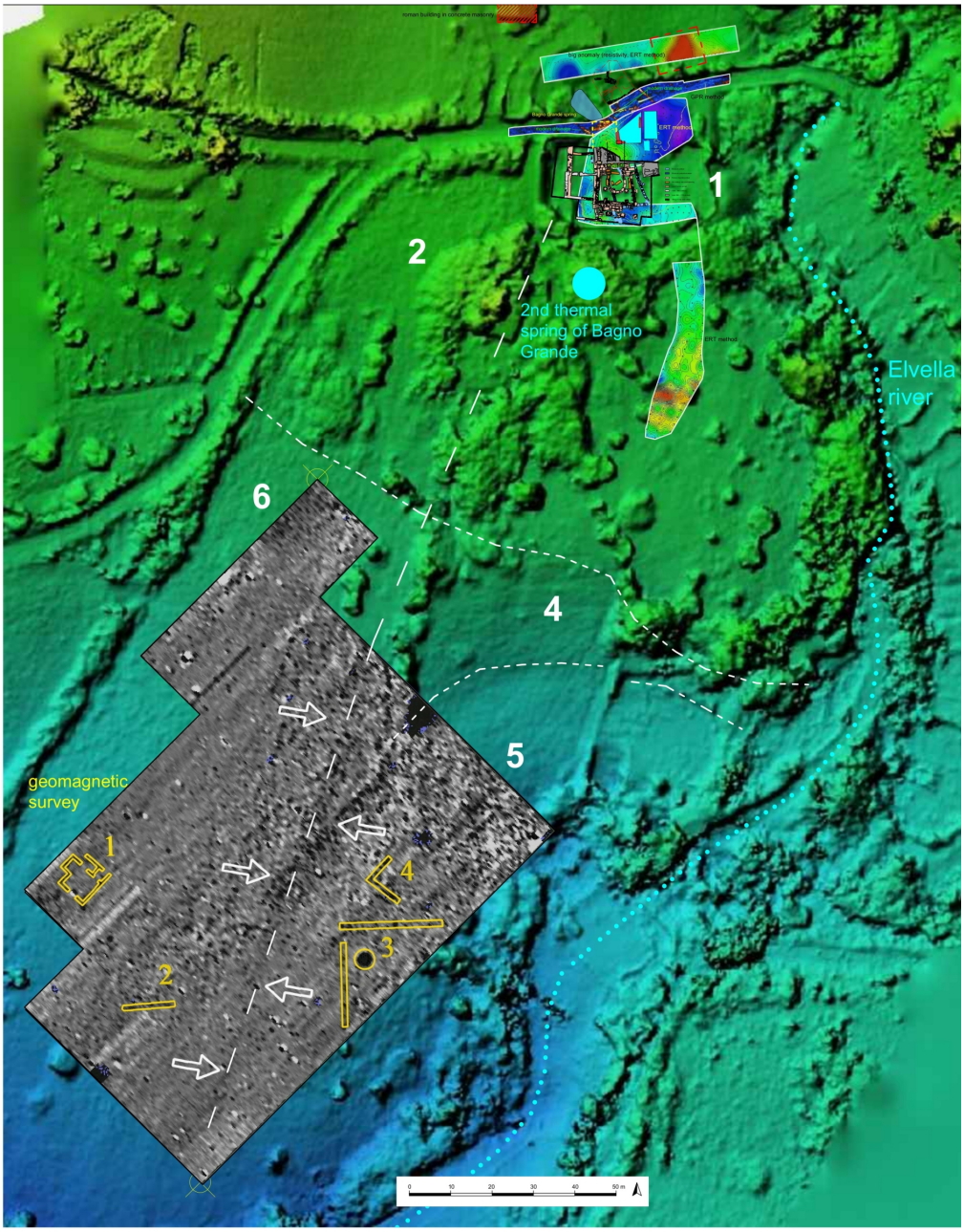
The analysis of the morphology of the terrain through the creation of a DEM is one of the essential tools of *remote sensing* in archaeology (Beex 2004; Bitelli *et alii* 2006; Campana,

Forte 2006; Campana, Francovich 2006; Fiorini, Materazzi 2017) and of the analysis of the archaeological landscape in general, understanding this as the outcome of the continuous interaction between anthropic and natural factors (Farinetti 2012). In the area of Bagno Grande this operation is particularly difficult, as already mentioned, especially because of the "environmental fragmentation" that characterizes its territory. The area we are interested in is inhomogeneous, with different uses, different degrees of past and recent anthropization, as well as morphological fragmentation of the land, due to springs and water flow, agricultural interventions with subsequent abandonments, and scattered but at the same time invasive vegetation. For these reasons, the digital terrain model was obtained by combining both aerial photogrammetry from drone and the use of GPS on the ground (Cina 2004).

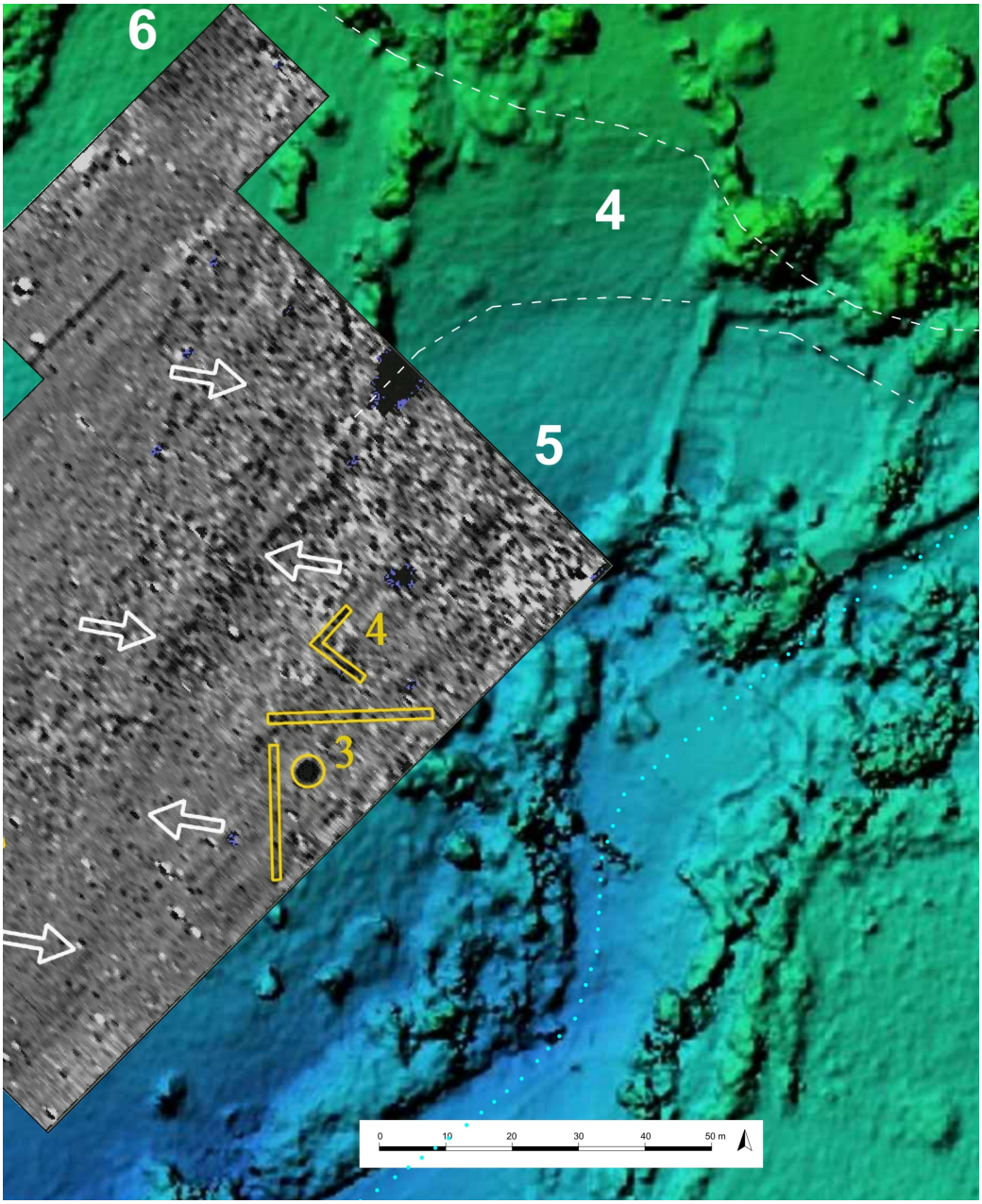
In analyzing the "shape" of the terrain, two main factors must immediately be taken into account: 1) the spring, as the topographical fulcrum of the area and its archaeological evidence, located at an elevation of about 512 m above sea level; and 2) the Elvella river, which collects the water from the springs and flows immediately downstream from the Bagno Grande. The stream demarcates the area to the east and south, sharply defining the entire area. The spring, located on the northern boundary of the system, marks the starting point around which the identified structures revolve, and from which the waters necessarily had to descend, also determining the destination of possible buildings and spaces depending on their position in relation to the spring itself. Based on the DEM, it was possible to divide the entire area of the Bagno Grande into well-defined zones [Fig. 06]. Zone 2 corresponds to the western area, and it is for the most part at a higher elevation than the spring. It is characterized by a regular plateau immediately beyond the excavation area, the origin of which is probably due to both underlying structures and the large regular burial ground, as shown in Fig. 2. The terrain then descends gradually southward to sector 6, where it increases in slope and then reaches the Elvella River. Sector 6 is characterized by scattering of materials in its central portion at the boundary with sector 5 (Pocobelli 2021), but at the same time it is almost devoid of geomagnetic anomalies, showing a certain uniformity of the subsurface [Fig. 07]. The most evident anomalies, although not well defined, are concentrated toward the east and on the northern boundary of the sector, where elevation jumps could also be determined by structures in the subsurface.

This dynamic is particularly evident starting from the excavation area and from Bagno Grande in general, identified with the number "1". Sectors 3, 4 and 5 are characterized by a continuous slope to the east and south; they also show outcrops of construction material, including the remains of travertine canalizations: in these sectors, although not extensively and systematically investigated due to vegetation and poor accessibility, geophysical prospecting has yielded unequivocal results.

Magnetometry, although it does not show defined contours of buildings or structures, marks a clear difference between sector 6 and 5, where the presence of subsurface material is clear, most likely washed away, destroyed, and dispersed by human and natural activities over the



6 | Bagno Grande area: overall geophysics survey overlapping the DEM (graphic processing and interpretation by E. Mariotti).



7 | Bagno Grande, southern area: geophysics survey overlapping the DEM, detail of zones 4 and 5, (graphic processing and interpretation by E. Mariotti).

centuries. Structures must have been present between sectors 4 and 5, and where anomalies are reconstructed [Fig. 07], there are outcrops of *caementicium* walls, unfortunately not clearly documented due to the abandonment of the fields, invaded by spontaneous vegetation. The separation corresponds to the jump in elevation on the terrain and the presence of a rectilinear anomaly (Felici, Morelli 2023, 25) on which some rows of trees are also aligned: along its direction there are further sporadic outcrops of structures (Pocobelli 2021), until reaching the western limit of the excavation area. At this point, a wall in almost reticulated masonry with the same north-south trend seems to mark the limit of the sacred area (Mariotti *et alii* Tabolli 2024, 4), perhaps the *temenos* of the Roman period, at least on this side. Area 3 constitutes a further terrace sloping eastward and southward, immediately downstream from the sacred pool of the Bagno Grande. The area is characterized by a second spring, a strong resistive anomaly as already described immediately downstream of it, a surface strewn with materials, and a regular ground morphology up to its southern limit. The total elevation difference ranges between 511 m a.s.l. at the edge of the sacred building brought to light by the excavation, and 506 m a.s.l. at the southern limit of area "3".

The transition to zones 4 and 5 represents the major morphological "anomaly" that can be derived from the DEM. A considerable jump in elevation, from 507 m a.s.l. to 495 m a.s.l., characterizes these areas [Fig. 07]: the terrain draws a kind of large arc about 50 m in width, until it reaches the creek limits. Based on the geomagnetic anomalies already described and the structures outcropping just to the south, it seems plausible to interpret this morphology as the result of the disintegration of structures and buildings in the subsurface, which are not yet well defined. It is equally probable, given the geological characteristics of the area, that these buildings took advantage of the natural course of the ground, already sloping in a southerly direction and subject to the flow of copious thermal waters to the stream below.

It is perhaps in these areas that it is possible to locate that oft-remembered "a broad range of facilities", which had the purpose of welcoming and caring for those who came to the sanctuary, but which nevertheless remains separate from the sacred area proper, if not directly replaced by the latter (Bolder-Boos, Calapà 2019, 116). The problem remains open, and in most cases it is complex to distinguish healing and cult spaces (Renberg 2006; Turfa 2006), although in some cases environments around the monumentalized spring can be read in this direction (Albanesi, Picuti 2009; Chellini 2002, 98-99). As excavations and research continue in the context of the Bagno Grande at San Casciano dei Bagni, it has already been noted how a topographical distinction increasingly emerges between the areas that make up the complex mosaic of this thermal site (Mariotti 2023, 44), at least for the Roman period. If this was considered a simple working hypothesis, based mainly on the characteristics of the architectural structures that emerged, the morphological analysis of the terrain through the DEM tool, seems to emphasize this concept, allowing the identification of very precise areas, distinct from each other.

Although the short duration of the recent excavations has not yet allowed us to bring to light other structures besides the sacred building near the spring, it is reasonable to expect a monumental complex as in the examples of Montegrotto Terme or Vicarello, just to mention two of the best-known contexts (Bassani 2012, 396; Bassani 2019, 9-14) and closer even from the point of view of the extent of the sites. Terrain morphology, contour lines, and vegetation distribution, when read against the backdrop of geophysical data and all other known archaeological evidence, seem to give clear indications as to how the archaeological landscape of Bagno Grande can be read: the area of the sacred springs and the cult spaces connected to them seem to correspond to the areas identified by the numbers "1" and "3", while further downstream and more distant from the springs, even separated materially from them (Mariotti *et alii* 2024, 16), must have been the other structures that were public or used for the curative and daily use of the thermal waters. Similarly, Area 2 to the west and the structures immediately above the spring could not have been related to the use of water from the Bagno Grande, precisely because of their location and their higher elevation: the suggestion that we see in these plateaus and raised platforms some sort of temple building remains strong even though not yet proven.

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Abstract

The aim of this contribution is to analyse the archaeological topography around the Bagno Grande spring at San Casciano dei Bagni, particularly as regards the Imperial Roman age. Starting from the structures that have emerged in recent years, the area of a large sanctuary that has its focal point in the spring itself and is bordered in its southern and eastern parts by the Elvella stream is increasingly defined. The combined analysis of the visible elements on the ground, the archaeological evidence brought to light, the geophysical prospections and the 3D reconstruction of the terrain (DEM, Digital Elevation Model), makes it possible to propose an initial overall reading of the area, which covers approximately 4 hectares. The morphology of the terrain, based on the geophysical results, appears to be determined by natural and anthropic factors. On the natural terrace sloping down from the source of the Bagno Grande towards the south, structures and different land uses have succeeded one another up to the present day. All of these interventions have contributed to shaping the current surface, which presents, no less, markers such as vegetation and elevation changes, capable of defining different areas, perhaps with different archaeological destinations.

keywords | Digital Elevation Model; San Casciano dei Bagni; Roman Imperial age; Thermal spring.

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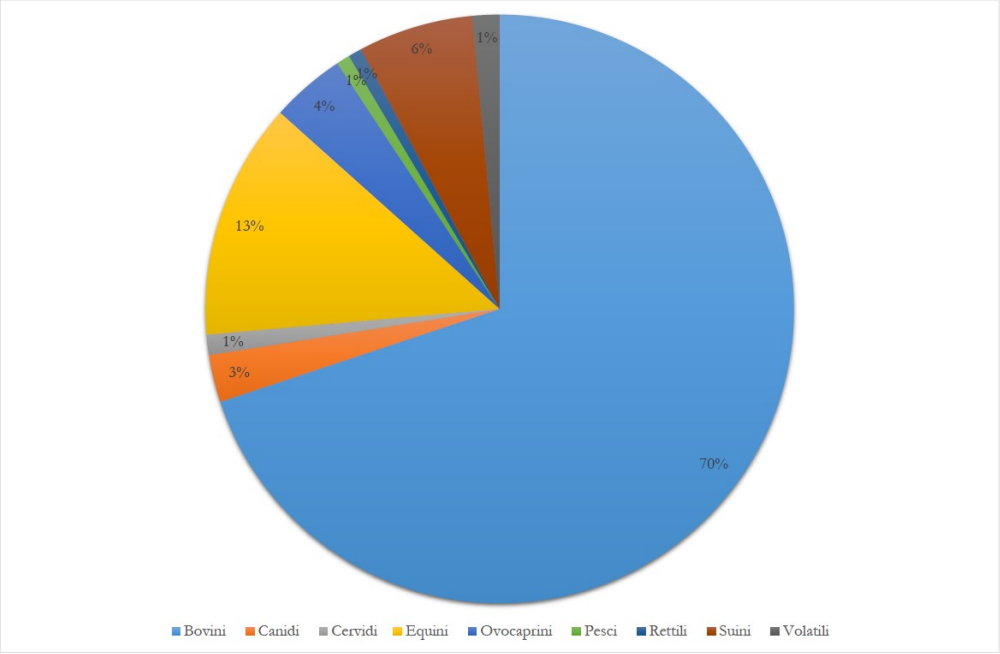
Of Souls and Animals

Healing Properties of Hot Springs and Livestock Economies

Edoardo Vanni



1 | Percentage of attestations of full-length animal *ex voto* by species (7th-2sd century BC; modified from Arbeid 2010).

Places of worship and animals: brief *status quaestionis*

The attendance of animals at ancient places of worship is an issue that continues to fuel a lively debate among scholars of various ages and backgrounds. It concerns more generally the relationship between humans and animals in the ancient world in its innumerable facets, including the sharing of spaces, functional, economic, ritual, and symbolic, as well as the dynamics of exclusion/inclusion and overlapping/separation of a non-human agent other than,

but similar to, humans (*Atti Spoleto* 1985; Frizell 2004; MacKinnon 2004; McInerney 2010; Kindt 2017; Newmyer 2018; Mattila, Ito, Kint 2019).

Concerning sacred and ritual contexts, we have begun to ponder and question the significance that particular cultic manifestations of *ex voto* of domestic animals may have assumed. These manifestations, whether they be statuettes depicting the whole animal or anatomical parts of it, are numerous and varied from the ages of protohistory through the entire republican era, found in votive deposits and places of worship in ancient Italy [Fig. 1] (Comella 1981; Bartoloni, Colonna, Grottarelli 1989-1990; Bellini 2004; Comella, Mele 2005; Bassani 2012b, 186-188). Different interpretations regarding them have, on the one hand, emphasized the role of animals within certain religious practices (Meniel, 1989; Van Andringa, Lepetez 2003; Doyen-Higuet 2007; Volpe, Buglione, De Venuto 2010), and on the other hand, insisted on ceremonial and social aspects (Circi, Vitali 2006). In the latter case, linking the presence of bone remains and animal votive offerings in ritual and religious contexts with a desire to highlight the sacrificial character in honour of the deceased or deities (Malnati, Gamba, 2003; Scheid 2008) or as a substitution for the sacrifice itself. In other cases, animal votive offerings have been interpreted as generic offerings made for the successful return from a journey (Stieda 1901; for critiques on these issues, see De Cazanove 2014, 24).

Only recently has this particular category of offering in religious contexts been traced, more appropriately, to the sphere of health as a loose vow, in the full sense of the term, for healing that has occurred (Santillo Frizzel 2004; Santillo Frizzel 2010; Bassani 2011; Bassani 2012a; 2012b; 2012c; De Cazanove 2014), following the lines of what has been hypothesised for human-figure and anatomical *ex voto* (De Cazanove 2009, 357). These offerings are seen as dedicated offerings following a formally subscribed vow that, once fulfilled, compels the dedicator – *damnatus voti* – to perform their vow. In this case, the vow could have been pronounced when the animal was injured or sick (De Cazanove 2012, 31; Paci 2006, 270-275) or as a wish for good health and prosperity for the animals, whether they were companion or work animals, a vow therefore periodic and generic pronounced throughout the year (Scheid 1990, 298-356). No one solution, of course, excludes the other, but they could interpenetrate, overlap, complement or substitute each other as appropriate and necessary (Scheid 2005).

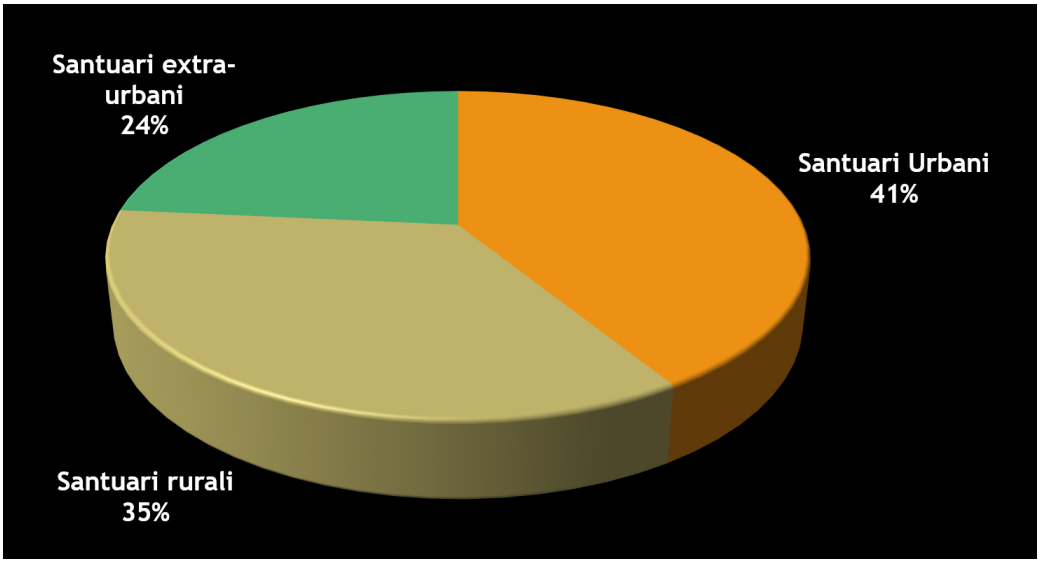
The exegesis surrounding the meaning of animal votive offerings in places of worship and their ubiquitous presence in spaces shared with human beings does not solely pertain to aspects of religion or ritual, whether private or public. It also sheds light on how animals do or do not have access to these spaces, why they are present, and what role they play outside or within the sacred landscape or in livestock economies in general. The 'metaphorical' question, namely whether the animal anatomical part symbolically represents the part in place of the whole or refers concretely to the injured and then healed part, or in the case of whole animal figures, whether it represents the individual animal or generically the herd or flock, does not seem to me to be fully resolved. In particular, the social categories that accessed the shrines to affix

the dedication still elude us, and also, not a secondary problem, which animals and what their productive and economic function was within the sacred landscape (Vanni 2021).

The second order of problems relates to the question of the 'representativeness' of the sample of these *ex voto*, which primarily depict cattle, definitely the most numerous, to a lesser extent horses, donkeys, and pigs, and only rarely, for example, sheep and goats or domestic animals (Söderlind 2004, 278, fig. 1; De Cazanove 2012, 27). Cato's famous passage in chapter 83 refers precisely, for example, to a loose vow for the health of oxen (Cato *De agr*. 83), which along with offerings for their healing also proposes recipes to heal them or maintain their good health (Cato *De Agr*. 71, 103), in which a symbolic and religious level overlaps with a practical one by keeping a close correspondence between a specific situation, illness or injury, and a wish for the individual's preservation. The high recurrence in votive deposits and places of worship of requests for healing and protection of one animal species over another could be explained by the extreme proximity to humans of cattle and horses and their involvement in high-stress physical activities that impair their integrity and survival. The frequency with which figures of bovids or horses appear could refer concretely to a predominant agricultural world around the sanctuary and thus to the social category of peasants and, in general, to draught animals, which, as Columella recalls, are accustomed to injure their legs with the plough or acquire eye infections during ploughing operations (Colum. 6.15.1; 6.17.7). It should not be ruled out, however, that the predominance of both oxen and horses, as well as pigs, is not instead due to their far greater intrinsic economic value than, for example, sheep and goats, making the mobile world of petty livestock inconspicuous in places of worship. The latter, for example, has twice the reproduction rate of cattle, which, in turn, have a much slower growth rate and require a much more significant investment in resources and time for their maintenance (White 1970, 301; Potter, Wells 1985, 34; Barker 1975, 1989).

Healing waters, places of worship and animals

Suppose it now seems widely accepted that the presence of statuettes of animals or anatomical parts at shrines and in votive deposits refers to a specific request for healing. In that case, the situation appears more complicated if we look at those ancient places of worship that arose at thermo-mineral springs or, in general, connected to the cult of water (Santillo Frisell 2004; Veronese 2010). Indeed, for human beings, it is incontrovertible that these shrines were frequented for eminently therapeutic purposes or for phenomena of social and political cohesion through a specific ritual practice involving the concrete use of the waters. This ritual could involve the ingestion of or immersion into the water, for the healing of a whole range of pathologies, including infertility, ocular, gastrointestinal, endocrinological, dermatological problems, or superficial wounds (Zanetti, Rizzi, Mantovanelli, 2012). However, the situation appears more polysemous in connection with both animal frequentation of sacred spaces at thermo-mineral springs. Such frequentation of a healthful place of worship, whether episodic or periodic, involves the repetition of activities prolonged in time, linked to a concrete practice and conditioned by the use of a specific resource, such as immersion in water, and therefore activates at the same time phenomena of mobility to reach the place of worship and an ap-



2 | Animal *ex voto* and their prevalence in Republican shrines (modified from Söderlind 2004).

propriation by the subjects involved. The presence of specific structures at water sanctuaries such as ponds, basins, and canals is the result of planning to regulate the flows of humans and animals and to arrange a division of spaces that are functional for the many planned activities.

In addition, the rituality subtended by the dissolution of the vow for healing that has occurred involves an investment in terms of time (waiting for healing and the production of the *ex voto*) as well as in resources. We can ask: were there dedicated, shared spaces or different immersion times for animals and humans? Were animals also allowed to frequent the oligomineral waters? And if so, which ones? What parties were involved in the practice of animal care? Many of these questions will remain unanswered, but we will try to construct a framework of suggestions to fill in some of them.

Here, too, there are many problems. The occurrence of animal votive offerings related to hot springs and waters, in general, is primarily concentrated in central Italy, and their occurrence is significantly lower than that of human votive offerings. However, this is in contrast to what we know from ancient sources about practices related to veterinary medicine, for example. Barbro Santillo Frizell analyzed the literary and archaeological evidence related to thermal waters and the presence of animals from the particular perspective of their use for veterinary purposes, concluding that not only did “Ancient man know that the health of the animal influenced the quality of the end product, whatever it was: wool, meat or cheese” but also that “Many of the sacred places with particular healing waters were probably used for animals earlier than for humans”, and, more generally, this topic of study “is a vast subject to be

explored overall in the Mediterranean area where large scale transhumance was practiced" (Santillo Frizell 2004, 88). These reflections highlight well, without perhaps grasping all its implications, the link between the strategic location of these particular points of 'electrification' in the landscape, mobility and the practice of transhumance (Vanni 2021, 71), a scenario well evident for Daunia (Apulia), where we know from Strabo how the practice of cleansing the flocks in thermal waters for the cure of epizootic ills was in use precisely among transhumant shepherds (Strabo 6.3.9-10). The same well-known inscription from Tivoli, found in 1733 at *Aquae Albulae* along the Via Salaria and not far from the temple of Hercules, mentions a horse named Samis, injured at Roselle by a wild boar and healed thanks to the healing properties of the waters, illustrates well the use of this practice for different situations but in the apparent regime of mobility practices (*CIL* XIV 3911; Paci 2011; *contra* McDonough 2011, 658). In a passage from Ovid's *Fasti*, where the ritual and prerogatives of Pales the *dea pastorum* (Goddess of Shepherds) are described (Heurgon 1951; Coarelli 2012, 168-197), as protector of animals and flocks, it is intuited that the presence of animals must not have been unusual in sanctuaries and sacred areas placed near hot springs, alongside that of humans, precisely because the latter were used for veterinary purposes (*Nec noceat turbasse lacus: ignoscite, nymphae / mota quod oscura ungula fecit aquas / tu, dea, pro nobis fontes fontanaque placa / numina, tu sparsos per nemus omne deos*). Again, from Ovid, we know that the ritual of Pales involved the use of sulfur fumes to sanitize the stables and the animals themselves (*caerulei fiant puro de sulphure fumi, tactaque fumanti sulphure balet ovis*, Ovid. *Fast*. 4. 756-760). M. Söderlind, precisely by considering the presence of humans and animals in the sanctuary contexts of the 4th-1st century BC [Fig. 2], through that particular cultic manifestation that are the terracotta votive offerings in central Italy has recognized two parallel phenomena related to therapeutic and medicinal functions: "Above, human and animal votive figures have been considered as parallel phenomena. The point of departure for the discussion is a catalogue of ninety-three sites where both kinds of figures appear together. They suggest that man and animal were given very similar religious attention in town and countryside alike. Function and significance were, therefore, in all likelihood, in several respects similar. Both can probably be associated with a procreative and a medical/therapeutic sphere" (Söderlind 2004, 283). In this regard, Varro speaks explicitly of *medicina pecudum* and hints at the existence of a specialized person in charge of veterinary care of flocks (Varro *Rust*. 2.10.5), while Virgil on several occasions in the *Georgics* refers to the activity of soaking sheep in waters for the treatment of scabies (Verg. *Georg*. 3.440-450). Pliny the Elder, on the other hand, mentions the use of muds and clays of waters, probably salty-bromine-iodine, for the treatment of human and animal diseases (Plin. *nat*. XXXI, 41.86) as well as the importance of an ointment elaborated on a vegetable base, the excipients of which were without doubt bitumen and the fact of using sulfur water, to be used as an eyewash to the compound, while the same vegetable bitumen was used to treat wounds (Plin. *nat*. XXXV, 177; Taborelli 2014, 26; Nicosia *et alii* 2022, 19-20; Zambito 2022, 96).



3 | The valley system gravitating around Contursi Terme and an image of the 'vagnatura' ritual (lower right) (source: Google Earth).

Modern and ancient dipping: some analogies

These brief and partial reviews of sources indicate how well known to the ancients, from an empirical point of view, were the hydro-chemical qualities of certain types of waters and also the use of their by-products for therapeutic purposes (Polizzi, Ollivier, Bouffier 2022; Zambito 2022). This indicates a very precise differentiation and specialization in practices, depending on the type of source and, in turn, on the spheres of pertinence of the deities (Oberhelman 2014), as well as the widespread presence of sheepherders at the sources and shrines connected to the thermo-mineral waters. A direct causal relationship, as a consequence of the co-presence of humans and animals in the same spaces of the sanctuaries, for the treatment of a variety of pathologies, has been hypothesised, for example, regarding the votives of Ponte di Nona, a tangible result of animal-borne diseases (Potter, Wells 1985; 1989, 100).

This healing practice for animals, for epizootic purposes, is also corroborated by numerous modern and ethnographic sources at hot springs. Worthy of mention is the phenomenon of saline waters in the Modenese plain, i.e., liquid and gaseous hydrocarbon emissions mixed with mud, used by farmers to treat ailments of the joints or muscles of animals, notably sheep at the Sassuolo spa at Salvarola, built in the 19th century (Guandalini 2006, 275).



4 | Dipping of sheep and goats by Kazakh and Uyghur transhumant herders in the Xinjiang region, (edited by E. Vanni).

Salty-bromine-iodine waters are also found in mountainous environments such as at Montese, in the Tuscan-Emilian Apennines, near Lake Bracciano, where there is a salty spring called Rio Acqua Salata. In the nineteenth century, specimens of votive bronzes dated between the sixth and fourth centuries B.C. were found, including five representing animals: two bovids, two sheep, and a horse (Miari 2000, 128), whereas even in the early twentieth century, transhumant shepherds took their sheep there to bathe. The water was used to treat gout (Badiali 2013, 323). For the veterinary treatment of horses, we know from modern documentary sources that, at Sant'Angelo in Formis, on Mount Tifata (Caserta, Campania), where the pre-Roman and Roman sanctuary of Diana Tifatina, linked to the hot springs, stood (De Franciscis 1956; Quilici Gigli 2000, 46-48), unique tubs were built with differentiated modes of access for sick beasts, so as not to infect other animals or humans themselves (Novi [1886] 1979, 225). The same modes of use are found in the Euganean spa area, where Maddalena Bassani has collected a whole series of literary testimonies between the sixteenth and eighteenth centuries, testifying to the practice of soaking or, if you will, the practice of 'grazing the waters' for different types of animals suffering from the most varied veterinary diseases

(Bassani 2011, 225-226; Bassani 2012b, 194-196). The written sources not only document in detail the ways by which animals accessed the thermal bath facilities and for what diseases they were treated but also testify to a continuity of occupation from the ancient to the modern period, implying a continuity in the same therapeutic as well as cultic practices (Manselli 1982; Spanu 2008; Giulierini 2010, 130-132; Binazzi 2012; Archetti 2015).

The custom of soaking animals in thermo-mineral waters is still practised in some areas of central-southern Italy, such as in Contursi Terme (Salerno), at the confluence of the Tanagro and Sele rivers, where the ritual of '*vagnatura*' or 'bathing' of the sheep into the thermal water before shearing is repeated every year in June. Shepherds lead the animals on a stretch of the river characterized by carbon-magnesium waters, which can give luster to their fleece and promote the healing of any wounds [Fig. 3]. A winter grazing terminal was undoubtedly to be found in the plain of the lower course of the Sele, while the upper Sele valley constituted a real junction linking the Tyrrhenian areas with the transhumant routes of the Ofanto valley and Apulia and the upper Irpinia and Benevento (Filippone 1993, 21-25). This mobility network, active since Roman times, acquired significant economic value in the Norman era precisely in relation to seasonal pastoralism (Di Muro 2005, 118-119). Geographically distant but structurally significant are also some examples from the steppes of Central Asia and Central Africa.

Indeed, ethnographic surveys conducted on nomadic and semi-nomadic populations of Eurasia have observed how the practice of sheep and goat dipping fits neatly into ordinary resource management within pastoral economies based on transhumant farming.

In Georgia (Chenais *et alii* 2021), as well as in the Tibetan Ordo Plateau (Wang *et alii* 41) or among nomadic pastoralists active between Kazakhstan and China, sheep and goats are immersed twice a year in artificial tanks and canals filled with spring water, sometimes with added pesticides (Kerven, Robinson, Behnke 2021; Ferret 2014). In the Georgian case in particular it was noted that one of the significant concerns of shepherds was precisely the need to keep the treatment constant throughout the year and ensure its repetition along the routes of their movements and, therefore, "the availability of dipping stations along the migration roads" (Chenaise *et alii* 2021, 12) [Fig. 4].

Hot springs and pastoral economies

The therapeutic aspect, of course, does not exhaust the implications of animal presence at sanctuaries and springs, and its productive and economic aspects have been emphasized by several parties (Di Giuseppe 2012; Bassani 2016, 886-887; Bassani 2022; Vanni, Cambi 2015; Vanni 2021). After all, the very practice of cleaning the fleece of sheep with thermal water has primarily productive purposes, namely to make the wool more valuable and easily workable, as well as for the elimination of parasites. Thus, incoming mobility at thermal facilities was undoubtedly dictated by economic reasons for maintaining the animal resource, which in turn ensured the quality and profitability of the collateral production system. This was, for example, found to be the case for the saltwater springs of the Modena area, where the by-products derived from this hydro-geological phenomenon, such as salt, sulfur-rich mud, bi-

tumen, and nitrogen, were used not only for curative purposes but were part of an economic system of integrated animal husbandry practices. The same system seems to have been present at the Bagni di Abano in the Euganean Hills, where sheep were taken to wash their fleece, drink the cold waters, and simultaneously feed at the salt deposits (Bassani 2012b, 195). Salt constitutes an element of fundamental importance for animal nutrition, particularly for sheep and goats. Its regular administration in the animal diet drastically reduces the occurrence of diseases, increases reproductive and dairy capacity (Vanni, Cambi 2015, 111-112 with bibliography), and is an essential element throughout the production cycle of secondary products (Sherratt 1983, Greenfield 2005, 2010; Marciniak 2011). The importance of this food in the management of transhumant, sedentary, and semi-sedentary herds has led to glimpses of a real topographical overlap between the location of salt supply sites, including thermal sites, and the resting places of herds. Salt production and herding found in the thermal waters a point of convergence and electrification for constructing the ancient productive landscape.

Once again, the use of analogy and comparison, both chronological and spatial, restores to us the complexity of a world that would otherwise remain inaccessible. An adamantine example of this complexity and the diversification and integration of practices, strategies, and exploitation of particular resources is the site of Poiana Slatinei, in Romania, where salt-extraction facilities in the vicinity of saltwater springs are attested from at least the Neolithic period, with cultic manifestations pertaining to the Bronze Age (Weller, Dumitroiai 2002) and with a continuity of use up to contemporary times [Fig. 5]. Ethnographic investigations have not only observed how the local shepherds directly use the saltwater from these springs for cheese production but also that the shelters and pens themselves are directly carved out near the water pools to ensure both the hygiene of the animals and a constant supply of salt for their feeding (Alexianu *et alii* 2011, 12-13). At the site of Hălăbutoaia – Țolici, near a salt spring only 25 km away from that of Poiana and occupied between Neolithic and Chalcolithic times, analyses of phytoliths in the archaeological deposits revealed an essential amount of millet, suggesting that its cultivation was directly related to its use as fuel in pyrotechnic operations for salt extraction (Danu, Delhon, Weller 2022). Millet has also been shown in different contexts and for different periods to have been cultivated primarily as fodder for sheep and goats (Hermes *et alii* 2019; Zhang *et alii* 2021).

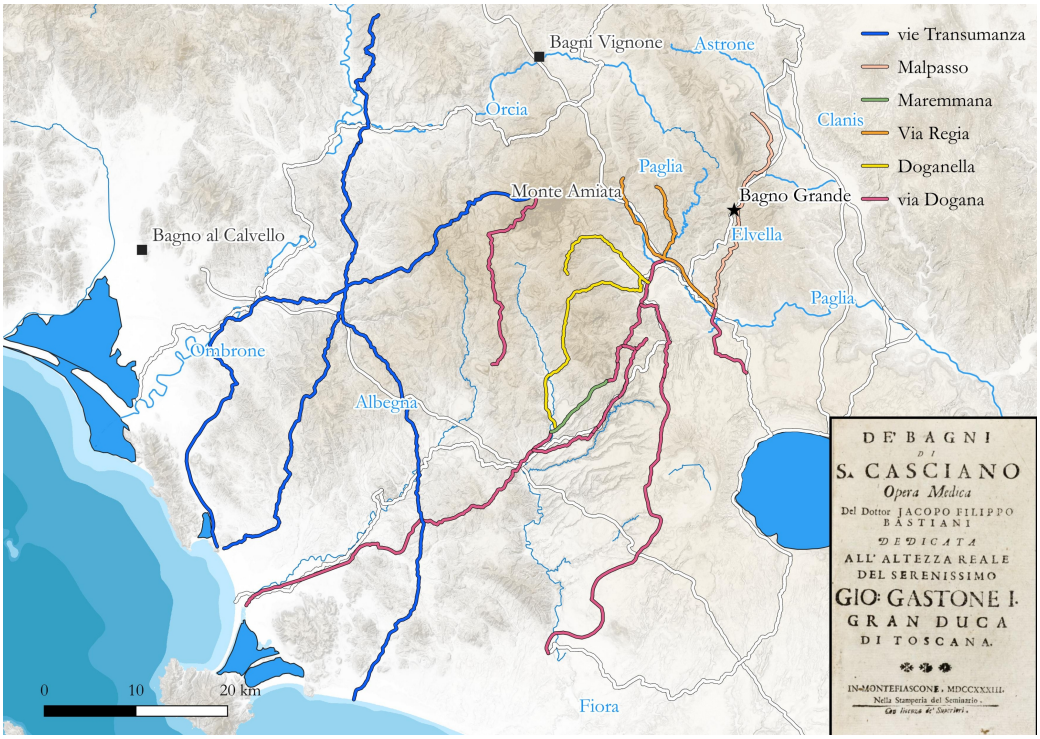
Completely changing the geographical context, but not the morphology of the mode of production, the use of hot springs by transhumant, nomadic, and semi-nomadic pastoralists is well attested in Africa. In the Ahmara region of Ethiopia, which is rich in hot springs, about fifty thousand pastoralists with two hundred thousand cattle in tow converge on these highlands during the dry season to take advantage of the water resources and pastures here (Tinsae, Zemede, Sebisibe 2022; Biru, Tessema, Urge 2017, 10; Derso *et alii* 2015, 3). Conversely, in Uganda, at the thermo-mineral springs in the Bunyoro region, salt extraction and mobile farming are again closely linked, but in different ways from the Romanian case: mobile farming ensures the circulation of salt loaves produced from the salty thermal waters to city markets (Moinier 2015, 26). In the village of Kibero, the division of labour is rigidly organized, and



5 | The Poiana Saltinei site (Romania) with modern facilities for dairy production that directly exploits the saline properties of the springs (from Alexianu *et alii* 2011).

while women are responsible for the extraction and production of salt, males provide for its transportation by animals. Pastoralists from different tribes also converge in this water-rich territory, triggering a circuit of inter-regional trade and exchanges of different kinds, attracted by the possibility of treating their animals with sulfur mud or producing medicines by soaking plants in the hot waters (Nabukenya *et alii* 2014, 11). Those who obtain their raw materials from the thermo-mineral springs, such as salt and those who buy products that co-flow here are immersed literally in the same hot pools (Good 1972).

Salt is, however, only one of the many secondary products that can be obtained through the use of sulfurous waters, as in the case of their use in the production cycle of textiles from plant material or derived from them, such as travertine (Cataldi 2005; Bassani 2021, 81). Recently, considerable attention has been paid to sulfur production in antiquity, which was helpful for a whole range of medicinal and religious activities. At Tor Caldara, between Ardea and Anzio, a locality with numerous springs, both hot and cold, rich in sulfur, sulfur mining activities are known throughout the modern age (Bassani 2016). Here, a series of structures dating back to Roman times, along with extensive production of *ollae*, have suggested that this production may have been at the center of an economic system even in ancient times. The presence then of reddish impasto *ollae* from the Final Bronze/Early Iron Age could be evidence of an even earlier production but connected to salt extraction (Di Gennaro 2008). Similar exploitation, certainly dating back to Roman times, can also be seen in the area of Agrigento, Sicily, where numerous phenomena related to secondary volcanism have as their manifestation the presence of thermal waters or simply waters that contain sulfur, among other minerals. Here in the vicinity of sulfur springs are attested ancient basins, canalizations, and specific ceramic productions for the production of medicaments, such as Lykion (Taborelli 2014), connected to

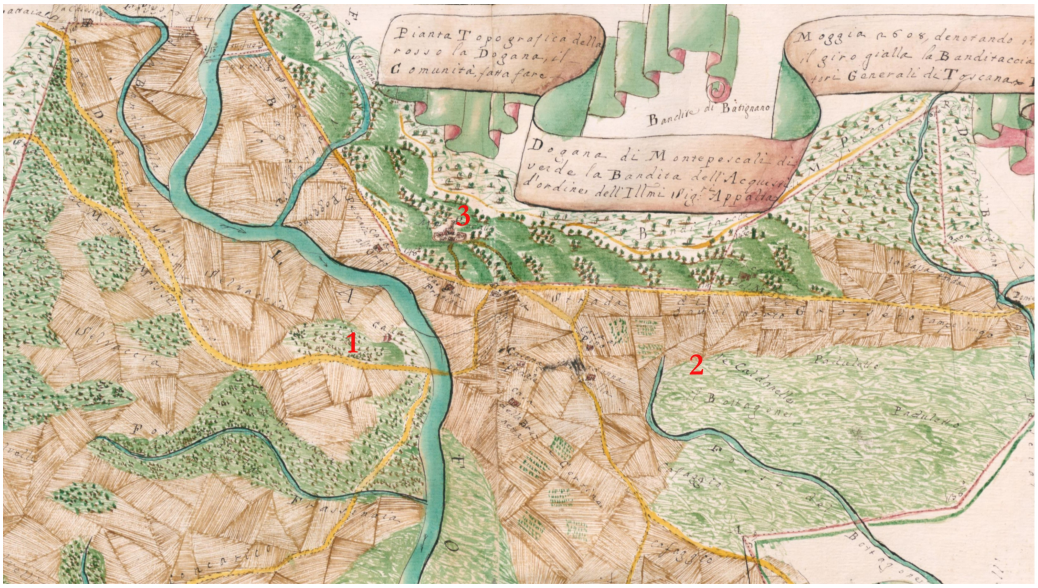


6 | Some Medieval thermal sites mentioned in the text and the medical treatise on San Casciano dei Bagni by Jacopo Filippo Bastiani (bottom right).

the sulfur cycle and the collection of bitumen (Zambito 2022), still practiced throughout the medieval and modern ages.

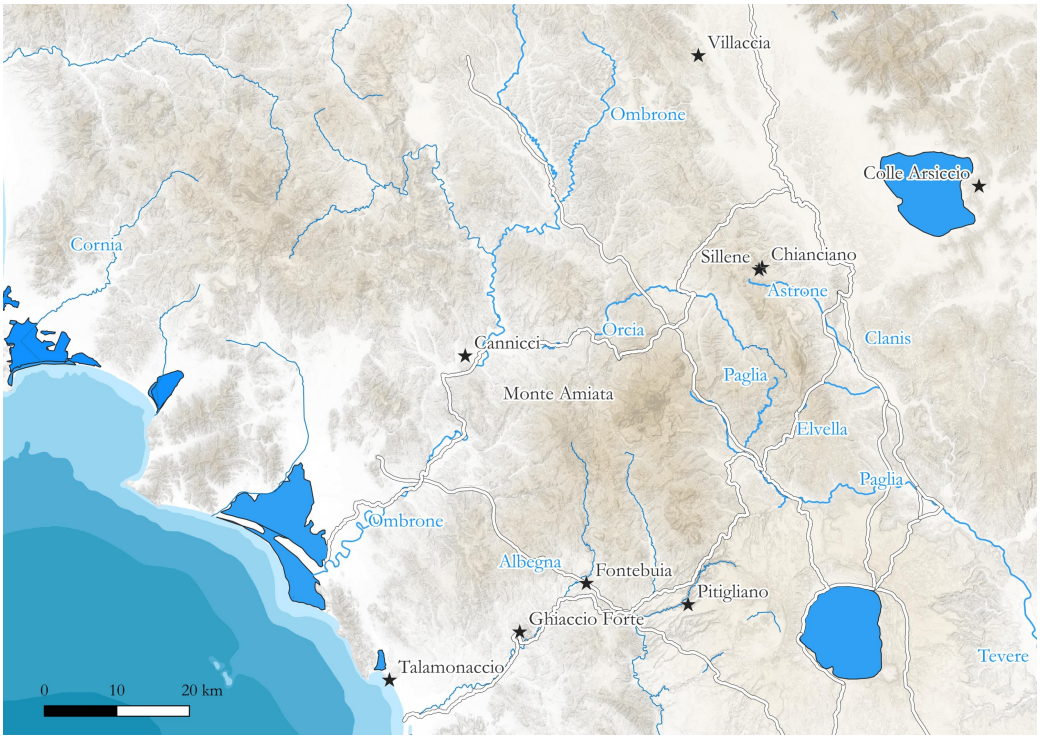
Mobility as a condition of existence and continuity of use of thermo-mineral springs in Etruria

The understanding of the phenomenon related to hot springs should be placed within the more complex framework of a series of strategies and practices related to mobility phenomena. As we have argued elsewhere (Vanni 2023), mobility constitutes a crucial element in activating and maintaining the use of a cultic site connected to a particular resource, such as thermal water. When viewed as a condition of existence, it is even more decisive in those territories where the fabric of the population tends to structure itself in a discontinuous manner, the so-called broad-mesh peopling, or for those sites located in ecologically and socio-economically marginal spaces. In such contexts, the instability of the social groups in charge of ensuring the usability and functionality of a place of worship may find in some mobile segments of the communities occupying a territory a guarantee of survival.



7 | The Bagno al Calvello site (No. 2) in a historical map (1745) illustrating the Dogana di Montepescali (No. 1) with the *calla* site (No. 1).

However, mobility also triggers other processes directly affecting how animals are managed. Although, for example, the sheep is an animal that is well adapted to travelling long distances and undemanding when it comes to grazing, it is at the same time also very fragile. Transhumant sheep, in particular, are subjected to the stress of very long and continuous movements, and seem to be the most affected by diseases and epizootics (Cristoferi 2019, 44-46). The possibility of contracting diseases and therefore the need to prevent or treat them, in connection with the ecology of the environments frequented by the animals and the mobile practices, is evident in the agricultural and zootechnical treatises of the 18th and 19th centuries (Dandolo 1804, 123; De Crescenzi 1805, III, chapters LXIX-LXXV, LXXIII; Doriglioni 1785, 6). This knowledge empirically rises to a real system of management and prevention. Certain diseases such as marchia or watery cachexia, for example, affect sheep that frequent wet pastures or morning dew, environmental factors that are very common along the coasts of central Tyrrhenian Italy and particularly in Etruria (Barontini 1913, 22-23; Tessier 1812, 3, 159,161; Salvagnoli-Marchetti 1856). The practice of transhumant mobility and its related activities, such as *calla* (counting animals for tax purposes) or selling in livestock markets, involved the meeting, joining, and recomposition of several flocks at different times and seasons of the year, promoting the development of epizootics and increasing the risks of contracting diseases. This risk seems to be alluded to in the news of the refusal by transhumant shepherds to go for the Paganico *calla* in 1405 (ASS, General Council, Deliberations, 202, cc. 37v-38r September 18, 1405), the seizure in 1420 by the officers of the Paschi, of several sick sheep



8 | Attestations of animal votive offerings connected to mineral and thermo-mineral springs in Etruria between the 7th and 1st centuries BC (source: Geoscopio).

which could not be sold in the square of Grosseto, or the prohibition, in the statute of Gavorrano in 1465, of grazing to those beasts that had contracted diseases (Cristoferi 2019, 45, no. 177), so proper and systematic management of these issues significantly affected the income of the breeding economies.

In Etruria, the frequentation of thermo-mineral springs in Medieval and Modern times for the treatment of epizootics and diseases caused by contact with animals, especially scabies, from sites already frequented in earlier times, is documented in numerous written sources (Boisseuil 2002, 321-389; Chellini 2002, 73, 119, 127, 135, 135, 139, 145, 151, 162, 166, 171, 180). These healthy activities, as we have tried to suggest, are never divorced from productive and economic practices. This structural complementarity of financial systems, let us call them pre-capitalist, has not yet undergone compartmentalisation and rigid fragmentation into discrete segments typical of modernity, so that even ancient spaces are mostly hybrid, shared places frequented simultaneously by different actors, who may be involved simultaneously in closely related activities. The hybridity of practices and spaces does not mean the absence of logic. In San Casciano dei Bagni, for example, we know from the description of the physician Jacopo Filippo Bastiani [Fig. 6], that in the mid-18th century, numerous hot springs and con-

nected pools were frequently used for numerous activities beyond those that were properly medical. In particular, from the Bagno Grande spring, which was already rich in archaeological finds at that time (Mariotti, Tabolli 2021; Mariotti, Salvi, Tabolli 2023), Bastiani again signals how "All this water flows for its channels in the adjacent ditch, and provides the comfort of three large piles, in two of which the clothes are washed, and in one of which the sheep and other animals that have mange are bathed", and also "It gives motion to the water to a nearby hollow, and forms together with the water of the other baths the Fiumicello Elvella, from which three Mills are made grinding, and motion is given to another Gualchiera in the distance of a mile", a sign once again of the extreme economic versatility linked to the use of thermal waters, of the hybrid character of the spaces but also of a precise desire to organize them for differentiated practices (Bastiani 1733, 25; Morelli 2021, 95-96). As proof of the polyfunctionality of the health waters and the structures connected to them, we can cite the example of Mezzomiglio (Chianciano Terme), once again in the territory of Chiusi, where in the late antique phases of the pool built to harness the spring and use it for therapeutic purposes, we can trace the clear signs of a re-functionalization for breeding purposes (Soren 2006, 199; Mackinnon 2009, 196; in this issue, see the article by M. Pacifici).

The desire to rationalize spaces and the dual mechanism of inclusion/exclusion and interpenetration/separation is clearly visible once again in official acts. Also, in San Casciano dei Bagni, a notarial deed of 1485 enjoined that "nulla persona (...) possit aliquo modo neque pertransitum firmare, tenere apud balnea et in confinibus balneorum aliquam quantitatem pecorum" (A.S.S. Notarile antecosimiano 784, f.14). Not far away, Bagno Vignoni, located on the slopes of Monte Amiata and at the meeting of the Orcia corridor and the Via Francigena, was also explicitly forbidden to use the baths for animal washing (Boisseuil 2002, p. 14; Tintinnano 1297, dist. IV, rub. XXIIII). Interdictions to animal bathing can be found in the mid-15th century in the statute of the community of Montepescali (1427-1428), in the heart of the Maremma plain, in which the immersion of animals in the pools of the Bagno al Calvello or Caldanelle [Fig. 7], located close to Lake Prile, was prohibited so that, at the same time, its use for watering grazing animals was guaranteed (Imberciadori 1946, 217).

The small rise overlooking these springs and wetlands, called Poggio Calvello, experienced a protohistoric occupation that can be framed in the Early Iron Age This was of a seasonal nature, undoubtedly related to the exploitation of the lagoon's resources, such as salt and pastures (Aranguren 1985-1986), and of the same nature as other coeval neighbouring settlements such as Poggio Diaccialone and Colle Macinaie (Bergonzoni 1973) and early medieval occupation. Not far away, on the road between Montepescali and Grosseto, near another thermo-mineral spring at Poggetti Vecchi, we know from antiquarian evidence that transhumant shepherds, still in the mid-18th century, used to "wash their sheep for cutaneous ills" (Boldrini 1761, 154) in tubs from Roman times, yet another proof of that continuity of use in the discontinuity of practices (Curri 1978, 200).

All these news and prescriptions indeed allude to a widespread practice and report on the desire to manage collective spaces shared (and divided) between productive activities and different subjects, also suggesting the massive presence of animals, particularly sheep, which can only be linked to the presence of transhumant flocks. These came, in the case of San Casciano dei Bagni, Bagno Vignoni and Paganico, from the Casentino and the Umbria-Marches Apennines (Massaini 2005), while in the case of Montepescali and Gavorrano from Garfagnana, reaching the alluvial plains and the mid-Tyrrhenian wetlands (Piccinni 1989, 205; Landi, Calzolai 2015, 102). The overlap between the places deputed to the *calla* of sheep and those of Dogana, for fiscal counting and flow management, and the thermomineral stations, as at Petriolo (Vanni *et alii* 2023, 224-228), at Montepescali, and at Paganico (Cristoferi 2021, 49-50), is not a mere coincidence. Furthermore the continuity of their frequentation in ancient times, as in the case of San Casciano, as well as the insistence of the sheep-tracks and ancient road system along the springs, shows the long-term resilience of a vast and complex economic and ecological system.

Beyond economy and the sacred

There is no reason not to think that these "landscapes of complexities", composed of ecological elements (healing springs, pastures, rivers, etc.), manifestations of worship, therapeutic practices (shrines, lights, votive offerings, etc.), and socio-economic structures, closely interrelated, did not have their own and peculiar configuration even in Antiquity. So why, for example, are the manifestations of worship materially expressed by animal *ex voto* and routinely used to index how sacred spaces were frequented and the people involved only background noise in a sea of complexity? Let's look at the Etruscan and Roman worlds. Etruria records a relatively small amount of animal *ex voto*, whether anatomical or depicting the animal in its entirety, except for a few exceptional finds, such as Lake of the Idols, on the Falterona (Arezzo) or in general for the Trasimeno and Bolsena Lake areas (Arbeid 2010). Even rarer appear the attestations in connection with sanctuaries and thermo-mineral springs. How, then, can this *argumentum (quasi) ex silentio* be interpreted? Having reached this point, we can only speculate. It is, in my opinion, indisputable that places of worship at thermo-mineral springs were frequented, in equal measure, by both humans and animals and that the latter were subject to a process of 'humanisation' within a ritual practice precisely because they were non-human actors. This praxis, which involved the dissolution of a vow for healing, is quite comparable in procedures and symbolic manifestations to that of human actors, who are ultimately the ritual substitutes for animals.

However the ritual and therapeutic aspect does not, as we have seen, exhaust the dynamics of the use and frequentation of thermo-mineral resources. The economic aspect is undoubtedly the dominant characteristic of the system, which involves, in each case, mobility, whether continuous, occasional, periodic or seasonal. In short, occupying and using worship spaces means doing so in various ways, not necessarily religious in character. This could be one possible explanation. On the other hand, we need to point out how the need to regulate, divide, and prohibit collective spaces of use, a dynamic well operating, as we have had the opportuni-

ty to see, in San Casciano, produces, at different levels, a series of privileges of access to the structures and procedures of exclusion such as to make some archaeologically 'invisible' and overrepresent others. A final aspect might relate to communal forms of economic and cult management, in which multiple entities might have joined together to dedicate a single offering, in accordance with the relatively high costs of producing it, as we know to have happened to the *sodales oviari* (group of shepherds) of the Betica, active along the entire course of the Guadalquivir, in Roman times (Gomez Pantoja 2001, 198-201).

Even amidst the disorganized representativeness of the data, we must highlight how animal devotion during Etruscan and late republican times was largely concentrated, spreading in a widespread and uniform manner, primarily in the inner Tiberine and northern part of southern Etruria. This phenomenon notably impacts the region between Perugia, Cortona, and Chiusi, centered around Lake Trasimeno and the area between Orvieto and Vulci, with Lake Bolsena at its core. Conversely, to the south, this phenomenon appears not to extend beyond the Albegna corridor, except for the singular discovery of bronze cattle from the Ara della Regina in Tarquinia (Arbeid 2010, 23-24).

When we specifically consider travel corridors and macro-areas, we observe this phenomenon tending to structure itself between the river courses of the Orcia and Ombrone rivers to the north and the south, along the Osa and Albegna rivers, eventually reaching the interior and influencing certain areas of the Apennines. These animal votive offerings, particularly those made of bronze, appear to circulate, move, and percolate along and across border spaces—the ecological and productive interfaces situated between different landscapes and political entities (between Volterra, Chiusi, and Roselle on one hand, and Orvieto, Vulci, and Roselle on the other).

Thus, if there exists a historical (and historiographical) distinction between the 'two Etruriae', northern and southern (Camporeale 2005), or rather between multiple Etruriae (Milletti *et alii* 2021), with varying times and velocities, this differentiation likely stems from their distinct ecological and productive vocations. These differences result from a combination of well-defined choices regarding resource exploitation strategies, the implementation of practices dating back at least to the Final Bronze Age, and the ecological composition of landscapes, which have long-term consequences even into the Roman age (Vaccaro 2008, 244-245).

An adequate understanding of these complex structures, thickened around sacred spaces and thermal springs, must use a necessarily territorial perspective to place places, rituals, and human and non-human subjects within the modes of production and micro-ecologies of which they are the expression and premise. One must be able to de-ritualize space and de-situate the material manifestations of worship to bring out the 'landscapes of complexities' in which (and with which) humans, things, animals, and systemic configurations (symbolic, social, economic) are 'trapped' or 'intertwined' – or entangled? (Hodder 2012, 94).

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Abstract

This contribution aims to analyse the complex functional and symbolic links between the presence of thermo-mineral springs, places of worship connected to them, and mobile livestock farming economies in a particular border area of Etruria. These three elements constitute an integrated system of practices and a specific mode of production, the continuities and discontinuities of which can be traced over the long term. By analyzing various ancient documentary sources and making extensive use of ethnography, this

study will highlight the entanglements specific to this sacral, thermal, and economic system within the ancient landscape.

keywords | Ancient Etruria; Healing Sanctuaries; Pastoralism; Anthropology; Thermalism.

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The Etruscan and Roman Territory of Trequanda (Siena, Italy)

Rediscovering the Ancient 'Thermal' Complex of Pieve di Santo Stefano a Cennano at Castelmuzio

Jacopo Tabolli, Debora Barbagli, Cesare Felici

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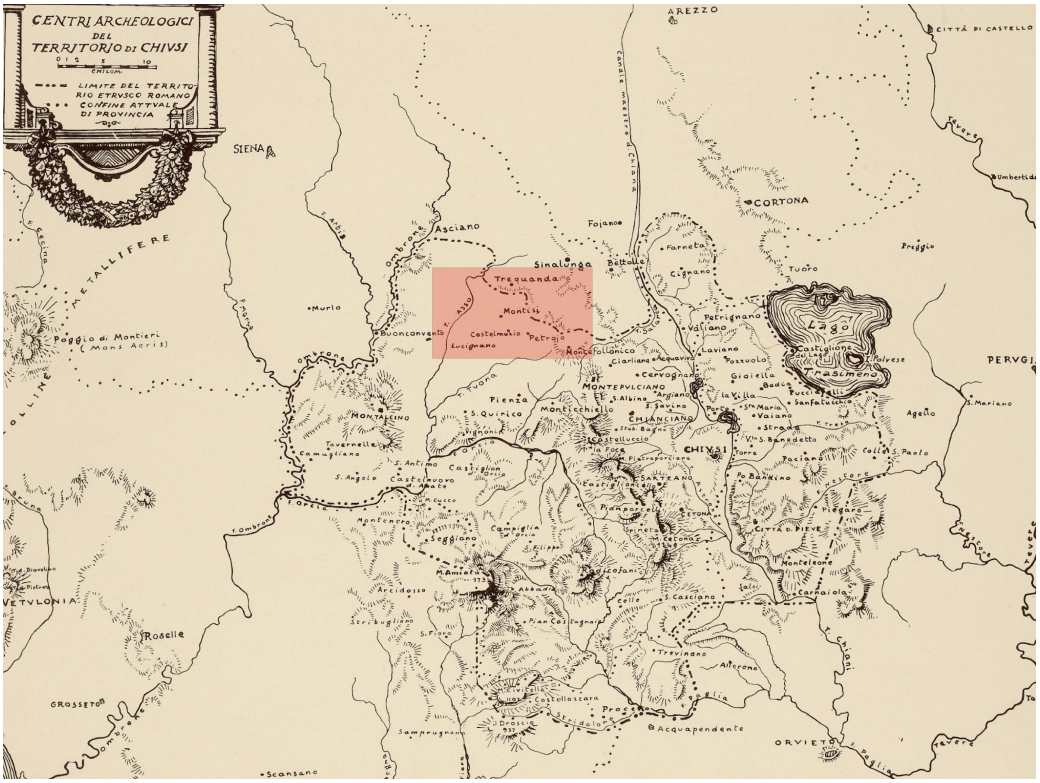
I. Introduction

I.1 | The territory of Trequanda between Etruscans and Romans

One hundred years after the dissertation of Ranuccio Bianchi Bandinelli on the Etruscan and Roman territory of Chiusi, looking at the map of the area considered to be directly under the control of the city-state, the municipality of Trequanda marks part of its northern border (Bianchi Bandinelli 1925, pl. 1) [Fig. 1]. Sitting halfway between Val di Chiana, Val d'Asso and Val d'Ombrone, and still characterized by a pluricentric medieval articulation between the villages of Trequanda, Petroio and Castelmuzio, this territory was often considered to be a marginal area within the general understanding of the region of Chiusi in the first millennium BC. Despite Bianchi Bandinelli's view on the direct control operated by Chiusi on its western territories a traditional low-key consideration on the Chiusine power on this region has prevailed in literature (e.g. Rastrelli 2002). Recently, the work of Valeria Acconcia has once again brought new light on this territory 'half way' between Chiusi and Volterra, stressing the role of Chiusi especially in the area of the valley of Ombrone (Acconcia 2012). New studies looking at the power of the city-state in the first millennium, with different degrees of control (Salvi, Tabolli 2020) over its economic resources (Vanni 2023) are constantly stressing the dense network

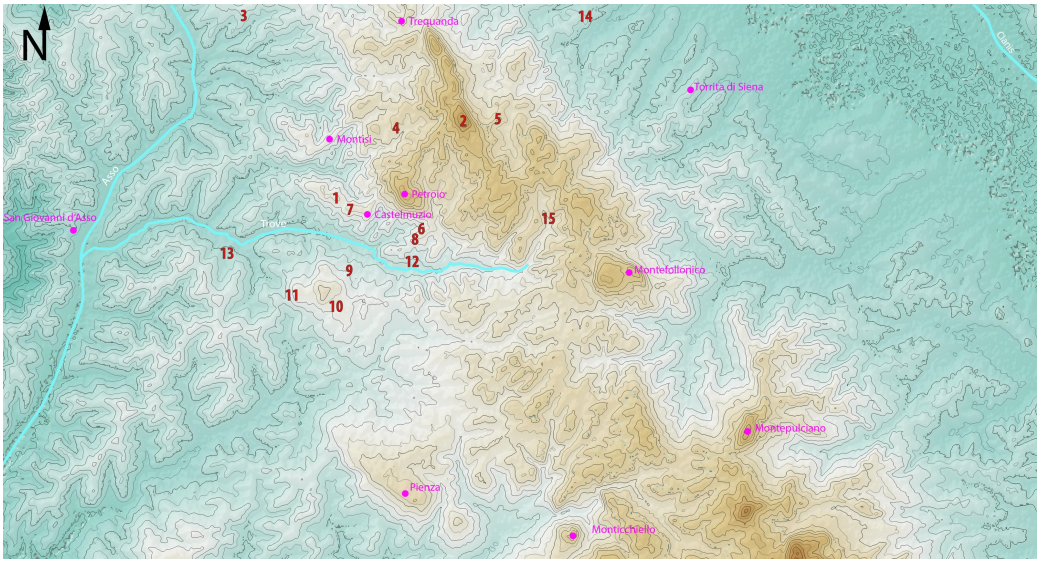


1 | The territory of Chiusi during Etruscan and Roman times (after Bianchi Bandinelli 1925). The area outlined indicates the region of Trequanda (image by J. Tabolli).

of evidence – satellite sites, necropoleis, and sanctuaries – that defines a consistent strategy in the occupation of the crucial passes operated by Chiusi.

In the area of Trequanda, the sites of Petroio and Castelmuzio and the long ridge between them played a particular role. The valley of the small river Trove constitutes a perfectly oriented east to west corridor that joins Val di Chiana with Val d'Asso [Fig. 2]. We are at the modern border between the municipalities of Trequanda and Montalcino (previously San Giovanni d'Asso) that remains a strategic location still nowadays. In this landscape, the Pieve di Santo Stefano a Cennano [Fig. 2, no. 1], which is the focus of this contribution, is a Medieval church that occupied the end of this geographical ridge. Situated in a picturesque corner of the Tuscan landscape, in an elongated plateau characterized by secular olive trees, the site is located 400 meters above sea level.

The first mention of the church dates back to the 8th century AD (for a complete bibliography, see Pericci 2021). From the Pieve, the control over the landscape is impressive. From the mountain of Cetona, one can easily see Radicofani and Amiata to the south and the Chianti



2 | The area of Trequanda. Medieval villages are in purple. Numbers in red indicate the ancient sites mentioned in the text (image by C. Felici and J. Tabolli).

and Pratomagno to the north, thus controlling the vast majority of the current province of Siena.

This area is characterized by the *longue durée* life of sites and routes, from Etruscan to Roman times, especially starting from the Late-Archaic and the Hellenistic periods. S. Vilucchi and A. Salvi have published the important fortified site of Piazza di Siena (Vilucchi, Salvi 2008) [Fig. 2, no. 2] that functioned as a stronghold of Chiusi during the Hellenistic period at a time in which the fortification with *oppida* characterized a large part of ancient Etruria and the entire province of Siena (Tabolli 2021). Excavations demonstrated a possible frequentation also from the Archaic period, from the 6th century BC until the beginning of the 1st century BC. The number of evidence for the 3rd and 2nd centuries BC increased especially in terms of small or medium size necropoleis. Numerous tombs were discovered between 1905 and 1910, in the locality Belsedere [Fig. 2, no. 3] along the river Asso, northwest of Montisi (Paolucci, Minetti 2011; Acconcia 2012, 113, no. 529, with complete bibliography; Paolucci, Salvadori, Turchetti 2016), especially in relation to the famous tomb of Petru with five preserved urns (Maggiani 2016; Turchetti 2018). West and East of Piazza di Siena, the discovery of urns testifies to the presence of small necropoleis in the localities of Collelungo (Acconcia 2012, 112, no. 536, with complete bibliography) [Fig. 2, no. 4] and Badia Sicille (Acconcia 2012, 113, no. 544, with complete bibliography).

The area of Castelmuzio, in the southern part of the territory of Trequanda, reveals the larger amount of evidence. At least two necropoleis have been partially excavated at the beginning

of the twentieth century. In the area of "Fondo Perugini" [Fig. 2, no. 6] – the first publication was provided by E. Galli in 1915 (Galli 1915) and a complete bibliography was summarized by V. Acconcia (Acconcia 2012, 113, no. 541, with complete bibliography) and especially around Podere Tomba (Fig. 2, no. 7) (Acconcia 2012, 113, no. 540, with complete bibliography) dated unanimously to the 3rd century BC. In the case of Fondo Perugini, most of the artifacts date to the 2nd century BC, although the urn with the inscription *venel spurina* dates to the 5th century BC (Cherici 1989, 54: 33), possibly testifying to the long use of the chamber tomb. South of Fondo Perugini another small nucleus of tombs has been identified at Marabicce [Fig. 2, no. 8] (Pistoi 1997, 125). The site of Podere Tomba with its evocative toponym was excavated by Pietro Piccolomini Clementini (Bianchi Bandinelli 1927, 21 no. 2-3), the sienese archaeologist who also owned this land, and the author of the excavation at Pieve di Santo Stefano a Cennano discussed in this contribution. A series of chamber tombs at Podere Tomba, with urns in fetid stone and inscriptions of the Etruscan families *titulni* and *acrnis* (Acconcia 2012, 278), dated by R. Bianchi Bandinelli during the 3rd century, but still unpublished (Turchetti 2018, 242). Recently, this area was surveyed by M. Pistoi, who mentioned the possible location of some of the urns in the castle of Rocca d'Orcia (Pistoi 1989, 49; Pistoi 1997, 122-123). Some of these family names also occurred on urns mentioned in the Sloane manuscript at the British Museum recorded in 1552 in the "house of Matteo Salvi", but coming from Trequanda (Cristofani 1979, 142-143). It should be noted the analogies in the occurrence of these family names at Castelmuzio and the necropolis at San Provenzano-La Ripa, in the territory of Castiglione d'Orcia (Acconcia 2012, 290): both sites are within the land of Piccolomini.

The east-west belt of necropoleis along the fringe between Petroio and Castelmuzio possibly corresponded to the consolidation of an ancient route, controlling this crucial passage in the landscape. Castelmuzio is also at the crossroads of an important north-south route. Still in the 3rd century BC, the presence of a sanctuary at Sant'Anna in Camprena, at Podere Lama [Fig. 2, no. 9], attested by a long inscription mentioning family names of different families (Maggiani 1988), confirms the focal character of this area that was also characterized by a large necropolis in the area of Mensa Vescovile [Fig. 2, no. 10] (Acconcia 2012, 121 no. 603), covering a period that from the Hellenistic times reaches the Empire. Another small votive deposit has been identified at Podere Raguzzi [Fig. 2, no. 11] (Felici 2004, 105-106 no. 51.1).

The full Romanization and 1st century BC transformations represent a smooth transition, possibly with limited events of destruction at the time of the war between Sulla and Marius in the early 1st century BC, as evident at the site of Piazza di Siena [7]. The control over this only apparent peripheral part of land increased during the course of the 1st century BC, under the new administration of the municipality of *Clusium* (Paolucci 1988a; Paolucci 1988b). The complicated road system between *Clusium* and *Saena Iulia* is still under debate, especially decrypting the distances between *Ad Novas, Manliana, Ad Mensulas*, and *Umbro Flumen*, of the Peutinger Table (Tabolli 2021). The debate has been focused and 'stuck' between two main itineraries. The northern hypothesis (through Montepulciano, Torrita, Sinalunga and Rapolano Terme) was discussed by M. Lopez Pegna (Lopes Pegna 1953, 428) and S. Patitucci Uggeri

(Patitucci Uggeri 2009) on one side; on the other one, the southern hypothesis (though Montepulciano, Torrenieri and Buonconvento) was discussed first by G. F. Gamurrini (Gamurrini 1898, 274) and recently, by S. Bertoldi, applying GIS based analyses (Bertoldi 2013). The ongoing excavations at the Etruscan and Roman thermo-mineral sanctuary of Bagno Grande at San Casciano dei Bagni have reopened the question (Carpentiero, Felici 2021) of the primary road corridor between the Val di Paglia and Valdorcia since the high Imperial age, and of its early organization, perhaps as a *cursus publicus*, considered to be a sign of imperial interest in the area (Vanni 2023). The recent publication of new evidence from Pieve di Corsano at Monteroni d'Arbia (Pericci 2018) and especially the important inscription of a servus attesting the presence of senatorial families in the Julio Claudian period from Romitorio at San Quirico d'Orcia confirm the existence of a denser series of crossroads at least during the time of Claudius (Lazzeretti 2023).

Moving back to our area of interest, recently the presence of a Roman Villa has been pointed out along the river Trove, to the south-east of Castelmuzio, in the locality Molino di Trove [Fig. 2, no. 10] (Della Giovampaola, Pericci, Sordini 2019). The site has been identified during aerial survey and field survey campaigns, and after rescue excavations. Although preliminary, data reveal a large site on one of the terraces along the river, thus suggesting a dense network of evidence for the Roman Imperial period in the area. It is important to stress that the river Trove is also characterized by a number of thermo-mineral springs. In the area of Bagnacci [Fig. 2, no. 12], southwest of Castelmuzio, a thermo-mineral (located along the so called Rapolano-Trequanda ridge) complex functions, not far from Sant'Anna in Camprena. Other areas with hydrothermal presence are known at Podere Miciano (east of Trequanda) [Fig. 2, no. 13] and along the Borro delle Solforate [Fig. 2, no. 14], close to Petroio. In the geological maps of the territory, the area of Pieve di Santo Stefano a Cennano is also mentioned for its thermo-mineral waters, although with the exception of a travertine basin preserved into the Romanic church, no evidence appears on the ground of a possible thermal spring.

J.P.

I.2 | The discovery of a "thermal" complex at Pieve di Santo Stefano a Cennano

In 1927 Ranuccio Bianchi Bandinelli, while publishing the volume on the Montepulciano area in the series "Archaeological Map of Italy", described a Roman archeological site at "Castelmuzio, Pieve di Santo Stefano, in the Province of Siena, Municipality of Trequanda" (Bianchi Bandinelli 1927, 21 no. 1):

> Ruins of Roman thermal baths "really similar to those found by Piccolomini in Siena at Bozzone" that appeared during agricultural works around the year 1900. Bricks, fragments of mosaics and one fragment of wall-painting. 1st to 2nd centuries of the Empire. In the properties of Piccolomini Cinughi. Artifacts found are preserved in Siena at the Museum Piccolomini. Unpublished.

Although Ranuccio Bianchi Bandinelli mentioned that the site was discovered during cultivations in the land owned by the "Piccolomini – Cinughi de' Pazzi" family, and that the artifacts

discovered where later displayed at the "Museo Piccolomini", and notwithstanding the direct comparison suggested between this site and the Roman thermal complex at Pieve al Bozzone "found by Piccolomini", for unknown reasons R. Bianchi Bandinelli did not mention the excavator of the early 1900 research at Castelmuzio: the archaeologist Pietro Piccolomini Clementini (Barbagli, Tabolli 2022; Barbagli, Tabolli 2023, 13-38). This omission of the name of P. Piccolomini by R. Bianchi Bandinelli is not uncommon. We have recently outlined that in the entire series of publications for the *Carta Archaeologica*, R. Bianchi Bandinelli, despite pointing out the references to the Museo Piccolomini, did not stress his intellectual debt towards the work of P. Piccolomini. The vast majority of sites discussed by R. Bianchi Bandinelli, especially concerning the territory close to Siena, is indeed based on the information collected between 1893 and 1907 by P. Piccolomini, and on sites that he had directly surveyed or excavated, including objects purchased by Piccolomini for his Museum (Barbagli, Tabolli 2022). The unfortunate dismemberment of the "Museo Piccolomini" at Palazzo del Capitano following the death of his widow, Marianna Cinughi de' Pazzi, and of their only daughter Pierina Piccolomini Clementini in 1962, consisted in the division between the five heirs of the entire archaeological collection, that was unfortunately not protected by a single archaeological decree at that time, and for a long time considered lost (Barbagli, Tabolli 2023).

In parallel to the loss of the Collection, it seems that in archaeological literature the exact location of the 'thermal' complex discovered close to the Pieve di Santo Stefano at Castelmuzio was lost too. All publications that mentioned this site referenced only the few lines described in 1927 by Bianchi Bandinelli, as is the case of the *Atlante dei siti archeologici della Toscana* edited by Mario Torelli (M. Menichetti in Torelli 1992, 335) and the *Archeologia in Valdichiana* by Giulio Paolucci, to mention the most important ones (Paolucci 1988a, 68). From the same area "*in quibus pars balneorum detecte est*" (*CIL* 07242) in 1907 a marble funerary headstone with inscription was found and said to belong to the properties of Emilio Ciani: it appeared on the *Corpus Iscritionum Latinarum* in 1926, published by E Bormann. The inscription belongs to the series of funerary inscriptions "optime de se meritate", possibly related to the presence of a *libertus* and is preserved in four fragments. Slightly modifying the publication by C. Gabrielli, the inscription reads (Gabrielli 2020, EDR 158187):

D(is) [M(anibus)]
Sad[- - - ae?]
T(itus?) Sa[- - -us?]
Lib[- - -] 5 - - - - - -
- - - - -
[op]time [de se]
merita[e - - -]

E. Bormann based the *CIL* publication of the inscription on the apograph by R. Egger. However, in 1926 the fragments were already lost. The 1907 date of discovery coincides with the year of death of P. Piccolomini for scarlet fever, when he was only 27 years old (Barbagli, Tabolli 2022). As we will discuss further on, the land surrounding the Pieve had previously be-

longed to the family of P. Piccolomini, as recorded also by R. Bianchi Bandinelli, and probably came from Piccolomini's wife M. Cinughi de' Pazzi. The land was sold to the Ciani family prior to Pietro's death, therefore the circumstance of the discovery of the inscription is associated with the new owner in R. Bianchi Bandinelli's account.

No archaeological research was undertaken in the area surrounding the Pieve until the early 2000, when under the direction of Silvia Vilucchi from the Superintendency of Archaeology of Tuscany, the area of Pieve di Santo Stefano a Cennano was surveyed (the operations on the field were carried out by Ada Salvi) in light of the project of developing the plan for the archaeological municipal museum of Pienza that, once opened, would have hosted a section on the territory. Nevertheless, the museum has never opened. In 2002, within the framework of the landscape studies promoted by Riccardo Francovich and carried on in this area by Cristina Felici (Felici 2008), ten topographic units with concentration of fragments have been isolated during the surveys of 2003, and related to a Roman villa, with finds dating from the Late Republican period to the Late Antiquity.

The area has also been included in the geophysical studies on this region by F. Pericci, but no new surveys were conducted at this time, because the discovery and subsequent rescue excavations at the Roman thermal site of Pian del Molino di Trove, located 2 km to the south east constituted the focus of the research (Pericci 2021; Della Giovampaola, Pericci, Sordini 2019). Despite this new season of research, the exact location of the thermal complex and its characteristics remained based only on R. Bianchi Bandinelli's description.

J.T.

II. New data on the "thermal" complex

II.1 | Documents in the Archive of the National Archaeological Museum of Florence

In the Historic Archive of the National Archaeological Museum of Florence a folder is preserved, containing documents listed "*Siena. Pietro Piccolomini. Ruderi antichi in Comune di Trequanda in terreno E. Ciani*" (transl: Siena. Pietro Piccolomini. Ancient Ruins in the Municipality of Trequanda in the land owned by E. Ciani). The folder contains a group of six letters and postcards, written by P. Piccolomini, Luigi Adriano Milani, at the time director of the Etruscan Museum of Florence and Emilio Ciani, an engineer and agronomist to which the land surrounding the Pieve di Santo Stefano a Cennano belonged at the time of the discoveries. Despite the mention of R. Bianchi Bandinelli in 1927 (Bianchi Bandinelli 1927, 21 no. 1), the properties of the Podere Pieve belonged to Emilio Ciani since 1903, when - as the agronomist wrote to the director Milani (letter dated September, 19th, 1906 [Historic Archive of the National Archaeological Museum of Florence F21, September, 19th, 1906]) - he bought this part of territory near Castelmuzio. Actually, this land had been previously part of the vast possessions of the family Piccolomini (*Consorteria Piccolomini*), as Pietro himself specified in a letter

on February, 14th, 1906 [Historic Archive of the National Archaeological Museum of Florence F21, February, 14th, 1906]. Castelmuzio was placed under the jurisdictional law of Andrea Piccolomini in 1470, (Repetti 1972, 565-566; Cammarosano, Passeri, Guerrini 2006). It must be therefore underlined that the young count Piccolomini knew this part of the Sienese territory, because of the many properties that his family had administered in Val d'Asso, Asciano, Trequanda (Barbagli, Tabolli 2022).

As already pointed out, during agricultural works, ruins of walls, bricks and mosaic floors were discovered. In a letter sent to the director Milani and dated February, 14th, 1906, Pietro Piccolomini provided few details about these discoveries, his involvement and intervention, together with information about his 'pioneering' approach to the archaeology of territory. When Piccolomini was informed of the discoveries of ruins of walls, fragments of *opus signinum* and *opus tessellatum*, he undertook at his own expense "excavations in order to understand if the discovered artifacts were connected" [Historic Archive of the National Archaeological Museum of Florence F21, February, 14th, 1906]. As it was confirmed by the continuation of research on the field, the discoveries could belong to a "quite sumptuous Roman Villa" with thermal baths. The few artifacts, including fragments of painted walls, were at the time stored in Ciani's house. Piccolomini asked the director if he suggested continuing with the excavations "not with the hope to discover important artifacts, but with the only aim to find as much as possible the plan of the building".

In his answer, dated February, 22th, 1906, Milani asked Piccolomini to write a brief article for the journal *Notizie degli Scavi* including a plan "with the task to make the article more interesting" [Historic Archive of the National Archaeological Museum of Florence F21, February, 22th, 1906]. We do not know why this was never published in *Notizie degli Scavi*, where the tombs of Fondo Perugini were published in 1915 (Galli 1915).

Despite the absence of a final publication, an important sketch with the plan of the excavations, probably made by the new owner Emilio Ciani, is conserved in the folder of the Archive. Together with the plan, the last documents testify to the correspondence between Luigi Milani and Emilio Ciani: in the letter dated September 1906 [Historic Archive of the National Archaeological Museum of Florence F21, September, 19th, 1906] the agronomist expressed his will of ending the archaeological excavations because of the economic costs. Ciani mentioned an "attached sketch" concerning the excavations that "occupy a larger space than the one included in the sketch".

According to the documents preserved in the Archives in Florence, this is the last archive report that we have about the discoveries in Podere Pieve near Castelmuzio. Before examining the plan, some aspects concerning the approach of Pietro Piccolomini on archaeological investigations and on the knowledge of the territory can be pointed out. As we mentioned, the territory near Trequanda belonged to the Piccolomini family for a long time and the willness to discover and preserve the history of the territory characterized the entire life of P. Piccolomini. The interest of the youth count seems to be concentrated on the publishing of his family's

archaeological collection and on the archaeological excavation in his properties at Pieve al Bozzone (years 1893/1899) (Piccolomini 1899). After 1900, P. Piccolomini was involved in historical and archeological publications concerning Siena and its territory (1901-1905), with the partial exception of Castelmuzio, where the count undertook archaeological research. The interest on the area of Val d'Asso appears indirectly in other documents: Pietro Rossi, a professor of Institution of Roman law at the University of Siena and an important member of the Sienese cultural context at the end the the 800s / beginning of the 900s (Bracci 1931), wrote the necrology for P. Piccolomini, stressing that at the moment of his death he was going to prepare new publications "on important Etruscan-Roman archaeological excavations from Val d'Asso and Val d'Orcia, by the same count with competence discovered and undertaken" (Rossi 1907).

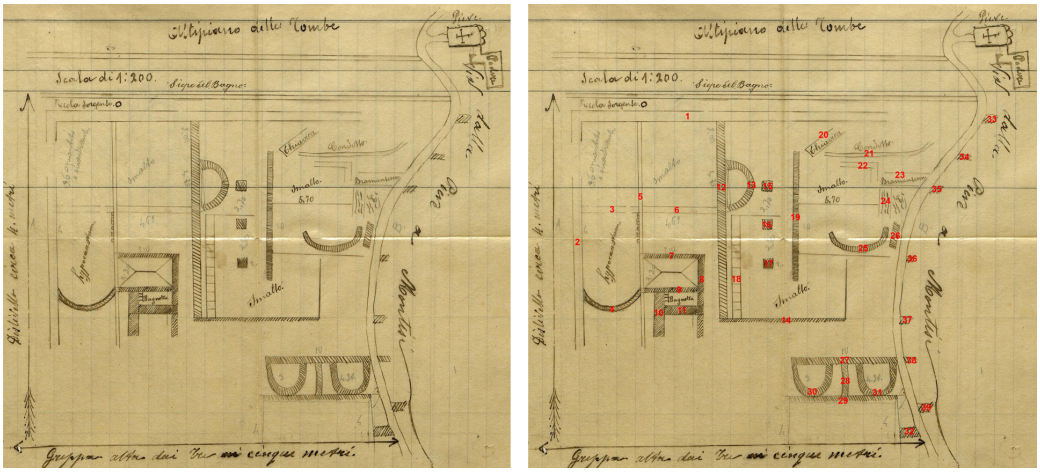
The epistolary correspondence with Luigi Milani also documents the relationship between the director and the Sienese Count. It is not the first time that Milani leans on him. In 1903, for example, Pietro informed Milani about the demolition of the Tower "del Pulcino" in Siena and the discoveries of sporadic artifacts, such as common ware and black glazed fragments (Barbagli, Tabolli 2022, 363). The friendly relationship between the two of them is also testified by the above cited letter: before the conclusion, Piccolomini invited Milani to come to Siena and visit his museum "where he will find some news". Milani was therefore aware of the important collection put together in Piccolomini's villa at Santa Regina, near Siena. It is perhaps the death of Count Piccolomini in 1907 that prevented him from concluding his study on this area of the Sienese territory, to which he was deeply tied and in which he was deeply interested.

D.B.

II.2 | A "New" Plan for the Thermal Complex at Santo Stefano a Cennano

On the final page of the documents a pencil drawn plan of the thermal complex is hand drawn probably by Ciani, on a 1:200 scale [Fig. 3]. An arrow to the left of the plan possibly indicates the north with a "height difference of approximately 4 meters", thus suggesting a north to south slope. A curved dirt road descends north to south in the right part of the plan, labeled as "via dalla Pieve a Montisi". Ancient walls appear both to the west and to the east of the road, although it looks as if only the western part of the complex had been excavated. To the northeast of the road, the Pieve, with the characteristic Romanic three apses, and a Podere are represented. As we will discuss further the dimensions of the Pieve and Podere as they appear in the plan are certainly out of scale, as the Pieve and the Podere appear extremely small. The road continues to the north towards Montisi, historically under San Giovanni d'Asso and currently Montalcino, outside the area of the Municipality of Trequanda.

The Bath Complex appears to be located between two different areas. To the north, an area identified as a "Plateau of Tombs" is separated from the area with structures by a "Fence of the Bath". To the very south, an horizontal arrow indicates a "three to five meters terrace" ("greppa" in Italian). The presence of tombs to the north of the "bath complex" is confirmed by the 1907 discovery of the abovementioned funerary inscription. We assume that "fence of



3 | Map of the Archaeological Complex at Pieve di Santo Stefano a Cennano (courtesy of the Museo Archeologico Nazionale di Firenze, Direzione Regionale Musei della Toscana).
4 | Wall numbers on the map of the Archaeological Complex at Pieve di Santo Stefano a Cennano (image by J. Tabolli).

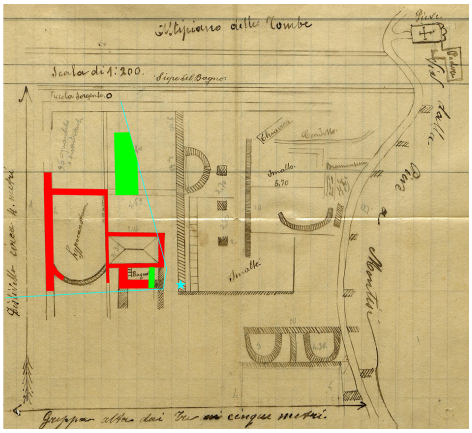
the Bath" may refer to an ancient longitudinal external wall. Immediately to the south of the "fence", a circle indicates a "small spring", possibly serving the entire complex.

South of the spring a large rectangular wall [Fig. 4, no. 1-2] presents an opening close to its north western corner, possibly an entrance. It is the thicker wall represented on the plan and it may correspond to the perimeter wall of the complex. It is important to outline how some walls on the plan are blank while others are filled in with diagonal lines, possibly suggesting different techniques or preservation conditions, as we will discuss further on.

Looking at the plan of the complex as a whole, we observe a possible central partition represented by a large north to south wall [Fig. 4, no. 12]. To the west of it, three walls [Fig. 4, no. 5-6, 3] represent a partition of spaces. A label "smalto", possibly referring to a plastered floor characterizes an area (between the walls in [Fig. 4, no. 1, 5-6, 12]), while an elongated room with a southern apse (between the walls in [Fig. 4, no. 2, 3, 5, 4]) is identified as a "hypocaust". Small square elements along the eastern wall may represent pipes. Immediately to the east, a first room (between walls [Fig. 4, no. 5, 7, 6, 12]) appears to have an opening to the southeastern corner. A second and smaller room (between walls [Fig. 4, no. 5, 7, 8, 9]) has a peculiar representation of the floor, possibly identifying sloping surfaces. South of this room, a "small bath" ("*bagnetto*" in Italian), (between walls [Fig. 4, no. 9, 8, 11, 10]) is represented with two steps along the western wall.

Moving to the east of the central wall [Fig. 4, no. 12] we observe an apse [Fig. 4, no. 13] and a large corridor with three pillars [Fig. 4, no. 15, 16, 17]. The area is closed to the south with





5 | Excavation photograph of the Archaeological Complex at Pieve di Santo Stefano a Cennano (courtesy of Ferruccio Malandrini - photographic collection).
6 | Comparison between the map of the Archaeological Complex at Pieve di Santo Stefano a Cennano and the excavation photograph (image by J. Tabolli).

what looks like a thinner wall [Fig. 4, no. 14]. Parallel to the longitudinal wall [Fig. 4, no. 12] is a line filled with small squares [Fig. 4, no. 18] that marks the eastern space that was plastered. It is unclear if the wall that constituted the eastern side of the portico [Fig. 4, no. 19] was only partially preserved or if it did not reach on purpose the northern perimeter wall [Fig. 4, no. 1] and the southern wall [Fig. 4, no. 14], thus allowing for a passage. The space between this sector and the road appears more confusing on the plan in terms of alignments. A diagonal "sewage canal" is drawn to the north west [Fig. 4, no. 20] (labeled "*chiavica*" in Italian), close to a "pipe" [Fig. 4, no. 21] (labeled "*condotto*" in Italian); a central area presents once again a plastered floor, located between the angle of a wall [Fig. 4, no. 22] and a second apse to the south [Fig. 4, no. 25]. The orientation of a wall to the east of the apse is unclear [Fig. 4, no. 26]. Similarly, pencil lines, similar to small 'waves' [Fig. 4, no. 24], reached to the north a horizontal "*bramantesca*", which is an archaic word in Italian for "sloping surface" or "barrier" [Fig. 4, no. 23].

The plan also displays the southern sector of the complex, along the western side of the road. Two parallel east-to-west walls [Fig. 4, no. 27, 29] define two apses [Fig. 4, no. 30, 31], also separated by a north to south wall [Fig. 3, no. 28]. It should be noted that the northern wall [Fig. 4, no. 27] is the only one that continues [Fig. 4, no. 38] directly to the east of the road, while the others [Fig. 4, no. 33, 34, 35, 36, 37, 39] appear possibly as schematic notes on the presence of other walls, although some are possibly aligned [Fig. 4, no. 33 to 1; 37 to 14]. Another rectangular space (4x10m) appears to the south, before the location of the terrace interrupts the sequence (with undefined small walls continuing across the road, such as [Fig. 4, no. 32 and 39]). This invaluable plan demonstrates the articulation of spaces but its interpretation remains highly problematic. A fundamental help to unlock the plan probably drawn



7 | Detail of the mosaic visible on the excavation photograph of the Archaeological Complex at Pieve di Santo Stefano a Cennano (courtesy of Ferruccio Malandrini - photographic collection).

by Ciani and to give evidence to the complex came unexpectedly from a sienese collector of photographs, Ferruccio Malandrini. Among four photos labeled “Piccolomini” we were able to identify in November 2023 one image of the 1900 excavations of the complex [Fig. 5]. The photo portrays an excavation scene with eight people. The three figures to the left are currently excavating, two men are standing in the center, while three men are at a higher elevation to the back, along the slope. The young man in the center of the image, partially leaning on a wall, is certainly P. Piccolomini.

We should situate the photo prior to the time in which the ground plan was drawn, because some walls are only partially exposed [Fig. 6] and the workers are still excavating the room labeled in the plan as “hypocaust”. The photo was taken from the south-eastern corner of the “small bath” (“*bagnetto*”), (between walls [Fig. 4, no. 9, 8, 11, 10]). It is evident the plastering of this small space with the two high steps on the western side. The room immediately to the north (between walls [Fig. 4, no. 5, 7, 8, 9]) has a white mosaic floor [Fig. 7], as the representation visible on the drawing. This room is the ‘protagonist’ of the photo as all the people are gathered around and Piccolomini is standing in front of it. Possibly the discovery of the mosaic attracted the viewers.

There are a few discrepancies between the photograph and the plan that are worth mentioning, because they illuminate possible small mistakes of the plan. In the case of the *bagnetto*, while on the plan this seems to be aligned with the mosaic room (through wall Fig. 4, no. 8]), the photo reveals that the space of the small bath is actually smaller (as in [Fig. 6]). Similarly, the photo reveals a very large structure, north of the mosaic room (wall [Fig. 4, no. 7]) that is

located at a higher elevation and presents a semicircular section, partially cut on its southern edge. Although no bricks are visible in the photo and it could be built in *opus caementicium*, this structure does not appear in the plan. One could argue that Piccolomini interpreted this evidence as a later element in the area and therefore did not represent it on the plan. It is also possible that there is a wrong drawing on the plan of the large central wall [Fig. 4, no. 12] although we tend to exclude this possibility. Considering the proximity of the *calidarium*, one could argue that we are facing part of the *praefurnium* of the structure.

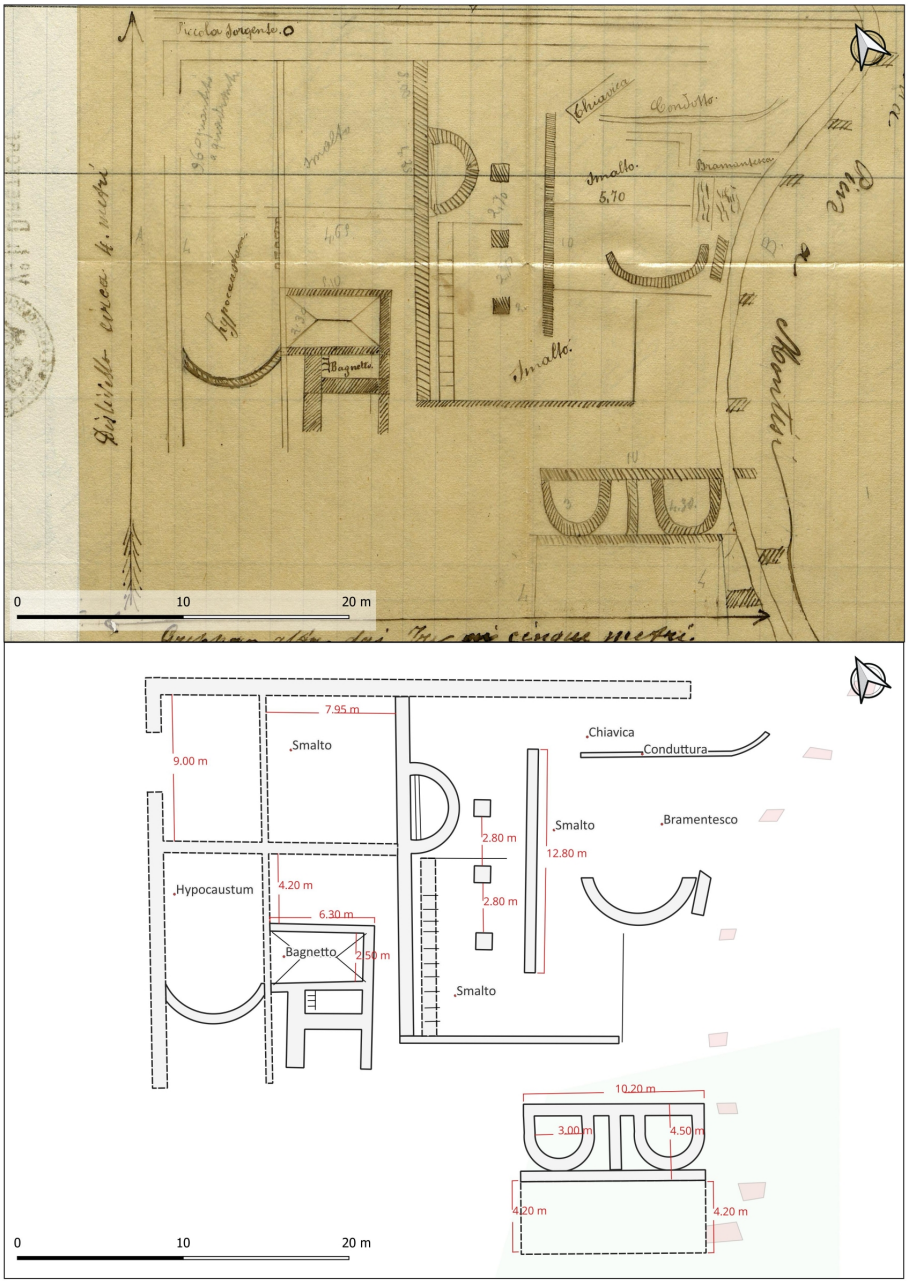
J.T.

II.3 | Mapping the new evidence

The plan made by Ciani in 1906 was georeferenced inside a GIS platform, using open source QGis 3.30.3. The digitization of the plan has allowed us to anchor it to the Cadastral Map of 1820, using especially the north to south road "via dalla Pieve a Montisi". Comparing the scale of the drawing by Ciani with the cadastral map, it is clear that the dimensions of the Pieve and the "Podere" represented are out of scale, and functioned as a generic identification of the location of the archaeological complex, when compared to the street and the church. This building probably was meant to serve as a spatial reference of the excavation area and to provide landmarks.

The second element that proved to be fundamental for the localization of the site has been the artificial cliff represented on the lower part of the plan. This cliff has been identified on the field and is visible on the orthogonal photo of the area (2019). Maintaining the 1:200 scale based on the assumption that the measures, also recorded close to each section of the walls and for the pillars, are accurate – Ciani was an agronomist – we were able to project an overlay on the cadastral map and on the 2019 orthogonal photo. Thanks to the metric references written on the plan, it was possible to import the drawing into the GIS platform on the basis, not of geographical and spatial parameters, but of the metric data reported by the author. The resulting map is metrically correct within the GIS project [Fig. 8]; thus the ancient structures were digitized, giving a .shp file which is a more manageable version than the GeoTIFF image. In this way the creation of a digital map can help to speculate on the correct location of the buildings. The comparison between the two base-maps demonstrates that an error of approximately two meters exists between the cadastral map and the satellite images.

Analyzing Ciani's plan, we became aware of two important indications given by the author on the top and bottom of the structures; in fact, on the top the presence of the "*altopiano delle tombe*" (the plateau of the tombs) is indicated, while on the bottom there is a drop in elevation due to "*Greppa alto dai tre ai cinque metri*" (a cliff three to five meters high). These indications allowed us, after an *in situ* survey (January 2024), to locate the thermal complex approximately 49 m northwest of the Pieve di Santo Stefano a Cennano, within an olive grove in the southern part of which an elevation difference ranging from 2.50 m to 3.50 m is still visible [Fig. 9]. According to this geo-referenced plan, the ancient structures would have had the same orientation as the Pieve and would occupy an area of approximately 1500 square



8 | Digitization of the map of the Archaeological Complex at Pieve di Santo Stefano a Cennano (image by C. Felici).

meters. Naturally enough, this contribution does not presume to geo-localize the excavation carried out by P. Piccolomini with a centimetric accuracy, but to try to hypothesize the location of the complex and to reconstruct the landscape and environmental context with which it relates today. What has been obtained is therefore a starting point for planning future field research aimed not only at relocating the 'thermal' complex, but also at gaining a better understanding of how this landscape must have looked in ancient times, which is likely to have seen the presence of other structures and a road system [Fig. 10].

C.F.

III. Conclusions

The analysis of the discovered plan and photograph has finally given concrete evidence to the 1927 short description by R. Bianchi Bandinelli (Bianchi Bandinelli 1927, 21 no. 1). The identification of the precise location of the site and the projection to the ground of the plan leads to an understanding of the dimensional characteristics of this complex. We can argue that the area lies on the southern slope of the plateau where the church is located; the church itself possibly was built on the top of earlier Roman structures located on the summit of the plateau, thus suggesting the existence of different terraces in the area and their consistent use. Although the information combining the plan and the photograph does not allow for a complete reading of the complex, we should imagine that the room to the west, with the southern apse functioned as a *calidarium*. The "small bath" with steps to descend could have also functioned as a reservoir for water. Highly problematic remains the distinction between ways in which walls are represented. As an hypothesis, we can suggest that walls filled with diagonal lines represent parts of structures preserved only at the foundation level, while the outlined ones are actual walls preserved in some height. This could be proved by the photograph [Fig. 5]. This reading of the ways in which Ciani differentiated the walls in the plan could also explain the small 'closed' apses [Fig. 4, no. 13, 30 and 31]. If their function was to be small pools, similarly to many cases of baths with small 'individual' pools around the larger spaces, these could have appeared closed at the foundation level and then opened in the actual wall (only at the apses).

Based on the photograph, the outlined walls are all in *opus latericium* while the ones filled with diagonal lines are all cut at the floor level. The *opus latericium* is not particularly elegant in the shapes of the bricks and it looks as if only inside the *calidarium* the walls were also plastered. The painted fragment recorded in E. Ciani's letters [Historic Archive of the National Archaeological Museum of Florence F21, September, 19th, 1906] and in R. Bianchi Bandinelli's publication (Bianchi Bandinelli 1927, 21 no. 1) is not visible in the photograph. Foundations are visible in the case of wall in [Fig. 4, no. 2] and consist of smaller bricks. At the foundation level of wall [Fig. 4, no. 3] a rectangular space is opened, possibly functioning as an air access.



9 | Overlay of the map of the Archaeological Complex at Pieve di Santo Stefano a Cennano on the 2019 Orthophoto (image by C. Felici).
10 | Hypothesis of the location of ancient structures of the Archaeological Complex at Pieve di Santo Stefano a Cennano on the 2019 Orthophoto (image by C. Felici).

The most problematic part of the comparison between the plan and the photograph remains the vaulted structure visible in the photograph, ending where wall [Fig. 4, no. 6] is represented on the plan. We could argue that the possible identification as a cistern can be related to the "small spring" immediately identified to the north of this room, as it is visible on the plan. If this structure was indeed a *praefurnium* it would have been aligned to the *calidarium*.

Looking at the complex as a whole we can certainly note the complexity of the plan with the articulation in different areas, possibly at different elevations, with pools concentrated to the west and the east of the long wall [Fig. 4, no. 12]. Passages are granted at least where the corridor covered by pillars was located.

The major problem remains the identification of the type of complex. With the absence of any data on the topography of the ancient structures around it, it is difficult to determine if we are facing a Roman Imperial villa with annexed baths or a thermo-mineral complex, such as a small spa, considering the possible presence of springs with thermal water in the vicinity. The presence of areas with squared pipes in the room that Ciani identified as "*hypocaustum*" and possibly a *calidarium*, suggests that water was artificially warmed at the site. In this perspective the small spring visible on the map and currently invisible on the field could have been a cold spring. Mixed complexes with thermo-mineral and artificially warmed water existed (Bassani, Fusco, Bolder-Boos 2019) and the evidence is from the plan and photograph are too limited to ascertain a specific function.

A major result of this study is to clarify a second important excavation by P. Piccolomini after the campaigns at Pieve al Bozzone (Piccolomini 1899). Once more, the role of this sienese archaeologist at the beginning of the Twentieth century appears fundamental for the understanding of Romanization in the province of Siena. The complex on-going project of locating

and documenting the dispersed artifacts once at the Museo Piccolomini (Barbagli, Tabolli 2023, 13-38) will hopefully provide new evidence for the understanding of this complex. New surveys and excavations will target the site to understand how the structures on this terrace functioned compared to the ancient road system and if we are dealing with a large complex similar to a statio or a smaller villa with baths. In anycase, the plan drawn by Ciani and the photograph portraying Piccolomini are finally placing this site on the maps of the Etruscan and Roman territory of Trequanda, at the time of passage between the Etruscan city-state of Chiusi and the Roman municipium of Clusium.

J.T.

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Abstract

This paper discusses 'new' and fundamental evidence for the understanding of the Etruscan and Roman landscape in the area of Trequanda, Castelmuzio (province of Siena, Italy). This Medieval village is located in the northern area of the territory that during the first millennium BC was under the control of the Etruscan city-state of Chiusi and later of the municipium of *Clusium*. We discuss the discovery of a plan and a photograph of a Roman 'thermal' complex in the locality of Pieve di Santo Stefano a Cennano. This site was previously known only thanks to a few lines by Ranuccio Bianchi Bandinelli in 1927. It is now possible to position the site accurately on a GIS-based platform and to reconsider the entire topography of the area, which appears crucial both in Etruscan and Roman times.

keywords | Trequanda; Pietro Piccolomini Clementini; Pieve di Santo Stefano a Cennano; Clusium; Thermo-mineral sites.

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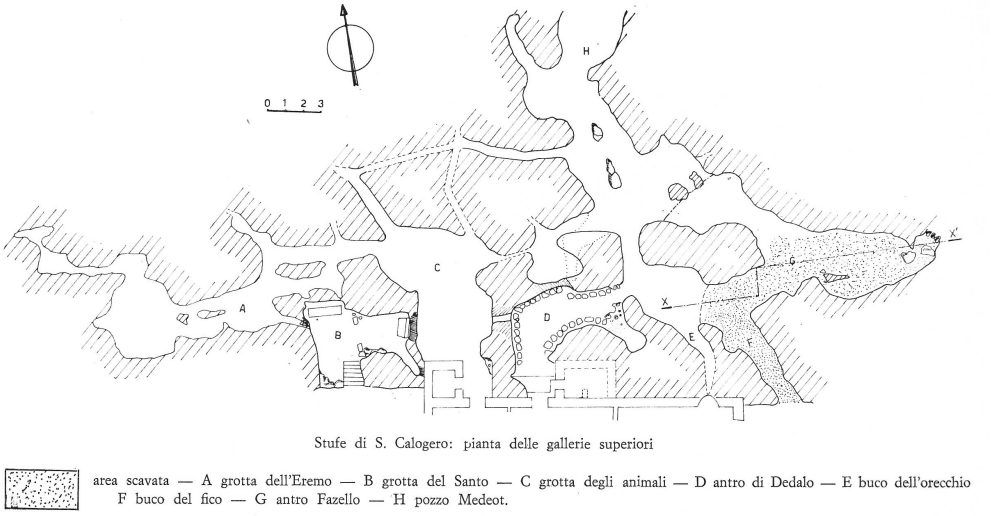
Healing with Mineral Waters

Places, Objects and Written Sources in Roman Italy

Maddalena Bassani



1 | Sciacca (AG), plan of the Kronio's Grottoes (Maggi 1976-1977, tav. LXVIII).

Man's exploitation of natural thermalism has very ancient origins and has affected the history of settlements in the Mediterranean area where hot or cold but highly mineralised springs flowed, whether in the plains, on the hills, or at high altitudes (synthesis in Annibaletto, Bassani, Ghedini 2014; Matilla Séiquer, González 2017; Pérex Agorreta, Miró i Alaix 2018; Bassani, Bolder-Boos, Fusco 2019; González Soutelo *forthcoming*). Thanks to specific research insights, it was possible to examine archaeological, topographical, historical-epigraphic and literary data, without excluding the analysis of the natural and cultural environment in which thermalism developed over time. Depending on the epochs and building capacities, man left multiple traces of frequentation of the springs: either through sacred deposits and ex-voto to thank the deities for recovered health or to request it, or by means of very complex and articulated buildings where to practice therapy or to reside during the cures, or through literary or epigraphic texts to emphasise experience and knowledge of the *aquae*. Finally, equally important traces are obtained from intangible sources such as legends and oral traditions, which

were entrusted with the memory of mythical figures who had discovered and enhanced the use of thermo-mineral water for individual and collective well-being. Apollo, the Nymphs, Heracles, Minerva, the *Aquae*, the *Fontes*, sometimes Asclepius, and other deities are evoked in ancient texts as patrons of springs and as healers from diseases thanks to those special waters: treatments could take place through bathing in pools, or through drinking, steam baths, inhalations, and mud baths.

This, of course, does not exclude that other 'traditional' treatments were planned and practiced by the physicians working in the healing stations, but this can only be plausible from the late Republican and early Empire ages: it is only from this phase that thermo-mineral therapy spread widely thanks to the indications of the methodical school and internationally renowned physicians, such as Asclepiades of Prusa, Celsus, Galen, up to Soranus of Ephesus and Oribasius of Pergamum, the latter of whom lived in the late period (most recently Zanetti 2014; Rizzi 2014).

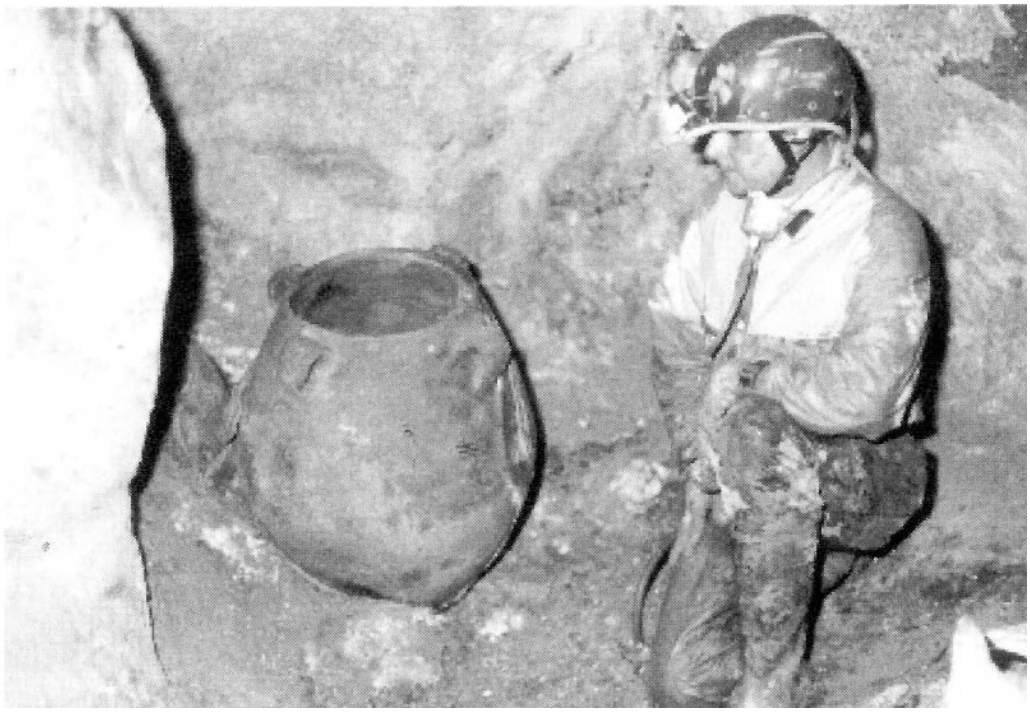
If in fact it is the late Hellenistic and Roman culture that recognised the efficacy of mineral waters for the treatment of a variety of pathologies depending on their organoleptic characteristics, now scientifically defined (Bassani A. 2014), Roman engineering should be credited with the ability to make the most out of the therapeutic potential of the waters and the consequent income from the surrounding satellite activities (think of the proliferation of *hospitia* and *hospitalia*, *stationes* and *mansiones* along the roads that led to the establishments, but also of the residential villas and productive buildings serving the Roman spas: Ghedini 2014; Medri 2016).

Earlier, i.e. in the pre-protohistoric and archaic ages, structural data are scarce, whereas there are multiple mobile artifacts at mineral springs, where humans had direct experience on themselves and their kindred, including animals, of how *aquae*, vapours, and mud could solve mild or serious pathological states.

Therefore, it may be interesting to examine the traces of these frequentations not only within the large and articulated healing resorts of the Imperial age that arose close to the main thermo-mineral basins, but also in sparsely built environmental contexts, such as the caves and natural recesses of the earliest phases. Anthro-therapy, after all, has remained to this day one of the possibilities of using natural thermalism.

The Kronio Grottoes, Sicily

Early human awareness of the healing potential of mineral springs is documented at some Italian sites as far back as the Neolithic age. Exemplary is the case of Mount Kronio near Sciacca (AG), Sicily, where there is a series of natural caves extending for more than 3 km on the southern slope facing the sea, from which hot air escapes (Verde 2000; Tiné, Torelli 2013; Gullì 2014). Among them are the Daedalus cave [Fig. 1], so called because the myth attributes to the Greek inventor the construction of a *therma* connected to the palace of King Cocalus; the cave of the Animals, which was traditionally for 'veterinary' use; the cave known as the

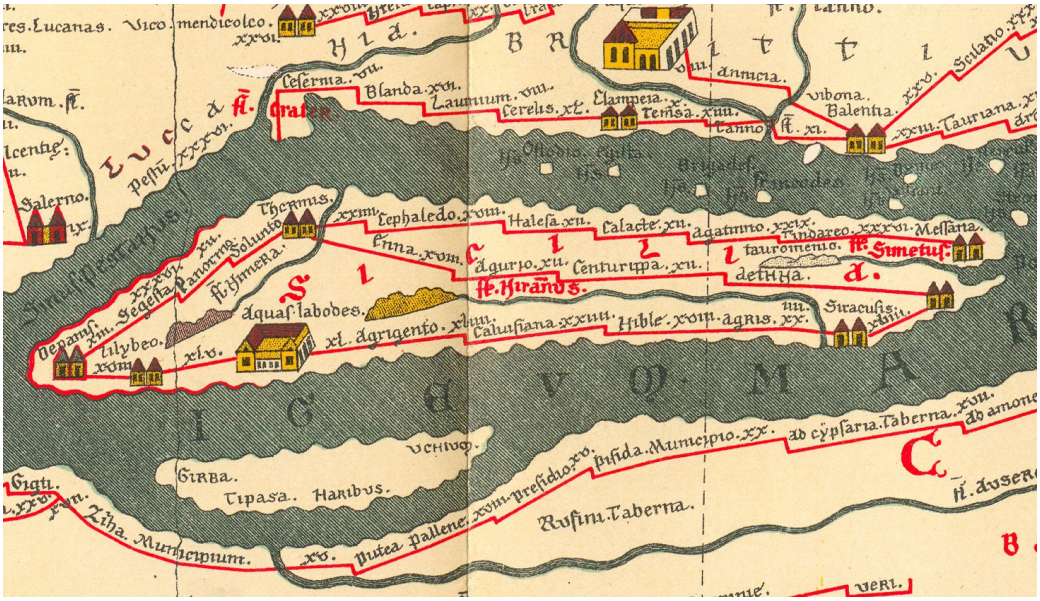


2 | Sciacca (AG), the discovery of an intact prehistoric vase in the tunnels of the Kronio's Grottoes (Verde 2000, 13, fig. 1).

'Ear Hole' for the treatment of deafness; and again the cave of the Fig and the cave of the Nobildonna (Gentlewoman), as well as the Leper's Cave, the Stoves of San Calogero etc. The average temperature in the caverns is around 37°-39°C and therefore the environmental conditions are not at all favorable: humidity prevents one from staying longer than 40 minutes, after which one can collapse due to the rapid loss of sweat and the onset of a 'heat stroke'.

With respect to the hot air in the caves, several springs along the lower part of Mount Kronio gush out, flanked by catchment wells: the latter are now widely exploited in the Sciacca thermal baths and are classified as salso-bromo-iodine, sulfurous and hyperthermal, ranging from 32° to 56°C.

Despite the adversity of the location, the constant presence of hot air from inside the caves must have attracted the curiosity of prehistoric men, who, if they certainly did not settle here to live, left objects in those recesses, testifying to a kind of cult and devotion to the waters and vapours that could help them heal simple or complex ailments. In fact, during speleological surveys carried out in the 20th century, 40 large vessels dated between the 6th and 3rd millennia BC were found inside some of the caves [Fig. 2], which were intentionally brought there for votive purposes. Speleological inspections have shown that only the acknowledged



3 | Sicily in the *Tabula Peutingeriana*, segments VI-VII (Omnes Viae).

healing effectiveness of that natural resource could have driven prehistoric man to such great risks, and therefore it is not surprising that a very rich series of legends and myths developed around the Kronio springs, codified in Greek and then Roman times.

According to Diodorus Siculus, for example, the mythical architect-sculptor Daedalus took refuge with King Cocalus in Sicily to escape Minos, Pasiphae's husband, and there:

> τρίτον δὲ σπήλαιον κατὰ τὴν Σελινουντίαν χώραν κατεσκεύασεν, ἐν ᾧ τὴν ἀτμίδα τοῦ κατ' αὐτὴν πυρὸς οὕτως εὐστόχως ἐξέλαβεν ὥστε διὰ τὴν μαλακότητα τῆς θερμασίας ἐξιδροῦν λεληθότως καὶ κατὰ μικρὸν τοὺς ἐνδιατρίβοντας καὶ μετὰ τέρψεως θεραπεύειν τὰ σώματα μηδὲν παρενοχλουμένους ὑπὸ τῆς θερμότητος (Diod. IV, 78, 3).
>
> He built on the Selinuntine beach a cavern from which smoke evaporated from the fire so that, to those who entered, sweat was caused by the effect of heat, so that the bodies were cured with a certain voluptuousness, without at all feeling any molestation (Diod. IV, 78, 3).

The evidence, although reported by a Greek author of the 1st century BC, is of great importance because it traces knowledge of the therapeutic efficacy of the hot vapours given off by thermo-mineral waters back to prehistoric times, with a relevant continuity from the Archaic age onwards.

If in fact the mythical beaches of Selinunte coincide with the area of Sciacca and Mount Kronio a few kilometers to the southeast, the legend about the building activity of Daedalus is indicative of a very ancient frequentation of those caves, in which, thanks to the talent of the most

famous ancient inventor, the precious hot steam was channeled into a kind of therma, which allowed King Cocalus and his subjects to be able to cure themselves "without feeling any molestation". Diodorus evidently well knew the therapeutic potential of natural thermalism since he was writing in the 1st century BC, when it had by then entered full-fledged medical practice: not only through baths in pools and tubs within establishments for hundreds of people, but also through steam baths, of which those at Baia were among the most famous (Medri 2013).

It should also be mentioned that in his time thermal facilities located on the slopes of Kronius must have been functioning, using the thermo-mineral waters that still exist today. These were the *Aquae Labode*s, of which no archaeological remains are known but which are mentioned in the itinerary sources [Fig. 3]: in the *Tabula Peutingeriana* they are depicted as an enclosed quadrangular building characterised by two gabled towers, in accordance with one of the agreed symbols used in this extraordinary ancient street directory to depict such buildings. The *Aquae Labode*s were in fact located on the coastal road and were considered one of the most attractive tourist destinations on the southern Sicilian coast (Caminneci 2014).

Thermo-mineral waters and vapours at Mount Kronio were therefore exploited over the centuries for curative purposes, and it is no coincidence that in addition to the prehistoric deposits inside the caves other votive offerings, such as statuettes, coins, and amphorae, dated with certainty from the Archaic to the Classical and Hellenistic ages, have been found. Moreover, traces of building and infrastructural works to enable the caves to be frequented for therapeutic purposes coincide with a floor of terracotta slabs dated between the 3rd and 1st centuries BC, which extended from the so-called Antro degli Animali to the Antro di Dedalo (this information is contained in an unpublished typescript by J. Schneider, D. Caporusso dated 1987 and published by Guidi, Verde 2001, 92; further information in Mannoni 1975, 389-392).

In the same context at the end of the 4th century AD a separation wall was erected between the two caves, while during the 5th century AD seats were equipped, carving the rock of the walls of the same Antro di Dedalo, perhaps among the most striking and accessible ravines of the Sicilian mountain. It is here, moreover, that tradition has St Calogero, the "handsome old man" who cured the body and spirit and who in the 6th century AD resided in the so-called Grotta del Santo: here he is said to have performed some miracles by driving out pagan demons and evil spirits to encourage people's use of the healing waters. He took action himself to create spa constructions, and indeed recent archaeological excavations have revealed hot steam channeling works referable to the early Medieval age, thus showing a simple but constant continuation of the frequentation of the Kronio caves through the millennia to practice the so-called anthro-therapy.

What remains today of this long medical tradition? The contemporary thermal baths in Sciacca are located downstream from the mountain, in a slightly detached position, while the huge hotel dedicated to St Calogero, which was built overhanging the Kronio in the 1950s and restored several times, has never been opened due to design flaws: it seems the connections to the city sewers were missing, at least according to newspaper reports. Sweat therapies were

supposed to have been practiced here in memory of ancient customs proven over millennia, simultaneously housing, in eighty rooms spread over three floors, hundreds of people who, thanks to an elevator, could then descend into the underground stoves and heal themselves effortlessly, as Diodorus put it. Unfortunately, the structure is dilapidated and in complete disrepair, but one hopes that a new Daedalus will come up with a plan that may live up to the history and healing potential of the Kronian waters.

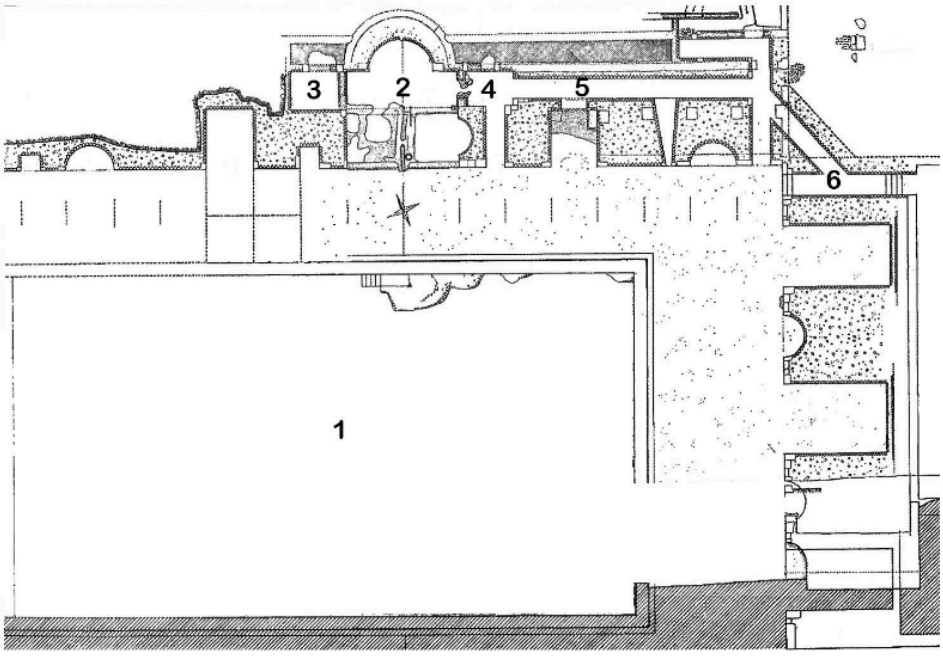
From the grottoes to the thermo-mineral buildings: the *Aquae Cutiliae* in northern *Latium*

The Sicilian example described above not only illustrates a primordial, as well as effective, form of natural thermalism, but also allows us to broaden our gaze to other situations, in which archaeological and written sources attest to curative practices within building complexes articulated by means of water, steam and mud by a very large number of people from different social backgrounds.

In the Italian territories where the census was carried out, basically four types of settlements emerged, which can be in turn divided into four large macro-settlements, which could develop where there were springs with relevant and constant water flow, in order to ensure a stable supply of the natural resource, as it still happens today (Annibaletto, Basso 2014). Places of a predominantly cultic and sacral nature are attested, either provided with a sacred building or only indicated by votive deposits (Bassani 2014a and Bassani 2014b; in this issue, see articles by Jean Turfa and Jacopo Tabolli *et alii*); medium and large-scale health resorts (Annibaletto 2014), as well as private villas with mineral springs, or hotels and *hospitia* for travelers and tourists (see, for example, Bassani 2017; on the phenomenon of *stationes*, see Basso, Fanini 2016). Finally, production facilities are attested through the by-products of mineral waters (clay, salt concretions, mineral extracts, the motor power of the springs etc.), which allowed the development of economic and commercial activities partly intended to cater for the patients, partly designed for a wider market (Bassani 2016; Bassani 2021). We will dwell on an example of a public therapeutic station, in order to derive data about the cures practiced there and the health and economic benefits associated with them.

These are the *Aquae Cutiliae* in the province of Rieti, where the cold hydrogen-sulfide-bicarbonate-sulfate-alkaline springs were well known to Vitruvius, Strabo, Macrobius, Pliny the Elder and Celsus and other ancient writers (Rizzi 2014; on the facility see Sapelli Ragni, Mari 2011, esp. 286-287; Alvino 2009, esp. 98-99, who interprets the construction as a terraced sanctuary complex). By the 2nd century BC they were channeled into a huge structure centered on an open-air pool (60x24m), dug into the rock and lined with travertine slabs and built by means of the opus incertum. Numerous rooms were prepared around the pool, including rooms for resting, preparatory or post-bathing treatments, as well as changing rooms used by patients, who attended the baths over time [Fig. 4].

The grand facility was accessible from the Via Salaria and was articulated in three terraces extending for about 300m, in which the large pool occupied the second terrace; here a monumental northern façade with rectangular niches, with a *nymphaeum* behind, and other rooms



4 | Cittaducale (RI), plan of the *Aquae Cutiliae* thermal building (Sapelli Ragni, Mari 2011, 286).

were placed in connection with the lower and upper floors, attested by corridors and service stairs. Other areas only partially investigated were extended in the other two terraces, but the settlement around the establishment must have been capillary to ensure logistical assistance to the many tourists who came there for centuries.

Strabo informs us on the healing treatments: either taking partial baths inside the large pool while sitting, or staying in the surrounding rooms practicing hydro-pinic therapy:

> Σαβῖνοι … πόλεις δ᾽ ἔχουσιν ὀλίγας καὶ τεταπεινωμένας διὰ τοὺς συνεχεῖς πολέμους, Ἀμίτερνον καὶ Ῥεᾶτε, ᾧ πλησιάζει κώμη Ἰντεροκρέα καὶ τὰ ἐν Κωτιλίαις ψυχρὰ ὕδατα, ἀφ᾽ ὧν καὶ πίνουσι καὶ ἐγκαθίζοντες θεραπεύονται νόσους (Strabo V 3, 1).



5 | Cittaducale (RI), view of the large pool of the *Aquae Cutiliae* (photo by Author, 2012).

> The Sabines … possess some small towns ruined by continual wars, such as Amiterno and Reate, near which is Interocrea and the icy springs of Cotilia, whose waters are not only drunk, but are employed to cure diseases, by sitting in them (Strabo V 3, 1).

In fact, those who wished to enter the pool could make use of some masonry stairs still visible today on the long sides of the pool, the depth of the basin being less than a meter [Fig. 5]: they could remain in it standing or sitting on wooden (or other material) seats for a short time, since the water averaged less than 15 °C. Other patients could have been housed in the rooms facing all around the pool, but we do not know whether other pools provided bathing at other temperatures by heating with *praefurnia*, if we suppose them to have been in the disappeared floors or other pavilions of the establishment.

Attendance was varied and long-lasting, up to the mid-4th century AD, and counted illustrious people, even of the highest rank. We know from Suetonius (*Vesp*. 24) that the emperor Vespasian used to come there every summer on holiday, staying at his villa, which is perhaps to be recognised in the residence of the *Aurelii Cottae* in the locality of Ortali. During his ninth consulship, because persistent fevers had debilitated him while he was in Campania, he decided to travel hastily to *Cutiliae* to regain his strength, but he found death there:

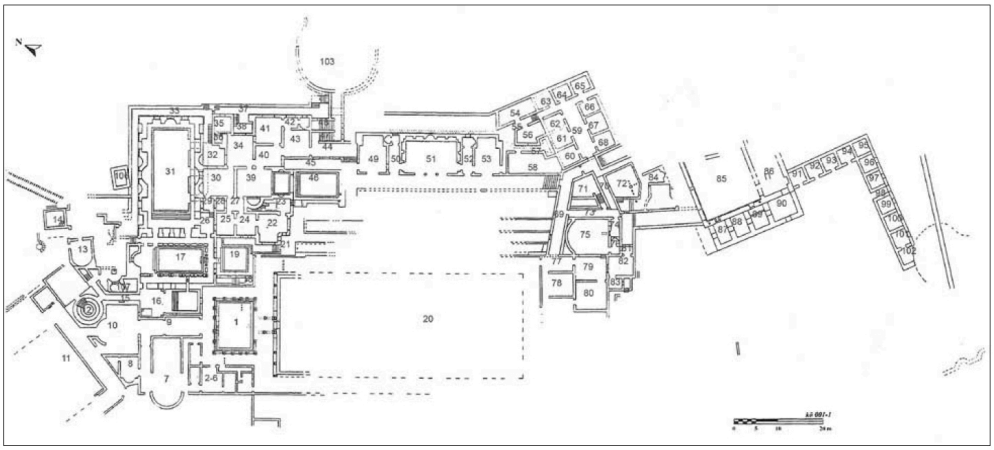
> Consulatu suo nono temptatus in Campania motiunculis levibus protinusque urbe repetita, Cutilias ac Reatina rura, ubi aestivare quotannis solebat, petit. Hic cum super urgentem valitudinem creberrimo frigidae aquae usus etiam intestina vitiasset, nec eo minus muneribus imperatoriis ex consuetudine fungeretur, ut etiam legationes audiret cubans, alvo repente usque ad defectionem soluta, “imperatorem”, ait “stantem mori oportere”; dumque consurgit ac nititur, inter manus sub-



6 | Cittaducale (RI), interior of the church of St. Victor (©wikicommons).

> levantium extinctus est VIIII. Kal. Iul. annum agens aetatis sexagensimum ac nonum superque mensem ac diem septimum (Svet. *Vesp*. 24).
>
> Here, to aggravate the illness was still added indigestion, from drinking an excessive amount of ice water; nevertheless, he continued to perform, according to his custom, his duties as emperor, even receiving delegations while in bed, until, feeling himself dying from a sudden attack of diarrhea, he said, 'An emperor must die standing up!' and as he made an effort to rise, he expired in the arms of those who were helping him, on the ninth day before the kalends of July, at sixty-eight years, one month and six days (Svet. *Vesp*. 24).

Vespasian therefore died on June 23, 79 AD precisely at the Baths of *Cutiliae* due to the ingestion of excessive amounts of mineral water; it is possible that in a picture of general debilitation the prolonged, low-temperature intake adversely affected the emperor's balance, but it is nonetheless true that then as now mineral water therapy had to be guided by medical personnel, and its improper application could prove fatal. A Medieval source, moreover, reminds us that near the springs of the *Cutiliae* Baths St Victorinus was martyred at the end of the 1st century AD, hung upside down and forced to breathe in the sulfurous exhalations emanating from the waters until he was poisoned by them (thus in Adonis of Vienne, 9th century AD, *Passio* of Saints Nereus and Achilleus: *eum locum qui Cotilias appellatur ubi putentes aquae emanant et sulphureae*). A small church dedicated to him arose on the site of his martyrdom



7 | Civitavecchia, plan of the *Aquae Tauri* thermal building (Annibaletto 2014, 132, fig. 61).

during the 8th century, which was later expanded in the 17th century [Fig. 6]: the peculiarity was that it had a spring of water inside, which ended up completely invading the building, so much so that it had to be abandoned. In addition, near the western sector of the baths, a number of mills were set up in medieval times for grain milling activities, which greatly compromised the legibility of the Roman structures.

However, the memory of the healing and evocative power of the ancient splendors remained in time, if in 1983 Andrei Tarkovskij filmed a scene of the film *Nostalghia* there, and the church is today a destination for spontaneous pilgrimages because of the mineral springs, still considered healing and beneficial.

Places of care at the *Aquae*

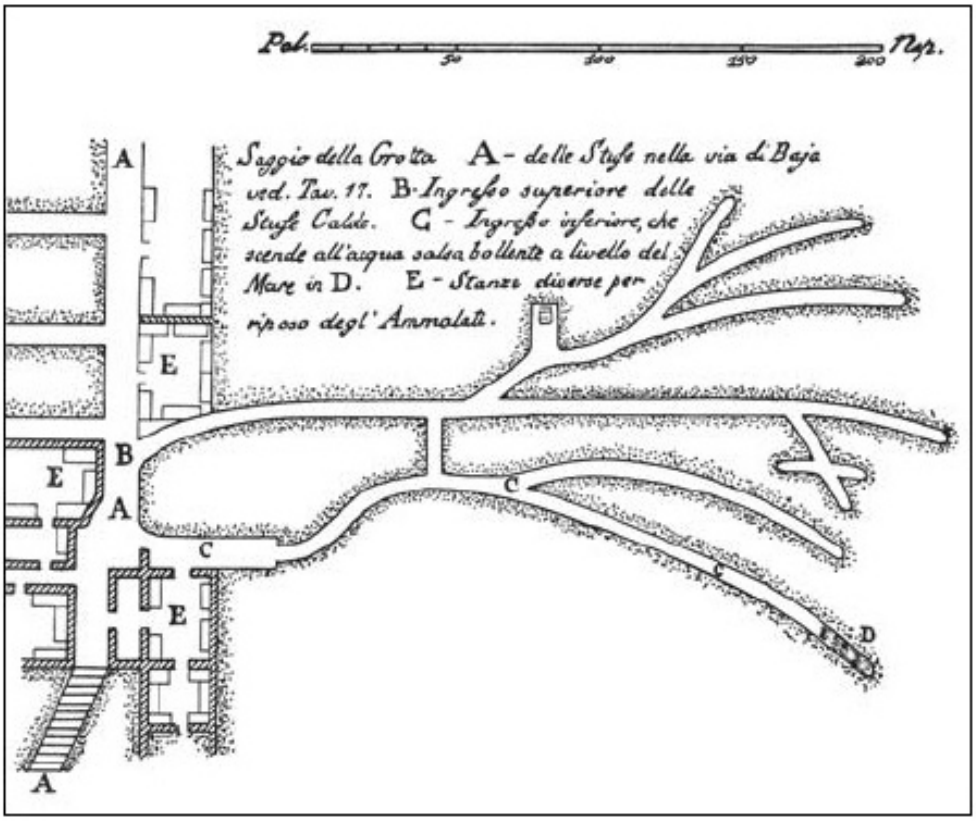
The story of Vespasian and St Victorinus who died from the cold, sulfurous waters of Cittaducale brings us back to consider, as we turn to the conclusion, the organizational logistics that underpinned the management of ancient healing facilities. If the articulation of pools with hot or cold water was closely linked to the presence of the spring, the latter was often monumentalised, as is well shown in the case of the *Aquae Tauri*: in this case it served basins of different widths and probably at different temperatures (Köhler 1999; Ghedini, Bassani 2014, esp. 268), around which were located, as at *Cutiliae* and as in so many other cases, compartments with various purposes. Ancient literary sources record that the *aquae* were staffed by medical personnel, who operated in rooms used as “clinic rooms” where the sick could be examined before, during, and at the end of the thermo-mineral treatment. But there were also staff we would nowadays call ‘paramedic’, such as specialised masseurs, called *unctores* and *iatraliptes*, who treated body parts using oils and ointments (see, e.g., Cels. 1, 1, 1), but also *fricatores* and *tractatores*, who were in charge of frictions (see, e.g., Cael. Aur. *chron*. 3,

7, 92). These were mostly of servile extraction, but we infer from the texts that they had specific expertise within the spas (as well as in the hygienic baths), and their services involved a wide range of activities, in which mineral water, salts and mud were mixed in liquid solutions or in creamy versions, to be applied on patients lying on beds or in individual tubs: this must have been the purpose of the many rooms surrounding the pools so frequently found in Roman healing stations.

These were probably the rooms that ancient sources call *cubicola diurna* open on the peristyle and courtyards, such as those at *Aquae Tauri* ([Fig. 7]: Turchetti 1999, in partic. 60) but also at Montegrotto Terme, in the spa of Via Scavi (see the small rooms between the baths, perhaps connected to a gymnasium in front: Bonomi, Malacrino 2012, esp. 167-168). To the *cubicula* should be added the rooms used for hydro-pinic therapy, where patients stayed on seats to drink, as in the case of *Cutiliae*. Again, in some rooms equipped with drainage ducts, irrigation and washing could be carried out, nor can it be excluded that in some cases showers and inhalations were performed; there was evidently no shortage of latrines either, of which no less than five have been identified at *Aquae Tauri* (Köhler 2011, 121-122).

About the presence of spouts from which jets of thermo-mineral water for showers came out, one may recall the lead pipes discovered in the pillars surrounding the thermal pool at *Aquae Caeretanae*, in Latium, whose source is at 40 °C with a high sulfur component (Turchetti 1999, 69). These tubes had an inclination opposite to the planes of the pool, which allowed the jet to fall with a fountain effect, under which patrons evidently placed themselves with their whole body or just the parts to be treated. When the therapy was over, they could then stand in the adjacent rooms, three of which have been brought to light and which look like rooms for resting and siestas: they had frescoed walls and mosaic floors, facing a courtyard. In the more complex and articulated healing stations, such as the *Aquae Tauri*, there were also rooms for reading: the large room 51 overlooking the uncovered space in front has been interpreted as a probable library, due to the presence of rectangular niches necessary for the placement of shelves. As for inhalation by steam, however, the most relevant evidence from the Roman period is found in the Baian installations, particularly in the Stufe di Nerone/Sudatorio di Tritoli (Pagano 1984, esp. 155-168). Here on several occasions long conduits dug into the rock were found, which allowed the flow of hot air, to be used for heat baths (the *laconica* or *sudationes*) or for inhalation [Fig. 8], to be brought into the rooms built by incision of the yellow tuffaceous bank of the hill.

Sources also tell us of spas where people could be entertained through recitations and performances designed to amuse the patients. In Montegrotto Terme at the large baths, there was actually a small theater (Bonomi, Malacrino 2011), where plays, compositions, and musical performances could be attended by the sick and the pilgrims between treatments. Only one other example of a performance building connected to healing stations in Roman Italy is known, in the water city of Acqui Terme, but it is possible that non-permanent wooden structures were provided in many other contexts as well, to cheer the stay of pilgrims and wayfarers



8 | Agnano, plan of the Stoves of Nero, where rooms connected to underground passages for capturing hot vapours are noted (Pagano 1984, fig. 7).

who stopped at the *Aquae* (Bassani 2017). Indeed, the presence of multiple residences discovered around the main mineral springs confirms that there was extensive development of accommodation facilities of various social levels, attested in Italy and in many contexts of the empire (Annibaletto 2014, esp. 102-104).

And precisely because the user base was diversified, the possibilities of making use of those special waters must also have been varied, useful for humans but also for animals, at least for those needed for the family property and essential for the maintenance of the satellite activities for their derivatives. I have already offered several observations on this aspect, to which I would like to refer (Bassani 2011; Bassani 2012). Thermal therapies could involve both baths in special pools of water and mud baths, according to a practice that the Romans certainly knew and used, as inferred from a passage by Pliny the Elder:

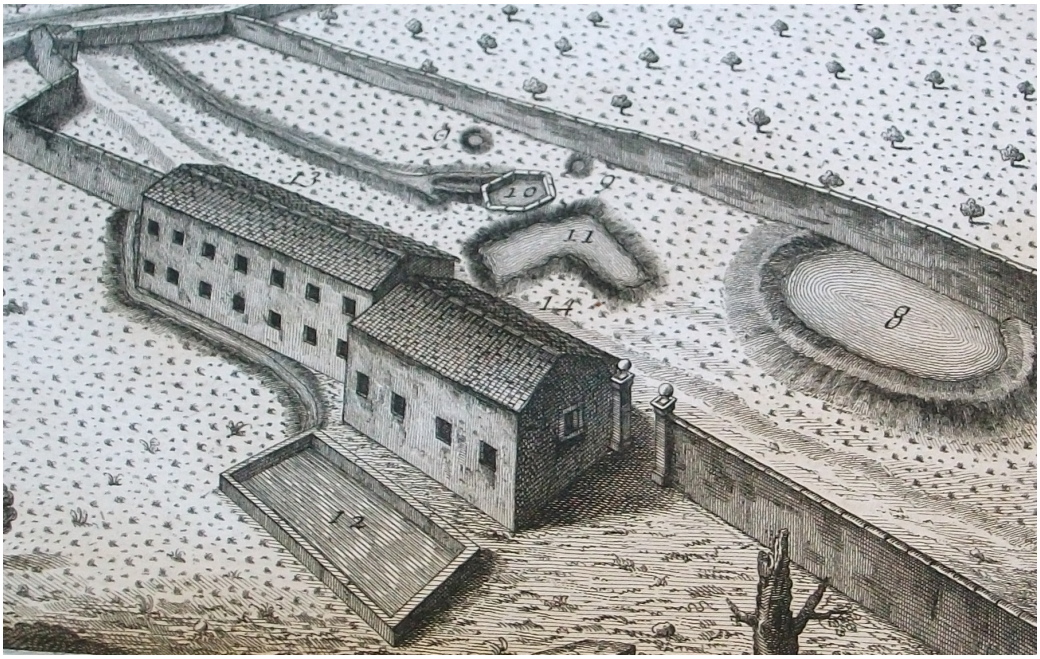


9 | Pesaro, Museo Oliveriano, photos of some anatomical votive offerings from the *Lucus Pisaurensis*, including a mask, human hands and feet as well as mono- and biungulate animal legs (Di Luca 2004, 27, fig. 32).
10 | The base with the ode in honor of the *Aquae Albulae* for the healing of the horse *Samis* (Paci 2006, fig. 6).

> utuntur et caeno fontium ipsorum utiliter, sed ita si inlitum solem inarescat (Plin. *nat*. XXXI, 2, 32).
>
> Mud from medicinal springs is also used with advantage, but the application must be sun-dried (Plin. *nat*. XXXI, 2, 32).

In fact, domestic animals were also taken to the *Aquae*, primarily those that were bred, as is evident from the analysis of ex-votos recovered at various surveyed thermo-mineral sites in Italy, which could refer not only to a generic sacrifice but also to a request for protection toward the animals themselves: from Veneto to Emilia, from Marche to Lazio to Campania and probably also in Sicily, there are clues to 'veterinary' care as early as the Archaic age.

In the cases examined, it emerged how votive offerings could include not only horses and oxen, which were considered then as now to be precious animals of great economic value, but also sheep, thus apparently less valuable livestock. The presence of statuettes of sheep and goats testifies to the importance also attributed to these animals in the ancient economy, which based much of its fortune on the trade of different types of wool: after all, flock farmers today confirm how important it is to avoid the spread of mycosis and parasitic forms among sheep precisely by bathing in thermal lakes, distributed in central Italy but also in other Euro-



11 | Map showing some buildings and thermo-mineral water springs for use in horse baths near Monteortone, between Abano and Montegrotto Terme (Mandruzzato 1793, Plan I).

pean locations. Near Pesaro, for example, in the shrine known as *Lucus Pisaurensis* (Di Luca 2004), very explicit anatomical votive offerings have been found, since they are in the shape of monungulate legs (so horses) and biungulate (oxen, sheep and pigs) that clearly represent the healed parts of sick animals [Fig. 9]. But the most important evidence of this practice is found in the discovery at the *Aquae Albulae* near Tivoli of a very interesting inscribed base, which bears a hexameter poem in honor of the *Aquae Albulae* and is dated to the Hadrianic age [Fig. 10]: the aquae had healed the horse Samis of which a statue was placed over the base, now lost but whose footprints remain. The animal had been wounded by a wild boar during a hunting trip near Roselle, and only thanks to the healing properties of those springs was Samis then able to make a full recovery (*CIL* XIV, 3911=*Inscr. It.* IV, 1, no. 596; reread in *AE* 2000, no. 380: Gascou, Janon 2000). The thanks of the horse's owner could not have been more evident, and indeed in the inscription the dedicator specifies that the gift had been placed in such a way as to be visible from Hadrian's Villa, in the direction of the Sanctuary of Tivoli: and since, as is well known, this residence had been conceived and planned by Hadrian, there has been no lack of scholars who have proposed that the dedicatee of the ex voto was the emperor himself, or someone very close to him.

The base of the Samis horse statue from Tivoli thus suggests that at the *Aquae Albulae* there were not only healing buildings for humans, but presumably also separate areas for animals,

which, then as now, could heal skin diseases or wounds by water immersions or mud applications. This practice also had a long tradition in the post-antique age precisely in the Veneto region, as clarified both by a note by the physician Gabriele Falloppio in his 1564 *De medicatis aquis*, which mentions a "balneum equorum, eo quod soleant equos in ipsum immergere", and a 1793 map by Salvatore Mandruzzato, which in the Euganean area indicated the presence of pools for animals and specifically for horses ([Fig. 11, no. 11] "Horse bath"). In Montegrotto, then, tradition records that free thermal water pools for equine bathing were attached to the Hotel Vulcania in the last century. The importance of having healthy animals did not only respond to economic demands, but was also, and perhaps above all, a matter of collective well-being. In societies in which humans shared the same spaces with animals, it was essential to avoid the transmission of diseases by contact, such as certain mycoses or other skin diseases such as rabies (animal) or scabies (human), not to mention other parasites (lice, ticks, fleas). This emerges well from the *Carmen Lustrale* transmitted by Cato where the dedicator of a *suovetaurile* addresses Mars to protect not only his family and home, but also the fields and livestock, and asks in particular that the flocks be kept safe and sound:

O Father Mars
I pray and beseech thee,
that you may be favorable and propitious
To me to the house and to our family.
And for this grace
Around my field,
my land and my fund a swine,
a ram and a bull I have caused to be led
For thou the visible and invisible evils
the doom and devastation
calamity and inclement weather
Thou shalt prevent, drive out and drive away,
and that the harvests,
the grain, the vineyards and the saplings,
you let them grow well and develop,
and the shepherds and flocks
keep them safe and sound,
and good health and prosperity thou givest
To me and to my house and family:
Therefore, for these things,
to purify the bottom, the earth and my field,
to obtain purification,
as I said,
be honored with the sacrifice
Of this swine, of this ram, and of this bull
that is still suckling (Cato *agr.* 141, 2-3).

Mars pater te precor quaesoque
uti sies volens propitius
mihi domo familiaeque nostrae.
Quoius rei ergo
agrum terram fundumque meum
suovitaurilia circumagi iussi,
uti tu morbos visos invisosque
viduertatem vastitudinemque,
calamitates intemperiasque
prohibessis defendas averruncesque,
utiques tu fruges frumenta,
vineta virgultaque,
grandire beneque evenire siris,
pastores pecuaque
salva servassis,
duisque bonam salutem valetudinemque
mihi domo familiaeque nostrae:
harunce rerum ergo,
fundi terrae agrique mei lustrandi
lustrique faciendi ergo,
sicuti dixi,
macte hisce suovitaurilibus
lactentibus inmolandis esto.

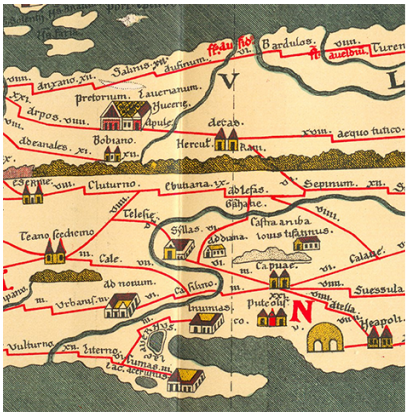
The large-scale scope of this phenomenon can also be discerned in the Campanian shrine at Mount Tifata in the vicinity of Capua and dedicated to Diana, which was frequented from the Republican age until the late Imperial age. As I have had the opportunity to propose (Bassani 2014a, esp. 155-160), it is possible that here Hannibal, after defeating the Romans at Canne in 216 BC, chose to have his army stop not only for strategic reasons in order to better control the territory, the sanctuary being on a hill that allowed the view of the entire surrounding plain [Fig. 12], but also because there were precious sulfurous waters supervised by Diana, suitable for healing the wounds of soldiers and animals. Her attention to the equine component is conveyed to us by Polybius, who mentions in no less than two passages treatments to counteract diseases occurring to men and animals:

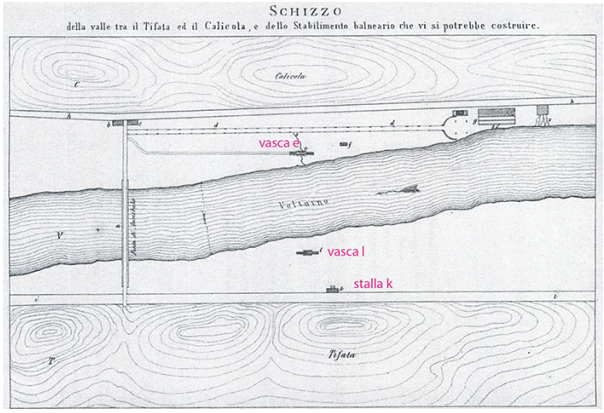
> (1) ἐν ᾧ καιρῷ καταστρατοπεδεύσας παρὰ τὸν Ἀδρίαν ἐν χώρᾳ πρὸς πάντα τὰ γεννήματα διαφερούσῃ μεγάλην ἐποιεῖτο σπουδὴν ὑπὲρ τῆς ἀναλήψεως καὶ θεραπείας τῶν ἀνδρῶν, οὐχ ἧττον δὲ καὶ τῶν ἵππων.(2) ὡς ἂν γὰρ ὑπαίθρου τῆς παραχειμασίας γεγενημένης ἐν τοῖς κατὰ Γαλατίαν τόποις, ὑπό τε τοῦ ψύχους καὶ τῆς ἀνηλειψίας, ἔτι δὲ τῆς μετὰ ταῦτα διὰ τῶν ἑλῶν πορείας καὶ ταλαιπωρίας ἐπεγεγόνει σχεδὸν ἅπασι τοῖς ἵπποις, ὁμοίως δὲ καὶ τοῖς ἀνδράσιν ὁ λεγόμενος λιμόψωρος καὶ τοιαύτη καχεξία. (3) διὸ γενόμενος ἐγκρατὴς χώρας εὐδαίμονος ἐσωματοποίησε μὲν τοὺς ἵππους, ἀνεκτήσατο δὲ τά τε σώματα καὶ τὰς ψυχὰς τῶν στρατιωτῶν: μετακαθώπλισε δὲ τοὺς Λίβυας εἰς τὸν Ῥωμαϊκὸν τρόπον ἐκλεκτοῖς ὅπλοις, ὡς ἂν γεγονὼς κύριος τοσούτων σκύλων (Polyb. III, 87, 1-3).
>
> (1) Pitching his camp on the shore of the Adriatic, in a district extraordinarily rich in every kind of produce, he took great pains to refresh his men and restore their health, and no less so that of the horses. (2) For the cold and squalor of a winter spent in Gallia Cisalpina without the protection of a roof, and then the painful march through the marshes, had brought upon most of the horses, and the men as well, an attack of scurvy and all its consequences. (3) Having therefore now got possession of a rich country, he got his horses into condition again, and restored the bodies and spirits of his soldiers; and made the Libyans change their own for Roman arms selected for the purpose, which he could easily do from being possessed of so many sets stripped from the bodies of the enemy (Polyb. III, 87, 1-3).

Again, Polybius informs us that:

> Ἀννίβας δὲ κατὰ βραχὺ μεταθεὶς τὴν παρεμβολὴν ἐνδιέτριβε τῇ παρὰ τὸν Ἀδρίαν χώρᾳ καὶ τοὺς μὲν ἵππους ἐκλούων τοῖς παλαιοῖς οἴνοις διὰ τὸ πλῆθος ἐξεθεράπευσε τὴν καχεξίαν αὐτῶν καὶ τὴν ψώραν, παραπλησίως δὲ καὶ τῶν ἀνδρῶν τοὺς μὲν τραυματίας ἐξυγίασε, τοὺς δὲ λοιποὺς εὐέκτας παρεσκεύασε καὶ προθύμους εἰς τὰς ἐπιφερομένας χρείας (Polyb. III, 88, 1).
>
> Though Hannibal shifted his quarters from time to time for short distances in one direction or another, he remained in the neighbourhood of the Adriatic; and by bathing his horses with old wine, of which he had a great store, cured them of the scab and got them into condition again. By a similar treatment he cured his men of their wounds and got the others into a sound state of health and spirits for the service before them (Polyb. III, 88, 1).

It is no coincidence that the *Tabula Peutingeriana* records the location of a site called *Castra An(n)iba(lis)* near both the river and shrines in honor of Diana and Jupiter, as well as probable baths traceable back to Silla (*Syllas*), and still in the mid-nineteenth century we hear of





12 | Sant'Angelo in Formis (Capua), the area of the Tifata Mountain in the *Tabula Peutingeriana*, segment VI (Omnes Viae).
13 | Plan sketch by Giuseppe Novi showing the curative buildings to be constructed at the Tifata springs, including pools and stables for horses (after Novi [1886] 1979, 257).

bathing practices for horses at the same springs. Giuseppe Novi, in his 1886 work devoted to the construction of a bathing complex on the slopes of Mount Tifata to exploit the medicinal waters, envisioned the construction of a pool for healthy horses separated by means of the Volturno River from a second pool for sick horses, in order to treat their sores and other skin diseases (Bassani 2014a, 157 and footnote 73 [Fig. 13]).

In conclusion, then, the study of thermalism in ancient times allows us to understand the dynamics of the use of *aquae* not only to ensure *ad hoc* therapies and comforts of various kinds for humans, but also to provide for the health and healing of their animals, in a perspective of general social and economic well-being that was maintained over the centuries without interruption.

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Abstract

The article discusses some aspects related to the exploitation of natural thermalism in Antiquity starting with an examination of pre-Roman and Roman contexts that were used for curative purposes over time, focusing on the Grotte del Kronio, in Sicily, and the *Aquae Cutiliae*, in Latium. These two sites are different from each other both in terms of the quality of the geo-thermal phenomenon and the type of settlements, but they also allow us to gather interesting elements on aspects related to the literary and cultural-historical tradition that developed around them over the centuries. Prospects for further study also open up to the consideration of the socio-economic consequences that the exploitation of mineral springs entailed for ancient societies, including veterinary care and the economic incentive resulting from the possession of healthy herds with high commercial potential.

keywords | Thermalism; Kronio; *Cutiliae*; Healing treatments.

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Offering Truncated Bodies in Roman Gaul

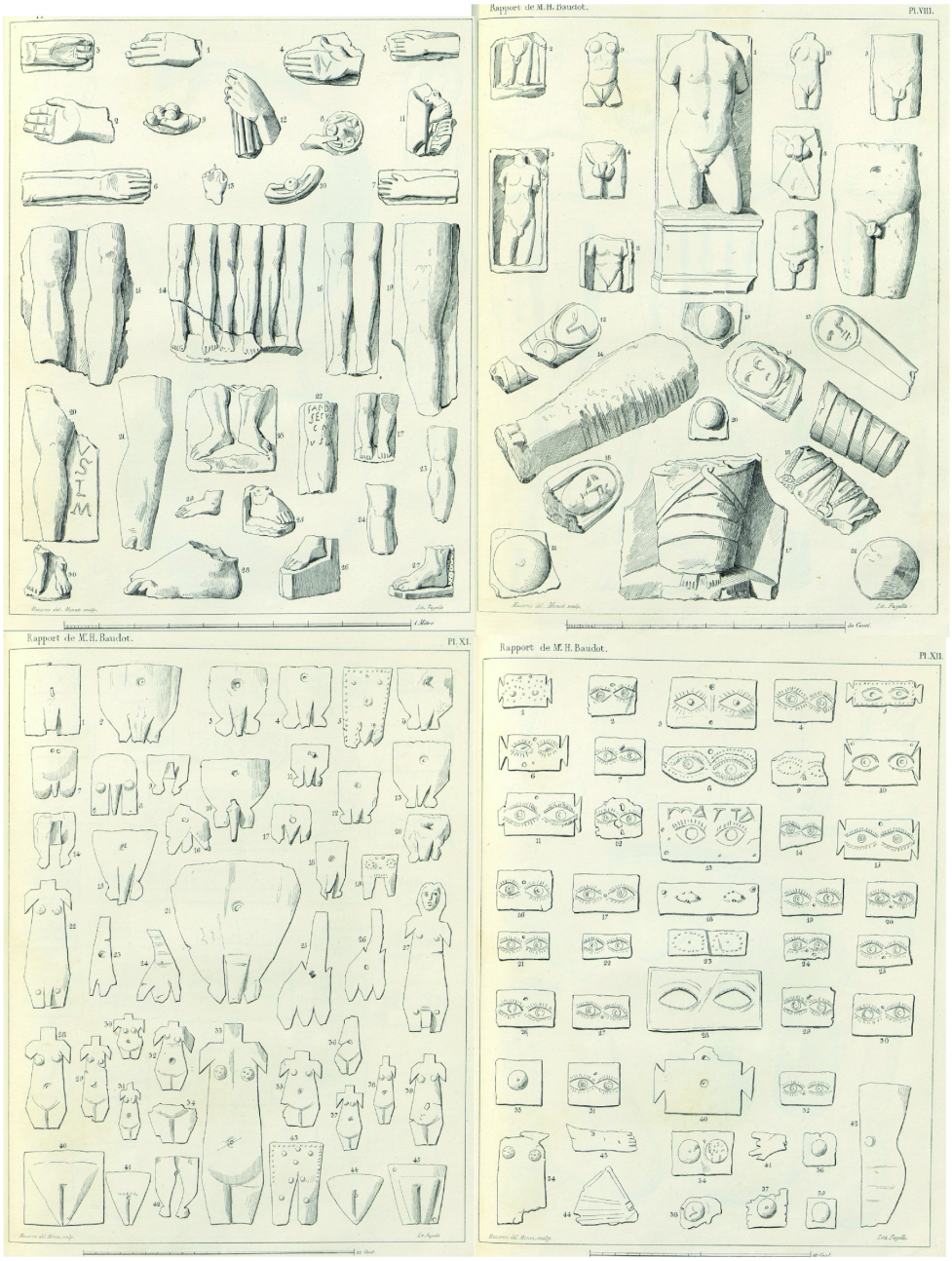
Layouts, Antecedents and Interpretations

Olivier de Cazanove

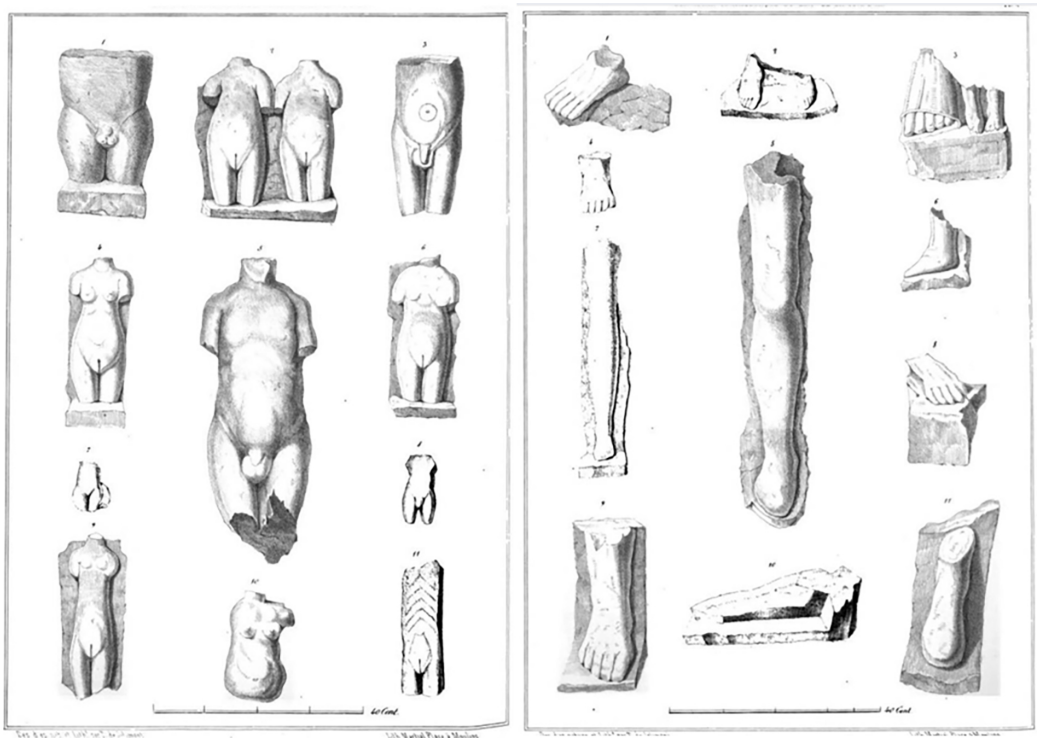
The anatomical offerings of Central Italy are certainly those that enjoy the greatest notoriety today, due to their huge quantity, their apparent omnipresence, the interest of the general public and scholars periodically enhanced by spectacular discoveries, and finally by the increasing number of publications. However, although the first discoveries of votive offerings in Italy were made at an early date, virtually no votive contexts were published in a scientifically adequate manner until the 1960s (Cazanove *forthcoming* a). And it was not before 1986 that a series devoted to this topic was created, the *Corpus delle Stipi votive in Italia*, edited by Annamaria Comella and Mario Torelli.

Some Greek votive offerings were published earlier. When Carl Roebuck provided a catalogue of the votive terracottas from the *Asklepieion* of Corinth in 1951, he incidentally mentioned the existence of important comparative material in Italy, but added that information about them was scarce and that no monographs on the topic existed: "The votives from Corinth… were of terracotta… The only similar large finds of terracotta votives of this type are reported from the sanctuaries of Diana at Nemi and Veii, and from the *Asklepieion* on the Tiber island in Italy. Comparison with these, however, is difficult since they still await full publication" (Roebuck 1951, 112).

But it must be added that more than a century before the votives of Corinth, the first assemblage of anatomical ex-votos to be discovered and then immediately made known and illustrated in an almost exhaustive manner came from the excavations carried out by Henri Baudot from 1836 to 1842 at the sanctuary of the topical goddess Sequana near the Seine Springs in Burgundy. It was published in the *Mémoires de la Commission des Antiquités du département de Côte d'Or* as early as 1847 (Baudot 1842-1846). The plates [Fig. 1] that accurately illustrate the finds (architectural elements, inscriptions, offerings, but also *instrumentum*) can be easily compared with the artefacts preserved up to the present day. Body parts are associated, exactly as in the Central Italian deposits, with statues, heads and babies in swaddling clothes. The anatomical offerings at the Seine Springs are sculpted in limestone, but also embossed or punched on thin bronze plates: eyes, breasts, male and female genitalia, torsos and pelvises, and even schematic representations of internal organs (Deyts 1994). It wasn't until more than a century later, in 1963, that hundreds of wooden



1 | Four plates from the original publication by Baudot of his excavations at the sanctuary of Sequana next to the Seine Springs (Baudot 1842-1846).



2 | Two plates from the publication by Mignard of the excavations at the sanctuary of Apollo Vindonnus (Essarois; Mignard 1847-1852).

offerings were discovered at the Seine Springs, making the sanctuary famous in scientific literature (Deyts 1983).

The year after the publication of the Seine Springs offerings, another local scholar, Prosper Mignard, released the finds from the temple of Apollo Vindonnus in Essarois, also in Burgundy (Mignard 1847-1852). The anatomical votives are very similar: limbs, male and female torsos and so on [Fig. 2]. It is also worth noting that, for the first time, offerings in limestone, wood and on bronze plates were found on the same cult site.

A third example of ancient excavations can be cited for our purpose, the Halatte forest temple in the *Silvanectes* territory (north of the *Parisii*) explored in 1873. The similarity of the votive facies with the offerings from the Seine Springs and Essarois – hundreds of sculptures in limestone – was immediately noted: heads, torsos, "a certain number of which… never had heads or legs, which proves that they were ex-votos relating to diseases of the organs of the trunk" (Caix de Saint-Aymour 1906), upper and lower limbs, breasts, complete statues, clothed or naked (the latter often with an oversized scrotum), children in swaddling clothes,

statuettes and animal limbs. However, it was not until 2000 that this collection was fully published (Durand, Finon 2000).

Only one category of offerings will be examined here, representing not isolated limbs or organs, but the human trunk, either fully or partially represented. However, distinctions must be made. There are basically three different layouts of these truncated bodies, which exist in two formats: life-size and reduced, and were made of three materials: wood, stone and bronze (in thin bronze plate or in the round).

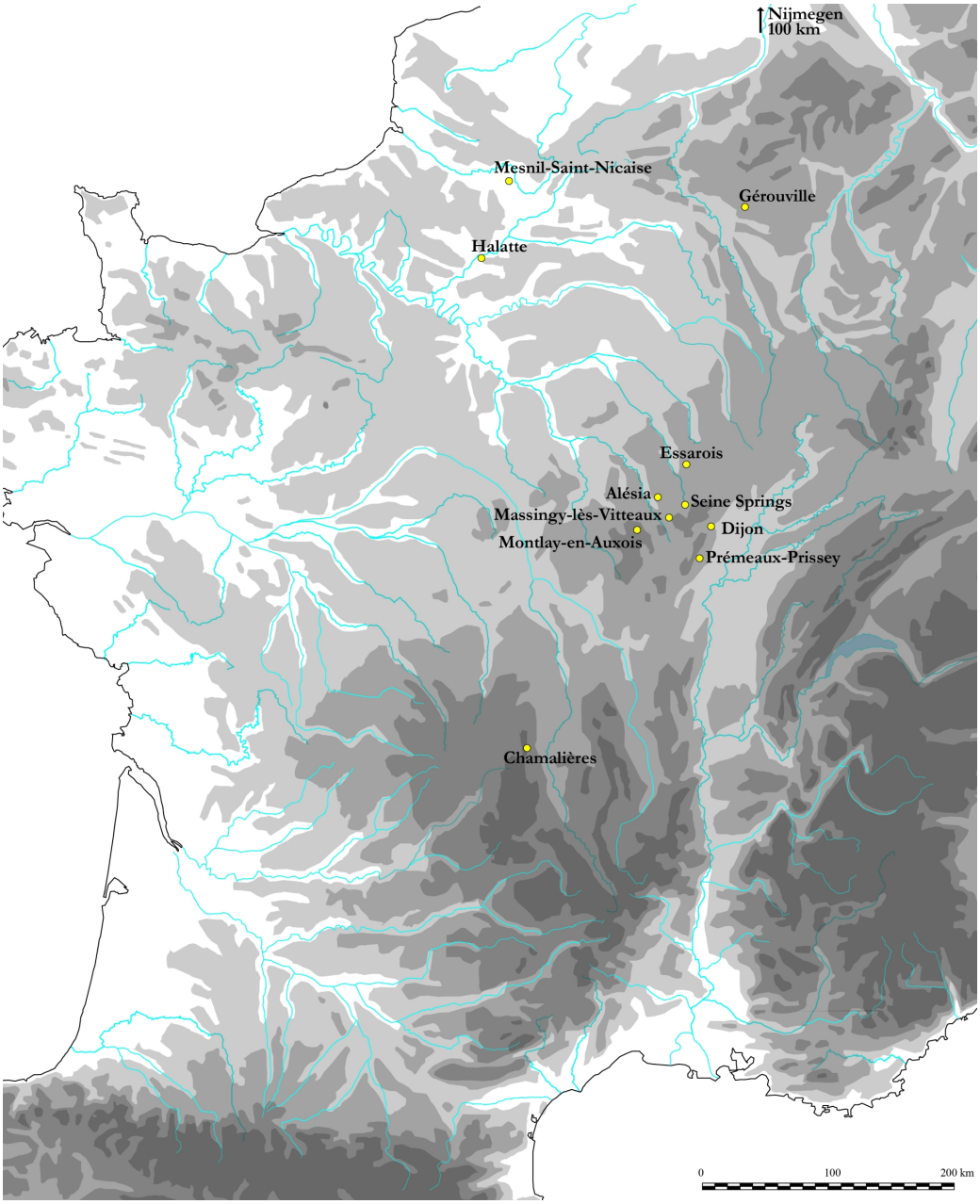
– the torso, without head or limbs (or with thighs only) [Fig. 4];
– the abdomen and thighs [Fig. 6];
– the lower part of the body, from the waist to the feet [Fig. 8].

The torsos

These are whole trunks, both male and female, from the neck to the groin and thighs. The three main sites where they have been found have already been mentioned: the sanctuary of Sequana at the Seine Springs, Essarois and Halatte [Fig. 3]. But there are others too, such as the cult place of Apollo Moritasgus at Alesia, from which a possible stone trunk bearing the dedication of a certain Diofanes was found (Espérandieu 1925, 7140; *CIL* 13, 11241), as well as a fragmentary pelvis from the 2023 excavations, and a small bronze plaque representing a torso whose sex cannot be determined due to its poor state of preservation [Fig. 4, 25].

The main characteristic of these artefacts is therefore that they are limbless and headless. The only exceptions are two schematic male figures from the Seine Springs with a small face embossed on the rounded cut-out above the body [Fig. 4, 19-20]. A third male bronze sheet in the shape of a trunk, also from the sanctuary of Sequana, has only the neck indicated [Fig. 4, 21], as do the 16 female examples [Fig. 4, 21-24]. In fact, all the other torsos from Gaul, whatever their origin or material, have no head, starting with those from the Seine Springs, in stone (10 examples in stone, mostly male [Fig. 4, 1-2], and wood, 11 examples, mostly female). The same is true of Central Italy [Fig. 4, 5-7] and Greece (where only three terracotta male torsos are known, from the *Asklepieion* in Corinth: Roebuck 1951, 121).

Because all these naked trunks from the Greco-Roman world are as much masculine as feminine, and above all because they are headless, it is impossible in my opinion to equate them, as J. Reilly did in an often-quoted paper (Reilly 1997), with the female statuettes held by girls on a series of Attic stelae [Fig. 5]. Some of these figures are complete, seated and clothed, while others are naked, without arms and with their legs cut off above the knee (Cavalier 1988). J. Reilly (following Daux 1973) rejects the idea that these figurines refer to the young girl's offering, on the eve of her wedding, of the childhood toys she is about to leave behind. She is probably right to relate them to truncated terracotta figurines, which unfortunately have no definite provenance, making it impossible to determine their meaning (see also, on the female "poupées nues" from the *Artemision* of Thasos, Huysecom 2020). But she goes further: for her, "the so-called 'dolls' on ancient Athenian grave reliefs are not toys, but are

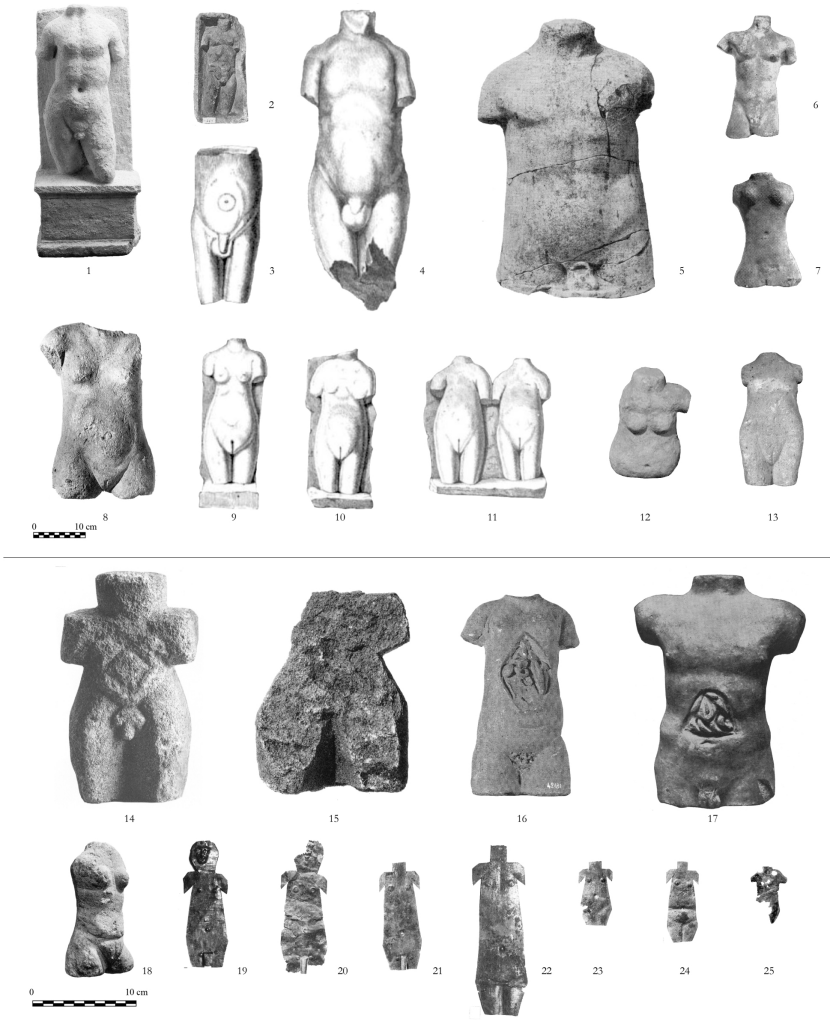


3 | Map showing where offerings in the shape of truncated bodies were found in Roman Gaul (O. de Cazanove).

votives" (Reilly 1997, 164); and again: "the truncated figures on the grave reliefs, I propose, are in actuality anatomical votives. The truncation of the figure, similar to the anatomical votives dedicated to healing gods, signifies its votive function" (Reilly 1997, 162). However, this truncation differs in at least one essential respect: while the head is present on the figurines in the stelae, it is always absent on the anatomical ex-votos, allowing the emphasis to be focused solely on the very core of the physical body. J. Reilly's next step in interpretation is even more purely assertive: according to her, the truncated female figures on the funerary stelae "crafted as votives… reveal a complex of ideas about a female's body and about an especially female concern, the achievement of menarche. The child is depicted with a dedication to ensure her healthy development and functioning as a woman" (Reilly 1997, 159). Unfortunately, there is no material evidence to support this reconstruction. There is very little archaeological evidence of whole votive torsos in the Greek world, only in Corinth, and only of men. And what about these male trunks? It would be methodologically wrong to ascribe a completely different meaning to them than to the female trunks. In any case, it would be prudent to completely separate the question of Greek female figurines without limbs but with heads, whose significance may continue to be debated, from that of ex-votos representing "real" trunks limbless and headless.

Despite these interpretative aporias, J. Reilly's paper has been influential, even outside the Greek world, and even on the most informed studies of religious and social practices in Roman Gaul. A few years ago, it was suggested that the female torsos, pelvises, breasts and sexes at the Seine Springs were offerings made "on the occasion of rites celebrating the bodily maturity of girls and therefore the age of menarche" (Derks 2012, 71). T. Derks places the emphasis on rites of passage, adopting Van Gennep's theses as the key to his anthropological interpretation. In spite of the importance one may wish to ascribe (or not) to the rites of passage in Roman society in general, and in votive practices in particular, it is difficult to follow the author if one challenges the Reilly's paper on which he relies. There are other difficulties too: attributing the same overall meaning to a whole range of different offerings (female torsos, pelvises, breasts and vulvas) when there must have been a reason for these different focuses. The same applies to the truncated male representations at the Seine Springs and elsewhere: to assume that they were made solely to signify the generative capacity acquired at puberty seems limiting, especially for the full torsos where the focus is not particularly on sex. Finally, to take into account only votives showing sexual organs means isolating only a small part of the coherent assemblages formed by anatomical offerings, in Gaul and elsewhere, which include all parts of the body.

A different approach is therefore needed to interpret the truncated bodies, and first of all the whole torsos. At the Seine Springs, alongside examples of good craftsmanship [Fig. 4, 1-2, 8, 18], there is also a small, crude trunk, 22.5 cm high (Deyts 1994, 73-74), with the neck and the beginnings of the limbs indicated [Fig. 4, 14]. Above the male genitalia, a lozenge-shaped incision lies over the belly. Despite its schematic nature, this is undoubtedly a laparotomic opening designed to reveal the abdominal cavity. Of course, this in no way implies any surgical



4 | Truncated bodies: torsos. 1. Seine Springs (Deyts 1994, 72, 75, pl. 27, 1); 2. Seine Springs (Deyts 1994, 75, pl. 27, 2); 3. Essarois (Mignard 1847-1852, pl. 6, 3); 4. Essarois (Mignard 1847-1852, pl. 6, 5); 5. *Lavinium*, 13 are (Fenelli 1975, 255, D 12, fig. 349); 6. Veio (Bartoloni, Benedettini 2011, 567, H13 I 1, pl. 73 a-b); 7. Veio, Comunità (Bartoloni, Benedettini 2011, 569, H13 VI 1, pl. 75 a-b); 8. Seine Springs (Deyts 1994, 80, pl. 32, 3); 9. Essarois (Mignard 1847-1852, pl. 6, 4); 10. Essarois (Mignard 1847-1852, pl. 6, 6); 11. Essarois (Mignard 1847-1852, pl. 6, 2); 12. Essarois (Espérandieu 1911, 3431); 13. Halatte (Durand, Finon 2000, 24, 00 5216); 14. Seine Springs (Deyts 1994, 73, pl. 26, 4); 15. Seine Springs (Deyts 1994, 74, pl. 26, 5); 16. *Lanuvium*, Tenuta Quarti (Haumesser 2017, 171, fig. 9.5); 17. Cales, Madrid, Museo Arquelogico Nacional, coll. Salamanca (Tabanelli 1964, fig. 12); 18. Seine Springs (Deyts 1994, 78, pl. 32, 1); 19-24. Seine Springs (Deyts 1994, 80-81, pl. 33, a-c, e, j, i); 25. Alesia, Moritasgus sanctuary (de Cazanove *forthcoming b*).

knowledge on the part of the craftsman or the commissioner, nor even less any trace of 'temple medicine', but more basically the simplified reproduction of earlier models. These models, showing the entrails *in situ* in the open trunk, already existed in Central Italy, particularly in Latium and Rome [Fig. 4, 16-17].

I won't stress this point any further, as in a recent paper (Cazanove *forthcoming* a), I sketched out a typology of offerings representing open bodies in the votive deposits of Central Italy. It is more than enough to say that the small open trunk from the Seine Springs is one of several clear indications that representations of truncated bodies in Roman Gaul derive from Italian or, more broadly, Mediterranean antecedents. Chronology confirms this. A schematic wooden female trunk [Fig. 6] from the Seine Springs can be dated to shortly before the beginning of our era (i.e., one or two generations after the Gallic War) using dendrochronology (felling of the tree between 15th and 5th BC). Bronze and stone votive offerings are more recent, but are related to the same traditions, even if many links are missing to enable us to retrace this long history in detail.

In Italy, the open trunks showing the internal organs must refer, as we would expect, to illnesses affecting the interior of the body, or more generally to the dysfunction of the organism, supposedly restored (or avoided) by divine intervention. It is interesting to note that, in the same sanctuaries, there are both open and closed trunks, some of which belong to the same morphological types, e.g. in Tessennanno, Veio, Palestrina or *Lavinium* (Pantanacci). As a result, it is logical to assume that the meaning of closed trunks is, if not exactly the same, at least related to that of open torsos. We can therefore suppose that the closed trunks would also draw attention to what is embedded inside the body – but without showing it explicitly, unlike the complex representations of the entrails – and which enables it to function, but sometimes causes it to malfunction, leading to pain and illness. More visible ailments (wounds, injuries, and so on) should not be excluded from the occasions on which such artefacts were dedicated. These are polysemic votives to a certain extent, likely to refer, depending on the case, to anything that might affect the central part of the individual. In Gaul, as the existence of open trunks suggests, these offerings could also be interpreted in the same way.

The abdomen and thighs

A second layout of truncated bodies shows only the lower half of the torso, or more precisely the combination of abdomen and thighs, from the navel to just above the knees [Fig. 7]. It exists in both male and female versions, always naked, in natural size or on a reduced scale, in wood, sheet bronze and limestone. It cannot be the equivalent (or at least the exact equivalent) of the trunks, because the body is cut differently[1]. Nor can it be a question of local peculiarities, of local ways of doing, since both can be found on the same sites.

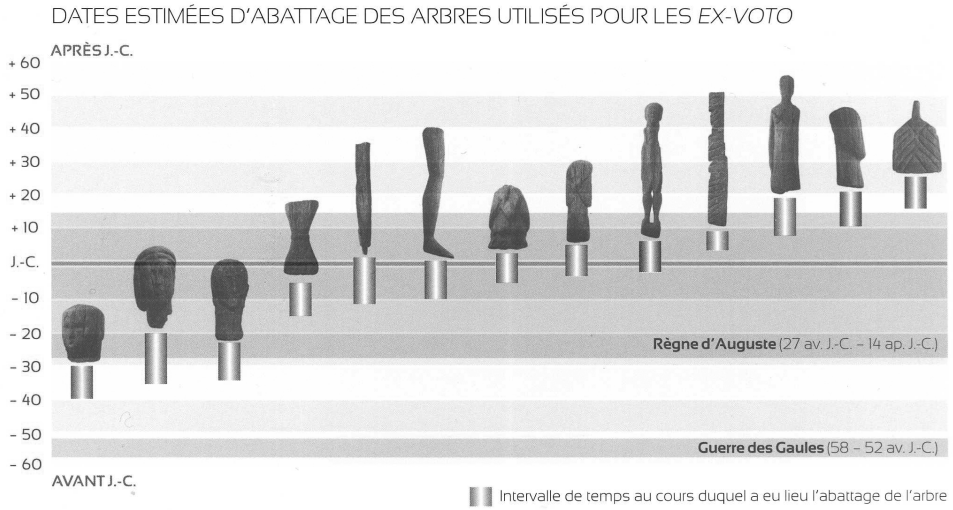
With regard to this particular layout of the truncated bodies, it is more credible to think that they are mainly representations of the male and female sexual organs, displayed in their bodily context. Firstly, because these representations of the abdomen and thighs focus on the genitalia, which are more or less at the centre of the artefact. Secondly, because there are



5 | Young girls carrying figurines on funerary stelae. From left to right, Boston stela, Aristomache stela, Plangon stela, Calvet Museum stela, Melisto stela, fragment from Athens 1993 (after Cavalier 1988). Note the different types of figurines and poses, as well as the recurring presence of pets.

no sexual organs on their own sculpted in stone in Roman Gaul; conversely, there are numerous male and female genitalia on a shield-shaped bronze plate (Seine Springs: Baudot 1842-1846, here [Fig. 1], and Deyts 1994, 76-78, pl. 28-31), but no female abdomens and thighs and relatively few male specimens [Fig. 1, 23-31]. There are several possible solutions: either the stone abdomens and thighs were an alternative to the bronze sheet genitalia for practical reasons (the metal ones were suspended; the stone ones had to stand upright) and/or for reasons of prestige (the stone offerings were larger and more expensive[2]). Either this means that different materials were preferred for the various parts of the body (in fact, not all types of anatomical votive are attested in metal sheets). Or lastly, it may be a question of chronology, depending on the date of appearance of anatomical votives in wood, metal or stone (Cazanove 2017, 63-69).

So the abdomens can in fact emphasise the sexual organs. But not only. They can also refer to any ailment, visible or invisible, external or internal, affecting this part of the body. Proof of this is provided by a small representation of an abdomen, in oak, from the Seine Springs (Deyts 1983, 88-89) [Fig. 7, 22]. It is atypical: below the male sex, clearly recognisable with the penis and testicles, there is no indication of the slit in the crotch (whereas the rounded belly is suggested in the upper part of the artefact). But there is more: above the right testicle, there is a ball-shaped protuberance whose shape and position leave no room for doubt: it is undoubtedly an inguinal hernia. This feature makes the object quite exceptional. Indeed, unlike the many attempts, made by doctors and surgeons who were also frequently collectors of antiquities (Haumesser 2017, 174-182), and who, often beyond all probability, sought to diagnose all manners of disease, lesions and deformities on the parts of the body they were examining, it has to be admitted that the identification of recognisable pathologies is almost always a doomed enterprise. There are very few exceptions, and this one is perhaps the clearest. It undoubtedly indicates a particular order from the commissioner, since in the vast majority of cases, the illness was not depicted on the ex votos. In any case, the oak abdomen from Alesia is not an offering linked to a passage of age or, despite the representation of the male geni-

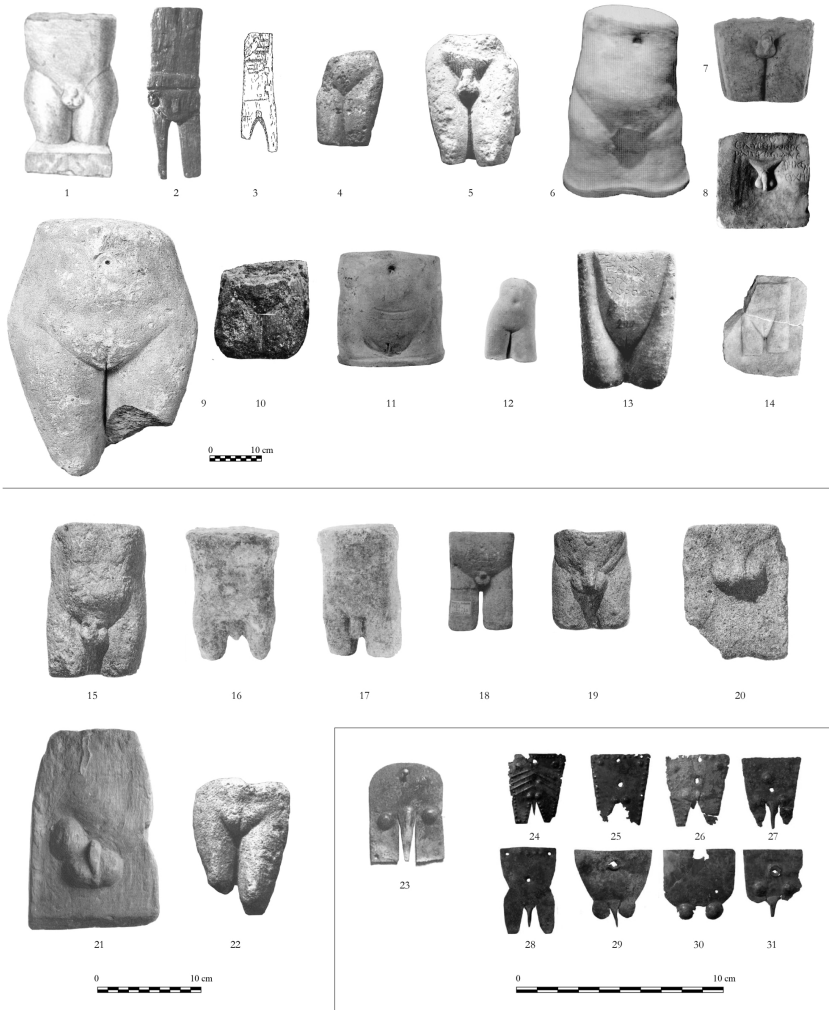




6 | Dendrochronological dating of the wooden offerings from the sanctuary at the Seine Springs. Below, schematic female torso in oak dating from between 15 and 5 BC (Vernou 2011).

talia, with sexuality either, but more banally with a pathology of the lower abdomen. It could be dangerous to extrapolate and give a univocal meaning to this iconographic type of ex voto in which the dedicator could put a range (albeit limited) of different interpretations.

These representations of the body cut between the navel and the inguinal region or the knees also had predecessors in Italy [Fig. 7, 6, 11, 12], at life-size or reduced (often on the same sites where are found complete open and/or closed trunks, for instance at Veio (Bartoloni Benedettini 2011, 567-571, pl. 73-76, H13) or *Lavinium*, Pantanacci (Attenni Ghini 2014), but also in Greece [Fig. 7, 7-8 and 13-14]. Sometimes the abdomen and thighs are detailed and



7 | Truncated bodies: abdomens with thighs. 1. Essarois (Mignard 1847-1852, pl. 6, 1) ; 2. Seine Springs (Deyts 1983, pl. 23, 70); 3. Montlay-en-Auxois, Fontaine Segrain (Dupont, Bénard 1995, 70-72, fig. 10); 4. Halatte (Durand, Finon 2000, 25, 00 5217); 5. Halatte (Durand, Finon 2000, 37, 00 5099); 6. Veio (Bartoloni, Benedettini 2011, H13 VIII 1, pl. 76 a); 7. Athens, *Asklepieion* (Forsén 1996, 44, 1.28, fig. 25); 8. Piraeus, *Asklepieion* (Forsén 1996, 77-78, 10.2, fig. 77) ; 9. Halatte (Durand 2000, 138, fig. 64); 10. Alesia, Moritasgus sanctuary (Espérandieu 9, 7132); 11. Tarquinia, Ara della Regina (Comella 1982, D41, 110-111, pl. 74, c); 12. Collezione Palestrina, MNR (Pensabene 2001, 368, 332, pl. 94); 13. Samos, Aphrodite sanctuary (Forsén 1996, 93, 25.1, fig. 96); 14. Paros, *Eileithyia* sanctuary (Forsén 1996, 100, 31.7, fig. 106); 15. Seine Springs (Deyts 1994, pl. 27, 4); 16-17. Massingy-lès-Vitteaux (Espérandieu 3, 2397); 18. Nijmegen (Espérandieu 9, 6630); 19. Seine Springs (Deyts 1994, pl. 27, 7); 20. Seine Springs (Deyts 1994, pl. 27, 8); 21. Seine Springs (Vernou 2011, 59, n. 60); 22. Halatte (Durand, Finon 2000, 25, 00 5220); 23. Seine Springs (Deyts 1994, pl. 30, 35); 24-31. Alesia, Moritasgus sanctuary (Cazanove *forthcoming* b).

developed, sometimes the emphasis is only on the pelvic region, but the groin and crotch areas are sketchily modelled. For our purposes, we should at least mention the dedication of Eleutherion (2nd-3rd century AD) in the Piraeus *Asklepieion* [Fig. 7, 8]. Eleutherion fulfils his vow "once cured" (*therapeuteis*) : Ἀγαθῇ Τύχῃ Ἐλευθερίων θεραπευθεὶς ἀνέθηκεν εὐχήν (Forsén 1991). It is clear that this type of ex-voto, which is often associated more with a request for fertility than a demand for healing, is in this case the image of a healed organ. More generally, the ex voto of Eleutherion clearly shows how artificial is the distinction between the "*sanatio* sphere" and the "fecundity sphere" (a binomial constantly found in studies on the composition and interpretation of votive deposits). The women's pelvises found in the sanctuary of Aphrodite in Samos, with a dedication to the goddess by a certain Smaragdis [Fig. 7, 13], or in the Parian cult place of *Eileithyia* [Fig. 7, 14], the goddess of childbirth, easily suggest the reasons for such offerings, which could be varied: proper functioning or, on the contrary, affections of the sexual parts, sterility or its opposite, pregnancies, etc. Here, too, they are not to be contrasted with other parts of the body offered for the recovery of health. All the anatomical ex votos actually refer to the functioning or disfunctioning of the physical body, whatever the point or function affected.

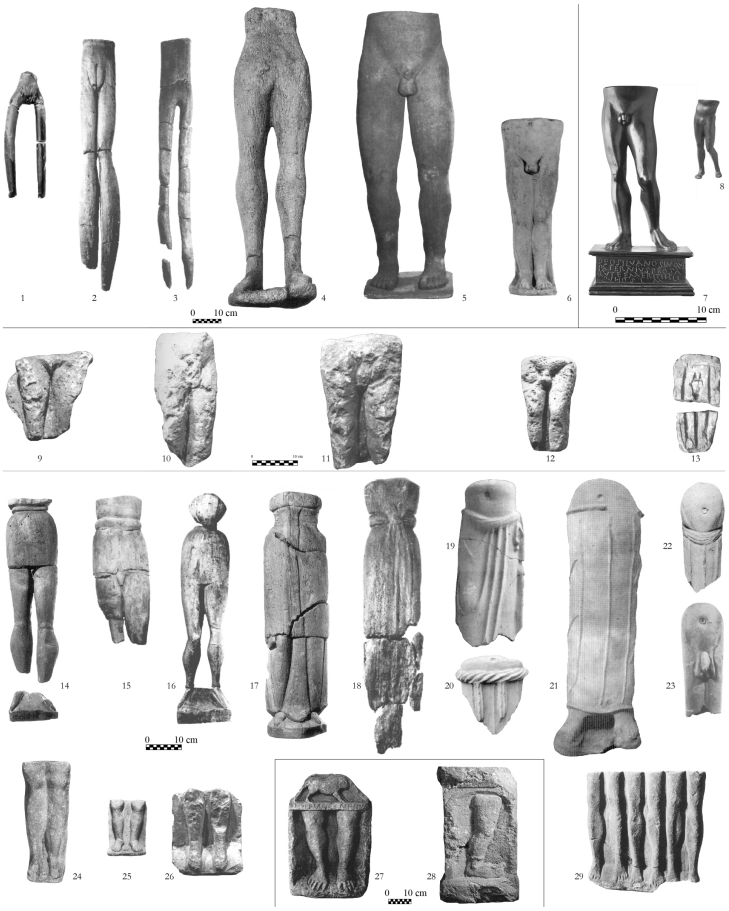
The lower part of the body from the waist to the feet

The third way of truncating the human shape is to keep only the lower part of the body, starting above the navel and extending down to the two feet. It is well documented in Roman Gaul, with 41 wooden specimens at Chamalières (Source des Roches) (Romeuf, Dumontet 2000, 75-77, 463-503) [Fig. 8, 2-4 and 14-18], plus a more recent specimen from preventive archaeological excavations at Mesnil-Saint-Nicaise (Dietrich, Lecomte-Schmitt 2018) [Fig. 8, 1]. There are also stone sculptures at Halatte [Fig. 8, 9-13 and 26], in the sanctuary of Sequana (Seine Springs [Fig. 8, 24-25 and 29]) and elsewhere in Burgundy [Fig. 8, 27-28]. We should also mention two bronze statuettes from a cult place at Gérouville [Fig. 8, 7-8], not far from the border between France and Belgian Luxembourg (Namur 1848). In the current state of research, we know of no lower parts of the body made of bronze sheet.

This specific impagination of truncated bodies is itself found in three forms : in the first one [Fig. 8, 1-4 and 7-13], the lower part of the human figure is entirely naked, from the navel to the feet, and can be male, female or neutral, i.e., without a recognisable sex. The upper part of the object ends in different ways: the top can be flat or domed, like the abdomens previously examined. The feet (when preserved) are bare.

In the second version (only represented in Gaul at Chamalières [Fig. 8, 14-18], the lower part of the body is dressed with a short tunic for men and a long garment for women, cinched at the waist by a belt. Above, the artefact ends in the shape of a tablet which may be strongly protruding or a vaguely globular mass.

Finally, in a third version [Fig. 8, 24-29], the representation starts a little lower, between the groin and the knee, and ends, as before, at the feet. The two legs are shown together, but no part of the abdomen is visible. They are therefore no longer truncated bodies in the sense that



8 | Truncated bodies: human lower parts. 1. Mesnil-Saint-Nicaise (Dietrich, Lecomte-Schmitt 2018, fig. 3); 2. Chamalières (Romeuf, Dumontet 2000, 75-77, 492); 3. Chamalières (Romeuf, Dumontet 2000, 75-77, 498); 4. Chamalières (Romeuf, Dumontet 2000, 75-77, 499); 5. Cales (Ciaghi 1993, 185-187); 6. Tarquinia (Comella 1982, 113, D6I, pl. 76 a); 7-8. Gérouville (© Institut Archéologique du Luxembourg – Musée Archéologique d'Arlon); 9. Halatte (Durand, Finon 2000, 28, 97 4003); 10. Halatte (Durand, Finon 2000, 37, 00 5101); 11. Halatte (Durand, Finon 2000, 36, 00 5096); 12. Halatte (Durand, Finon 2000, 35, 00 5092); 13. Halatte (Durand, Finon 2000, 43, 00 5194); 14. Chamalières (Romeuf, Dumontet 2000, 75-77, 465); 15. Chamalières (Romeuf, Dumontet 2000, 75-77, 463); 16. Chamalières (Romeuf, Dumontet 2000, 75-77, 474); 17. Chamalières (Romeuf, Dumontet 2000, 75-77, 484); 18. Chamalières (Romeuf, Dumontet 2000, 75-77, 488); 19. Veio, Comunità (Bartoloni, Benedettini 2011, 580, H16 I 1, pl. 79 a); 20. Veio, Comunità (Bartoloni, Benedettini 2011, 582, H16 V 1, pl. 80 a); 21. Veio, Comunità (Bartoloni, Benedettini 2011, 581, H16 IV 1, pl. 79 d); 22. Tessennano (MacIntosh Turfa 2004, 365, 317, pl. 96); 23. Tessennano (Costantini 1995, 82, pl. 33, E5 I1, p. 33 b); 24. Seine Springs (Deyts 1994, 101, pl. 43, 5); 25. Seine Springs (Deyts 1994, 101, pl. 43, 3); 26. Halatte (Durand, Finon 2000, 76, 00 5249); 27. Prémeaux-Prissey (Espérandieu 13, 8228); 28. Dijon (Deyts 1998, 56); 29. Seine Springs (Deyts 1994, 101, pl. 43, 1).

we previously used the term, but their iconographic proximity to human lower parts justifies their inclusion here. They are found in stone at Halatte and Seine Springs, as well as at neighbouring sites (Prémeaux). One *unicum* (in Dijon [Fig. 8, 28] is represented by an ex voto with the legs in profile and the feet shod (the curved ends of the two shoes are visible, one behind the other) accompanied by a dedication to the god Britos (Deyts 1998, 56, 23; AÉ 1926, 59).

This very specific truncation, which leaves only the lower part of the body visible, has clear predecessors in Italy. The 9 terracotta votives from the Latin colony of Cales (the specimen reproduced here is life-size [Fig. 8, 5] can easily be compared with the best nude exemplars from Chamalières (also life-size [Fig. 8, 4]) or, on a smaller scale, with the half-statuettes from Gérouville [Fig. 8, 7-8]. In a previous study, I have already assumed a derivation from Italy to Gaul (Cazanove 2017, 72-74), but it is difficult to be more precise due to the lack of intermediate links.

The derivation seems even more obvious for the second version, i.e., the clothed lower parts of the body, at least the female ones. This form of anatomical gift is atypical and even paradoxical because the very nature of an offering representing a part of the body is to represent it naked, in its physical materiality and not as a social person, distinguished by clothing. The fact that the same exception to the rule existed in Italy and Gaul, for the same type of particular layout, suggests that they should be interpreted in the same way. The same iconographic attributes can also be seen, in particular the belt tied at the waist [Fig. 8, 18-20]. A detailed discussion of the various hypotheses that could be put forward in this respect would take us too far. We will simply note that in Central Italy the clothed lower part of the body appears to be the feminine counterpart of the naked male lower part. The case of Tessennano is clear on this respect [Fig. 8, 22-23]. A selective *pudor* is displayed (genitalia apparent / not apparent). Similarly, the series of clothed lower bodies from Veio (9 examples + 4 fragments) refers more to a feminine iconography (Bartoloni Benedettini, 499). At Chamalières, things are more complex, with both male and female clothed half-bodies, while at Halatte there are male (mostly) but also female nude lower bodies. The image of *pudor* shifts, but remains in display, however paradoxical this may seem for anatomical ex votos, which should show naked body, limbs and organs. However, the basic principle of the anatomical ex voto is preserved, i.e., to show only the part of the body directly concerned by the vow. Just as the torsos, as we saw earlier, refer to the functioning of the body beyond the skin, so the clothed human lower parts could refer, beyond the garment, to the legs, the genitalia and the inguinal area (we can leave the range of possibilities open) even if the the naked body is not shown, except for its extremities: the feet and the navel.

The third variant is an abbreviated adaptation of the first, with the two legs shown together, but without the abdomen. There are no archaeologically attested Italian parallels, but we can assume that the “legs from the feet to the groin” (*femina ap pedibus ad inguen, femina* here meaning *femora*) attested epigraphically in the dedication of *L. Marcius Grabillo* at the Bagno Grande of San Casciano dei Bagni (Gregori 2023, 195-198) refers to something similar. In the

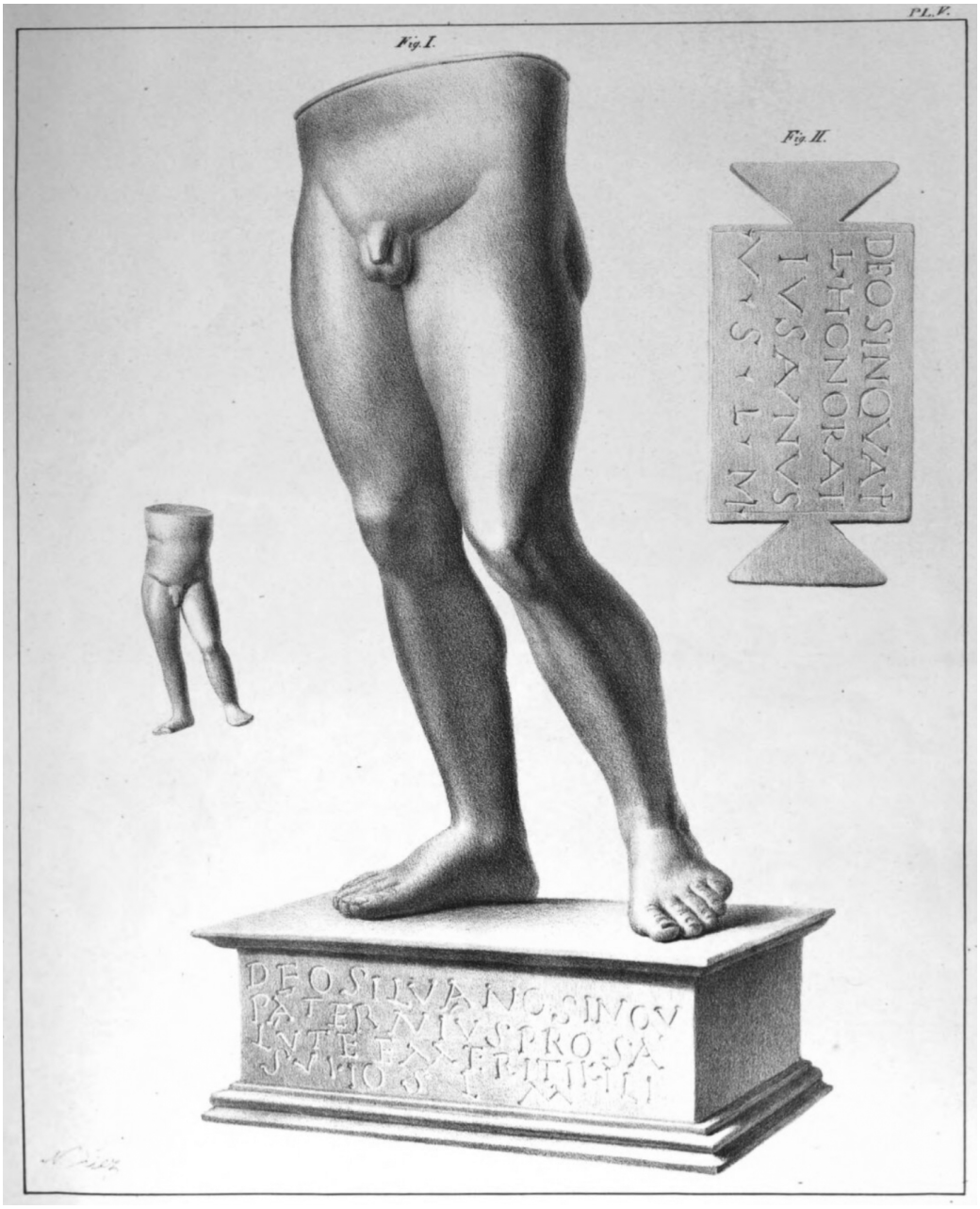
inscription, the alternation between the plural (*pedibus*) and singular (*inguen*) must be significant and refer to pairs of legs, connected at the groin. The *femina=femora* offered by *Marcius Grabillo* were somewhat intermediate between our variant 1 (with abdomen up to the navel) and our variant 3 (cut below the connection with the groin). Did Grabillo offer six independent legs, three pairs of legs, or even a single ex-voto representing all six? It is not impossible. At the Seine Springs, there is a limestone slab on which three pairs of legs are sculpted in very high relief, six in all, half their natural size [Fig. 8, 29]. This is, of course, only comparative material, but it suggests that all possibilities should be left open.

The two statuettes discovered at Gérouville (Namur 1848), depicting a naked male lower body, are the antithesis of the schematic ex-votos previously examined [Fig. 9]. With their pronounced *contrapposto*, they are direct echoes of the great plastic, probably taken from moulds intended for statuettes of divinities. One of them is mounted on a base bearing a dedication to the god Silvanus Sinquatis (*CIL* 13, 3968). The vow *pro salute* made by *Paternius* for his son *Emeritus*, could possibly have had, in another context, the more general meaning of a vow for the overall safeguard of the individual, for the good state of his affairs. But here, as it applies to a partial reproduction of the human body, it cannot be seen as referring to any other thing than good physical health.

Conclusive remarks

As we saw above, there is a large amount of ancient data available on anatomical ex voto and related offerings (children in swaddling clothes, heads, statues) in Roman Gaul, some of them published very early on; our knowledge is also growing exponentially today, thanks to preventive and programmed excavations. All these results should be put to greater use in current debates on the significance and wide distribution of this category of offerings (from the Aegean basin and Anatolia to Italy, Spain and Gaul), even if chronocultural specialisations remain a source of partitioning. This is not to deny the existence of areal specificities, nor to avoid a careful study of all the variances. Nevertheless, the morphological similarities encountered in each category of anatomical ex votos in the different areas where they are present (e.g. the three 'layouts' of the truncated body: torso, abdomen with thighs, lower body from the feet to the groin - but the same could be said for practically all classes of anatomical votive) strongly suggest derivations and borrowings (which does not, of course, rule out re-elaborations, re-semanticisations or autonomous developments). In short, these artefacts must be considered from a Mediterranean and long-term perspective (Hughes 2017, albeit from a different angle), against the ever-recurrent temptation of localism.

The chrono-cultural and socio-cultural contextualisation of anatomical offerings, which in Italy remains contentious around the never-ending Romanisation issue (Papini 2024, 831), becomes largely depassionate in Gaul, where no one will deny that this class of offerings appeared after the Caesarian conquest. This is undoubtedly confirmed not only by the Latin dedications that commonly appear on these objects, but also by the very precise dendrochronological dating of the first wooden votives, some less than half a century after the



9 | The two bronze statuettes representing truncated lower bodies, from Gérouville (Géromont) (Namur 1848, pl. 5).

Gallic War (but always afterwards) [Fig. 6]. These wooden ex votos remained common until the end of antiquity, and beyond. However, when studying the sanctuaries of Gaul, it is important to avoid schematic oppositions between 'before' and 'after' the provincialisation of these territories. Here too, the process of evolution and transformation of sanctuaries is a long-term one.

Another question still under debate is the meaning to be assigned to anatomical ex votos, i.e., the occasion of the offering. Reacting against the long-dominant medical gaze of anatomical offerings, another line of studies denied that these objects - or at least some of them - had anything to do with physical health: legs and feet would be offerings made, not for a cure, but on return from a journey, etc. Where the medical gaze placed all anatomical votives on the same level, believing to discover signs of illness everywhere (unsuccessful attempts with very rare exceptions, as seen above), a non-medical reading tends to unravel the unity of this category, disregarding the strong typological and contextual similarities that these objects have in common (Cazanove 2013, 23-24).

In Gaul at least, where wooden anatomical ex-votos are well attested right up to the transition between Late Antiquity and the High Middle Ages (and beyond), there can be no doubt about it. They unquestionably concerned physical health. As a young man, Saint Gal, the future bishop of Clermont (489-551), set fire to a temple in Cologne where "limbs were carved in wood according to the pain that affected each of them"[3]. The Synod of Auxerre (561-605) forbids the fulfilling of vows "among the thickets, nor near sacred trees or springs; if someone has subscribed a vow, let him spend a vigil in church and fulfill this vow for the benefit of the poor; and let him in no way presume to do so with objects carved in wood: neither a foot, nor a man". Pirmin of Reichenau (670-753), in the *Scarapsus*, certainly reproducing an earlier prohibition, admonishes: "do not make or place wooden limbs at crossroads, on trees or elsewhere, because they cannot give you any healing" (Hauswald 2006, 19-21, 85-86). This is enough to invalidate the recurrent theory that votive feet or legs are gifts made after a journey, in some way comparable to *pro itu and reditu* footprints. More generally, the *membra* mentioned by Gregory of Tours in the Life of Saint Gall must refer to the different categories of anatomical ex-voto, since each one targets the variety of painful diseases that affect them.

The truncated bodies could not have had a different meaning. As we have seen, *Paternius'* vow *pro salute Emeriti filii* must, according to the context, concern the physical *salus* of his son. More generally, the truncated male and female bodies, in their three main variations that we have briefly reviewed, refer to the functioning or dysfunction of the body, whether apparent or hidden. In Italy, the closed or open trunks (the latter revealing the entrails) are partly of the same formal types and are found on the same cult sites. Although not identical, their meanings are probably related. In Gaul, only one open torso is known (two others are hypothetical), but we can assume that the conceptual framework for interpreting the other trunks is similar: the diseases inside the body and the health restored within it. The fact that these bodies are headless and limbless draws attention specifically to that part of the in-

dividual, even if most of it remains invisible. It is also the absence of a head that prevents the votive torsos from being likened to the statuettes held by little girls on Greek funerary stelae. The other two variations of truncated bodies (abdomens with thighs, lower parts of the body from the feet to the navel) draw more attention to the lower abdomen, the inguinal region, the apparent sexual organs, and of course the legs. The occasions for vows could be differentiated, and I think we should retain the idea of a "limited polysemy" of these offerings, within a range of meanings that were acceptable and recognised by the entire group of worshippers.

Notes

[1] It is sometimes difficult to attribute some fragmentary anatomical pieces to one of the three arrangements of the truncated body distinguished here. If the body is accidentally broken at the waist or knees, it cannot be ruled out that it continued upwards (in which case it would be a torso) or downwards (in which case it would be a lower part of the body).

[2] Even if one must remain cautious when faced with the financial argument, too often put forward to justify the choice of materials that are in reality inexpensive (terracotta, limestone, bronze plates...). The real leap forward, both economically and qualitatively, is that of lost-wax metalworking, as demonstrated today by the extraordinary finds at San Casciano dei Bagni (Mariotti, Salvi, Tabolli 2023). There is no equivalent in Roman Gaul, but the existence of relatively expensive anatomical offerings (i.e., in metal in the round) is indicated by the bronze statuettes from Gérouville (figs. 8, 7-8 and 9).

[3] Grégoire de Tours, *Vitae Patrum*, VI, 2: *erat autem ibi fanum quoddam diuersis ornamentis refertum, in quo barbaries proxima libamina exhibens usque ad uomitum cibo potuque replebatur, ibique et simulacra ut deum adorans, membra secundum quod unumquemque dolor attigisset, sculpebat in ligno*.

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Abstract

There is a large amount of ancient data available on anatomical ex voto in Roman Gaul, some of them published very early on (Seine Springs, Essarois, Halatte). Only one category of these offerings is examined here, representing the human trunk, either fully or partially represented. There are three different layouts of these truncated bodies, which exist in wood, stone and bronze : the torso, without head or limbs (or with thighs only) ; the abdomen and thighs ; the lower part of the body, from the waist to the feet. These three layouts of truncated bodies have clear antecedents in Greece and Italy, so they should be considered from a Mediterranean rather than a narrowly local perspective. They undoubtedly appeared after the Roman conquest (dendrochronological dating, language of dedications) and concern the preservation or restoration of the body's good condition, focusing specifically on the part affected. Occasions for vows could be differentiated, and offerings could present a certain degree of polysemy, but a "limited polysemy", within a range of meanings acceptable and recognized by the entire group of worshippers.

keywords | ex voto; Anatomical offerings; Roman religion and cults; Roman Gaul.

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Hotel Montecarlo nearby the Archaeological Area of Via Scavi in Montegrotto Terme

The Archival Sources

Maddalena Bassani and Maria Elena De Venanzi

Introduction

In the spa town of Montegrotto Terme, various pre-Roman, Roman and post-antique contexts are known, that testify to the development of the settlement from the 7th century BC to late Antiquity and until the Middle Ages, without interruption up to the present day around the hyperthermal saline-bromine-iodine thermal springs (86°C: [Fig. 1] (Lazzaro 1981; Grandis 1997; Bassani, Bressan, Ghedini 2011; Bassani, Bressan, Ghedini 2012; Bassani, Bressan, Ghedini 2013; Ghedini *et alii* 2015; Bassani *et aliae* 2021).

The exploitation of the thermo-mineral resource, present not only in Montegrotto Terme but throughout the entire Euganean Hills water basin (Brogiolo 2017), has in fact been the main factor of wealth and economic development, and has enabled, over time, both the use of thermal mud, now certified and known on an international level (Gris *et alii* 2020), along with secondary products such as stone formations and minerals, and everyday use (applications of thermal water heat, its motive power, and its properties for agricultural and domestic uses: Bassani 2014; Bassani 2017). In addition to this main resource, recent studies have also documented the dynamics that occurred in the area in relation to, for example, livestock breeding and agriculture (Varanini, Demo 2012), as well as the extraction and processing of Euganean trachyte (Zara 2018).

Considering the conspicuous amount of archaeological, literary, cartographic and documentary sources on how man has settled in and exploited mineral waters over the centuries, scarce attention has so far been paid to an apparently minor but, arguably, no less interesting category of documents, namely the archival sources pertaining to the construction of the spa hotels in the Euganean towns, i.e. those documents from relatively recent times that are preserved in municipal archives and those of the Archaeological Superintendence. In fact, the buildings for the accommodation of the numerous thermal users who came to Montegrotto Terme in particular, not only from Italy but often also from abroad from the post-war period to the present, have undergone a great phase of development from the post-war period onwards, and are today in many cases in a state of abandonment and decay, so much so that the Mu-



1 | The most important archaeological areas at Montegrotto Terme (graphic reprocessed after Ghedini *et aliae* 2015, 12).

nicipality has been led to step in with demolitions and redevelopment projects in synergy with the Archaeological Superintendence of Padua (Pettenò *et aliae* 2012).

Archive documentation relating to the second half of the 20th century can therefore be significant not only to reconstruct, albeit in fragments, the evolution of the urban and socio-cultural dynamics of those years, but also to recover evidence about the events that affected the archaeological sites, which are fortunately visible and can be visited today, but which at the time were not fully perceived as attractors of economically useful cultural tourism (see the effective observations proposed by Daniele Manacorda in a recent work: Manacorda 2014).

The following pages describe and analyse a number of documents recently recovered as part of the research activities of the Centro Studi classicA of the Iuav University of Venice (De Venanzi 2022): they shed light on the south-eastern sector of the area of Via Scavi, i.e. on the construction, close to the two major Roman thermal baths, of Montecarlo Hotel, which is today in a state of total abandonment and serious deterioration.

M.B.

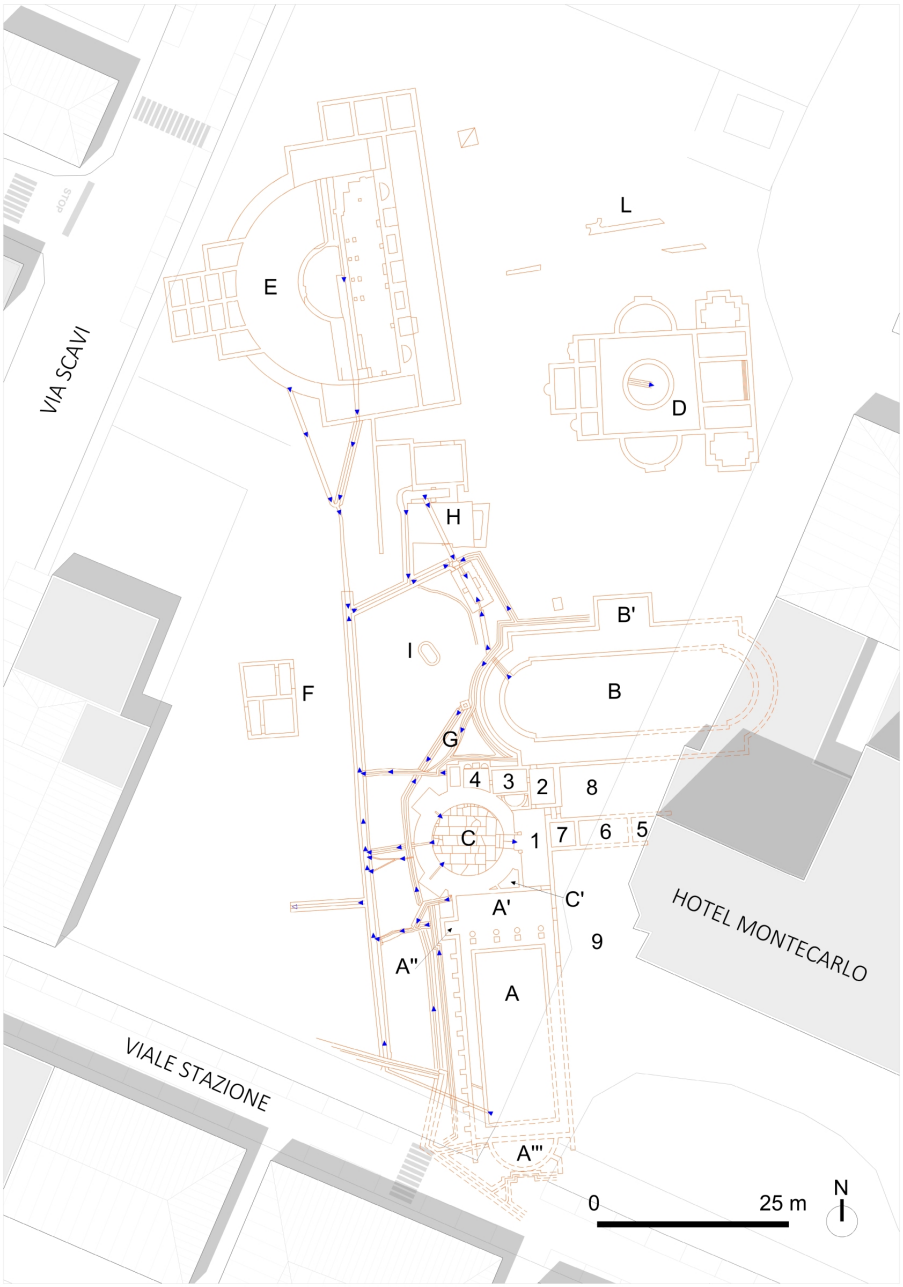
Hotel Montecarlo in Montegrotto Terme and the Roman thermal baths in archive documentation

Hotel Montecarlo is located in the immediate vicinity of the archaeological area of the Euganean spa town between Viale Stazione and Via Scavi. Not only does the hotel border the archaeological site, but the embankment supporting the hotel's imposing structure cuts through and partially conceals two of the ancient Roman pools in the excavated thermal complex, namely basins A and B [Fig. 2]. In order to understand the dynamics involved in the construction of this hotel structure, research was conducted into the documentation in the municipal archives of Montegrotto Terme and in the archives of the Soprintendenza Archeologia, Belle Arti e Paesaggio of Padua (Padua Superintendence for Archaeology, Fine Arts and Landscape). The aim was to understand and compare the construction and archaeological events that occurred between 1950 and 1970, with particular regard to the construction of this hotel structure and the re-discovery of the Roman thermal baths, which had already been brought to light in the 18th century (Mandruzzato 1789-1804), but were subsequently re-interred until new excavation work was carried out in the second half of the 20th century [Fig. 3].

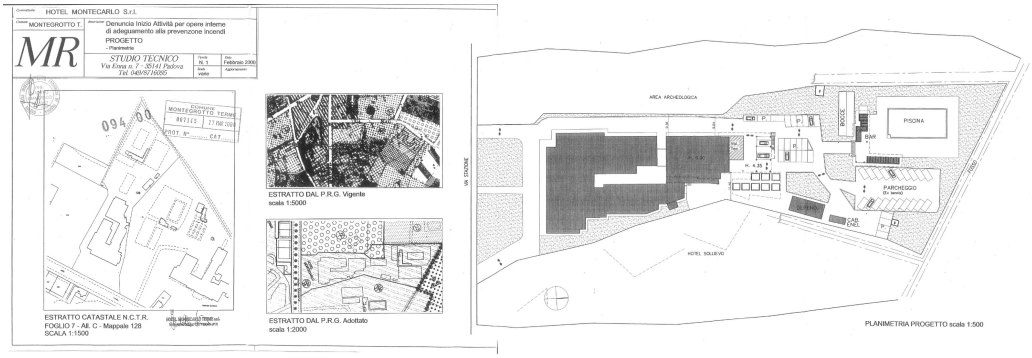
The documentation in the archives of the Municipality of Montegrotto concerning the construction of Montecarlo Hotel does not contain any information on the archaeological area bordering the building, which includes, as is well known, three bathing pools with adjoining rooms for additional therapies (Bonomi, Malacrino 2012, 155-172), a small theatre-*odeum* (Bonomi, Malacrino 2011, 29-55), a polylobate building subject to recent analyses that suggest its similarity to a nymphaeum (Bassani 2022, 101-123), and some service rooms. The general plans for the construction of Montecarlo Hotel, which were attached to the first building permit dating back to May 1961, show a white area without any particular distinguishing



2 | View of Montecarlo Hotel from the south-east side of the archaeological area between Viale Stazione and Via Scavi; notice part of the eastern wall of the Roman cistern A (photo by Authors, 2022).



3 | Plan of the archaeological area of viale Stazione/via Scavi with identification of the rooms and representation of the direction of water flow in the pipes (graphic reprocessed after Bonomi, Malacrino 2011).

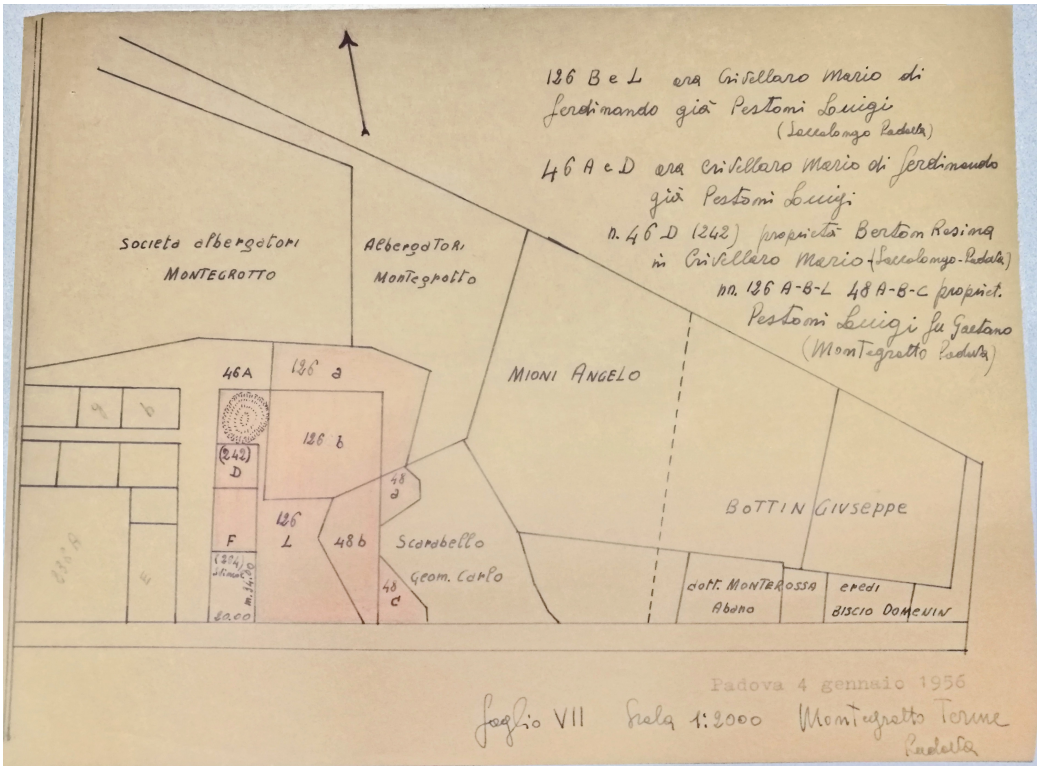


4 | *Tavole Denuncia Inizio Attività per opere interne di adeguamento alla prevenzione incendi PROGETTO-planimetrie*, archive of the Municipality of Montegrotto, febbraio 2000 (Courtesy of Municipality of Montegrotto Terme).

marks. The first graphic table for the architectural project of the hotel, where the archaeological remains are indicated, dates back to February 2000: it is a D.I.A. (denuncia di inizio attività = pre-declaration of works) for internal works to adapt to fire prevention rules [Fig. 4] (see Documentary Sources, 01). An extract of the P.R.G. is in fact present in the table, where the archaeological area is marked with a special screen; moreover, the general plan indicates an 'AREA ARCHEOLOGICA', although the ancient structures are not drawn.

The only actual reference to the Roman remains in the municipal archives is a set of three letters dating back to 1977 that pertain to problems of sewage infiltration in the archaeological area caused by a leak in the hotel piping (see Documentary Sources, 02-03-04). In fact, Montecarlo Hotel's sewage pipes had to intercept (or reuse?) part of the ancient Roman hydraulic canals, thus causing serious sewage stagnation inside the Roman tanks. Moreover, the problem must not have been solved afterwards, as hints to such infiltrations were even recently given, during the renovations carried out between 2010 and 2012, when the hotel was by then in a state of complete abandonment (Pettenò *et aliae* 2012, 248-249).

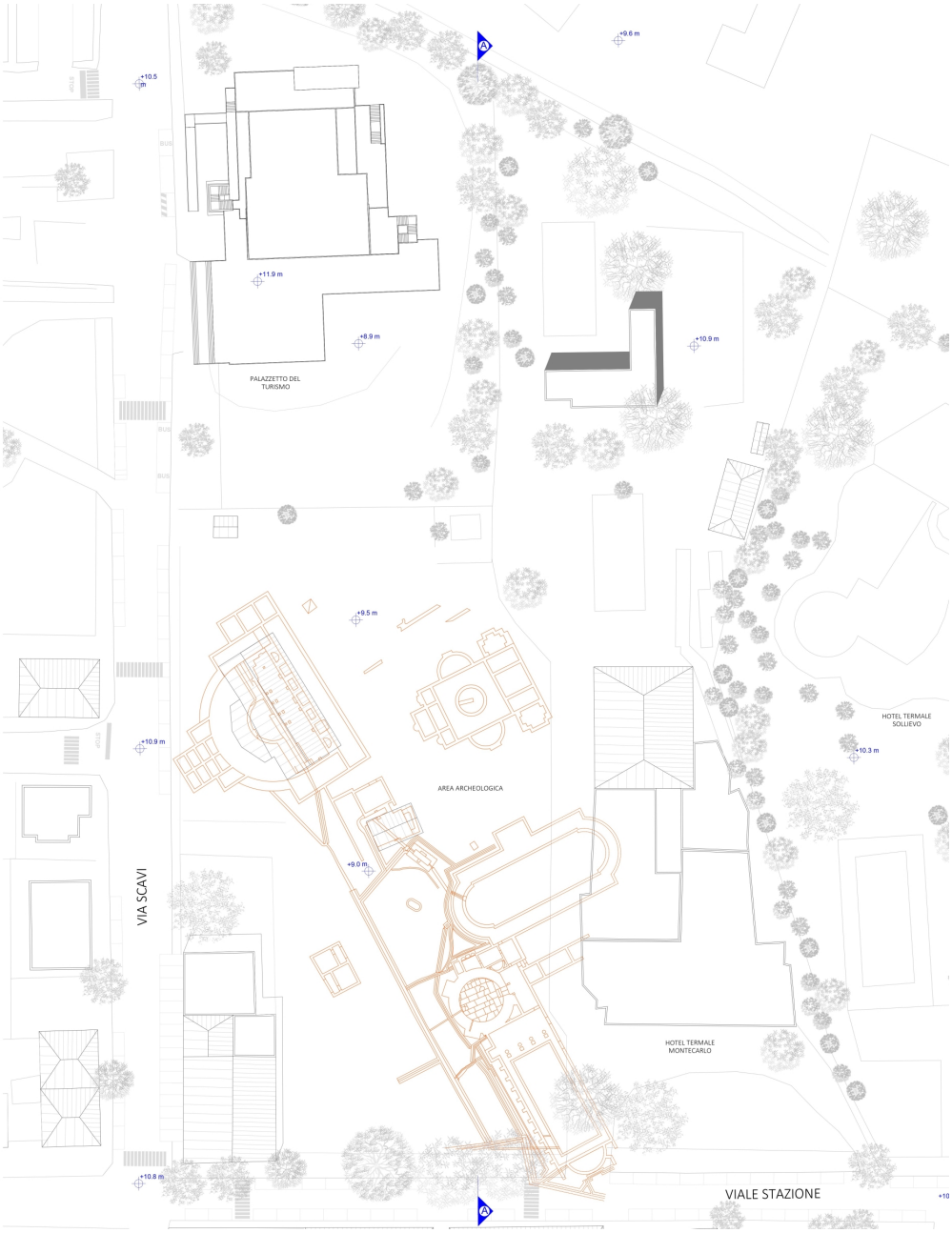
The letters are dated from 30th June to 18th July 1977 and, apart from this infiltration incident, there is no other reference to Roman remains in the files dating between 1961 and 2000: this, despite the fact that the first archaeological discovery in Viale Stazione dates back to 1953, i.e. almost a decade before the construction of the historic spa hotel began and a good 150 years after the famous 18th-century excavation season documented by Salvatore Mandruzzato (Mandruzzato 1789-1804). In fact, the first building authorisation for the Montecarlo dates back to 1961 and the construction proceeded until the first floors were declared fit for habitation in 1968. However, as mentioned above, the first information on the excavation activities in Viale Stazione dates back to 1953, but there is no mention of the large thermal baths: in fact, the discoveries concern both a minor structure that was immediately demolished (De Venanzi 2022, 78-86), and the first elements related to the Roman theatre.



5 | Land registry map with the areas affected by the ancient structures, Montegrotto Terme: *Excavation essay at the Montagnola*, report accompanied by explanatory schematic drawings of the excavation essay and the cadastral plan of the area of interest, Archive of the Padua Superintendence, January 1956 (by courtesy of ASAP Padova).

It seems therefore interesting to understand whether the previous archaeological documentation published by Salvatore Mandruzzato was taken into account when starting new excavations and the construction of Montecarlo Hotel between 1953 and 1961, or why the rapid construction of the hotel was not halted to conduct timely archaeological investigations. On the other hand, Scarabello construction firm that built Montecarlo hotel had been involved in the excavation of the ancient theatre as early as 1956 (see Documentary Sources, 05) and the owner of the firm, Carlo Scarabello, was the owner of the Montecarlo: it appears evident that those involved in the new construction were aware of all the discoveries and new findings in the archaeological area.

Research in the archives has provided interesting elements in this respect. The first document regarding the problematic relationship between the ruins and the new accommodation facility is to be found in the Archives of the Superintendence of Padua and corresponds to a land registry map with the location of the Roman thermal baths (see Documentary Sources, 05): it is dated 4th January 1956 and represents the maps of sheet VII of the Montegrotto Terme



6 | Schematic representation of the Via Scavi/Viale Stazione area (processing based on orthophotos from Google Maps).



7 | View of the large pool A at the archaeological site of Via Scavi/Viale Stazione cut by the concrete embankment of Montecarlo Hotel (photo by Authors, 2022).

Municipality on a scale of 1:2000 [Fig. 5]. The hand-drawn plan shows the area created by the intersection of viale Stazione with the first section of via Scavi (extended in the following years), while the areas restricted by the Superintendence are coloured in red and correspond to the listed maps with all the relative owners in the top right-hand corner; the list is given here:

126 B and L was Crivellario Mario di Ferdinando of the late Pestoni Luigi (Saccolongo Padova)
46 A and D was Crivellaro Mario di Ferdinando of the late Pestoni Luigi
n. 46 D (242) ownership Berton Resina of Crivellaro Mario (Saccolongo Padova)
nn. 126 A-B-L 48 A-B-C owners. Pestoni Luigi of the late Gaetano (Montegrotto Padova).

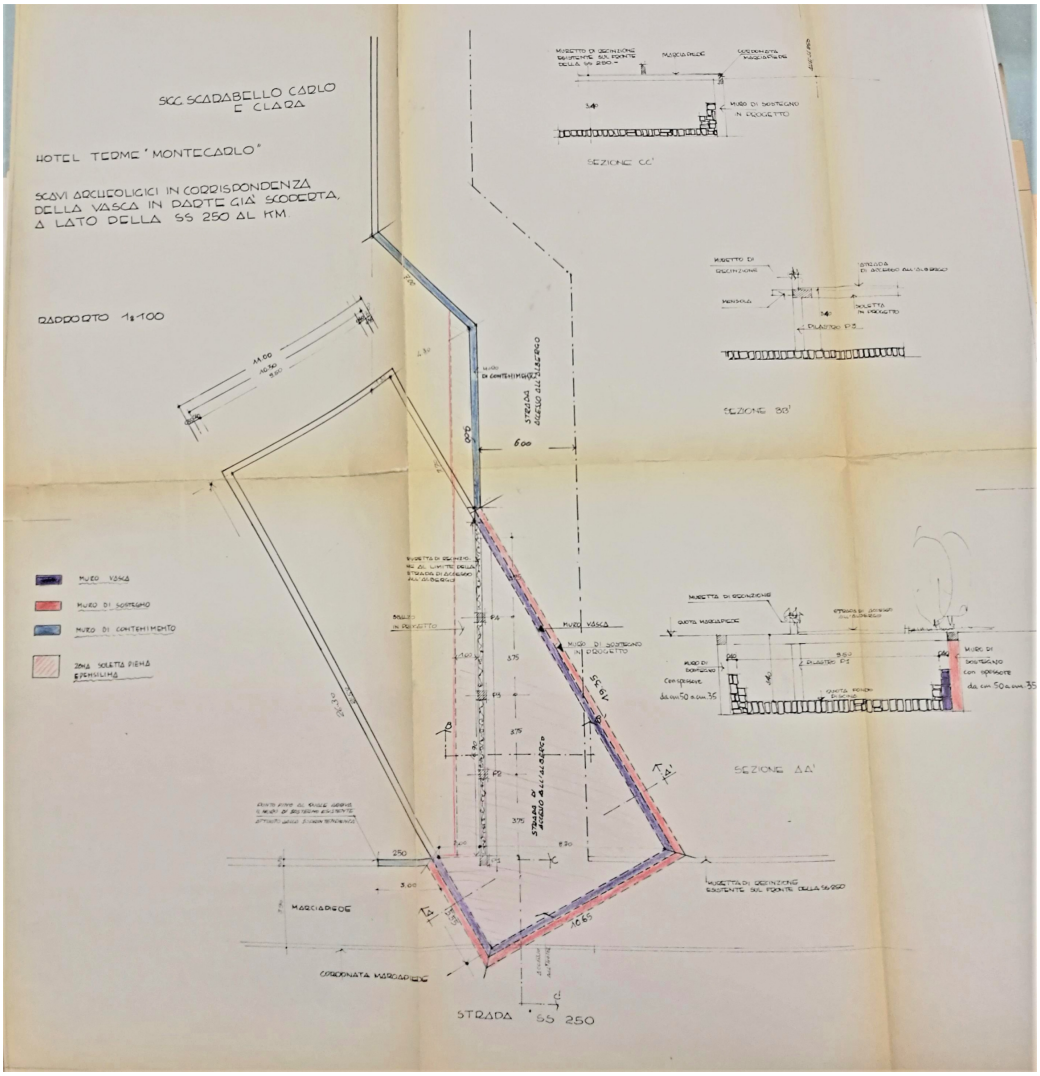
In the drawing, the restricted area appears as extensive as the entire complex brought to light today. Even more remarkable is the shape of the mappings 48 A-B, which precisely follow the shape of the Roman baths, some of which were still buried: even the three mappings 48 A-B-C follow the shape of the three large baths and the rooms connected to them. This correspondence cannot certainly be accidental and proves that in January 1956 the plan of the spa



8 | View from Viale Stazione of the access road to Montecarlo Hotel bordering the archaeological area (photo by Authors, 2022).

complex was known at least well enough to mark a secure boundary between the land to restrict and the land to be parcelled out for new tourist constructions. It can therefore be stated with certainty that both the Superintendence and Impresa Scarabello (the firm in charge of the construction of the Montecarlo) in 1956 knew the boundaries of the restricted land parcels and the position of the ancient structures still buried there. It should also be pointed out how clearly visible in the plan is the land parcel in the name of Scarabello Geom. Carlo (where the Montecarlo was to be built in 1968) adjacent to the land parcels 48 A-B-C, which extend eastwards, creating a highly irregular boundary of the restricted area. The foundations of the hotel were to be built not far from the pools, and the outlines of the latter, marked on this map, lay under the side access road to the hotel and Viale Stazione [Fig. 6].

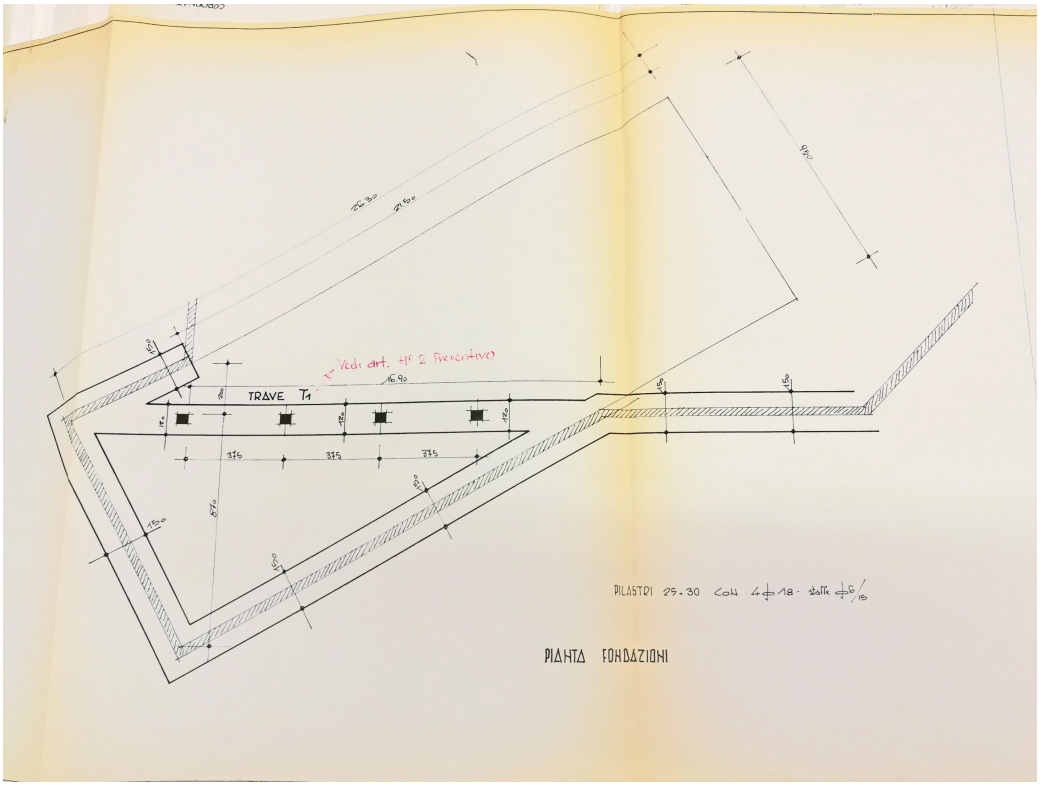
The land remained under restriction in the following years too, during which the Superintendence sought funds to begin a systematic excavation and build a small museum. However, it was not until 25th August 1965 (nine years later) that excavations were allowed to begin, bringing to light the remains of the ancient theatre, witnessed by many newspaper articles of the time where, however, there is no mention of the thermal baths. The latter are mentioned for the first time in the documents kept in the Superintendence in a letter from the Superin-



9 | Project to unearth pool A in Via Scavi, letter by *Geom. Scarabello - Edilizia civile e industriale, opere stradali e movimenti di terra alla Soprintendenza alle Antichità di Padova*, archive of the Padua Superintendence, May 1968 (by courtesy of ASAP Padova).

tendent Giulia Fogolari to the Padua Chamber of Commerce, dated 23rd October 1965 (see Documentary Sources, 06):

> It is reported that work carried out in 1965 brought to light a small theatre building dating back to the first centuries of the empire, which is of exceptional interest due to its architectural features and different construction phases (it is a type hitherto unknown in northern Italy) in a good state



10 | Foundation plan of the project to bring the Via Scavi basin to light, letter by *Geom. Scarabello - Edilizia civile e industriale, opere stradali e movimenti di terra alla Soprintendenza alle Antichità di Padova*, archives of the Padua Superintendence, May 1968 (by courtesy of ASAP Padova).

> of preservation so as not to rule out a full tourist exploitation. In addition, emerged buildings and a complex of pools occupying an area of approximately 2000 square metres are identified. It is said that these discoveries require careful exploration in order to establish respective relations and valorisation criteria within the framework of the creation of a vast and important archaeological park area, the first in the Padua thermal area.

The "complex of pools" mentioned in the letter, although not further described, was clearly located together with the theatre in the area of 2000 square metres; but in the same months, on the adjacent land, the foundations of the Montecarlo were being built, as testified by a letter dated 18th June 1965 sent by the Director of the Civic Museum of Padua to the Superintendence: in the text, the Director, Alessandro Prosdocimi, denounced the presence of ancient remains under demolition inside the Montecarlo building site (see Documentary Sources, 07):

> I am informed that in Montegrotto, next to the Albergo Sollievo, where foundations are being built for a new hotel, a Roman brick wall with a ladder has been found. The wall, which is of considerable proportions, is currently submerged in water and is being demolished.

Even today, going from the centre of Montegrotto towards the railway station, Sollievo hotel is located on the left just after the disused Montecarlo building: the 'new hotel' to which the director refers is thus precisely the Montecarlo spa hotel, whose foundations were under construction in June 1965 (as confirmed by the building documents in the municipal archives). Unfortunately, there is not enough information about the 'Roman brick wall with a staircase' to connect it to the nearby spa complex, but it is highly probable that these ancient structures, perhaps a small pool with steps, were part of the complex of the ancient health resort. Excavations, limited to the theatre, in the area in viale Stazione stopped in the autumn of 1965 and resumed on 4th April of the following year, with 12 workers working thanks to funding obtained by a committee especially set up in October 1965 (see Documentary Sources, 08): 1 million lire was allocated by the Hoteliers and another million lire by the public thermal care authority. With the resumption of archaeological excavations, the problem of the remains lying below the access road to the hotel was immediately brought to light. In May, the Superintendence asked Mr Scarabello for permission

> To carry out soundings under the service road of his property, subject to the opening by the Superintendence of an alternative route.

As the foundations of the hotel had been finished by 1966, the request to carry out excavation tests indicates that it was hoped to unearth the baths still intact and not demolished during the construction of the Monte Carlo, which lay some 7 mt from the boundary with the archaeological area. The same idea seems to be supported in an article published by the 'Difesa del Popolo' on 17th July 1966, where the findings following the excavations of the same year are described and where the thermal baths are finally mentioned (see Documentary Sources, 09):

> Attached to the theatre are the baths, consisting of three large pools, two round and one quadrangular, partly still covered by a wall soon to be demolished [as we know, the pools are one circular and two rectangular: the text evidently contains an error, ed].

The article by Mariangela Ballo also highlights the problem of the hotel adjacent to the archaeological area:

> But in order to extend the excavations, considerably serious difficulties must be overcome; for example, the one posed by a large hotel that stands right in front of the archaeological area. Will it be possible to overcome them? It would certainly be a wonderful thing if the whole ancient Roman Montegrotto were to come back to light.

According to the data gathered so far, therefore, in 1966 the Superintendence had also begun to unearth the pools and, given the evident continuation of the remains underneath the hotel building site whose foundations had already been completed, excavation tests were intended to be carried out in the area of the Scarabello property in order to understand how to bring to light the still-buried part of some of the ancient structures. The work was interrupted at the beginning of July 1966 due to a lack of funds and then resumed on 22nd August thanks to the arrival of a 3 million Lire grant from Rome (see Documentary Sources, 10-11). Further information on the state of the excavations can be found in a letter from the Superintendence in

1967 in relation to the fencing of the excavations in Montegrotto (see Documentary Sources, 12), in which it is specified that:

> The area has been fenced off along the west and south sides with retaining walls at ground level so as to prevent water infiltration and ground subsidence from the street side. Along the east side bordering the Scarabello property, a short section of wall of a different nature had previously been built by this Superintendence to allow the passage of the construction firm trucks.

It is evident from the text that at least part of the eastern boundary wall of the archaeological area was built by the Superintendence itself in agreement with the Scarabello company in order to allow lorries and other vehicles to reach the site, while at the same time attempting to protect the ancient structures: the aforementioned wall thus appears to be the one delimiting the archaeological area from the private portion where the secondary access road to the hotel is still present [Figs. 7-8]. After the break in the winter season, excavations resumed in September 1967 thanks to funds under the management of the Superintendence. A communication dated 10th August listed the planned work (see Documentary Sources, 13):

– construction of the access stairs to the archaeological area;
– landscaping of the garden in the part without remains;
– the most urgent restoration work;
– continuation of the excavation towards Montecarlo hotel.

Regarding the continuation of the excavations, the discovery in the Superintendence archives of the existence of a complete project to bring to light the rectangular apsidal basin A, digging under the access road to Montecarlo Hotel and Viale Stazione, appears to be of some importance; the graphic documentation of this project has been recovered [Figs. 9-10]. The complete estimate with the costs for this work was sent by land surveyor Carlo Scarabello to the Superintendence on 27th May 1968 (on this date the hotel had already obtained compliance status for the first floors, so it was in the final stages of construction: see Documentary Sources, 14):

> Following your kind invitation, we would like to submit to you our best cost estimate for the work to bring to light the entire basin next to Montecarlo Hotel, in the archaeological area of Montegrotto Terme-Viale Stazione.

The project therefore envisaged a collaboration between the Scarabello firm, which had already worked in the archaeological area, and the Superintendence in order to uncover part of the southern pool without blocking the access road to the spa hotel: the creation of an accessible covered area was planned by inserting pillars directly inside the Roman pool to support the road above. The planned works included several actions:

1. the removal of earth to bring the entire pool to light and the transport of material to the landfill site (a job that could be done either by hand or with mechanical diggers);
2. the supply and laying of four 20-cm-wide pillars, placed along the entire length of the underground pool;

3. the supply of concrete and iron for the supporting and retaining wall of the covering;
4. roofing slabs for the basin and the associated shelter;
5. the cement mix to build a protective wall delimiting the road;
6. the plaster and mortar to be laid on the exposed surfaces;
7. the relocation of the route of the existing pipes above the basin (which included the aqueduct, methane pipeline and sewer);
8. the felling of tall trees in the area of operation, in order to allow the remains to be viewed without hindrance.

The cost of the works, excluding the necessary permits and any final arrangements of the fence between the archaeological area and the hotel, was estimated at 6.581.847 lire. Attached to the proposal were a number of graphic hand-drawings by Engineer Mario Geremia and dated 27th March 1968: they depicted the operation as a whole, with an abundance of details by means of plans, sections and reinforced concrete calculations. The project drawings show in blue the existing retaining wall of the access road to the hotel, which was to be diverted (the project retaining wall is shown in red: [Fig. 9]), and in grey the wall built by the Superintendence inside Roman pool A: in the new project the retaining wall would flank the perimeter of the old pool, as marked in purple on the plan. In place of the demolished wall, four pillars (P1-P2-P3-P4) would be inserted, 3.75 mt apart, which seem to have been placed in the middle of the Roman basin: they were to support the roofing slabs and the fence wall between the hotel property and the archaeological area. The project drawings also include a plan of the foundations of the four new pillars connected to a series of beams (in the plan collectively indicated as T1, each 1.2 mt wide for a total length of 16.9 mt): the detailed description of this wooden foundation in the estimate in point 2 is of interest:

> Supply and installation of 4 N.P. of 20 cm for pillar base foundations placed side by side along the entire length of the pool, at a distance between centres of 30 cm, the cost of fitting into the slab of the pool included in the price, the transversal welding of 9 iron beams, 20 cm in length, at each pillar and on the heads for fixing among them, and the filling of the gap between the iron beams with cement concrete with 300 kgs of fine-grained gravel, and brushing on the visible side.
> N.B.: No provision has been made for a continuous plinth foundation for the above-mentioned pillars cast prior to the excavation, in the slab of the pool, because in the very probable case that the ground is not of good consistency, it would be necessary to drive in cement piles, with obvious greater expense.

The estimate explains that the pillars were fixed to a foundation beam embedded in the 'slab of the pool' and that it was composed of 9 metal profile joists shaped as a double T, 20 cm long, placed at a distance between centres of 30 cm and joined by cement concrete to fill the spaces between the joists. Looking at the project sections, it is clearly visible how the insertion of the project pillars allowed for the creation of a portico of the same dimensions in plan as the ancient pool, resulting in a roof at an internal height of 3 mt. Towards the archaeologi-

cal area, a small shelf was also planned to protect access to the covered area (project section BB': [Fig. 9]).

The project therefore envisaged the preservation of the pavement of Viale Stazione and the access road to the hotel through the creation of a portico underneath, which would completely free the ancient basin, bringing it back to light; this covering was perhaps also intended to allow people to enter the basin and carry out any conservation work. Despite the fact that the project appeared detailed and ready to be implemented, there is no longer any reference in subsequent documentation to the excavation of the thermal pool buried under Montecarlo Hotel's side street, and even today it remains partly trapped in the boundary wall of the now abandoned hotel, and partly under Viale Stazione. There are various hypotheses that may have halted the project: either more urgent restoration work was carried out, or there were no funds left to further extend the excavations on the eastern side, or, finally, there were problems with the feasibility of the project that have not been mentioned in the documentation, such as, for example, the failure to obtain a permit to carry out these works.

From 1969 onwards, relations between land surveyor Scarabello and the Superintendence seem to have been limited to ordinary maintenance work, since, based on archive documentation, the company no longer seems to have collaborated directly in archaeological excavations.

M.E.D.V.

Some remarks on the archival documentation

The documents presented here pertaining to the archaeological area of Via Scavi in Montegrotto Terme, which refer to the period between the 1950s and 1970s, allow us to reconstruct, albeit in fragmentary form, some significant aspects of the history of archaeology in this Euganean town, shedding new light on aspects of conservation and planning, connected to the general socio-economic situation of the time.

On the one hand, the documentation preserved in the archives of the Superintendence of Padua and the Municipality of Montegrotto Terme shows the complexity of the dynamics that existed between those who were in charge of protecting the archaeological heritage of the Veneto town and those who wished to benefit economically from the development of tourism linked to the thermal mineral resource, a development that was also promoted thanks to State benefits, which funded sessions of thermal cures paid by the public health service.

The rush to build hotel facilities to accommodate large numbers of guests led, here as in many Italian cities, to the prevailing interest in an economic well-being that, after the collapse caused by the Second World War, promised a rosy future of profits, at the expense, evidently, of the preservation of everything that lay underground, which was to be excavated and transformed in favour of progress. It is therefore not surprising that the institutions in charge of protection had a hard time finding agreements with private individuals, as also emerged with regard to the events surrounding the excavation of *nymphaeum* D (the so-called polylobate building) in Via Scavi in the summer of 1970 and the acquisition of the entire area by the State

(Bassani 2022). On the other hand, however, the documents analysed above also highlight the attempt by the Superintendence to try to contain the serious effects caused by the aggressive building boom of those years, which disrespected both the archaeological heritage and the landscape in its entirety: it is well known how the Euganean area, and in particular the town of Montegrotto Terme, completely changed its appearance after the Second World War, losing its rural village character in favour of a pseudo-urban identity, characterised by gigantic hotel structures in utter disharmony with the natural environment.

Indeed, the project to unearth the underground portion of the A basin in Via Scavi below the side street of Montecarlo Hotel, although never carried out, highlights the effort to restore to the public what had been compromised, and the awareness of the importance of combining a newfound economic well-being with a solid shared historical memory of what the area of the *Patavini Fonte*s (Plin. *nat*. 31, 61) had been in ancient times. We do not know why the project was not put into practice: on the other hand, we can rejoice at this failure, because the sensitivity of today's archaeologists, restorers and architects would hardly allow the construction of such a wall over an ancient artefact (such as the one built by the Superintendence of Cultural Heritage itself to delimit the archaeological area from Montecarlo Hotel property), or the creation of a pillar roof resting directly inside an ancient room, compromising its perfectly preserved horizontal plane (as the pool's plane was at the time). It was perhaps a good thing that nothing came of this project, and it is not by chance that the archives of the Italian Superintendences collect many other examples of design hypotheses that were never completed: suffice it to think of the project for the creation of an underground café underneath the arch of the Roman bridge of S. Lorenzo in Padua, which was never executed (Vigoni 2018, in particular 141-146).

In conclusion, the archive papers that we have been able to examine represent a memento for future urban requalification activities, which we hope will be capable not only of preserving the ancient buildings in the best possible way and, if possible, bringing new portions of them to light, but also of enhancing them in a broader and more multifaceted vision: research and planning perspectives are needed, aimed at placing the artefacts of the past in dialogue with contemporary and possibly future times.

M.B.

We would like to thank the staff of the Soprintendenza Archeologia, Belle Arti e Peasaggio of Padova and the Municipality of Montegrotto Terme for their willingness to publish the archival materials stored in their institution archives.

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Abstract

The article presents previously unpublished data concerning the events surrounding the urban and building works between 1950 and 1970 near the archaeological area of Montegrotto Terme, with special attention to the construction of Montecarlo Hotel above parts of the Roman baths of the ancient curative complex. Thanks to the analysis of archive documentation, an architectural project is also presented, aimed at making visible the partially altered underground part of one of the two ancient pools, which has never been carried out.

keywords | Thermalism, Archaeological excavations, Archival sources, Architectural design.

questo numero di Engramma è a invito: la revisione dei saggi è stata affidata al comitato editoriale e all'international advisory board della rivista

La scoperta dell'acqua fredda

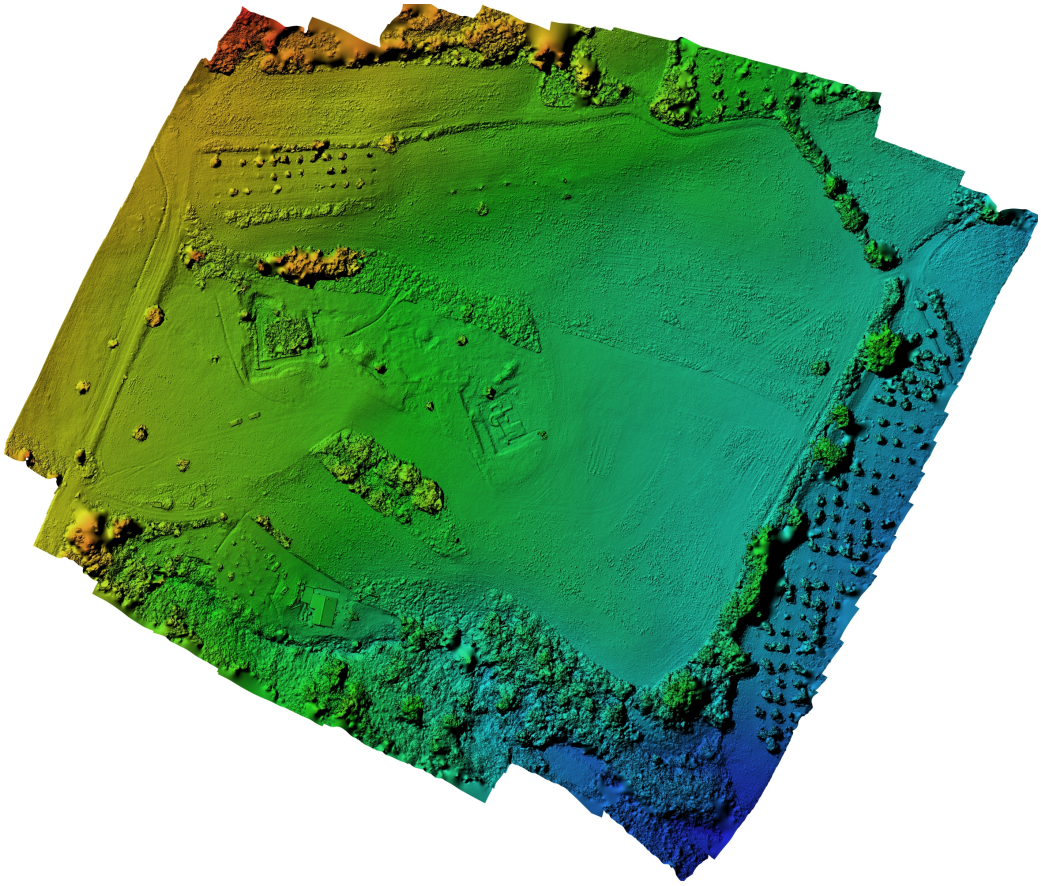
The Roman Thermal Baths of Mezzomiglio in Chianciano Terme Between Old Excavations and New Data

Marco Pacifici



1 | Satellite photo of Chianciano Terme with the area of Mezzomiglio (photo by Google Earth).

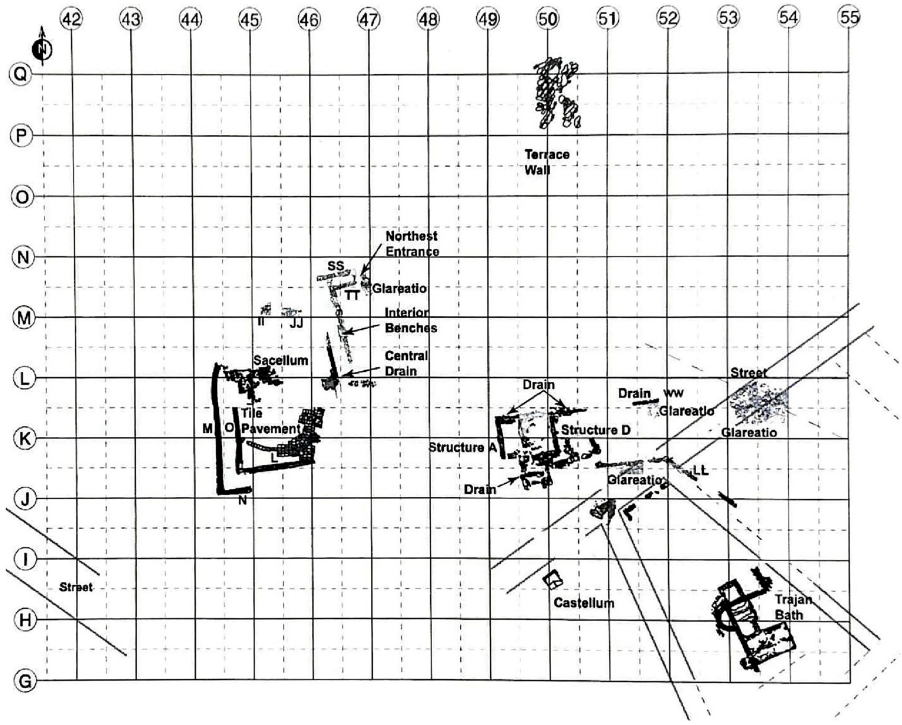
Within the territory of the municipality of Chianciano Terme (SI), the toponym Mezzomiglio relates to an area located respectively south and east of the modern Via della Valle and Viale della Libertà [Fig. 1] (Paolucci 2007, 92). This is a roughly flat, gently sloping portion of land



2 | Digital Elevation Model (DEM) of the Mezzomiglio area (ATS S.r.l.).

which follows a regular northwest-southeast direction. Archaeological excavations at this site have uncovered an articulated complex of structures with thermal function, mainly dating from the Roman period [Fig. 2]. Remains of masonry from this period were already reported in this area by local scholars during the 18th century (Paolucci 2007, 92). Afterwards, a marble block inscribed was found during the demolition of a building near the northern boundary of Mezzomiglio in the early 20th century. A text relating to the equestrian career of a *tribunus militum*, whose *cognomen* we know as *Laronianus*, was carved on it. Oral evidence also attested to re-used travertine blocks recovered in all probability from the nearby thermal baths (Paolucci 1997, 91).

The first excavations in the locality of Mezzomiglio, some test trenches, were carried out by the local Associazione Geo-Archeologica di Chianciano Terme in 1988 and 1989. More substantial explorations in 1993 and 1994 under the direction of G. Paolucci took place (Soren

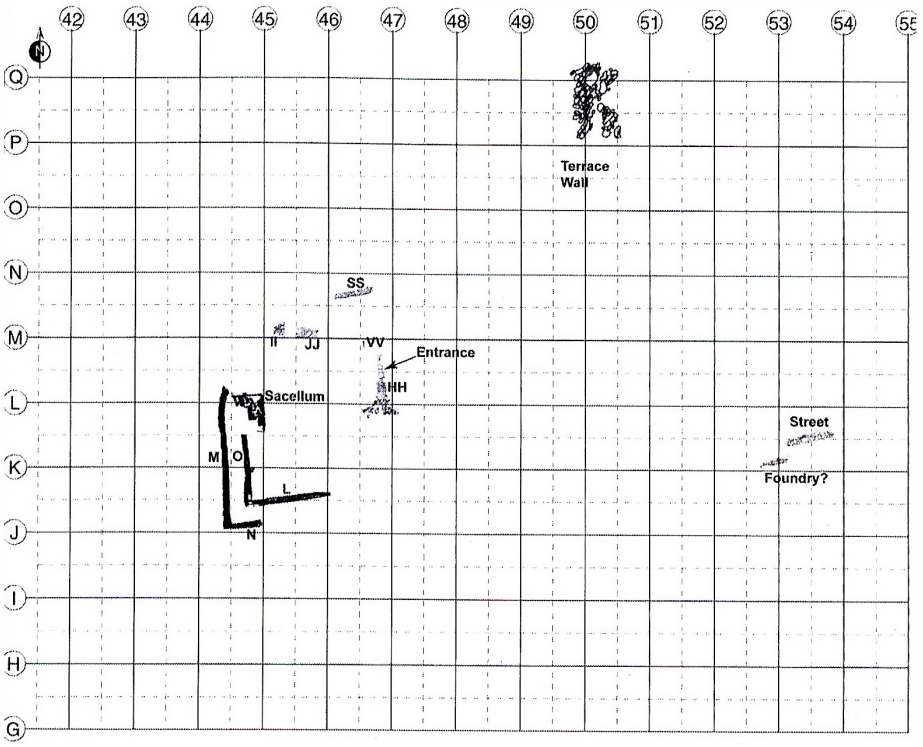


3 | Plan of Mezzomiglio site (after Mecchia, Soren 2010).

2006, 315). Systematic excavation campaigns finally started in 1995 under the direction of Prof. D. Soren (University of Arizona) and lasted until 2001, with a brief resumption between 2003 and 2006. Through the excavation, the American team was able to bring to light large portions of the site and to propose a chronological reconstruction divided - in its most updated version - into ten phases, ranging from the earliest data, which can be dated to the 3rd-2nd century BC, to the modern period (Soren in Mecchia, Soren 2010, 183).

It is not my intention to retrace in detail the history of the site, which was deeply presented by the excavators in the publication of the results of their investigations in 2006 and 2010 (Soren 2006; Mecchia, Soren 2010). However, I would like to briefly review the main stages of its development.

The oldest evidence identified (Soren, Bizzarri, Marzano, Olivas in Soren 2006, 316-324, phase 1; Soren in Mecchia, Soren 2010, 183-185, phase 1) is a collapsed polygonal structure made of large sandstone blocks at least 10 courses high, which was identified near the north-



4 | Plan of Mezzomiglio site in Phase 1 (after Mecchia, Soren 2010).

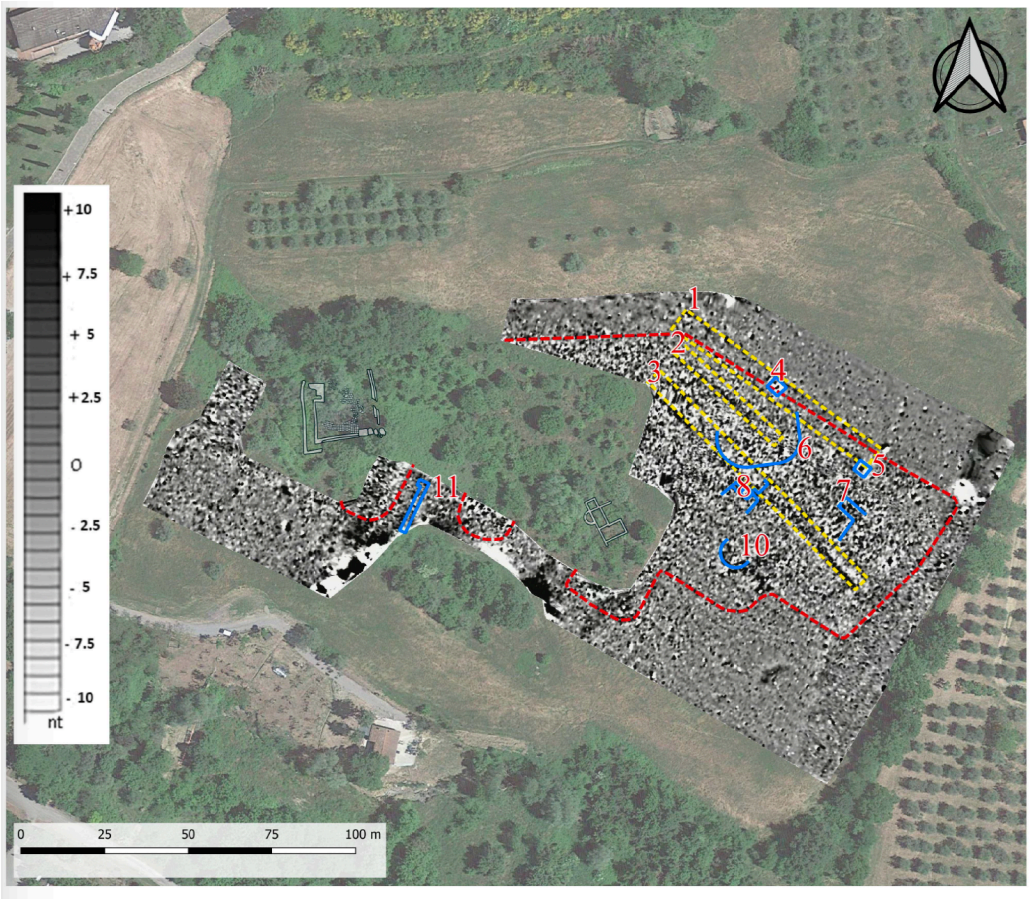
ern boundary of the Mezzomiglio area and generically dated by the discoverers to between the 4th and 2nd centuries BC [Fig. 3] (Marzano in Soren 2006, 355-357). Even the water basin, the so-called *vasca* in which it was possible to immerse oneself, hypothetically 21 m wide and 36-38 m long, and seen as the centre of the bath site, was already present at least from some unspecified time in the 2nd century BC, as evidenced by several fragments of *opus incertum*. These are the oldest masonry identified, which emerged in the eastern portion of the building in some test trenches carried out between 2003 and 2006 [Fig. 3]. The structure was characterized by a central quadrangular pool for immersion, most probably bordered on all four sides by columned corridors that ran all around the structure. The structure was possibly accessible on the east side, while on the west of the *vasca* a *podium* with a niche, a small *sacellum* according to the interpretation of the discoverers, was found. In their view, the *sacellum* could have housed a statue to which a marble fragment representing the portion of a horse's leg in two-thirds lifesize, found during the excavations, might belong (Soren, Bizzarri, Marzano, Olivas in Soren 2006, 321).



5 | Image of the *vasca*, with the floor made of *embrici*, being excavated (N. Soren photo).

The pool was fed by a spring of water that still gushes out in its original location near the structure, even though the changes that took place in the area over the centuries, culminating in the intense building development of the 20th century, have led to a decrease in the flow rate and mixing of the resurgent water with the sewage from some malfunctioning systems (in 2023 a remedy for the contamination of the spring was found). The water has a temperature of 15°C approximately constant throughout the year and high concentrations of sulphates, carbonates, and calcium (Artiola in Soren 2006, 290-293). In the area, at approximately 87 m northeast of the first spring, a second one, also characterised by high concentrations of compounds and a roughly similar temperature (15.9°C) is also attested (Artiola in Soren 2006, 292).

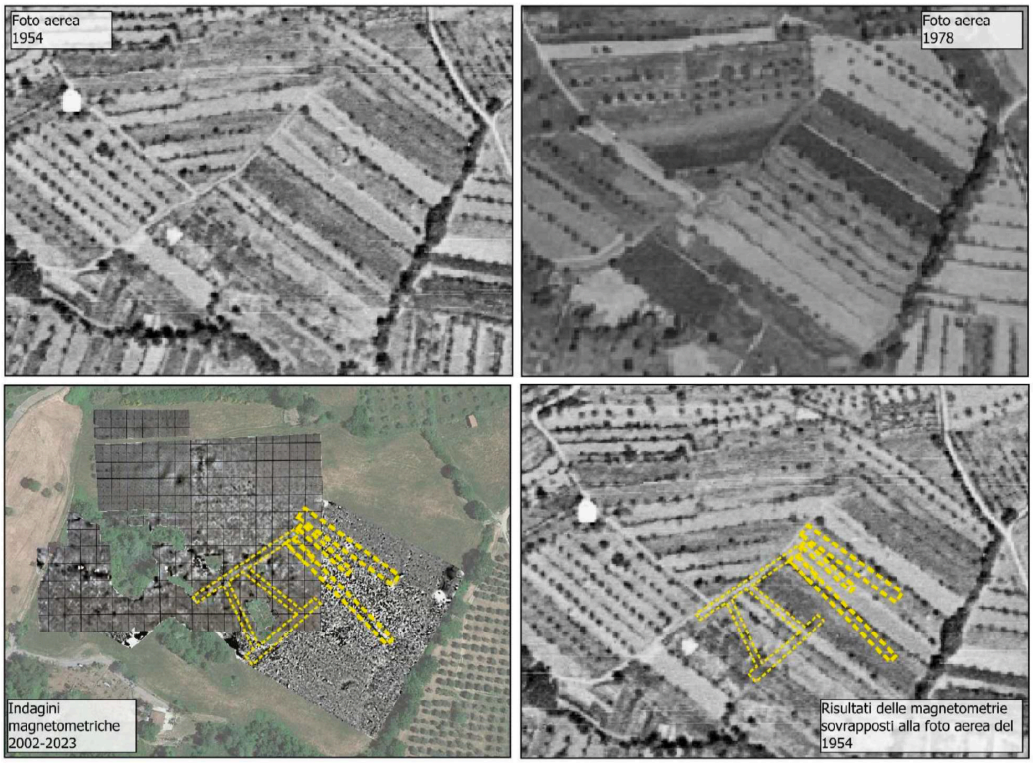
The high concentrations of substances in the water make it unsuitable for drinking except for very short periods (Artiola in Soren 2006, 292). However, the temperature of the two springs and their properties have led to the hypothesis that the site is associated with the locality in the territory of Chiusi where the poet Horace is said to have practised the cold-bath therapy prescribed for him by the physician Antonio Musa (Hor. *ep.* 1.15.2-9). He was a freedman and personal physician to the emperor Augustus, whose life he had saved with this practice, which



6 | Map with magnetometric survey and interpretations (ATS S.r.l.).

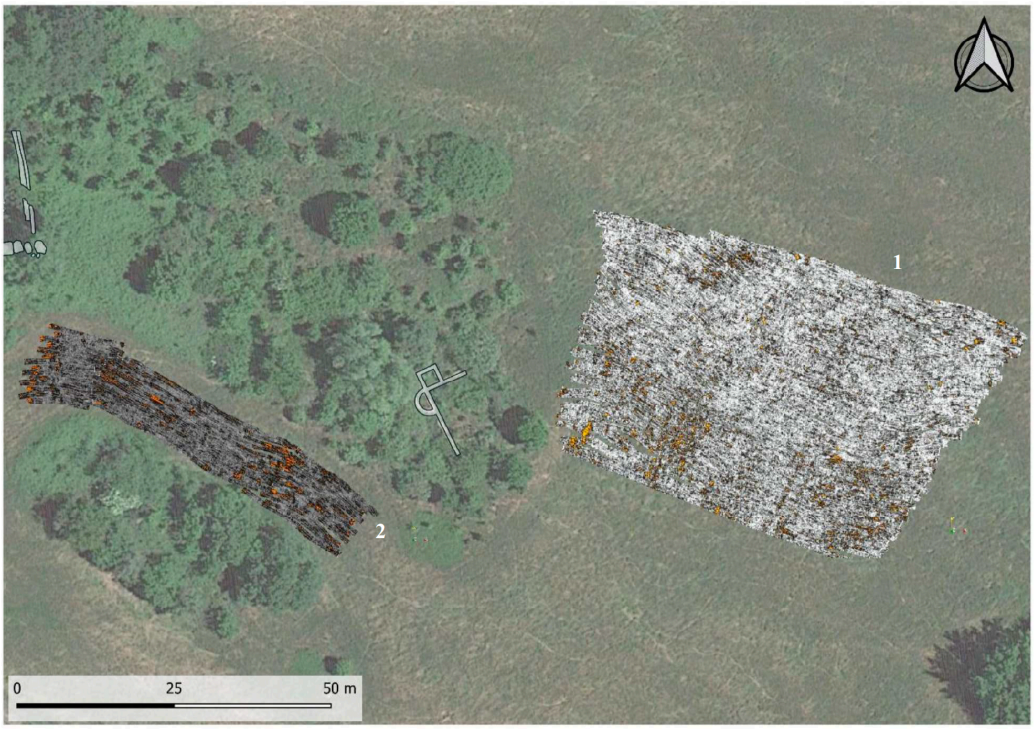
consequently found great affirmation and wide application between the end of the 1st century BC and the 2nd century AD (Romer, Soren in Soren 2006, 295-297). Although the evidence for a specific dating is rather scarce, it seems that a stone paved road identified to the east of the *vasca* can also be assigned to this older phase. Immediately to the south of this road, a particular concentration of iron slags has also made it possible to assume the coeval presence of a foundry [Fig. 4] (Soren in Mecchia, Soren 2010, 184).

During the 1st century BC (Soren, Bizzarri, Marzano, Olivas in Soren 2006, 324-329, phase 2; Soren in Mecchia, Soren 2010, 185, phases 2 and 3), the unstable ground conditions in the area where the large pool structure stands required continuous rebuilding and maintenance of the building, which was first carried out in *opus incertum* and then in *opus reticulatum*. Moreover, it was during this phase that the *podium* structure along the western edge of the *vasca* assumed its final form [Fig. 3]. In Trajan's time (Soren, Bizzarri, Marzano, Olivas in Soren



7 | Above: aerial photographs from 1954 and 1978 kept at the Tuscany Aerophoto Archive. Bottom left: map with reconstruction of the road routes identified through the geophysical surveys carried out in 2001 and 2023. Bottom right: road routes overlapped on the 1954 aerial image (ATS S.r.l.).

2006, 329-331, phase 3; Soren in Mecchia, Soren 2010, 185-187, phase 4), the site underwent a radical change and there was a probable development of the area in an 'urban' sense. The *vasca* structure underwent major reconstruction work on the walls and the use of lead piping for water management, as well as a floor made of inverted *embrici* laid on the clay bottom of the basin, 39 of which are characterised by the VOPETHASTCOS (*Vopisco et Hasta consulibus*) stamp, attested in Chianciano and Chiusi, which provides a date of 114 AD [Fig. 5] (Romer in Soren 2006, 354). Moreover, in this period to the southeast of the site, a small thermal complex of the type with *frigidarium*, *tepidarium*, and *calidarium* was built, its water supply ensured by a *castellum aquae* constructed to the northwest, which regulated the abduction of water from the spring using lead pipes. In the vicinity of this bath, also thanks to the data that emerged from geophysical survey, a system of four roadways that surrounded the structure may have been articulated. One of these, the one with a northeast-southwest orientation, represented a section of a wider and longer roadway that was perhaps one of the site's main paths [Fig. 3]. In the central portion of the investigated Mezzomiglio area, between



8 | Georadar survey map 40 cm deep (ATS S.r.l.).

the *vasca* and the road that bounds the area of the small bath to the northwest, some mud-brick and half-timbered buildings on stone foundations have been constructed, or perhaps renovated as they were built during the previous phase, whose function, however, cannot be convincingly hypothesised at the current state of knowledge [Fig. 3].

In the 3rd century AD, perhaps as early as the end of the previous one (Soren, Bizzarri, Marzano, Olivas in Soren 2006, 331-332, phase 4; Soren in Mecchia, Soren 2010, 187, phase 5), the beginning of the decline of the site can be recognised. No substantial changes to the structures are attested, but only partial refurbishments of mediocre quality, aimed at maintaining the functionality of the facilities as far as possible.

During the 4th century AD (Soren, Bizzarri, Marzano, Olivas in Soren 2006, 332-336, phase 5; Soren in Mecchia, Soren 2010, 187, phase 6), the *vasca* was no longer in use, as witnessed by the interruption of its use for bathing purposes, as indicated by the collapse of part of the colonnade and by the filling of the basin with sand and clay. A coin found in the collapse levels of the pool structures, dated between 335 and 341 AD, provides a firm chronological indication. The structures located in the central area of the site, in this phase already in a state of abandonment, were instead destroyed towards the end of the century by a possibly intentional



9 | Georadar map of Area 1 at different depths (ATS S.r.l.).

fire, hypothetically connected to the final disposal. At the end of the 4th century AD, probably around 380 (Soren, Bizzarri, Marzano, Olivas in Soren 2006, 336-338, phase 6; Soren in Mecchia, Soren 2010, 187, phase 7), the perimeter masonry of the *vasca*, which was probably in a serious state of disrepair, was reinforced with conglomerate walls and the building was used as a drinking trough for animals. Near the *podium*, a small basin was created with tiles placed at a 45° angle and only the central portion of the structure was kept clear to ensure access for the animals. Above the structures destroyed by fire in the previous phase, a small pool was also built, perhaps to construct a small new bath, using the same spring that had supplied the main *vasca*.

During the 5th century AD, the area of Mezzomiglio was definitely abandoned and only occasionally frequented (Soren, Bizzarri, Marzano, Olivas in Soren 2006, 338-340, phase 7; Soren in Mecchia, Soren 2010, 187-188, phase 8). The last evidence of the use of the area to access the spring water is to be dated to the Middle Ages when a well was built to the west of the pool structure for this purpose. The brief and concise analysis of the life phases of Mezzomiglio as reconstructed by the discoverers testifies that the site is one of the main Roman

baths in the area (Paolucci 2007, 189) and probably represents the bath complex, or one of the complexes, in the territory of Chiusi renowned for its cold hydrotherapy, particularly practised between the Augustan age and the 2nd century AD.

To enhance the site through a better knowledge of its various aspects and its inclusion in the cultural offerings of the territory, to overcome the crisis of the thermal spa mono-economy that has affected the territory in particular over the last fifteen years, in 2021 the Municipal Administration of Chianciano Terme acquired ownership of the cadastral parcels, which have always been private property, within which the archaeological site falls. The Municipal Administration also decided to participate in the financing of a Postdoctoral Fellowship at the Università per Stranieri di Siena with a project entitled 'Ancient Thermal Baths between the Etruscans and the Romans: Investigating the Site of Mezzomiglio at Chianciano Terme (SI) between Archaeology and Economy of Culture', starting from 1st October 2022, and refinanced for a second year, to deepen the knowledge of the thermal site and plan its inclusion within the tourist-cultural proposal of the municipal territory.

In the context of this assignment, an ongoing complete re-examination began of the considerable amount of documentation and archaeological material recovered during the excavations conducted by the University of Arizona at Mezzomiglio, as well as *ex novo* investigations to understand the original extent of the site and thoroughly investigate its internal articulation. In 2023, a geophysical survey was carried out in the area of Mezzomiglio owned by the municipality, to collect new data and verify those obtained through the use of non-invasive survey methodologies by the American team at the same time as the excavation campaign. The area, in fact, had already been surveyed in 2001 through three methodologies – electrical resistivity, magnetic field gradient, and GPR – which allowed the researchers to identify elements pertinent to the area's urbanistic layout (Jones, Maki, Soren in Soren 2006, 307-309). The new investigations, authorised by the Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Siena, Arezzo e Grosseto, embodied by the archaeology officer in charge for the territory of the Municipality of Chianciano Terme, Dr Ada Salvi, were carried out by the specialists of ATS S.r.l. - I would like to take this opportunity to express my sincere thanks to Ada Salvi, Francesco Pericci and Cesare Felici - and provided for the realisation, on areas of interest identified thanks to the analysis of the data already available and through examination in the field, of magnetometric and georadar surveys, as well as a photogrammetric survey of the entire area (approximately 7.5 hectares) with the relative elaboration of a high-resolution digital elevation model (DEM).

The magnetometer survey was carried out on an irregular shape area covering approximately 3 hectares to the northeast, east, and south of the complex of thermal structures unearthed by the American excavations. The surveys were carried out using a Foester Ferex magnetometer that employs fluxgate sensors, usable in different configurations. In particular, the exploration was carried out in cart mode (cart with 4 sensors spaced 50 cm apart). The resolution is also quite high thanks to each sensor's acquisition of a point every 10 cm on the

walking axis. The system is integrated with a GPS with centimetric correction, which made it possible to have all the grids georeferenced. The acquisition was carried out on 3rd May 2023 in the absence of obstacles on the ground, following the cutting of the vegetation by the municipality's staff, which was a perfect condition for the continuous acquisition of the data. The analysis of the magnetic data (the processing was carried out with values between +/- 10 nt) made it possible to identify and delineate quite precisely the perimeter of the area corresponding to the archaeological deposit that characterises the locality of Mezzomiglio [Fig. 6, area delimited by red dotted line]. The presence of archaeological material below ground level was in fact returned by the tool with a particular concentration of dipoles that disappear outside the limits of the area.

The interpretative analysis of the data also highlighted the presence of eleven specific anomalies characterised by dipoles, or clusters of dipoles, mainly concentrated in the eastern zone of the area under investigation, while it was possible to identify a single trace not far from the east of the large quadrangular *vasca*. Within the area delimited by the red dotted line, the presence of at least six dipoles, possible archaeological evidence, can be observed [Fig. 6, nos. 4, 5, 6, 7, 8 and 10]. In particular, two of these dipoles, nos. 4 and 5 [Fig. 6], show magnetic values compatible with strong exposure to heat, a circumstance that could suggest the presence of possible production contexts, perhaps furnaces, in the two points, a fact that seems compatible with what already emerged during the excavations.

Traces nos. 7, 8, and 10 [Fig. 6], on the other hand, present themselves as anomalies of a linear type, with an orientation roughly parallel to that of the small-scale bath building from the Trajanic period that emerged during the excavations. These are most likely buried wall structures. The analysis of anomaly no. 6, on the other hand, is more complex, with an irregular roughly ovoid shape, which would seem to have an orientation and structure inconsistent with that of the other identified anomalies. At present, it does not appear possible to make any convincing interpretations.

Dipole no. 11 [Fig. 6], located to the southeast of the large quadrangular *vasca*, appears as a linear anomaly that extends southwest-northeast for approximately 14 m and then terminates with a section that forms a right angle as it continues northwest; the thickness of the anomaly is regular and measures approximately 2 m. Even in this case, the interpretation of the trace presents non-negligible problems. Although it could hypothetically be associated with the large quadrangular *vasca* to the northwest, it is located a short distance from some modern concrete structures of a wastewater disposal system that is currently disused, located a short distance to the southeast within an area that is now fenced off and scrubby, a circumstance that leaves particularly significant doubts as to its interpretation (for modern period of use of the Mezzomiglio area, see Soren, Bizzarri, Marzano, Olivas in Soren 2006, 340-344, phase 9; Soren in Mecchia, Soren 2010, 188, phase 10).

Lastly, dipoles nos. 1, 2, and 3 [Fig. 6], identified to the northeast of the area under investigation, appear as three rectilinear anomalies roughly parallel to each other with a

southeast-northwest trend and a length of between 40 and 80 m. The overlapping of these results obtained with aerial photographs of the area taken in 1954 and 1978, which are kept at the Aerofototeca della Regione Toscana, has shown that these anomalies can at least in part be related to the modern agricultural land divisions or perhaps to inter-country road routes [Fig. 7], while only in the case of anomaly no. 3 could hypothetically be a road section approximately perpendicular to the main one with a northeast-southwest trend identified during the American investigations.

Unfortunately, as the results of the geophysical survey carried out in 2001 were not available in digital form, an attempt was made to georeference the results with the highest possible degree of accuracy. By comparing these data with the aforementioned 1954 and 1978 aerial images, it is evident that some anomalies, in particular the road layout with a northwest-southeast orientation located to the northeast of the 'block' within the small Trajan bath, appear to trace rural routes from modern times or possible agricultural land divisions. The idea that the local road system may have somehow traced an older, pre-existing system seems particularly suggestive, but not demonstrable given the present state of knowledge. Based on the results obtained from the magnetometry, the main anomalies identified were then investigated with georadar method. The instrument used for the survey was an IDS STREAM C configured with an array of 34 600 MHz antennas that ensure a scanning amplitude of 96 cm. The array of antennas is piloted by one or more multi-channel control units (DAD MCh Fastwave) capable of ensuring a fairly high entrainment speed. The system, interfaced with centimetric GPS, includes an array of antennas with dual polarisation (VV + HH): this peculiarity makes it possible to obtain an accurate 3D reconstruction of the structures present in the subsoil through a single scan.

The GPR surveys in this case were carried out on 26 September 2023 and covered two separate areas totalling approximately 3800 m2 [Fig. 8]. The signal penetration reached 1.70 m from the ground level, however, a constant background noise is noticeable, partly due to the smooth ground surface, and partly, as an attenuated signal, due to the consistent presence of clays. This technology, in fact, is less effective in the presence of conductive clay or water-rich soils where the signal is hindered in its propagation in-depth, a circumstance that unfortunately became evident in the Mezzomiglio area on this occasion.

In area 1 [Fig. 9] the first anomalies began to appear at around 40 cm depth from the walking surface, revealing the presence of a series of traces on the southeast and southwest sides of the area analysed. Continuing with the sections at greater depths, this delimitation of two distinct areas of anomalies continues, fading around 90 cm from the ground surface. At a depth of 1 m, the evidence highlights how a part of the signal, the one to the west, has been altered by the presence of modern workings on the ground, while the one to the east persists, highlighting alignments that cannot, however, be precisely defined. On the other hand, area 2 when investigated revealed traces in the eastern portion that appear at a depth of 35 cm from the ground level and end at approximately 1 m.

In light of the results obtained, the non-invasive investigations carried out *ex novo* in the portion of the Mezzomiglio examined allowed us to highlight part of the well-defined limits of the area of concentration of the buried archaeological deposit. This circumstance suggests an articulation of the ancient site limited in space and gravitating on the roadway with a north-east-southwest orientation that must have represented, from the earliest phases, the main access route to the thermal complex. However, while the excavation has permitted the reconstruction of the building of the *vasca* and part of the other structures present in the area to a good level of detail, compatible with their state of conservation [Fig. 3], the general internal organisation of the site is less clear. Perhaps, as we have seen, this pattern has been partly vitiated by not entirely correct interpretations of the data from the non-invasive investigations, which still need to be examined in light of the information available from the historical documentation [Fig. 7]. Also to be clarified is the role played by the Mezzomiglio complex in the more general panorama of the Chianciano area in Roman times. In this area, in fact, from the 1st century BC onwards, a reorganisation of the agricultural production system had taken place with the affirmation of the slave villa model (Paolucci 2007, 189). A boost to the development of the area, particularly in its eastern portion gravitating on the Val di Chiana, as evidenced for example by the large water reservoir in the Camerelle area (Masci *et alii* 1992), occurred particularly in the Trajanic period, not by chance the moment of greatest development of the Mezzomiglio complex. This was contemporaneous with the construction of the Via Traiana Nova that allowed an easier connection between *Volsinii* and *Clusium* (Harris 1965), and then with Hadrian who wanted the renovation of the Via Cassia between *Clusium* and Florence in continuity with what had been done by his predecessor (Paolucci 2007, 191).

Finally, some observations can also be made regarding the use of the waters of Mezzomiglio. If on the one hand, as already mentioned, the properties of the waters of the two springs have been related to the medical practice of cold-water baths well attested in relation to the *fontes Clusini*, the identification of two anomalies during geophysical survey interpretable hypothetically with productive structures connected to the use of high temperatures, in association with a foundry already identified through excavation, allow us to assume the use of the Mezzomiglio waters also for productive purposes, related but not limited to metalworking or the production of bricks (on the exploitation of thermo-mineral waters for non-therapeutic purposes Bassani 2016 and Bassani 2021). In this context, the toponym 'Podere Fornace', which indicates an area contiguous with that of Mezzomiglio and located immediately to the south-east, could also have a non-random value. This toponym also characterises other localities in Chianciano territory where evidence connected to settlement and production activities has been identified (Paolucci 2007, 49-50, no. 24). It cannot, therefore, be ruled out that the exploitation of the waters for therapeutic purposes may have been associated with productive activities, although we do not know their form or date.

In conclusion, it is evident that only a reconsideration with a multi-scalar approach of the thermal complex investigated in Mezzomiglio, associated with an in-depth investigation conducted with a plurality of methodologies, can allow for a better definition of the articulation and func-

tion of the archaeological site, also to analyse the structure in comparative terms with others known. For example, the affinity between the *vasca* discovered in Mezzomiglio and the one in Bagno Vignoni in terms of form, both quadrangular, and metrological ratio is suggestive. The latter, possibly built at least in the imperial age as attested by an epigraph, and then profoundly modified over the centuries, must have originally been 26.6 m wide, equal to 90 Roman feet, and about 70.4 m long - more than 20 m longer than the current one - almost corresponding to 2 actus (71.4 m) (Chellini 2002, 159-162). This datum, which would confirm the existence of the Bagno Vignoni basin at least from the Imperial age onwards, also seems to suggest a dimensional affinity with the Mezzomiglio *vasca*, whose measurements, certainly approximate due to the incomplete excavation and the conservation of the structure, could correspond in width and be the half in length.

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Abstract

In the territory of the modern municipality of Chianciano Terme, archaeological excavations carried out between 1995 and 2006 under the direction of Prof. D. Soren (University of Arizona) in the locality of Mezzomiglio, have brought to light and reconstructed an articulated complex of thermal structures from the Roman period, characterised in particular by a large quadrangular basin, the so-called *vasca*, bordered on all four sides by columned corridors. This *vasca*, fed by a spring of cold water (15 °C) that gushes out near the structure, was almost certainly used for cures based precisely on baths in water at low temperatures, which were particularly popular, according to literary sources, in the Augustan period and until the 2nd century AD. Starting from the results obtained by the research team of the University of Arizona, the paper aims to present the first data that emerged from new investigations carried out by Università per Stranieri di Siena as part of a research project intended to reconstruct the Roman site in greater detail and depth to include it in a new tourist-cultural perspective for the Chianciano territory.

keywords | Chianciano Terme; Mezzomiglio; Roman Thermal Bath; cold hydrotherapy.

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The Potential of Thermal and Archaeological Heritage through the Digital Humanities

Case Studies of the Promotion of Rural Areas*

Silvia González-Soutelo, Laura García-Juan

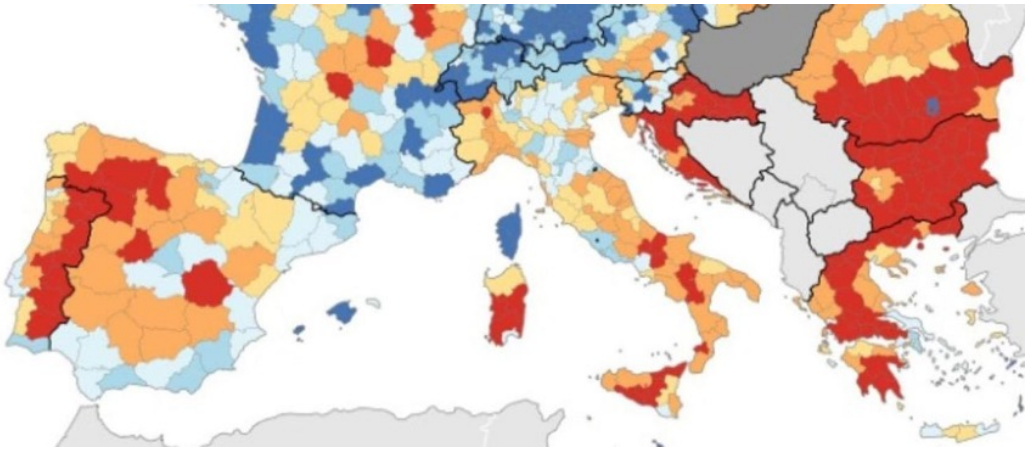
§ The importance of thermal patrimony as added value for the development of rural territories
§ A treasure to be exploited: archeological and historical geodata in the framework of the Digital Humanities
§ The Digital Humanities at the service of Historical and Archaeological research: pratical cases involving the phenomenon of thermalism
§ Conclusions and future lines

The importance of Thermal Heritage as added value for the development of rural territories

Achieving an accurate understanding of the present and its dynamics can only occur when knowledge and analysis of the past is considered through a voyage from today back to yesteryear. In our case, this involved the disciplines of archaeology, geography, and history. None of these are alien to today's world of constant change, where comprehending past reality better equips us to confront crucial global demands like the demographic challenge and the survival of rural communities and to safeguard the patrimony that has been handed down to us. In our research, instead of focusing on a single historical period we address these concerns by analysing one specific phenomenon: thermalism. This object of study is examined from diverse branches of knowledge and through distinct projects, using a multi-perspective approach that reveals the potential of existing mineral and thermal spas for catalysing rural economies.

The rural world: challenges and opportunities through the historical legacy

Any mention of the rural world transports us to scarcely-populated areas characterized economically and pre-eminently by an increasingly meagre primary sector. But this reality is actually much more heterogeneous and complex than this. Due to the so-called "demographic challenge", society today faces a situation in which population imbalances are generating significant demands in an ever more interconnected world [Fig. 1]. In contrast to densely-pop-



1 | Depopulation in Europe. Source: Eurostat (2020).

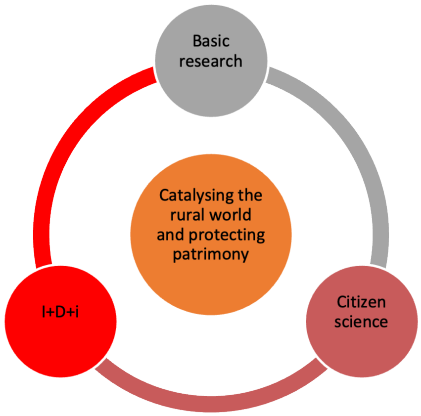
ulated metropolitan areas, we meet a rural world where depopulation is the great concern for society as a whole and the sphere of politics. This challenge alludes not only to low population densities, but also to poorly-distributed patterns of wealth, occupations, and exploitation that pose threats on distinct scales, including management of the cultural patrimony contained in rural areas.

Achieving the required equilibrium demands an active search for solutions that can help catalyse rural areas; that is, mechanisms that staunch demographic bleeding and, in the best cases, aid in establishing new contingents based, above all, on a younger population structure (Sáez Pérez 2021). This challenge is being taken up by researchers from diverse branches of knowledge, by public administrations, and by society itself.

We set out from a diagnosis that leads us to propose measures that often posit tourism as the main driving force, a direction by no means exempt from problems, and one that requires new strategies and proposals (Vázquez Varela, Martín Gil 2011).

Valorising tourism through research: the case of thermalism

One result of the widespread distribution of a rich and varied natural and cultural patrimony in rural territories is that tourism has frequently been identified as the solution to the challenges that arise. It is important to understand that while tourism, in all its modalities, can operate as an active agent, it must be responsible and coherent, and help catalyse rural regions by valorising their natural and cultural patrimony. This requires achieving an equilibrium in which sustainable tourism becomes an economic motor that acts in concert with local communities. These goals have led to the emergence of proposals based on innovation and technology [Fig. 2], like “smart tourism destinations” (STD), that emphasise key concepts such as accessibility and knowledge.



2 | Graph of the interrelation of the factors stressed in our research (elaborated by the Authors).

To achieve these goals, tourism initiatives require novel ideas and the support of new technologies that are available to us today (López Nores *et alii* 2023). In this study, we argue in favour of these principles and elucidate the pressing need to transfer knowledge gained through research to social reality, based on strategies that can bind technological development to our historical and archaeological knowledge of thermal spaces.

This process refers, as well, to advances in science, while seeing people as generators of information and receivers of knowledge that will encourage them to valorise and care for their patrimony and environment. This process, called "citizen science", is today a consolidated tendency in the conduction of important projects in which scientists work hand-in-hand with society to attain common objectives (Senabre *et alii* 2018). By means of this cyclical process, all the parties involved obtain mutual benefits through feedback and by generating a final product that has high cultural, social, and economic value.

UNESCO's recent recognition of Europe's principal spa cities as World Heritage[1] has clearly propelled the drive to centre attention on a field long exploited through wellness- and health-based tourism, but one that must also benefit from the rich historical and archaeological patrimony that characterizes it (Crecente Maseda, González Soutelo 2016; González Soutelo 2016). Indeed, beyond focusing on this resource and how it has been exploited from the traditional perspectives of health and leisure, it is imperative to ponder other tourism modalities, like those linked to cultural patrimony and the historical, archaeological, and geological wealth these enclaves present. This refers to a type of knowledge that seeks to turn to, and promote, cultural and economic products that, as occurred in past times, transform spas into catalysing agents of the surrounding territory.

Objectives and methodology

Our main objective is to elucidate a proposal that makes it possible to transform our results, and the knowledge acquired through several interdisciplinary projects in which we have participated, into a product that fosters valorising the thermal and archaeological patrimony of a region as a sustainable resource that can serve local communities. This is no simple goal, for it entails grim challenges related to both research and technology. Working in a field with a long tradition, today we seek to observe it through a novel proposal that involves acquiring large volumes of data. To do so, we employ tools that allow us to propose the pertinent consultations and hypotheses that will facilitate transforming the knowledge gathered into a product that represents a kind of purge for local communities, while simultaneously ensuring conservation of their patrimony.

The technological aspect of this methodology centres on (i) the **Digital Humanities**, a field that fosters cohesion among diverse disciplines, and (ii) **geotechnologies** that perform as protagonists in transforming the principles posited here into concrete products. With this, and our awareness of the need to create interoperable study models that endow projects with continuity and sustainability once they finalise, we advocate using free software that is easily accessible to anyone interested in the topic proposed, and elaborating standardised databases based on international norms and principles that will permit exporting and complementing the research conducted. Therefore, in addition to emphasising the potential of thermal patrimony as an exceptionally effective resource for catalysing rural areas, our work will demonstrate the growing interest in utilising these principles and tools in research projects that, through a focus on concrete themes, will allow rural territories to emerge as protagonists of their own dynamisation.

A Treasure to be exploited: Archeological and Historical Geodata in the Framework of the Digital Humanities

The concept of Digital Humanities encompasses diverse meanings, depending on the schools or countries taken as references (Russel 2011). In general, we can affirm that the Digital Humanities strive to analyse and manage the world from a perspective in which technology plays a preeminent role that goes far beyond that of a simple tool. In our work, the Digital Humanities are employed from the perspectives of archaeology and historical geography. In the concrete case of thermalism, through archaeology we strive to improve studies by moving towards an increasingly detailed, precise perspective that avoids unnecessary repetition in base research and allows to obtain greater benefits from the results of numerous projects. This, in turn, will facilitate the reutilisation and comparison of the data gathered by different

researchers (González Soutelo, Romano Martín 2023, with bibliography). Together, this can lead to the creation of a product that is exportable, expandable, coherent, useful, and accessible, one that increases people's familiarity with the archaeological patrimony associated with thermal enclaves and, hence, induces them to better valorise and enjoy those resources.

The geographical angle can enhance our perception and understanding of the territorial reality of each historical moment, and of the transformations that occurred in the past to configure existing landscapes. In this approach, emphasis is placed on historical geography, a branch of human geography whose objective is to reconstruct past societies in their context. This goal has been achieved by working with a broad range of geodata, or geohistorical sources, and digitalising them to obtain additional benefits, not only for research but also for society as a whole (García Juan, Alberto Villavicencio 2023).

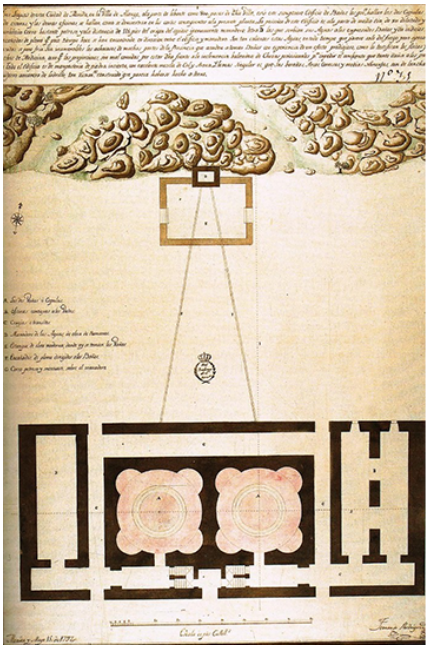
Geodata, then, constitute the starting point of this initiative. Reality must be abstracted in several spatial variables that make it possible to utilise and relate various sources. In relation to thermalism, we encounter diverse sources of geodata: archaeological, medical, hydrogeological, territorial, historical, and economic, among others. This has allowed us to relate architectural evidence from Rome and from Greco-Latin texts to treatises elaborated in the 15th or 16th centuries, and to cartographic and hydrogeological descriptions that make it possible to radiograph thermalism in its geographic, political, and socioeconomic contexts and, significantly, in a diachronic manner [Fig. 2].

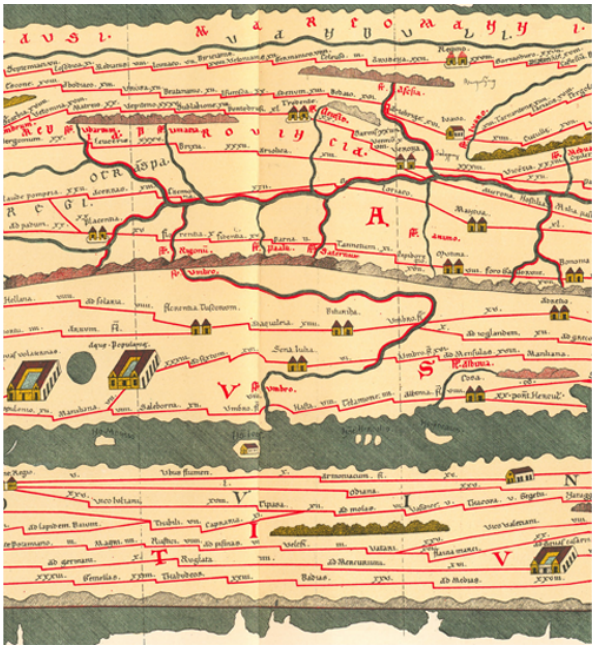
Without doubt, geodata, understood as a typology that associates a variable with a unique position in the territory, plays an essential role in historical studies that elucidate the knowledge and reality of a space through different prisms and over time. This affirmation makes more sense at a time when "Big Data" –the extension of GPS and other technologies that use the Internet as their channel of production and communication– increases the value of research for virtually all aspects of our everyday lives. This is another key theme of our research, though the digital Humanities pay less attention to it, especially in relation to aspects like shared use and interoperability.

To evidence the models of geodata to which we refer, we now describe three important cases from distinct historical moments. The goal is to enhance our understanding of the contexts in which those sources developed and how we can anticipate that they will increase our knowledge of territory in general, and thermalism in particular.

Before the 18th century

This period offers archaeological evidence of great value for understanding territory since antiquity. The geodata gathered in the works of classic authors can be presented in a wide variety of forms that may focus, for example, on topics like toponyms, transportation routes, ancient sites, administrative delimitations, and the areas of influence of different sites, among many others. To this we must add cartographical sources like the oft-cited *Peutinger Map* and *Antoninus Itinerary*, as well as data from archaeological excavations, including iconographic





3 | Plan of the spa in Alange (Spain), graph scale 80 Castilian feet (1797, Fernando Rodríguez, Sg. A5949. Real Academia de Bellas Artes de San Fernando, Madrid).
4 | Image of the *Peutinger Map* from the *Euroatlas Project*.

and epigraphic works, to mention just a few. It is true that when evaluated from a strictly geographic perspective these data fall short of modern standards for sources of highly technical, detailed cartography, but their value is incalculable for understanding past perceptions of territory.

The same is true for both the cartography elaborated since the Renaissance and the early geographic cartography linked to various monarchies, often associated with military campaigns and expeditions, or territorial projections that allow us to control in great detail readings of territory from antiquity to modern times, understand the changes that have occurred, and fully appreciate their function and significance.

The 18th and 19th centuries

Following the aforementioned process of experimentation, this period witnessed the development of technical cartography, where knowledge of territory reached its maximum splendour. For example, authorities in Spain in the 18th century conducted an extensive fiscal verification of the territories belonging to the ancient Crown of Castile. The promoter, Marqués de la Ensenada, an important politician of the time who led several ministries, wished to know everything he could about them, so he ordered a monumental compilation of economic data that, as it turned out, had significant social, economic, and geographic components. All of this was

recorded in a large number of bundles that gathered profound knowledge of territories and their peoples on distinct scales. That pioneering initiative obtained normalised data of very high quality (Camarero 2002). But this was not the only case we have from Europe, for that century was characterized by the flourishing of numerous projects that followed this philosophy of radiographing and registering contemporary reality. We also have multiple references from Italy. There, the Savoyard cadastre (land register) stands out due to the high quality and precision of its data (Alimento 2002). France is another country that provides important examples (studied in depth by Touzery 2002).

The main modality through which these projects were carried out was written sources, though as cartography developed they incorporated an important corpus of maps that steadily increased their protagonism. But whatever format was used, authors set out from drawings of the territory as the basis for improving management of the fiscal loads of each region. In that model, the documentary sources on territory considered variables that allow us to narrate the evolution not only of historical relations, but also of those between people and their surroundings.

From GIS to IDE: the great leap forward supported by technology

At the technical level, and beyond the advances in cartography mentioned above, which were of such great importance in the history of that field, we cannot speak of any other component that rivals the technological revolution of the 20th century. Around 1960, a new software came on the market in which the spatial aspect was the principal protagonist integrated to facilitate the advanced management of quantitative data; obviously, we are referring to the first "Geographic Information System" (GIS), a tool that evolved in step with advances and improvements in hardware, expanding and transforming itself into the broad series of geotechnologies we know today. Regarding geodata, normative issues began to arise in this process as attempts were made to impose order on the growing volume of information that ran the risk of being lost if no way could be found to make it interoperable. Today, thanks to initiatives by the European Union, we have the INSPIRE directive, the OGC, and numerous ISO norms, all at the international level. These measures ease the use and exchange of ever-greater volumes of data.

With respect to historical data, the uploading of archives to the Internet provides broad access to veritable treasures heretofore restricted to just a handful of researchers. One field that has benefitted greatly from this phenomenon is historical cartography, thanks to the emergence of map libraries, a visual resource generated for use with current data that has facilitated uploading these materials to networks.

Without doubt, archaeology is another discipline that has been favoured by this series of technical and conceptual developments (Pastor *et alii* 2013; Zamora Merchán 2016, with bibliography). The ability to accurately locate a site and its associated material culture geographically allows us to better recognise, document, and record archaeological patrimony, and model working hypotheses that make it possible to refute earlier interpretations while broad-

ening our capacity to study, interpret, and accumulate knowledge and streamline processes like managing and disseminating the information gathered. As García-Sanjuan *et alii* (2018, 163) stress, GIS have spurred a fundamental methodological advance in archaeology, especially in three areas: mapping and specifying the georeferentiation of sites, combining data and focuses from distinct sources on geographic entities, and evaluating the dispersion and density of findings.

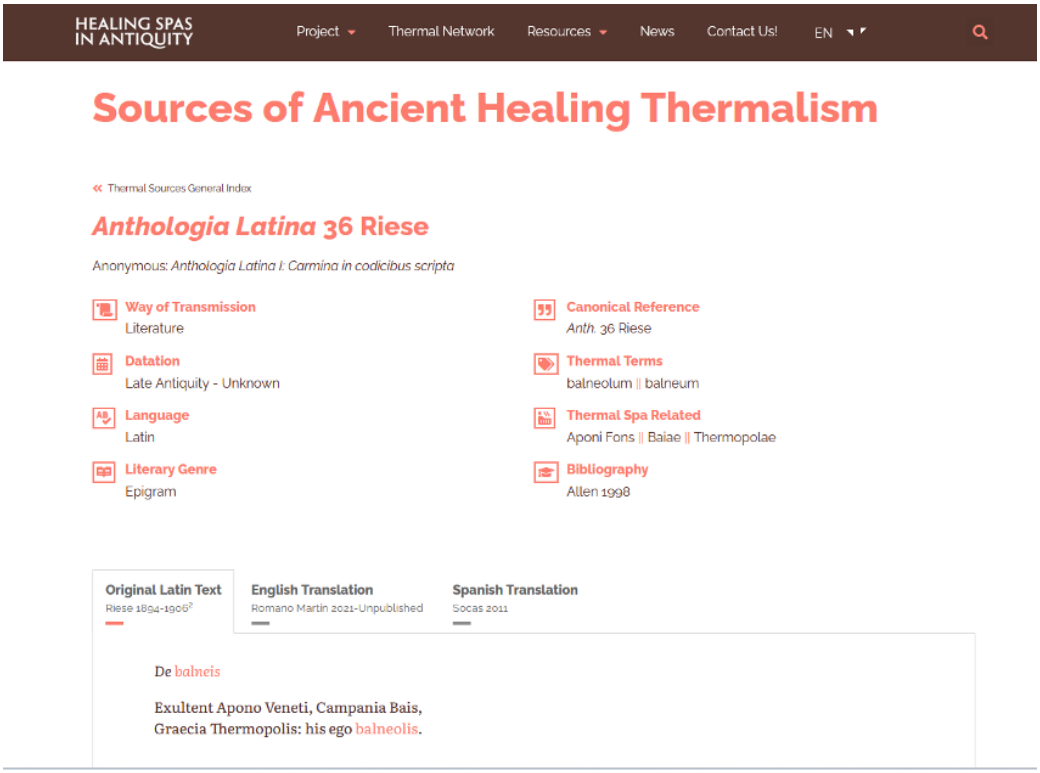
The challenge: interoperability and its application in today's society

The main challenge confronted when working with such diverse data from the past is the need to digitalise the information. Despite the technological advances described above, this process still has some hurdles to overcome, such as elaborating interpretations while, at the same time, modelling data to give them a second life in settings for which they were not conceived. This means that digitalisation must go beyond simply scanning documents and uploading them to a network. The most important step consists in constructing large databases with information that can be applied in a complementary way in diverse fields; a goal that has not yet been achieved.

The habitual process consists in working in circumscribed spaces with a research team, or on a concrete area where technology is applied, in one way or another, to treat, store, and upload data to a network. Emerging initiatives, however, are seeking to distinguish between the digitalisation of data, *per se*, and the utilisation of data in concrete research. This is exemplified in the projects we describe below, which address topics that are being debated in distinct academic forums (García Juan *et alii* 2018); for example, the possibility of creating a model similar to the IDE using historical-archaeological information. Scepticism in this regard is generated by two issues: the ownership of data, and data quality. While more and more projects are embracing this idea, many lack a connection through which some influential international institution provides support.

The Digital Humanities at the service of Historical and Archaeological research: Pratical cases involving the Phenomenon of Thermalism

In this section, we outline the methodological proposals that, according to our accumulated experience, will allow the Digital Humanities to support the kind of transference that fosters the catalysation of local communities. To this end, we recapitulate some of the conclusions extracted from projects in which we have participated in recent years, results that nourish our shared reflections on the aspects outlined previously. Regarding the development of methodological proposals, attention in each project has focused on one concrete element that correlates with some of the critical points detected while elaborating global proposals.



5 | Image of the database on classic sources developed on the Internet (photo by the Authors).

Project 1 | *Healing spas in Antiquity*. The historical perspective of thermalism seen through classic sources

In the framework of a Tomás y Valiente research contract at the UAM/MIAS, interest grew in creating an interdisciplinary project to identify, study, and conserve key archaeological evidence associated with a selection of thermal enclaves from across the Roman Empire. The researchers involved perceived the need to interlace the criteria and concepts related to those spaces through a bibliographic review and a process of updating the concepts and definitions required to analyse the complexes in detail. They also proposed creating a network of specialists in thermal spas from Roman times to foment international collaboration and establish a forum for debate on several aspects of their work.

Beyond proposing a channel of dissemination and encounter for researchers and others interested in this field, the website was set up to perform the labour of publicising the research undertaken in various projects, and to explore the possibility of creating working tools to facilitate exploiting the studies conducted on those sites up to the present, from distinct perspectives. Among other initiatives, this project propelled the creation of an online database

where a collection of texts from Greek and Latin sources, in digital format, is accumulating. Including epigraphs, this collection offers concrete references to the phenomenon of ancient medicinal mineral thermalism. This approach made it possible, for the first time, to bring together distinct types of classic sources in one publication that facilitates analysing, comparing, and broadening existing works, while also actualising knowledge from the philological, historical, archaeological, and epigraphic perspectives (González Soutelo, Romano Martín 2023, including related and previous bibliography [Fig. 5]).

Among many other features, our proposal will allow online access to original sources for studying ancient thermalism, where the original texts (in Latin or Greek) are accompanied by rigorous translations in Spanish and English, so they can foster a critical, innovative, and continuously updated vision for the study of classic sources. This new working tool, accessible to all interested parties, will function as a living resource that provides access to primary sources, concentrates the studies conducted on this topic up to today, and allows researchers to analyse the origin of modern thermalism in greater detail and relate this to the vision of this phenomenon expressed by Greek and Roman authors.

Project 2 | *RurAllure*: A social and economic perspective. Tools for sustainable tourism

The territorial aspect and key topics examined in this project involve broader concepts and visions. In the framework of H2020[2] European calls, this initiative developed in Europe. Entitled *rurAllure: promotion of rural museums and heritage sites in the vicinity of European pilgrimage routes*, its principal objective was to create tools that promote the rural patrimony which exists around several pilgrimage routes that crisscross Europe. In diverse pilot studies, researchers elaborated a series of instruments to disseminate their findings, interact with pilgrims, and foment tourism. Those tools were designed to work with distinct types of patrimony (literary, thermal, natural, and landscapes) in diverse countries and territories. Lying behind their efforts is a broad range of studies of the patrimony of rural areas close to pilgrimage routes that stress using geotechnologies to connect that patrimony with proposals for sustainable, inclusive tourism. Some of the objectives and working proposals developed in this study have earned awards that recognise member's efforts to not only transfer the results of research but also convert them into a sustainable product designed to catalyse rural areas (Bassani *et alii* 2023).

Among the topics approached, thermalism carried specific weight in a pilot study designed to enhance the value of the significant thermal patrimony that exists in Tuscany, southern Italy, and along the *Vía Francígena*, a pilgrimage route that crosses Europe from Canterbury to Rome. This proposal, developed by specialists in the fields of archaeology, geology, and geography, procures direct contact with local realities through associations like the EAVF (European Association *Via Francigena*) and other colleagues and specialist of Italian Universities participating in this consortium (University of Padova and Iuav University of Venice), and with the protagonists – pilgrims – themselves. While this region is known worldwide for its history and the beauty of its landscapes[3], and is a common setting for movies and novels, it is clear that



6 | Experience of accessibility to the thermal area of Bagno Vignoni: a visit by a group of blind people (July 2022, photo by the Authors).

its exceptional nature reflects its isolated position in the territory and the scarce means of communication that, if expanded, would facilitate access to these spaces. These are, without doubt, aspects that must be addressed cautiously to prevent saturation and the development of destructive forms of tourism that would rob the territory of its essence.

One element analysed in relation to enhancing the value of tourism involved developing activities of an inclusive [Fig. 6], accessible character (González Soutelo *et alii* 2023) that would allow all types of people to enjoy the multiple facets of the area's thermal patrimony, through both a diachronic vision (from Etruscan and Roman times to the present) and the natural salutary virtues that these waters have demonstrated in the many regions where they emerge. Other outstanding features of this exceptional landscape include the volcanic area that produced it and the abundance of medicinal mineral waters of diverse nature scattered across the landscape.

Clearly, this objective, added to the dynamics that led to the development of a model of knowledge and dissemination in which all agents involved in the territory participate, are two

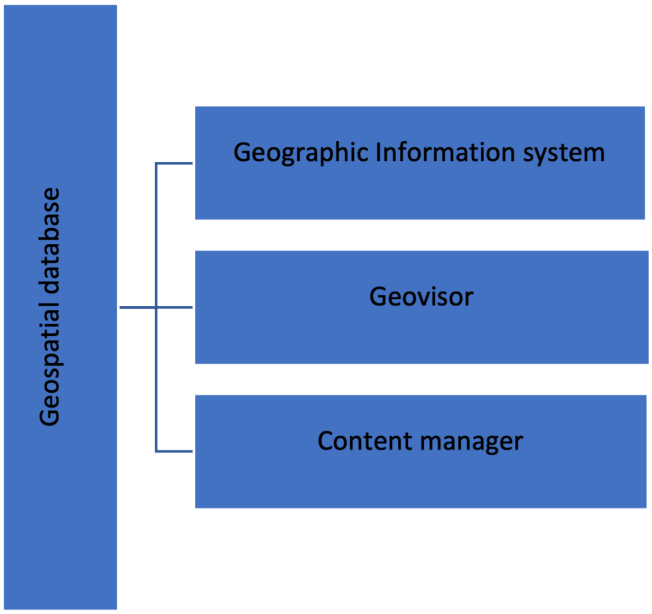


7 | Capture of THERMASCAPE visor, including a selection of thermal enclaves (González Soutelo 2019), possibly from Roman times, dispersed around the Mediterranean Sea (image by the Authors).

especially laudable aspects of this project. But the role of technology in achieving these goals cannot be lost from sight (López Nores *et alii* 2023). In this regard, of the three projects we describe, *rurAllure* has made the greatest contribution to this field, as members developed and tested a series of tools, among which a tourism app that transformed the research conducted into a concrete product stands out, together with various types of narratives, audios, and models of accessibility and social catalysation that constitute an excellent testing field to continue advancing along this path, while learning from both the errors committed and the achievements made.

Project 3 | *Thermascape*: A geographic and economic perspective from Roman times onwards based on historical and archaeological geodata

The final project discussed[4] has its roots in the previous two, as it adopted some of their principles and advances, but also set new goals. In this sense, though the final goal was to attain a deep understanding of the establishment of baths with medicinal mineral waters from antiquity, it also considered the historical, social, and economic roles that those waters played in their respective regions, and the constructions associated with them in the evolution and



8 | Main components of the structure of the information system generated (image by the Authors).

formation of the territory. To achieve this, the proposal materialized in the elaboration of an extensive geohistorical database with applications that, once more, go beyond the realm of historical and archaeological research, for they strive to obtain knowledge that can aid local communities through tourism, and to implement policies for local development that benefit from the knowledge gathered.

The novel aspects of our approach consist, precisely, in measures that open the way to introducing archaeological data, for this led to the development of a model that includes a series of geohistorical sources which monitor territorial changes and water management. An added value on which work is ongoing consists in putting into motion processes linked to thermal patrimony in certain regions through sustainable tourism. For example, with the support of virtual and spatial developers, we are involved in disseminating the role that the spa at Alange has played over time. As a function of the data found in the land register, products to date include an exhibition organised with the *Dirección General del Catastro* in the town of Alange (Extremadura, Spain) that displays, and accentuates, the value of a past that transcends health and a concrete period to form an integral part of a historical reality that must be preserved.

The result: a proposal for making the leap from research to production

One result of the experiences outlined above is that interdisciplinary projects based on technology have been proposed, so we can affirm that the validity of this knowledge and its expansion is determined by the use of free software. This movement allows software to be

utilised by any interested party, as there are virtually no impediments to access. In addition to free, open use, people can access the source code. This has facilitated the development of certain complements for managing information about the past. In this regard, increasingly consolidated and popular solutions –like the QGIS[5] project– incorporate specific complements to analyse data from the past, primarily linked to archaeology. In the independent historical and archaeological projects that we are currently carrying out, these software programs provide a common, uniform structural technique (see the graph below) that ensures viability in the development of unitary proposals [Fig. 8]. This kind of organisation also determines the fundamental parts of the methodological proposal we present.

Regarding technological components, we must clarify in relation to environments, the need to maintain a presence on the cloud to guarantee total accessibility to the network and the updating process. This has caused some problems, such as ensuring the security of archaeological data and the authorship of the layers created.

Finally, the heart of this proposal is a model of geospatial data conceived to be exploited from different research fields through distinct products that can be placed at the service of tourism-related activities.

The application developed in the *rurAllure* project, and the visor elaborated in *Thermascape*, are the best examples, for the essential features of these solutions are territory and its evolution. They offer an experience that, in relation to thermalism, goes beyond health-based tourism to emerge as a form of cultural tourism. This change in the tendency may also foment exploitation of thermal areas that do not yet have active spas, or where water management may be compromised.

Conclusions and future lines

In this paper, we set out to demonstrate how, in the heart of current society, it is important for researchers to foment dialogue and search for solutions. The so-called participative communities, founded upon the principles of solidarity and collaboration, so often involved in developing important products, must also be introduced into research. Some modalities –like projects in Europe– already demand the publication not only of results but also of the data that sustain them. We argue that working with information from the past obliges to take an additional step forward to foster the creation of spaces for the exploitation of those products. As we have shown, the benefits can be far-reaching and override any fears that may exist with respect to the quality of the results, or issues of authorship, since mechanisms exist to control this. Connecting research increases the amount of knowledge gathered, thus not only benefitting research, but also fulfilling a precept that today is institutionalised in science: transferring

knowledge to society. In this case, to a specific social sector and a concrete territory: a rural world involved in a pitched battle for its survival in the context of the demographic challenge.

In all these principles, the emergence of thermalism beyond a ludic practice generates a propitious context that demands new proposals. The one elaborated in this paper is designed to enhance the value of thermalism based on the principles of sustainability and inclusiveness, two essential goals of contemporary tourism. By no means are these minor issues. At a time when water is a protagonist, eliminating this component and centring this modality of tourism on other considerations means eliminating one of the most important challenges that lurks in the background. In addition, developing proposals like the one in the *rurAllure* project, addresses another important challenge, one for which solutions are currently being pursued: guaranteeing an inclusive tourism in which all profiles are reflected.

The experience accumulated over the years has led us to determine that training plays a primordial role in applying the precepts espoused in this paper, and in the digital Humanities more generally. In effect, this requires professional people with the capacity to transform the reality captured in past epochs and introduce it into the present without losing its essence but transforming it into products that catalyse local communities through tourism activities. Once again, training is key. The professionals who operate in the field of the digital Humanities must receive training in technology in general and, given the spatial implications, in geotechnologies in particular. To this we must add a more transversal form of training that will facilitate dialogue and collaboration with multidisciplinary teams and society as a whole. These competencies are rarely contained in study programs, which show an increasing tendency towards microspecialisation. Thus, the Humanities, in this case the digital Humanities, hold out a promising future in which, without doubt, historical and archaeological research will play an important role in dealing with emerging challenges to society.

* This article has been carried out in the context of three research projects in which the authors of this article have participated:1) the MIAS/UAM 'Tomás y Valiente' project "Healing spas in Antiquity" (2018-2023); 2) the European Union's Horizon 2020 Research and Innovation programme project *rurAllure* "Promotion of rural museums and heritage sites in the vicinity of European pilgrimage routes" (2021-2023), Grant agreement n. 1010048873); and 3) the Spanish National project "THERMASCAPE: El paisaje termal en Hispania. El papel de los recursos termales en la península Ibérica desde época romana / THERMASCAPE: The thermal landscape in Hispania. The role of thermal resources in the Iberian Peninsula since Roman times" (2023-2027) (PID2022-138809NB-I00).

Notes

[1] Declared World Heritage sites in 2021.

[2] *rurAllure* project: Promotion of rural museums and heritage sites in the vicinity of European pilgrimage routes" (2021-2023). This project has been funded by the European Union's Horizon 2020 Research and Innovation programme.

[3] Like the Val d'Orcia Valley in Tuscany, this was declared a Natural Heritage site by the UNESCO in 2004.

[4] Data from the project entitled *THERMASCAPE: El paisaje termal en Hispania. El papel de los resources termales en la península Ibérica desde época romana*, PID2022-138809NB-I00 (2023-2027), leads by one of the authors of this study.

[5] According to their description: "QGIS is a user-friendly Open Source Geographic Information System (GIS) licensed under the GNU General Public License. QGIS is an official project of the Open-Source Geospatial Foundation (OSGeo)". Accessed on 27/04/2024.

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Abstract

Mineral waters as a natural resource, together with their use and exploitation over the centuries, constitute a rich patrimony that is concentrated in rural areas due to unique hydrogeological and functional characteristics. However, the potential of thermalism phenomena has not been valued sufficiently, despite the important economic, political, and social roles they have played throughout history. This paper presents a necessary reflection on the possibilities of studying these phenomena integrally, setting out from the experiences obtained in a series of projects, and have now transformed into a proposal for the specific study outlined in these pages. We address the steps required to learn from the past, apply those lessons to current management issues, and exploit the archaeological and historical legacy of thermalism as an important catalysing agent.

keywords | Thermalism; geohistorical sources; sustainable tourism; rural catalysation.

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Thermal Scientific Research and Therapies in the Euganean Area

Fabrizio Caldara, Antonio Chiappetta, Pietro Scimemi

Thermalism, also referred to as balneotherapy or thermal therapy, encompasses the therapeutic use of various forms of water, such as hot springs, mineral baths, and mud baths, for the treatment and prevention of various medical conditions (for health and wellness benefits). The practice of immersing oneself in hot springs or thermal baths dates back to ancient civilizations, where natural thermal springs were revered for their healing properties. With advances in medical understanding and technology, the concept of thermalism has evolved into a recognized form of complementary and alternative medicine to incorporate a more scientific and holistic approach to health and well-being.

Thermalism in the Euganean region: an ancient history

Located in the northeast part of Italy, 50 km away from Venice, the Euganean Hills area is renowned for its abundant thermal springs, which have been recognized for their healing properties since pre-Roman times. The names of Abano and Montegrotto, two of the most popular destinations for hot springs in this area, seem to be primarily linked to the old tradition of thermalism in pre-Roman times. Attested by archaeological findings, Abano's origins are believed to go back to the 9th century BC, when ancient tribes living in the area used natural hot springs to perform rituals and recover from illness (Erfurt 2021). The nearby town of Montegrotto and its long tradition of hot spring use is another historical example, with the knowledge about the curative properties of the mineral-rich hot springs being placed as early as the Iron Age (onset circa 1380 BC).

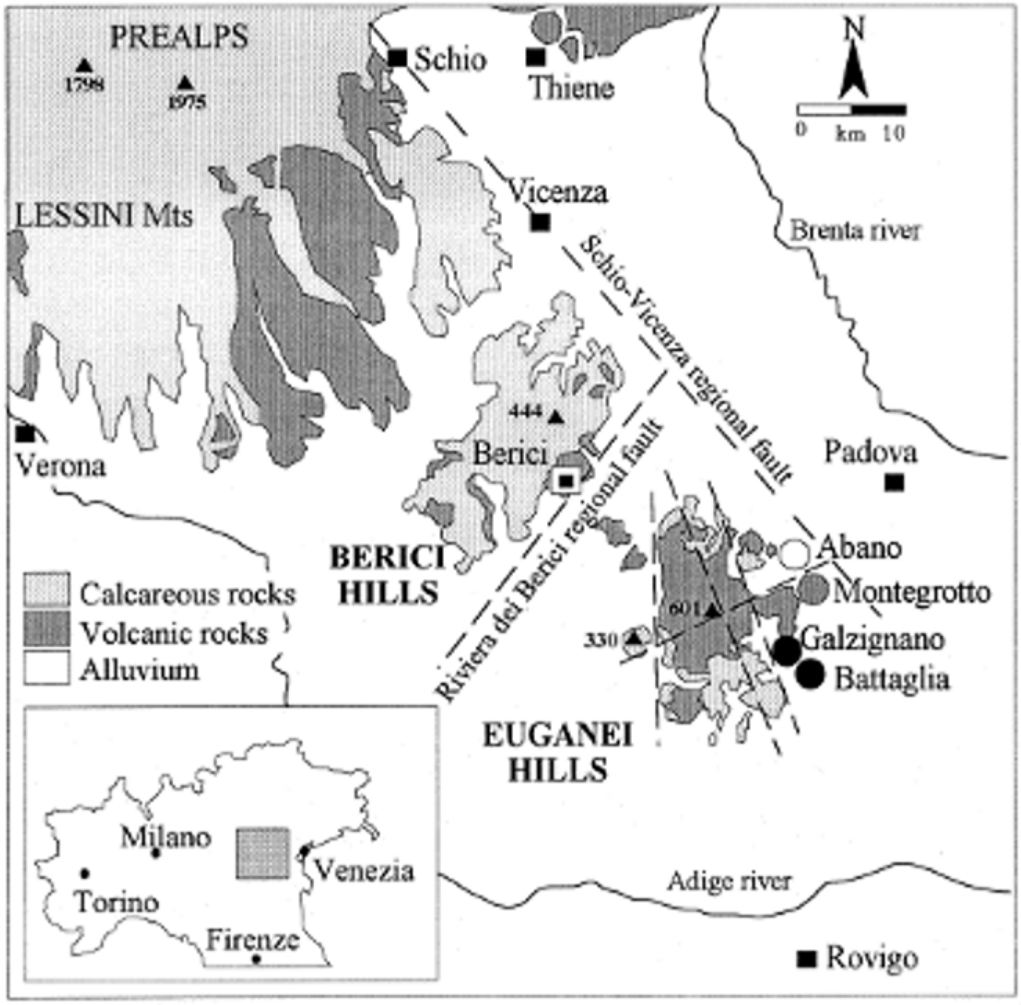
In Roman times, the Euganean region has long been recognized for the health benefits of its thermal waters, known as *Aquae patavinae*, as evidenced by archaeological remains of Roman thermal baths and historical references by writers like Livy and Pliny the Elder. The Romans built baths and spas around these thermal waters, which became popular destinations for relaxation and healing (see Bassani, Bressan, Ghedini 2012 with previous bibliography). The Romans certainly knew about the natural hot springs, as it is evidenced by the remains of an original Roman bathing complex, the *Terme Romanae*. This might explain the origin of the name Montegrotto, which, for tradition, is derived from the Latin *Mons Aegrotorum* and translates into "mountain of sick people". Claudius Claudianus, a Roman poet and senator of the 4th century AD, in a short poem recalls that by immersing oneself in the waters the suffering individual regains lost strength and returns to health. Additionally, some epigraphic texts have provided evidence of the deities believed to be responsible for the various thermal springs and

their purported healing and sacred properties. As a testament to the sacredness of the area of Colle Montirone in Abano, there is a high number of Roman glasses that Maria Paola Lavizzari Pedrazzini attributes to the presence of an emporium that provides containers for the sick devotees to draw and drink the healing thermal waters (Lavizzari Pedrazzini 1995). With the end of the Roman Empire, despite the economic difficulties that had caused its decline, the spa did not cease to exist, in fact it continued to be visited, no longer for fashion and pleasure, but for the waters. Even with the advent of Christianity, the beneficial and curative properties continued to be recognized.

During the Middle Ages, thermalism experienced a resurgence as monasteries and religious institutions began to develop spa facilities around the region's thermal springs. These spas became centers of health and wellness, attracting pilgrims and travellers seeking relief from various ailments. In the Renaissance period, the popularity of thermalism continued to grow, with prominent figures such as the Doge of Venice and members of the aristocracy patronizing thermal baths for both medical treatment and leisure. The renowned Renaissance physician and naturalist Pietro Andrea Mattioli also extolled the therapeutic virtues of the Veneto region's thermal waters in his writings. In more recent times, the waters of the Abano spas were recognized especially for their medicinal properties. A British traveller who visited Italy between 1663 and 1665 provided a vivid account of Monteortone's spring in Abano. He noted the presence of a fountain located a mile away from the Abano spas that was available for purchase in apothecaries' shops for drinking purposes. The demand for mineral waters may be attributed to the medical belief that each spring and spa possessed unique properties beneficial for treating various ailments and illnesses (Toffolon 2023). During the 18th and 19th centuries, thermalism experienced a golden age in the Veneto region, with the development of luxurious spa resorts and the emergence of medical tourism. Wealthy Europeans flocked to renowned spa towns such as Abano Terme, Montegrotto Terme to partake in hydrotherapy treatments and to socialize in the elegant surroundings. In the contemporary era, thermalism remains an integral part of the Veneto region's cultural heritage and tourism industry. The thermal spas continue to attract visitors from around the world, offering a wide range of treatments. Presently, the Euganean District boasts nearly 100 spas, making it one of the foremost centers for thermal baths and mud treatments globally, with approximately 1.8 million mud applications annually (Calderan *et alii* 2020).

The Euganean Geothermal Field and the curative properties of its waters and mud

The Euganean Hills represent the surviving remnants of ancient volcanic activity. The region's volcanic activity resulted in the formation of a variety of minerals and thermal springs. The volcanic rocks of the Euganean area have undergone hydrothermal alteration over time, a process that consists of the interaction of hot water with the rocks, resulting in alterations to their mineral composition. Consequently, the thermal waters that emerge from the springs are enriched with various minerals, including sulfur, calcium, and magnesium, which are believed to have therapeutic benefits. The Euganean Geothermal Field (EGF) is the predominant ther-



1 | Geographic localization of the Euganean thermal area (from Gherardi *et alii* 2000).

mal area in northern Italy, situated within the Veneto alluvial plain, southwest of Padua, and close to the northeastern edge of the Euganean Hills [Fig. 1].

The hills are composed of a variety of geological formations, including sedimentary rocks, volcanic deposits, and limestone. These geological formations play a crucial role in the hydrogeological conditions of the area, influencing the flow and composition of the thermal waters. Several studies and analyses have investigated the physical and chemical properties of the Euganean salso-bromo-iodic thermal waters. Available data indicate temperatures ranging from 60°C to 86°C, with a total dissolved solids concentration limit, a measure of the combined content of all inorganic and organic substances, of 6 g/L, primarily comprising 70%

chlorine and sodium, with secondary elements including calcium, magnesium, and potassium. The high temperature is another important factor in determining the therapeutic effects. Measurements of radioactive isotopes suggest a residence time exceeding 60 years, potentially extending to a few thousand years. Analyses reveal the meteoric origin of the thermal waters, which infiltrate an area up to 1500 meters above sea level (a.s.l.).

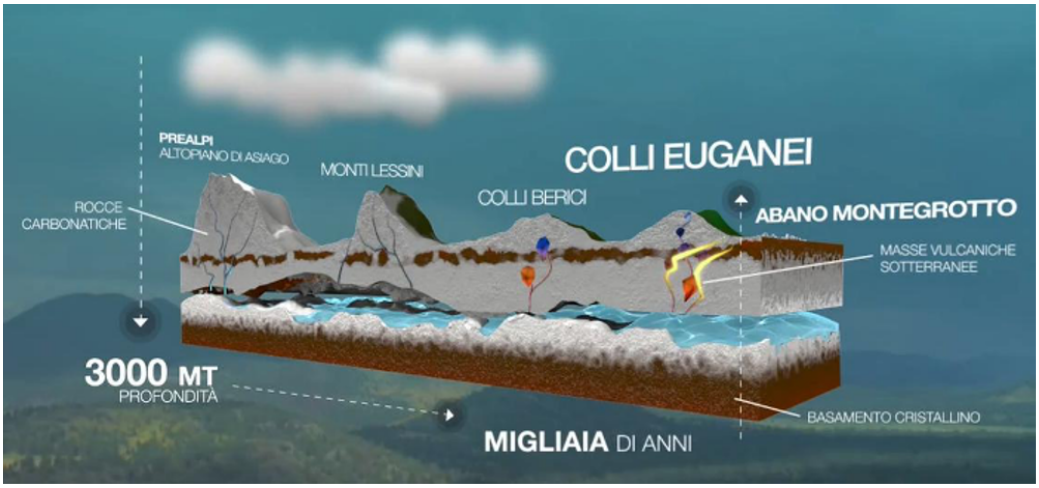
In the 1970s, a comprehensive study of the Euganean Hills and the EGF was conducted, which outlined the geological features of the district and proposed a straightforward conceptual model of the hydrothermal circuit (Piccoli *et alii* 1976). The Euganean groundwater originates from meteoric sources and infiltrates the Fore-Alps of the Veneto and Trentino Regions (NE Italy). It descends to a depth of approximately 3000 meters, where it warms due to the geothermal gradient, which is the increase in temperature as one goes deeper into the Earth. Fractures in the rocks facilitate the outflow of the thermal waters, warmed and enriched with minerals, particularly near the Euganean Hills [Fig. 2].

As with thermal waters, the therapeutic properties of thermal mud have long been known. Pelotherapy, a widely practiced method in spas worldwide, often involves the use of natural clay subjected to maturation procedures, enriching mineral substrates with organic compounds released by microorganisms (Carretero, Gomes, Tateo 2013; Carretero 2020; Calderan *et alii* 2020). While the therapeutic effects of mud therapy are generally attributed to mechanical, thermal, and chemical properties, only a few studies have examined the microbiota of peloids and its correlation with therapeutic activities.

Peloids are unique mixtures of muds or clays comprised of mineral and organic elements formed through geological, biological, chemical, and physical processes. Utilizing peloids, either through baths or packs has demonstrated beneficial effects in treating rheumatic disorders, osteoarthritis, skin conditions, and other ailments (Carretero 2020; Bellometti, Cecchettin, Galzigna 1997). This practice is widespread globally and has been utilized in Europe for two centuries. Typically, peloids in most spas are sourced from natural muds and clays extracted from local lakes or seas, then undergo a maturation period of up to two years in specialized ponds (Carretero 2020).

Euganean mud treatments, involving the direct application of warm mud onto patients' skin, are acknowledged by the Italian Health System as therapies for rheumatic diseases. Each spa in the region has its own hot thermal well and is responsible for independently preparing therapeutic peloids according to regional regulations (BUR, 2015). These regulations outline traditional Euganean mud maturation procedures necessary for obtaining "Mature Mud AOC" certification (DGR n. 857, 15/03/2010; BUR 2015). The maturation process, termed 'maturation', involves the use of 'virgin clay' collected from the bottom of the natural Lago della Costa thermal lake [Fig. 3], which is then laid in artificial ponds or tanks at the spas [Fig. 4].

Initially, the clay is moistened with thermal water at temperatures exceeding 55°C for a few days to eliminate undesirable micro-organisms, followed by continuous coverage with flowing



2 | Thermal water origin (from *Centro Studi Termali Pietro d'Abano* 2013).

water at around 40 °C for at least two months (BUR 2015). During this period, the growth of a microbial mat, primarily consisting of photosynthetic organisms, is observed, indicating proper mud maturation. Content analysis of a specific form of chlorophyll used in oxygenic photosynthesis, Chlorophyll 'a', is conventionally used for quality control of mud maturation (BUR 2015). Subsequently, the mature mud is combined with the thermal water, which has a temperature of approximately 60 °C, and left to stand for a period of between six and 24 hours. This process reduces the microbial load and maintains the fluidity of the product before its utilization in therapeutic applications. The Euganean district is a notable example of a region that has been the subject of extensive research in this field, and it is regarded as a benchmark for advancing knowledge in this intriguing area (Carretero 2020).

The development of green microbial mats on mature muds, unique to Euganean peloids, has been linked to the use of local natural 'virgin clay' and specific maturation processes. Mud maturation experiments comparing natural substrates with commercial ones have shown a significant difference in green microbial biofilm growth (Tolomio *et alii* 2004).

In 1789 Salvator Mandruzzato, as public professor at the baths of Albano and professor of pharmaceutical chemistry in Padua (a university chair established in 1797 by the Napoleonic regime), wrote in a reference text, renowned and valued for both its quality and scientific approach, that "certain plants thrive and grow within the Thermal waters of Abano, however, those that do not exceed 40 degrees of heat". An observation reported before in words but with a vivid image by Pliny the Elder in his *Historia Naturalis* ("*Patavinorum aquis calidis herbae virentes innascuntur*": Plin. *nat*. II, 227).

Only after the 20th century, the complete therapeutic potential of the organic component of thermal muds was fully understood. While some investigations have screened photosynthetic



3 | Lago della Costa, natural source of virgin clay (Courtesy: Centro Studi Termali Pietro d'Abano).

and non-photosynthetic microorganisms based on microscopy observations [Figg. 5-7], comprehensive characterizations of isolated cyanobacteria are more recent.

Studies on cyanobacterial species, highly prevalent extremophilic organisms inhabiting Euganean muds (Gris *et alii* 2020) and many other hot spring microbial mats worldwide, have demonstrated their ability to produce bioactive molecules. They are known for synthesizing a wide range of molecules that exhibit promising features, including antimicrobial and antioxidant properties. Of particular relevance is their anti-inflammatory activity, which is in line with the primary healthcare indication recognized by the National Health Service for local thermal waters and muds: the treatment of chronic joint diseases and inflammation of the upper and lower respiratory tract.

From a medical perspective, inflammation acts as a natural defense mechanism coordinated by inflammatory cells to safeguard the body against tissue injury and infection, while also restoring tissue balance. Triggered by inflammatory stimuli, these cells release pro-inflammatory mediators, or cytokines, which initiate and amplify the initial phase of the response. Typically, this phase is counteracted by the production of endogenous anti-inflammatory mol-

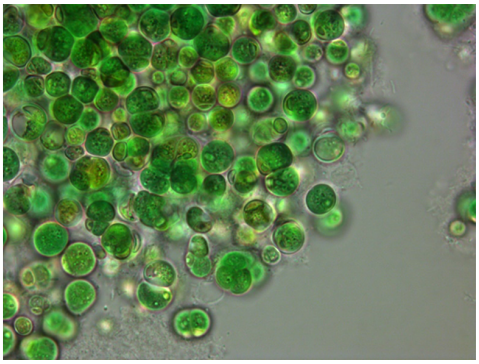


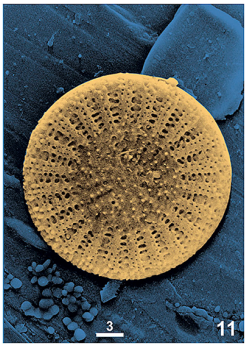
4 | Tank with mud in maturation (Courtesy: Centro Studi Termali Pietro d'Abano).

ecules, aimed at mitigating the severity and duration of the process. The recruitment of neutrophils and the peak of inflammation are followed by the resolution phase. Despite its protective role, prolonged and uncontrolled inflammation can lead to adverse effects, including extensive tissue damage, and may contribute to the development of various diseases such as rheumatic disorders, asthma, cancers, and cardiovascular conditions. In osteoarthritis (OA), the degenerative process results in gradual joint inflammation, breakdown of articular components, functional impairment, and pain. Conversely, prolonged use of synthetic anti-inflammatory drugs, such as cortisol analogs, can lead to undesirable side effects.

The exploration of the therapeutic properties found in high-value molecules produced by cyanobacteria thriving in the Euganean thermal muds is a crucial endeavour for scientifically validating the treatment of articular inflammation and uncovering new health-enhancing biomolecules. To date, research has confirmed the anti-inflammatory capabilities of lipids such as monogalactosyldiacylglycerol (MGDG) and digalactosyldiacylglycerol (DGDG), generated by Phormidium sp. ETS-05 (ETS, Euganean Thermal Springs) (Bruno *et alii* 2005; Ulivi *et alii* 2011).







5 | Cyanobacteria species at microscope (Courtesy: Centro Studi Termali Pietro d'Abano).
6 | Cyanobacteria species at microscope (Courtesy: Department of Biology, University of Padua).
7 | A diatom specie at microscope (Courtesy: Department of Biology, University of Padua).

The strain isolated from Euganean mature muds [Ceschi Berrini *et alii* 2004] is the most common species and is regarded as the primary focus for the maturation process. Its properties and lipidic composition have demonstrated sufficient effectiveness to obtain a European Patent confirming the therapeutic efficacy of the mud (EP1571203). Other biologically active compounds, polysaccharides, and complex heteropolymers have been extensively studied for their beneficial effects. Extracellular polymeric substances (EPS) represent polymers released by the microbial communities within biofilms. They form a highly hydrated gel, comprising around 98% water, which plays a crucial role in facilitating the formation of microorganism clusters. This gel enables various interactions among microorganisms, aids in resource capture, and enhances tolerance to environmental stress. Biofilms, depending on the ecological niche, can encompass both prokaryotic and eukaryotic microorganisms, such as archaea, bacteria, cyanobacteria, microalgae, and fungi. EPS released by bacteria and microalgae have been acknowledged for their antioxidant and anti-inflammatory properties [Zampieri *et alii* 2020; Zampieri *et alii* 2022; Zampieri, Caldara, La Rocca 2023; Caichiolo *et alii* 2024]. However, only a limited number of studies have delved into exploring these therapeutic attributes in cyanobacteria.

After 2020, the anti-inflammatory potential of polysaccharides directly extracted from Euganean therapeutic mud was investigated and their efficacy was validated through various inflammation models, encompassing morphometric analyses of the model organisms, assessment of immune cell recruitment, and analyses of inflammatory marker gene expression (Zampieri et al. 2020, 2022, 2023; Caichiolo 2024).

The intricacies of the microbiota biodiversity in spas, thermal mud, and the surrounding natural environment of the local thermal area remain inadequately delineated, including its potential for producing natural active compounds. The thermal springs of the Euganean Hills are not only characterised by their geological features but they are also often located in pic-

turesque natural settings. The surrounding lush vegetation and tranquil landscapes contribute to the overall therapeutic experience, promoting relaxation and stress relief.

Modern thermal treatments

The field of modern thermalism is concerned with the synergistic effects of heat, water, mud, and minerals on the body and mind. Thermal medicine in the Euganean region offers a wide range of treatments aimed at improving various health conditions. These treatments often involve immersing in thermal waters, mud baths, hydrotherapy, inhalation therapy, massages, and physiotherapy, and are typically carried out under the supervision of trained medical professionals, including doctors, physiotherapists, and spa therapists.

While numerous studies have investigated the efficacy of thermalism treatments for various health conditions, it is essential to note that the quality of evidence varies, and more high-quality randomized controlled trials are needed to confirm the therapeutic effects and mechanisms of action. Additionally, individual responses to thermalism treatments may vary, and factors such as water composition, treatment duration, and patient characteristics may influence outcomes. Overall, thermalism represents a promising complementary therapy for a range of health conditions, but further research is warranted to optimize its use in clinical practice. The following section will delineate the most significant conditions and disorders for which thermalis is indicated [Moros 2016].



8 | Male statue discovered in Montegrotto Terme in the 18th century possibly depicting a water deity (second half of 2nd century AD – Venice National Archeological Museum).

Rheumatological Conditions: Research has shown that thermal baths can be beneficial for individuals suffering from rheumatological conditions such as rheumatoid arthritis and osteoarthritis. The warm water and mineral content of thermal springs can help to alleviate pain, reduce inflammation, and improve joint mobility. Studies have demonstrated improvements in pain scores, joint stiffness, and physical function in patients with these conditions after undergoing thermal treatments.

Dermatological Disorders: Thermal waters containing specific minerals such as sulfur and selenium have been found to have therapeutic effects on certain dermatological conditions. For example, sulfur-rich thermal baths have been shown to improve symptoms of psoriasis, eczema, and acne. The anti-inflammatory and antimicrobial properties of these minerals can help to soothe irritated skin, reduce itching, and promote healing.

Respiratory Conditions: Inhalation therapy using thermal water vapour has been studied for its benefits in respiratory conditions such as chronic bronchitis, asthma, sinusitis, pharyngitis or laryngitis, vasomotor rhinopathy, otitis. The moist air can help to clear congestion and soothe irritated airways. The warm, moist air facilitates the opening of the airways, the thinning of mucus, and the improvement of respiratory function. Research has demonstrated improvements in symptoms and lung function in patients with these conditions following thermal inhalation therapy.

Chronic Pain Management: Thermal therapy may be a viable option for the management of chronic pain conditions such as fibromyalgia or neuropathy. Heat therapy can facilitate relaxation of muscles and improvement of flexibility, while cold therapy can provide temporary relief from pain by numbing the affected area.

Skin Conditions: The application of mineral-rich mud in a therapeutic context has been observed to exert exfoliating and moisturising effects on the skin. It has been demonstrated to be efficacious in the treatment of a number of dermatological conditions, including psoriasis, eczema, and acne, by its anti-inflammatory and healing properties.

Stress Reduction and Relaxation: Thermal spas are often associated with relaxation and stress reduction, which can have positive effects on mental health and well-being. Immersion in warm water has been shown to promote relaxation, reduce muscle tension, and alleviate stress and anxiety. Some studies have also suggested that thermal treatments may have antidepressant effects, although more research is needed in this area.

Rehabilitation and Recovery: Rehabilitation and recovery is a complex process encompassing a multitude of factors and stages. Thermalism is frequently employed as a component of rehabilitation programmes for individuals recuperating from injuries or surgical procedures. The buoyancy of water reduces the strain on joints and muscles, thereby facilitating gentle exercise and a more rapid recovery.

Sports Rehabilitation: Thermal therapy is a common component of the recovery regimen for athletes. Following intense training or competition, cold baths or ice baths are frequently employed to reduce muscle soreness and accelerate recovery. Another method of contrast therapy, which alternates between hot and cold treatments, may also be employed for similar purposes.

Other Conditions: gynecological diseases (e.g., pelvic connective sclerosis), Urinary system diseases (e.g., urinary tract stones), vascular diseases (e.g., sequelae of chronic phlebopathy or phlebitis, lower extremity varices), diseases of the gastrointestinal system (e.g., dyspepsia, irritable bowel).

In Italy, the National Healthcare Service (NHS) provides thermal treatments for patients suffering from various conditions, funded as part of the Essential Levels of Care (Livelli Essenziali di Assistenza, LEA). The treatments must be administered at a spa facility that is duly accredited

and affiliated with the National Health Service, and include a series of treatment cycles, as outlined below:

1. Mud or water baths (or showers) for arthroreumatic diseases
2. Baths for dermatological diseases
3. Stoves or caves
4. Inhalation cures (inhalations, nebulizations, aerosols, humages)
5. Vaginal irrigations (cycle of 12 irrigations)
6. Rectal showers
7. Hydropinic cures for urinary tract stones
8. Hydropinic cures for diseases of the gastrointestinal system
9. Treatment for rhinogenic deafness, including:
– ENT examination
– Audiometry
– Endotympanic insufflations
– Inhalation cures
10. Integrated cycle of care for controlled pulmonary ventilation
12. Hydrofangobalneotherapy for liver detoxification, including:
– mud baths
– carbonated baths
– hydropinic treatments

Conclusions

The combination of volcanic origin, ongoing geothermal activity, and hydrothermal alteration renders the Euganean Hills a distinctive geological area rich in thermal resources. The natural features have contributed to the development of spa towns and wellness resorts in the region, which have attracted visitors seeking relaxation, rejuvenation, and healing experiences. However, the past two decades have witnessed a decline in the number of spa guests, with the extent of this decline varying across different sectors. In particular, there has been a more pronounced decline in the number of spa guests with respiratory tract pathologies. Nevertheless, paradoxically, the number of chronic cases treated at the national level has been consistently on the rise. The causes of the decline in the number of treatments observed between the end of the last century and the first twenty years of the current century can be attributed to several factors. Firstly, there has been a question of the efficacy of thermal therapy. Secondly, there has been a decline in the prevalence of certain pathologies. Thirdly, there has been a failure of the therapeutic offer to evolve towards more promising areas. Fourthly, there has been a substitution of drugs. Fifthly, there has been a failure to teach thermal medicine in University Schools of Medicine.

Thermal treatments have been demonstrated to be an efficacious therapeutic means for alleviating the effects of disease, although they are typically not curative. It is often necessary to repeat the treatment every year, and this over long cycles. Nevertheless, the loyalty of spa guests is not in question, as numerous studies attest. Conversely, the challenge arises in re-

taining clients at the conclusion of the treatment cycle, as they are often replaced by younger individuals.

It is crucial to acknowledge that while thermalism may offer potential benefits for certain medical conditions, it should not be considered a substitute for conventional medical treatment. Individuals with specific health concerns should consult with their healthcare provider before incorporating thermal therapy into their treatment plan, particularly if they have underlying medical conditions or are taking medications that may interact with thermal treatments. Furthermore, the efficacy of thermalism may vary depending on factors such as the temperature and mineral content of the water, the duration and frequency of treatment, and individual response.

While there is some evidence supporting the therapeutic benefits of thermalism for certain health conditions, more robust scientific research is needed to validate its efficacy, safety, and specific applications. The lack of comprehensive evidence-based guidelines and protocols for thermalism treatments might deter healthcare professionals from incorporating them into their practice.

Addressing these challenges would require a multifaceted approach involving public education and awareness campaigns, investment in infrastructure and accessibility, regulatory reforms to ensure safety and quality standards, and continued research to establish the efficacy and best practices of thermalism medicine in the Veneto region.

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Zampieri *et alii* 2022
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Zampieri, Caldara, La Rocca 2023
R.M. Zampieri, F. Caldara, N. La Rocca, *Assessment of Optimal Growth Conditions for Biomass and Exopolysaccharides Production in the Thermotolerant Cyanobacterium Phormidium sp. ETS-05*, "Journal of Applied Phycology" 35 (2023), 1575-1587.

Abstract

Thermalism, also known as balneotherapy or thermal therapy, has been practiced for centuries across various cultures worldwide. The therapeutic benefits of thermal waters have been acknowledged since ancient times, and contemporary research continues to unveil its multifaceted healing properties. This paper provides an overview of thermalism medicine around the Euganean Hills of the Veneto region in Italy, elucidating its historical roots, physiological mechanisms, and therapeutic applications. Additionally, it discusses the current scientific evidence supporting the efficacy of thermal waters in treating various medical conditions, ranging from musculoskeletal disorders to dermatological ailments and stress-related disorders. Furthermore, it explores the potential mechanisms underlying these therapeutic effects, including the modulation of inflammation, pain perception, and stress response. Finally, this paper underscores the importance of further research to elucidate the precise mechanisms of action and optimize the therapeutic protocols of thermalism medicine for enhanced clinical outcomes.

keywords | Thermal water; Mud; Geothermal field; Euganean Hills; Thermal therapy.

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Encountering the Thermo-Mineral Spring of Bagno Grande in the Design of the Exhibition at the Archaeological National Museum of Naples

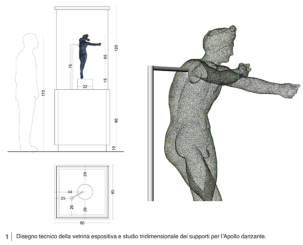
Massimo Osanna, Jacopo Tabolli



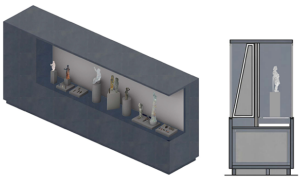
1 | The new display of the Sacred Spring (photo by G. Malizia and C. Bonanni).

After the conclusion of the exhibition at Palazzo del Quirinale in Rome the design of the new display at the Archaeological National Museum of Naples, in the synergy between the continuation of the excavation at Bagno Grande of San Casciano dei Bagni and the conservation of the bronze and organic artefacts, has significantly enhanced the previous concept (see Osanna, Tabolli 2023; Tabolli 2023). During fieldwork in the summer of 2023, a travertine donarium with a rare bilingual Etruscan and Latin inscription mentioning the “hot spring” was





1 | Disegno tecnico della vetrina espositiva e studio tridimensionale dei supporti per l'Apollo danzante.



2 | Studio della vetrina espositiva e dei supporti dei reperti votivi
3 | Dettaglio della teca bifronte contenente i reperti votivi e l'espositore delle monete

2 | Apollo in the new display at the Museo Archeologico Nazionale di Napoli (photo by G. Malizia and C. Bonanni).
3 | Study for Apollo and the last room of the new display at the Museo Archeologico Nazionale di Napoli (designed by G. Malizia and C. Bonanni).

discovered in this sanctuary, which seems to have been reused in a later wall (Tabolli 2024; Tabolli forthcoming; Mariotti, Salvi, Tabolli 2024). The inscription reads "*[fon]s caldus – flere havens*", and probably dates from the first half of the 1st century AD Although there is no data to confirm what the three holes located on the upper surface of the *donarium*, with traces of lead inside, held up in antiquity (and we hope that the continuation of the excavation will provide new data to understand this artefact), the role of the hot water within the 'context' of the excavation and associated research (Tabolli 2023a), is therefore once again stressed by the bilingual inscription.

As we have already outlined in the exhibition at Palazzo del Quirinale, the consistent presence of multilingual communities among the thermo-mineral spring, especially between the 2nd century BC and 1st century AD was exemplified by the encounter between visitors and two different bronzes both referring to the hot spring. The female deity of Havens, dating from the 2nd century BC (see Papini 2023; for the inscription Maggiani 2023) was associated in the display with the naked man, probably healed after an illness *Marcius Grabillus*, dating to the beginning of the 1st century AD (Papini 2023; for the inscription Gregori 2023). The first statue represents the Spring itself, as its Etruscan inscription specifies in the dedication, while the second one refers to the hot spring via its Latin text engraved on the right leg. These two small statues represented at Quirinale the sacred concept of the shrine and were therefore isolated in the first room, following the experience of the lightning bolt, which symbolically referred to the ritual of the *fulgur conditum* (Tabolli 2023b).

In the light of the discovery of the travertine *donarium* and of its inscription, we asked the architects of the exhibition, Gugliemo Malizia and Chiara Bonanni (Decima Casa studio asso-



4 | Final room of the exhibition at the new display at the Museo Archeologico Nazionale di Napoli (photo by G. Malizia and C. Bonanni).

ciato) to rethink the first encounter with the sacred thermo-mineral spring. The scenographic apparatus in Naples was conceived to enhance the qualities of the finds and to evoke their context: water and its sacred sphere. It consisted in the creation of an environment isolated from the architectural context by a perimeter panelling in backlit glass panels and decorated with a mixture of chromatic tones, between light blue, green and sand. The sound, taken from a composition by William Basinski, enhanced the effect of isolation from the outside, disposed the visitor to meditation and enriched the sensorial experience. The newly renovated rooms in the Archaeological National Museum of Naples, allowed for a choral display in the space close to the bilingual inscription (Osanna, Tabolli 2024). The statues [Fig. 1] were no longer isolated in their surroundings, but were at this time associated with the ancient donors of the shrine, both male and female. The conclusion of conservation undertaken on the female statue in the act of offering, a masterpiece of the 2nd century BC (Papini 2024), allowed for a direct dialogue with the man in toga (Papini 2023). The result amplified the perception of the context, considering that the four bronzes were stratigraphically excavated in a small area of less than four metres, at the core of the sacred pool (see Mariotti 2023; Tabolli 2023c).

The final room of the exhibition also underwent major transformations. Reflecting the central role of the hot spring, the statue of Apollo played the leading role as the fulcrum of the space

[Figs. 2, 3]. Visitors firstly discovered the link between deities and medicine at the shrine. Actual references to medical knowledge were exemplified by the polivisceral plates and a surgical gouge found in the votive deposit. We broke down the separation of the display of ex votos, and enlarged the space [Fig. 4]. The bronze ex votos and coins on two sides of this space allowed for the visitor to understand that despite the passage of time, between the 3rd century BC and the late 4th century AD, bronze was the most relevant type of offering to the sacred thermal spring, regardless of its form.

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Abstract

This paper presents an overview on the exhibition "Gli dei ritornano. I bronzi di San Casciano" on display at the National Archaeological Museum of Naples (February/June 2024). The two main themes of the exhibition are the sacred thermal baths (both in Etruscan and Latin script and represented by various bronze statues) and Apollo. Visitors perceive the sacred space around the spring through an 'immersion' in the display. Details of the design by G. Malizia and C. Bonanno are also presented.

keywords | MANN; San Casciano dei Bagni; Bronze; Immersive Display.

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