

PAPERS

TOMÁŠ ALUŠÍK

(Charles University of Prague)

MEDICINE IN GREECE BEFORE HIPPOCRATES – FROM PREHISTORY TO 500 BC

Based on the four categories of sources - human skeletal remains, iconographic sources, literary sources and other archaeological sources (especially organic residues) - an overview of the sickness rate and medical practice in the prehistoric and early historic Greece before 500 BC will be presented. Each of these categories present an interesting and important aspect of the medicine of the period in question. For example, human skeletal remains preserve evidence of skilled surgical interventions (e.g. trepanations) and nursing. Iconographic sources testify some healing cults and an existence of several diseases that don't leave any traces on bones. And literary sources mention an extensive use of medicinal plants (which is also proved by an analysis of some organic residues) and indicate that in the Mycenaean world healing might have already existed as a specialized craft or occupation. There is no evidence for any local healing schools during the period under study.

On the other hand, it is quite possible to discern several medical specializations or "traditions" – an invasive one (surgical interventions, such as trepanations), a non-invasive one (healing wounds and fractures by fixing etc.), nursing or assistance (incl. midwifery) and possibly also a dental care. It seems that during the prehistoric and early historic period medicine was mainly focused on healing/fixing the traumatic injuries and similar cases.

Despite some surprisingly advanced healing skills and knowledge (e.g. surgical interventions and the use of medicinal plants), the actual healing was rather dealing with acute cases or consequences (i.e. ad-hoc). There was probably no comprehensive theory that would also influence the medical practice of that time. Only at the end of the period in question, at the turn of the sixth and fifth centuries BC, a medical conception including not only a conservative and invasive healing, but also a "background" theory of the functioning of the human body was being created. This also enabled to focus gradually "from a disease to a man" (i.e. to see the medicine and healing in the wider perspective) and on the preventive aspects of some kind. This gradual process might have been related to the establishing and spreading of an individual healing deity – Asclepius. Unfortunately, many aspects of this process – and in general of the medicine of the period in question – remain still unknown and uncertain.

ROBERT ARNOTT

(University of Oxford)

CRAFT, INDUSTRY AND OCCUPATIONAL DISEASE IN THE HARAPPAN CIVILISATION

After a century of archaeological research into the economy and social prehistory of the Indus or Harappan Civilisation (2600-1800 BC), we now know a great deal about its regional and local economy, its settlements, large and small, both urban and rural and the many craft and industrial workshops associated with the manufacture of both precious and utilitarian objects. Whilst we have succeeded in achieving a much greater understanding of the production processes and what they manufactured, no attention has been given so far to precisely what the working conditions were like and what occupational diseases, traumas and degenerative conditions the workforce, both men and women, will have

suffered as the result of their everyday occupation. Using the evidence provided by archaeology, human and animal palaeopathology, palaeoepidemiology and comparisons with other contemporary Bronze Age societies, this paper identifies some of these injuries and illnesses that would have occurred in such workplaces and their causes.

HILARY BECKER

(Binghamton University)

**CAVEAT EMPTOR: THE PERILS OF TREATING DISEASE
IN THE ANCIENT MARKET PLACE**

The texts of Dioscorides and Pliny warned consumers against rampant fraud practiced in the ancient drug industry. In his *Materia medica*, Dioscorides mentions adulterated products frequently, and even provides methods for detecting these frauds in thirty naturally-sourced ingredients. There are three categories of archaeological evidence for ancient medicine: surviving samples, *collyria* stamps, and the containers and labels used to package the products. Reading this evidence in light of a commercial market fraught with possibilities for fraud and adulteration provides an opportunity to understand and even test the cautions of ancient authors.

First, the chance survival of ancient medicine allows us to see what materials were being used to treat disease and sickness. The medical tablets from the Pozzino shipwreck were made of zinc oxides, mentioned by Pliny as a cure for eye ailments and lesions—which continue today to be efficacious towards dermatological and eye diseases (i.e. calamine lotion). Lemnian earth, an example of which survives, was a medicinal earth used as a potential cure for poison, dysentery, or the plague. A second category is that of *collyrium* stamps (as well as extant exempla of *collyria*). *Collyrium* stamps, along with Lemnian earth, have often been read simply as “brands” in modern scholarship, but such inscriptions may instead have been important factors for helping consumers find proper, non-adulterated drugs. This may explain why Galen collected 20,000 samples of Lemnian earth when he was at Lemnos—for its authenticity was beyond repute. Distinct and recognizable containers for particular drugs, as well as labels, may also have a similar utility. For example, the drug *lykion* had different medical applications (and different prices) depending on whether it had originated from India or Greece. Thus, knowing about packaging practices may have helped to help identify the product and its origin, which could serve as a potential guarantee of quality and efficacy. Further, this evidence, when analysed together, provides a much better idea of the real hazards that both consumers and even doctors themselves faced when treating disease and illness, and attempting to locate *bona fide* products on the marketplace.

FRIEDRICH BAHMER

(University of Bremen)

THE LOUSY DISEASE FROM A DERMATOLOGICAL POINT OF VIEW

The lousy disease (phthiriasis) and its potentially deadly consequences is attested from antiquity until the second half of the 19th century, though the number of testimonies is quite limited. It is characterised by skin lesions ranging from smaller vesicles or cysts, which appear either localised or spread out on the body, to cysts of considerable size. Upon rupture or incision, swarms of tiny insects are released from the lesions. Extreme itch is the hallmark of the disease. D’Alibert’s (D’Alibert, 1825) 19th century textbook on skin diseases shows skin changes different from those reported for earlier cases of phthiriasis. The French dermatologist’s depiction of the lousy disease is suggestive of

superinfected eczematous skin changes seen in neglected persons infested by body lice. The British dermatologist Willan describes cysts filled with insects and the intense itch characteristic for the lousy disease. Yet, according to his description (Willan, 1798), the causal insect is considerably smaller than body lice. Both Willan and D'Alibert did not attempt to classify the insect associated with the lousy disease taxonomically according to the system of Linné (Linné, 1758). Surprisingly, the fact that lice cannot live in or beneath the skin did not stimulate further medical or entomological research.

Almost one generation after D'Alibert, the Prussian physician Berthold (Berthold, 1848), was the first to suggest that not six-legged lice but eight-legged mites were the cause of the lousy disease. This observation could not be verified, since no new cases of phthiriasis were reported. Based on a meticulous analysis of Willan's description, a comparison with modern dermatological research results on similar skin diseases and recent entomological findings, this paper will present a fresh look on the causes of the lousy disease (Bahmer and Eckert, 2016).

**FRANCESCA BERTOLDI; DANIELA COTTICA; VALENTINA GIACOMETTI;
DARIO PENZO; C. BASSANI**
(University Ca' Foscari, Venice)
***PALAEOBIOLOGY AND PALEOPATHOLOGY OF A LATE ANTIQUE
HUMAN SAMPLE FROM VERONA/ITALY***

The contribution will focus on the necropolis of Piazza Corrubbio, brought to light in Verona-Italy in 2009, during a preliminary archaeological survey connected to the building of an underground car park. A subsequent emergency excavation, conducted in cooperation with the local field unit (Soprintendenza del Veneto-Nucleo Operativo di Verona) between 2009 and 2010, allowed the discovery of 249 tombs of different typologies (the deceased were buried in so called "cappuccina" graves, in pottery amphorae-mostly used for children and infant burials- in brick and stone coffins and in simple graves dug into the ground), together with a few archaeological structures.

From the analysis of the available archaeological evidence the necropolis was used over a long period of time, stretching from the third century to the eighth-ninth centuries AD and comprehending three main phases. The first phase dates to the end of the third century-beginning of the fourth century AD, the second one to the seventh century AD, the third to the seven-eighth centuries AD. The human remains from the site have been studied by a team of Ca' Foscari University Venice and Archeolab Ca' Foscari, in a joint project with the local Superintendency directed by D. Cottica and F. Bertoldi.

The anthropological study of human skeletal remains so far examined relates to the first chronological phase of the necropolis and to three different burial typologies: so-called "cappuccina" graves, amphorae and brick coffins. The studied human sample, even if still partial, seems to be representative of the total number of individuals buried in the area. The population is formed by juveniles and adults of every age class. The highest mortality rates are at 1-3 years for children, 35-45 years of age for males and 18-25 for females. The general health status and lifestyle seems to be fairly good, with the presence of the most common markers of nutritional and occupational stresses such as *cribra orbitalia* and enamel hypoplasia and several palaeopathological cases recorded.

From the methodological point of view, we will illustrate details of a specific and experimental approach adopted in order to achieve a better evaluation of dental parodontosis (through the measurements and evaluation of horizontal and vertical bone loss in alveolar cavities), developed in co-operation with Dr F Pagliara. In addition, we will present results of a new method adopted for age definition in adult individuals and

developed by Professor R. Cameriere: it is a radiographic method applied to canines and it measures the reduction in size of the pulpar chamber of teeth, as age increases and secondary dentin develops. The combined results of osteological analyses will be presented and discussed in relation with the archaeological and historical context and within the framework of overall population dynamics in the territory of Roman and Late Antique Verona.

DR RUPERT BREITWIESER
(University of Salzburg)
APOLLO, PLAGUE AND PROVINCE

From the beginnings of Western literature, descriptions of epidemic outbreaks bringing death and pain can be found. The earliest written description of an epidemic can be found in the Iliad. The arrows shot by Apollo that release the "plague", are punishment for an offense. Epidemic as divine punishment in the form of deadly arrows is one of the most enduring motifs and can be traced in art and literature over millennia.

The earliest authentic description of a historic outbreak is dated the time of the Peloponnesian War. Thucydides created literary art in the highest form, which up to early modern times was a role model for numerous further descriptions of epidemic outbreaks. In the case of the Attic plague, the risk of contamination was perceived for the first time, but also the phenomenon of immunity. The Attic plague serves as a dramatic turning point in the history of Thucydides, the long road to perdition starts. Thucydides' suspicion that fountains poisoned by the Peloponnesians caused the outbreak of the disease is also remarkable. The disastrous effect spreads out not only by drinking polluted water, but mainly by the inhalation of polluted air called *miasma*.

The outbreak of the third pandemic of antiquity, the "Antonine Plague", is associated with Apollo too, because Roman soldiers, after conquering the city of Seleukia, plundered the temple of Apollo Komaeus. There they opened an alcove or box, from which the pestilential miasma escaped and the whole empire was contaminated. Chaldean magicians had locked it there. Following the trade routes at the time, the Antonine plague reached Smyrna in 165 AD and Rome in 166 AD. With the beginning of the war against the Markomans and Quads, the Antonine plague was also dragged into the western and northern provinces. A list of the members of the Mithras community from Virunum, the largest and most detailed Roman inscription in Austria, is a clue to the death rate from this pandemic.

ANDREW MICHAEL CHUGG
(Independent Scholar)
DISEASE AND THE DEATH OF ALEXANDER THE GREAT

The untimely death of Alexander in Babylon in June 323 BC may have altered the history of the world more profoundly than any other intervention of disease in the fate of mankind. Alexander had been poised to effectuate the conquests of Arabia, North Africa and Western Europe with a fleet of a thousand galleys and a vast battle-hardened army. It is most unlikely that anything else could have stopped him. Consequently, the exact cause of his demise has been a source of intense and enduring speculation ever since that fateful day. Ancient medicine lacked the skills to make a certain diagnosis and the corpse has been lost since the end of the fourth century AD, frustrating modern science of the opportunity for autopsy. Only words from witnesses remain and even those have been re-worked and re-edited through the hands of multiple intervening transcribers. What we have left can

be made to fit a range of diseases, syndromes and agencies. Scholars have usually felt free to regard these theories as a herd from which one is free to select whichever beast takes one's fancy. However, the objective of this paper is to show that the statistics of mortality provide a scientific basis for discriminating clearly between the various candidates and that one particular solution to the mystery is thereby rendered far more probable than any rival.

ELIZABETH CRAIK
(University of St Andrews)
UNDERSTANDING MALARIAL DISEASE

This paper will complement my previous publications relating to malaria in Ancient Greece: 'Malaria and the Environment in Greece' forthcoming in volume on Greek Environment, edited by Orietta Cordovana and Gian Franco Chiai and 'Malaria, Childbirth and the Cult of Artemis', forthcoming in the Festschrift for Vivian Nutton, edited by Laurence Totelin and Rebecca Flemming. It will be argued that Hippocratic doctors had a remarkably good understanding of the onset, development, complications and long-term effects of malarial disease, though of course no awareness of its cause.

CATHERINE DARBO-PESCHANSKI
(CNRS/University of Paris-Sorbonne)
***THE NORMAL AND THE PATHOLOGIC IN ANCIENT GREEK AND ROMAN
MEDICINE: THE CASE OF FEVER***

The nature of fever does not seem to be very stable in the Hippocratic Corpus. Sometimes fever is thought as a trouble that accompanies other ones without ever playing the role of a symptom; sometimes it is fully conceived as a disease of which the doctor can describe the process; sometimes it is only a part, not clearly delimited, within a vital continuum going from fire to heath (πῦρ, πυρετός, θερμὴ). This instability points to the early Greek peculiar conception of the normal and the pathologic that neither refer to an external pathogenic factor absence or presence nor to a bodily condition in accordance with or against the laws of nature but as different stages of a balance that can be overcome or not by the body. Hence the importance of the different kinds of fever in the prognostics.

ALEXANDRA ECKERT
(University of Oldenburg)
SULLA THE FORTUNATE AND THE LOUSY DISEASE

This paper will discuss the so-called 'lousy disease', which is attested in ancient sources from the fourth century BC until the fifth century AD.¹ This potentially lethal disease was characterised by strongly itching skin tumours. These would, after incision or as a result of bursting open spontaneously, release swarms of insects. In antiquity, these insects were believed to be lice. Hence, the Greeks called this disease φθειρίασις (phtheiriasis), after the Greek word for louse (φθείρ). Bodily deformation, defilement and long-lasting agony associated with this disease were also reflected in the close linguistic ties between its name φθειρίασις and the Greek verb φθείρω (to destroy). The Romans referred to the lousy

disease by either the Greek loanword phthiriasis or by using the Latin term *morbus pedicularis* (*pediculus*=louse).

In antiquity, the lousy disease and its deadly consequences were perceived as divine revenge for severe violations of fundamental social norms. Its most prominent victim was the Roman dictator Sulla Felix. Sulla was held accountable for the enormous death toll of about 140,000 Romans killed during the civil war of 83/82 BC and his cruel acts of vengeance in 82/81 BC.² Since there are relatively few attested cases of phthiriasis in antiquity and because of the strong connotations of divine revenge associated with it, classicists have doubted its existence and held ancient testimonies to be propaganda denouncing supposed victims.³

This paper will utilise Sulla as a case study to demonstrate that ancient depictions of the potentially deadly lousy disease are not necessarily fictitious. Based on a detailed analysis of ancient sources, it will argue that the lousy disease was caused by a particularly aggressive species of mite called *Harpirhynchus Tabescentium*.⁴

In the case of Sulla, the white skin lesions on his face may indicate a predisposition to skin infections. It is quite likely that Sulla encountered *Harpirhynchus* infested birds, as he loved hunting waterfowl. Even his remarkable decision to become the first Roman nobleman to be cremated on a pyre may be understood in the context of a *Harpirhynchus* mite infestation, serving as a way to destroy all traces of the disease once and for all through fire. Even after Sulla's death, his family tried to conceal that the 'fortunate dictator' had been smitten by divine revenge. It was only after the death of the last of Sulla's influential descendants under Emperor Nero

Notes

- 1 The lousy disease is e.g. mentioned in Aristotle (4th century BC), Antigonus of Carystus (3rd century BC) and Caelius Aurelianus (5th century AD).
- 2 For the death toll of Sulla's second march on Rome and his acts of vengeance cf. Eckert 2016.
- 3 See Nestlé 1936; Keaveney/Madden 1981; Schamp 1991; Steinacher 2003.
- 4 Cf. Oudemans 1940; Bondeson 1997; Bondeson 1998; Bahmer/Eckert 2015.

JARED EDDY

(Boston Medical Center/University of Cambridge)

TUBERCULOSIS IN THE EARLY ROMAN EMPIRE

Tuberculosis has been perhaps the most important infectious disease in human history. It emerged with human society and civilization from the Neolithic period and today still lies dormant in an estimated one-third of the world's population. The Roman era was no different. In fact, conditions within the capital during the late Republic and early Empire would have been ideal for its re-emergence within the capital and many other of the Empire's towns and cities. Early imperial medical texts support the establishment of tuberculosis as a prominent medical condition under the term *phthisis*. The number of putative tubercular osteological remains increases in this period on a European-wide scale. Finally, pairing what is known about tuberculosis from modern scientific studies with Roman urban living conditions and social practices suggests an environment in which the disease would thrive. I argue that tuberculosis was potentially the most important cause of mortality in the city of Rome and wider empire prior to the Antonine Plague of 165 AD, at which time the Empire's population began to suffer drastic losses possibly because of the introduction of new viral epidemics.

Note

I published an article in the journal *Tuberculosis* a few years ago: "The Ancient City of Rome, its Empire, and the Spread of Tuberculosis in Europe" *Tuberculosis*, 2015, Suppl 1: S23-28. [DOI: 10.1016/j.tube.2015.02.005. Epub 2015 Feb 19]

COLIN P. ELLIOTT
(Indiana University)
**PLAGUE AND PRICE CONTROLS IN THE LATE
SECOND-CENTURY ROMAN EMPIRE**

Second and third-century AD grain prices are a favoured proxy for assessing the demographic and economic impact of the Antonine plague. Scholars frequently note that private grain prices show a roughly two-fold increase from the AD 160s through the end of the second century. Under neo-classical and neo-Malthusian paradigms, such price inflation is (*ceteris paribus*) suggestive of sudden population decline, presumably due to the Antonine plague. At the same time, while many scholars are also aware that state grain prices are held roughly constant throughout this same period, this evidence rarely appears in plague narratives. In this paper, I argue that the interplay between inflexible state prices and highly variable market prices in Egypt augmented oscillations in the wider Mediterranean food supply, causing famines to be more frequent and of longer duration. The connection between famine and disease is well-attested in all historical periods, yet this relationship has been underappreciated in studies of the Antonine plague. While a great many factors (endemicity, climate, connectivity, urban density, etc.) intersected to produce the Antonine plague, the economic policies of Roman administrators also played an important role.

ELISA GROFF
(University of Exeter)
**"FOR WOMEN NOT IN LOVE DON'T CONCEIVE VERY OFTEN"
CAUSES AND TREATMENTS OF STERILITY IN BOTH MEN AND WOMEN
ACCORDING TO AETIUS OF AMIDA**

Was sterility considered a disease in the 6th century AD? Was it medicalised as a pathology in both medical and religious writings? Did people put issues of sexuality and reproduction into a medical framework or to other different categorizations in Late Antiquity? The Sixteenth book of Aetius of Amida's *Tetrabiblos* is about gynaecology, obstetrics and surgical techniques related to the female reproductive system in the 6th century AD. This compendium, which was meant to be instructive for medical students and was intensively in use until the eighteenth century, is of striking interest since it combines the so-called "Alexandrian medical curriculum" with ancient medical sources. All this is set side-by-side with Christian mysticism, and then mingled with the author's own experience as a practicing physician.

The present paper will briefly discuss the contents of chapter 26 in Aetius' *Tetrabiblos* concerning "the causes and treatments of sterility in both men and women". The author provides a detailed description of fertility's signs and potential physiological causes of sterility such as a short penis or excessive adiposity, along with "romantic" causes, thereby stating "for love is essential for conception; and women in love conceive very often". Furthermore, precise indications on diet (which food in which portion) and wellbeing (activity, sweating, vomiting) are illustrated. Scarborough (2013) has claimed that in Late antiquity medical knowledge emerges into a genre of "saint medical narrative". I argue that the analysis of Chapter 26 in Aetius of Amida will enable to gain insights into the sixth century medicalised knowledge of sex and reproduction which was characterised by an embroidery of evidence-based cases with non-clinical elements.

REBECCA FALLAS
(Open University)
INFERTILITY AND HEALTH IN THE HIPPOCRATIC CORPUS

Infertility was a subject of great interest to the writers of the Hippocratic Corpus. The causes, treatment and prognosis of those struggling to conceive are discussed at length throughout the corpus with the third book of the treatise *Diseases of Women* almost entirely devoted to the subject. Although the Hippocratic writers made a connection between a healthy womb and a healthy body it would appear that a woman could be unable to bear a child and yet still be seen as healthy. Helen King has noted in the gynaecological treatises of the Hippocratic Corpus that it does 'seem possible to be healthy while infertile: to be healthy as a person, while having an unhealthy womb'.

In the Corpus, there are multiple examples of women being described as 'cured' while the author also states that they will remain infertile. For example, in a case of ulceration of the uterus which is accompanied with fever and inflammation it is stated that '[i]n most cases the person is cured but becomes infertile' (DW.1.63.46 L.8.130.18; own translation). Whilst an unhealthy woman may be infertile, this does not mean that an infertile woman is deemed as suffering from a disease. In this paper, I will present the evidence from the Hippocratic Corpus to support this analysis and explore what these views on infertility can tell us about the Hippocratic approach to health and disease more generally.

LUTZ ALEXANDER GRAUMANN
(University of Gießen)
THE ATHENIAN PLAGUE: AN HISTORICAL HOAX?

The Athenian Plague is a main feature in the course of the Peloponnesian War by Thucydides. The Plague itself can hardly be interpreted by modern historians, especially medical historians, outside its own psychological and political context constructed by Thucydides. The described disease and symptoms appear too much fictional, its uniqueness and novelty are far from unquestionable. It will never be possible to conclude a single modern defined medical disease, at least any known infectious disease despite the bulk of medical and microbiological literature claiming this, e.g. the Thucydides' syndrome, Ebola infection etc. Being a mass phenomenon, any infectious disease may serve as an ideal explanatory tool. But, the enlightened modern medical historian has to distance her-/himself from any simple, mono-causal assignment. With that, any modern epidemiological explanation of the Athenian Plague also remains poor, because it is based only on modern microbiology. Only psycho-pathology of the Plague in the people of Athens (*anomia*) is of interest as one brick in the middle-term failure of the Athenian Power. The Plague itself recedes as a trivial event in history, just in contrast to Thucydides' own report.

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***EGYPTIAN CANOPIC JARS AS A RESOURCE FOR PALEOPATHOLOGY:
A 100-YEAR-LONG QUEST***

Canopic jars from Ancient Egypt have long represented an invaluable source of archeological and artistic information. Their biological contents (mummified internal organs), however, make these items a unique research opportunity since they allow a combination of multidisciplinary techniques ranging from philology to ancient DNA analysis. Mummies are regarded as an excellent source of biomedical information, nonetheless most internal organs are not preserved in them at the time of their investigation: this is a deplorable loss since it is known how several diseases (specifically infectious ones) localise in the viscera. Therefore, in order to establish the antiquity of a host of pathologies and determine their evolutionary history, it is important to study such jars with more traditional as well as cutting-edge technologies. This vision is at the heart of the current Canopic Jar Project of the Institute of Evolutionary Medicine (Zurich University), which is implementing a series of techniques – involving Egyptology, histology, chemistry, and molecular – on a vast sample size collected from several prominent Egyptian collections around the world, thus not only aiming to scientifically spot remarkable individual examples of ancient pathologies, but also to create for the first time a first epidemiology of diseases in Ancient Egypt. The first step of the project has been to re-examine past studies, approaches and attempts to study the contents of these jars and to re-examine with a critical eye and through the lens of modern clinical medicine the list of discoveries made in the past. The research has showed how the quest has lasted for over 100 years and how it was intimately intertwined with mummy research from the very beginning. The obtained results will be discussed in these papers, as well our team's perspective on old approaches, and future suggestions and methodological proposals shall be put forward.

Acknowledgments

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JULIE LASKARIS

(University of Richmond)

***'AN EVIL-SMELLING FLUX': OBSTETRIC FISTULA
IN GRAECO-ROMAN ANTIQUITY***

Fistulas are abnormal holes that develop between two organs. Obstetric fistulas generally arise from obstructed labour that may last three to five days, or even a week. They are most likely to form in very young mothers who have simply not grown big enough to deliver a baby and who, living in developing countries, have little or no access to good medical care. The baby's head presses tightly against the vaginal walls during the long labour, cutting off the blood supply to the tissue and causing it to disintegrate. The baby does not usually survive. An additional cause is the practice traditional in some regions of cutting into the vaginal wall to widen the birth canal and so accidentally damaging the tissue (this is similar to episiotomy, which is a major cause of obstetric fistula in developed countries). The most common types of obstetric fistula connect the vagina with the bladder or with the rectum and leave the victim with, among other problems, uncontrolled urinary or faecal incontinence through the vagina. Traumatic fistulas are the same in effect, but

are caused by sexual violence. They are seen most frequently in war-torn regions where rape is used as a weapon of war, but also in the context of marital rape especially (though not solely) in the same countries that favour a very young age at marriage. Fistulas cause other physical problems over the long-term and bring about great emotional suffering for the women, who are shamed and stigmatized because of their incontinence and are often rejected by their husbands and even their birth families. The World Health Organization estimates that 2 million women today live with fistulas.

The conditions that favour obstetric and traumatic fistulas are precisely those that obtained for many girls and women in Graeco-Roman antiquity: frequent marriage at menarche or even earlier, vulnerability to sexual violence and, at least in one source, cutting to widen the birth canal (*Celsus* 6.28). We do not, however, find many references in our medical texts to post-partum incontinence, although accounts of protracted labour are frequent. This paper will assume that “the absence of evidence is not evidence of absence,” and that obstetric fistula was necessarily a more frequent problem than our sources indicate. It will make two main arguments, that: 1) fistula may be “hidden in plain sight” in some texts - subsumed in the accounts of such more familiar conditions as post-partum uterine displacement (e.g., *Steril.* 247 (8.460.1-6L), where dripping urine is mentioned and fumigation recommended), ulceration of the uterus (e.g., *Steril.* 213 (8.410.2-5), whence comes the “evil flux” of the title), and *phthisis* (at *Aer.* 4 (2.43-5) owed to the ruptures of violent childbirth) and 2) ignored by some authors because: a) some or even many victims may have died rather quickly from it or other complications of obstructed labour; b) doctors could do nothing for surviving victims and so many saw no point in writing about them; c) out of shame, many surviving victims may have turned to female healers and/or simply isolated themselves.

SPYRIDON LOUMAKIS
(Concordia University, Montreal)
PURE IN BODY AND MIND BEFORE HEALING

My paper seeks to explore and interpret a change in the understanding of divine healing in the Asklepeia, requiring from the diseased persons to be profoundly pure in advance before looking to be healed. This is a shift that starts around the 1st century BCE (in the Asklepeion of Epidauros even earlier), and picks during the Roman Imperial Period. Taking as case study the work of Philostratus the Younger (late second – mid third century CE) *Life of Apollonius of Tianna*, the longest biography that survives from antiquity, I will try to show the mechanism behind this novel understanding of healing a disease in the ancient world. An example from the very first book of Philostratus’s work follows below, to show exactly the relevance of my argument:

Young Apollonius’s first public act in Augeas, near Tyan, was the study of philosophy of Epicure and Pythagoras, and his personal purification in a strict Pythagorean way, and it is only then that he enters the local sanctuary of Asklepios. There, an interesting healing story takes place. A Cilician man had one of his eyes fallen off and who had made massive sacrificial offerings on the altar and offered precious vessels as lavish gifts to Asklepios in order to have his fallen eye restored (I.10). Once hearing this story, Apollonius asks to learn more about this person who ended up being someone whose story Apollonius knew well. As a result, and despite his seemingly pious ritual act, this person was judged as *miaros* by Apollonios, who asked the priest of the sanctuary not to receive him favourably into it. Asklepios in a night vision appeared to the priest to confirm Apollonius’s judgement, calling the one-eyed Cilician as not worthy of having his other eye restored. The priest’s inquiry indeed revealed that this man had been acting *akolastōs* with his wife’s daughter from her first marriage and that he had lost his one eye as a direct result of that. This proved that the strict judgment made by Apollonius and Asklepios was true, although in

reality it meant that the one-eyed person's seemingly normal request was denied. The conclusion is that a person having committed abominable deeds should not be received in a healing shrine asking for cure for a bodily disability, even if his actual medical need is so obvious and, in our era, should have been undeniable.

This story also serves as an introduction to Philostratos's following scene where Apollonius enters into discussion (*ephilosopheito*) with the priest of the Aegeae Asklepieion (I.11). In this scene, both agreed that since the gods are just and wise, and know all human and divine affairs, then all those "coming to the god [i.e. Asklepios]" will be accorded the *agatha* provided that they are *hosioi* whereas they will be punished with opposite things if proven to have been *phavloi* (ill ones). The gods should act well to someone who has been found invulnerable to badness (*atrōton kakias*), whereas if they see someone corrupted (*diephthorota*), they should leave him to the consequences of his action (e.g. to be left unhealed). It is interesting that in the text of Philostratus the former is identified as those who are cured (or in good health) while the latter become the synonym of someone "being spotted" ("spots" being the visible signs of a major illness). In addition, the latter are bound to cause anger to the gods as "they dared to go often into sanctuaries while not being pure (*etolmēsan kai hiera esphoitān mē katharoi ontes*)." At the end of his short discourse, Apollonios looks towards Asklepios (or his statue [*es ton Asklepion*]) and asks him not to allow the ill ones (*phavloi*) to come to his sanctuary. In addition, the most righteous gods (*dikaioi*) should not give a favourable judgement to the ill ones. Sacrifices and offerings cannot make necessarily or automatically Asklepios cure suppliants, as in the aforementioned case of the rich but *mē katharos* Cilician.

PAWEL MADEJSKI

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WHEN HISTORY MEETS MEDICINE: COLLECTIVE MADNESS AND ROMAN HISTORY

The first century BC in the history of Rome meant a continuous fraternal bloodshed. For the modern historians, this period marks a turning point, the revolution that ended the Republic and laid foundation for the new order. The contemporary Roman perspective had been quite different. They were aware that there was a constitutional change, but it was still without clear shape. More important for them was the social psychology.

Collective madness was not anything unknown for the ancients. Such ailment usually affected smaller groups, like families, and was perceived as a divine punishment (the Greek tragedy and early historiography provide some examples). Besides literature, cases of "collective fever" that manifested – for example - in compulsive citation of pieces of tragedy are also confirmed for the urban populations of one city (Lucianos of Samosatae). In the Roman context madness, individual or collective, was more a matter of jurists than of physicians. The usual treatment comprised of settling a tutor of the mentally disabled person, and of - sporadically attested - a kind of psychotherapy: prayers, offerings to gods, healing and purifying rituals.

Collective madness turned to be a very suitable explanation of the civil wars of the last century B.C. Augustan poets, especially Horace, used terms like *furiosus*, *demens*, *insanus* to describe the psychical, inner attitude of the Romans toward their fellow citizens. A decade earlier such epithets could be used only as invectives – Cicero was a master of this. Now they served two specific aims. Firstly, it was a very convenient explanation of the civil wars. If all Romans were insane (one thing the poetry could not explain reasonably was the epidemic character of the madness; one way was to look for the divine wrath and collective pollution) while killing each other, there were no persons who could have been blamed for the bloodshed. The second reason was ideological. All *furiosi* needed tutors.

The Romans got the one – Augustus. He became their supervisor but also their healer. He used solemn collective religious ceremonies to relieve the social tensions, to purify and to restore the spiritual balance. In that case medical and legal solution served to justify the new regime. They were carefully designed – for example no one tried to describe the Romans when fighting civil wars as *mente capti – furiosi* and *dementi*, even *insani*, according to the common and legal belief, retained some degree of reason. Again medicine, together with law, was used to shape and explain the history to serve more important aims.

BRANDON McDONALD

(University of Oxford)

CLIMATE CHANGE AND THE ANTONINE PLAGUE

[Not yet available]

KATHERINE D. VAN SCHAİK

(Harvard University and University of Zurich)

***TOWARDS A NEW(-ISH) TAXONOMY OF DISEASE:
DISEASE CLASSIFICATION AND THE INTERPRETATION
OF ANCIENT TEXTUAL SOURCES***

The last five years have seen an increased focus on “precision medicine”, defined by the United States National Institutes of Health as “a ground-breaking approach to disease prevention and treatment based on people’s individual differences in environment, genes and lifestyle.” Precision medicine calls for “a new taxonomy of disease” that takes into account individual variation in terms of both genetic makeup and behaviour.

While our knowledge of the human genome and our ability to analyse the associated big data are new, physicians’ calls for “a new taxonomy of disease” are not. In Greco-Roman antiquity, when physicians such as Hippocrates, Herophilus, Sextus Empiricus, Thessalus, and Galen sought the best means to heal the sick, the way a physician decided how to classify and to treat a disease directly affected how he interacted with his patients and recorded their case histories. A central question in the history of health and disease was (and remains): how individual is this patient? To what extent can knowledge of manifestation of a particular kind of problem in one patient be generalized to another patient? How do we classify these problems of ill-health in ways that bridge this epistemological divide between the individual and the aggregate?

Today, as we move toward medical decision making that involves concepts such as ‘big data’, ‘crowd sourcing’ and ‘precision medicine’, a discerning view into past debates about the nature and organization of medical knowledge can help illuminate how we interpret ancient textual descriptions of ill-health considering ancient and modern definitions of disease. Drawing on textual sources in ancient Greek, Latin, and Arabic, this paper will address these issues, arguing that an understanding of disease taxonomies and the epistemological organization of past medical systems is vital for interpreting the textual sources that contribute to our understanding of disease in the past.

**MARIA A. SPYROU, AIDA ANDRADES VALTUEÑA, MARCEL KELLER,
MICHAL FELDMAN, ALEXANDER HERBIG, KIRSTEN BOS
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(Max Planck Institute for the Science of Human History, Jena)

**IDENTIFYING PLAGUE IN THE ANCIENT WORLD:
A MOLECULAR APPROACH**

Plague has historically been one of the most feared infectious diseases among humans, and is known to persist until today in certain parts of the world. Its causative agent, the *Yersinia pestis* bacillus, only recently achieved global dissemination, through the latest plague pandemic, which took place between the nineteenth and twentieth centuries. During this time, the bacterium reached the previously plague-free Americas and Australia. It's history in Eurasia, however, is known to be much lengthier, stemming from historical documentation of the disease and molecular identification of the bacterium in archaeological material from two infamous plague pandemics, namely the plague of Justinian, which took place in the sixth to eighth centuries AD, and the second plague pandemic that began with the Black Death (fourteenth century) and lasted until the eighteenth century in Europe. In addition, recent molecular identification of the bacterium's DNA in Bronze Age human remains suggests that it has been affecting human populations for at least the last 5,000 years, long before it could be recorded in historical documents. Here, we discuss the contribution of ancient DNA in uncovering the long history of plague by presenting previously published as well as newly produced data to examine the demographic and evolutionary history of the disease.

JEAN MACINTOSH TURFA

(University of Pennsylvania Museum)

ADRIAN HARRISON

(University of Copenhagen)

**"PLAGUE, BUT NOT EXCEPTIONALLY LIFE-THREATENING" - DISEASES IN
THE ETRUSCAN *BRONTOSCOPIC CALENDAR* AND THEIR SOCIAL
IMPLICATIONS**

The Etruscan *Brontoscopic Calendar*, part of the Etruscan religious scriptures, the *etrusca disciplina* of the first millennium BCE, was translated into Latin in the time of Cicero and into Greek in Justinian's Constantinople; only the last version survives. It contains omens prompted if thunder is heard on a given day. Many predictions refer to specific diseases, and some link disease with conditions of servitude or war, with disease of animals or with climatic conditions. Some diseases may be identified by very specific symptoms (e.g. "spotted diseases" may indicate cutaneous anthrax), while others called "plague" are not likely to be bubonic plague¹ or childhood diseases, but could be brucellosis, bacterial or viral enteric diseases (parasites would have been endemic), perhaps malaria, or even zoonoses or similar infections (e.g. Newcastle disease/mumps). (An intriguing unique episode is the Plague of Caere, perhaps a rare situation of airborne botulism triggered by Etruscan atrocities following a naval battle c. 535 BCE, according to Herodotus, (1.166-1.167.2) While nearly half the other omens in the Etruscan document may be derived ultimately from much older Mesopotamian divination texts, none of the disease omens can be linked to the environment of the Near East: they all reflect situations that had been experienced or discovered in Iron Age/first millennium BCE Italy.

The calendar alludes to the social impact of diseases, the spread of disease during war and famine, and among underprivileged classes, especially slaves. In addition to identification of specific diseases, the paper offers a survey of archaeological finds (burials)

and Etruscan epitaphs that may support the notion of waves of infectious disease that affected – and alarmed – early Etruscans.

Note

- 1 Rasmussen et al. 2015 (*Cell* 163: 571-582) indicate the presence of *Y. pestis* in Bronze Age Europe, which only became the virulent, familiar form, transmitted by rats, in the early first millennium BC. Etruscan settlements were too small to furnish a reservoir for such diseases to recur.

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PAULA VEIGA

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DISEASE AND THE ANCIENT WORLD: ESTABLISHING A CONNECTION BETWEEN SOME PLANTS AS INGREDIENTS FOR TREATMENTS IN ANCIENT EGYPT (c.3000-700 BCE) AND THEIR 'DIVINE' ORIGIN

The study of these plants as ingredients for treatment of various individual diseases (textual record) is complemented with the archaeological records of *specimina* found by missions working *in situ* in Egypt, and existing museum collections.

The possibility of identification of plant remains can be crucial to parallel their use as ingredients in prescriptions, how ancient Egyptians took them, as food, medicine, and magical items such as amulets, as to ensure their well-being. Plant and human remains found are important to establish the use of the plants in this society, as to prove their existence and their efficacy.

Having the notion that Egypt did not change that much since the arrival of Islam, which was faced with the ongoing Egyptian culture, and that folk medicine might still use the same ingredients and the same prescriptions as they were used in ancient times, we can better understand ancient Egyptians' knowledge of disease. The social and historical aspect of diseases' treatments is seen in the association of this plant group with an Egyptian god: Osiris, who gathered epithets such as god of the dead, a renewed self, but also god of agriculture, thus ensuring prosperity both in life and afterlife.

MAREK VLACH

(Institute of Archaeology, Czech Academy of Sciences, Brno)

DIGITAL MODELING AND ESTIMATING IMPACT OF THE ANTONINE PLAGUE

Generally, the so-called third century crisis of the Roman Empire is considered to be an outcome of complex development of both exo- (barbarian raids and military conflicts) and endogenous (social unrests, economic and political instability etc.) factors. Amongst the frequently mentioned causes also count the epidemics, potentially leading to significant impact into demographic, economic and other structures within the various regions of the Roman Empire. The present research comprises considerably wide margin of death toll estimates ranging even in many millions. The main intention of digital modelling attempt dwells in testing of existing hypotheses and estimates on basis of emulative digital

framework. Use of complexity reduction of studied context in form of cellular automata environment provides workspace for spatio-temporal quantitative modelling. Its dynamics is defined by differential equations of mathematical epidemiology. Based on wide array of input data there have been established various testing scenarios for assessment of potential quantitative and spatial impact aspects of the Antonine Plague.

STEFAN WAGNER

(University of Erlangen, Germany)

ANTONIO VINCI

(University of Milan, Italy)

***THE INVISIBLE ENEMY: DISEASES AS A DECISIVE FACTOR
IN THE WARS OF ANTIQUITY***

When Athens started to fight with Sparta in the last third of the fifth century BC, the first phase of this so-called Peloponnesian War was ended by the politicians of both sides by making a peace because of a disease which has weakened the population of Attica. The disease was described by Thucydides in his books, but despite of the fact that he described the disease in a very detailed way, it has not been possible to find out the true nature of it until today. Many proposals have been made, e.g. typhoid fever or other infections, but it never could be cleared which disease exactly caused the death of almost 25 per cent of the Athenian population. In the end, the disease turned out to be critical – not because of the heavy losses of people, but because of the death of Pericles, most admired Athenian political leader, whose advice concerning the strategy of Athens in the war had always been of vital importance for the city's success against Sparta. In the end, Athens lost the war – because Pericles' successors did not follow the plans of their deceased leader, as Thucydides states.

Another example of a disease which was influential on the course of a war in antiquity was the death of Marcus Aurelius, who ruled over the Roman Empire from 161 to 180 AD. During his second campaign against the Marcomanni, he died among his troops. The disease he was suffering on was described by Galen of Pergamum, who wrote about heavy diarrhoea and pharyngitis in combination with fever. Modern researchers have concluded on the possibility of variola, but – similar to the Athenian disease some centuries before – also the nature of this disease was never cleared completely. Because the disease appeared over the whole empire, the politico-military situation on the borders was destabilized for years. On coins from these years, we can see the goddess Minerva as a healer, also a clear sign for the great impact of the disease not only on the troops but also on the rest of the roman population. In fact, we can see in this coinage also archaeological evidence of the Antonine disease, which is very rare, because diseases are almost impossible to proof with archaeological data.

MATHIAS WITT

(University of Munich)

***THE GUINEA WORM (DRACUNCULUS MEDINENSIS):
A TROPICAL DISEASE IN GREEK AND ARAB SOURCES***

[Not yet available]

ENRICA ZAMPERINI
(University of Padua)
THE PROMETHEUS' DISEASE

My research interests lie in the History of Religions of the Classical World, with a focus on the relationship between politics and religion in the classic tragic texts. The aim of my PhD thesis is to investigate the relationship between hero's diseased body and the political context of the tragedy.

The analogic relationship between hero's body and the body of the city has been developed in the fifth century, the period of the great progresses of medicine. In the tragic plays, this relationship is stressed by analogy between *stasis* and *nosos*, between the civic strife and the disorder of the body. In particular, some heroes, after a fault (*hybris*), are stroked by a disease which is a physical infection with a further metaphorical meaning. These diseased heroes are expelled and emarginated, because of the impurity of their sickness that affects the whole *polis*.

Among Aeschylus' tragedies, the *Prometheus bound* is characterised by the remarkable presence of the word νόσος and specific medical terminology¹ such as μαλθάσσω, which means «soften, soothe», ισχναίνω², which is a medical term meaning «make dry, wither» and σφριγάω,³ «to be full to bursting, to be plump». According to this consideration, the aim of this paper is to analyse the protagonist of Aeschylus' tragedy as sick hero and the occurrences of medical terms. I will examine the physical aspects of Titan's disease and its metaphoric meanings.

In the first part I will study the forms of Prometheus' disease, on one side as the pain which torments his body, on the other one as inflexibility against the will of Zeus. Therefore, νόσος indicates both Prometheus' physical suffering (is chained and immobile to a mountain in the Caucasus) and his psychological state; this term presents not only a medical meaning, but also a metaphoric employment connected to the political setting, that is the Prometheus' incapability to adapt himself to the new power established by Zeus. Otherwise, Zeus is qualified as sick as well, struck by an illness which reveals his inability to manage rightly the power (Zeus is named τύραννος).

In the second part, I will focus on the metaphoric terms and images related to the medical environment and on the therapeutic indications given by Prometheus. He is the founder of medicine; but not only in its common meaning of "treatment of physical affections": indeed, he can diagnose also the sickness that upsets the *polis*. Prometheus' lexicon refers abundantly to medicine and shows that his knowledge is not only technical, but he knows the cure to heal Zeus of his inflexibility, of his anger, of his imbalance which causes political instability.

The loss of the other two tragedies of Prometheus trilogy does not allow us to understand how the Titan is released from both disease and chains. This paper will offer further contribution to the study of the influence of medical lexicon on the Aeschylean tragedy and its different meanings, analysing also the relation between politics and medicine. The Titan's intervention as healer refers metaphorically to a political solution to cure the society of the *stasis* which torments it.

Notes

- 1 Aesch. *Pr.*, 379-380: ἐὰν τις ἐν καιρῷ γε μαλθάσση κέαρ / καὶ μὴ σφριγῶντα θυμὸν ισχναίνῃ βίᾳ.
- 2 Hipp., *Apt.* V 22: δέρμα μαλάσσει, ισχναίνει; Hipp., *Artic.* 50: ἄμεινον δὲ καὶ τὴν κοιλίην μαλθάξαι κούφῳ τινί, ὅσον κενώσιος εἵνεκεν τοῦ σίτου, καὶ ἐπὶ μὲν δέκα ἡμέρας ισχναίνειν.
- 3 Hipp., *Mob. mule.* I 71: οὐδὲ γάλα ἐν τοῖσι πιθοῖσιν ἐγγίνεται, σφριγᾷ δὲ τοῦς πιθούς.

POSTERS

PHILIP STRAUB

(University of Freiburg)

CONTEMPORARY EXPLANATORY MODELS FOR CAUSES OF DISEASES IN ANCIENT GREECE AND ROME

In ancient times, death was much more present than in modern society. Only a minority of the inhabitants of the Mediterranean world died of old age, and for this reason even young people were far more aware of their own mortality. One of the main reasons for the – from a modern prospective – low life expectancies were, besides the much more intense physical violence, were without doubt the limited treatment options of ancient medicine. If they took an unfortunate course, even relatively trivial infections could have lifelong consequences or even result in death. In case of serious infections with more lethal pathogens the mortality rate was high. Therefore, one could expect that the question of how diseases develop would have drawn a lot of attention in the ancient world. Accordingly, there are indeed contemporary theories to be observed in the sources. The roman architect Vitruvius, for example, dedicated a part of his work to the issue of where a town should be located to benefit the health of its inhabitants (Vitr. 1.4.1). Thus, he strongly recommends one to keep clear of marshes, because the morning mist in association with the poisonous perspirations of creatures living in the swamp would weaken the bodies of the city's residents. Vitruvius' remarks show clearly that there were efforts to prevent infections and that he reflected on the causes of disease.

In this poster, I shall analyse a broad range of ancient source to identify models established by the ancient Greeks and Romans to explain the causes of diseases. Subsequently, those models will be organised into categories, which I shall use to identify potential distribution patterns. Was the knowledge about disease limited to a few specialists (like the architect Vitruvius) or – given its significance for individual wellbeing – was it distributed among the broad society? Are specific explanatory models linked to specific cultural groups? And did some models become more or less influential over time? These questions illustrate that it is not sufficient to limit the investigation to its social dimension. To fully comprehend how these explanatory models evolved and how they are related, it is imperative to include the spatial and temporal dimension.

LUTZ ALEXANDER GRAUMANN

(University of Gießen)

MISHAPS AND MISSTEPS: CHILDREN'S ACCIDENTS IN ANTIQUITY

This poster deals with the physically injured child in Greco-Roman antiquity. The injured child is of course not a recent and not an exclusive medical phenomenon. Even though there is nothing like paediatrics or paediatric traumatology in Greek and Roman antiquity, one can find a lot of different ancient sources which tell us the tale of the injured child, boys and girls, and very rarely of the treatment, much less of the prevention.