

COMPARATIVE GUTS



120



158



108



210



188



114



206



94



194



162



212



60



74



176



20



168



136



132



184



10



56



82



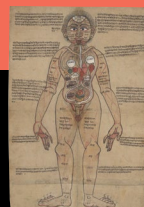
66



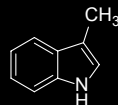
6



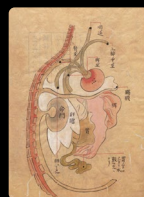
126



100



150



44



36



144



52

Christian-Albrechts-Universität zu Kiel,
Exzellenzcluster ROOTS

Kiel

©2024, CC BY-NC-ND 4.0

DOI: 10.38071/2024-00345-3

This work is generously supported by the DFG-funded Cluster of Excellence Roots (Subcluster Knowledge) and by the Inklusionsfonds at the Christian-Albrechts-Universität zu Kiel. Heartfelt thanks are due to the artists and institutions who allowed us permission to use their work and images from their archives, and to all contributors for their cooperation and efforts.

Design: christophgeiger.com



<u>2</u>	Bodies, Guts, Comparisons
<u>6</u>	Ancient Egypt
<u>10</u>	Africa
<u>20</u>	Mesoamerica
<u>34</u>	Comparing guts and East-Asian cultures: on the workings of the <i>ars combinatoria</i>
<u>36</u>	China
<u>44</u>	Anatomical images in Northern Song China
<u>52</u>	Images of the digestive organs in Korea
<u>56</u>	China and Japan in the modern Period
<u>60</u>	The body maps of Master Yan Luo
<u>66</u>	Japan
<u>74</u>	An example of 17th-century Sino- European cross-cultural medical history
<u>82</u>	Tibetan medicine
<u>94</u>	Ming-Qing illustrations of the organs
<u>100</u>	Yoga and Ayurvedic medicine in South Asia
<u>108</u>	Arabic and Persian materials
<u>114</u>	Hunter-fishers of Norway
<u>120</u>	Greenland guts in ritual, myth and daily life
<u>126</u>	Mesopotamia
<u>132</u>	Roman-Etruscan materials
<u>136</u>	Graeco-Roman antiquity
<u>144</u>	Graeco-Roman medical cultures
<u>150</u>	Gut scent—The smell of guts
<u>158</u>	The ancient <i>Stomachion</i> , a Graeco-Roman guts-game
<u>162</u>	Digital imaging and the history of medicine
<u>168</u>	Medieval Europe
<u>176</u>	Birth of modern anatomo-pathology
<u>184</u>	Lightpainting art: der Kreislauf des Lebens
<u>188</u>	Contemporary imaging techniques for medical purposes
<u>194</u>	Contemporary guts
<u>206</u>	Gut feelings
<u>210</u>	The Gut / Der Darm
<u>212</u>	Drawing breath > < Gut feelings
<u>222</u>	Biographies



EXPLORING THE INSIDE OF THE BODY THROUGH TIME AND SPACE

BODIES, GUTS, COMPARISONS

Chiara Thumiger

The images and texts in this catalogue are testimony to a wonderful cooperative effort: the coming together of over thirty anthropologists, artists, and historians to explore the human body from a comparative angle. In fact, our focus is on one particular body part: the innards of the lower torso, what English-speakers sometimes call the “guts”, and the way human beings have desired and attempted to learn about them, describe them, and represent them visually. The result of this work was the digital exhibition *Comparative Guts* (comparative-guts.net), which aimed at overcoming regional boundaries and cultural structures in order to provide space for testimony that was as varied as possible, no matter how particular and specific, far apart, or obscure and eccentric.

Comparison and the “comparative disciplines”, of course, never allow for straightforward, monolithic projects, and cannot be methodologically innocent in their goal to “make equal”, *comparare*, different things. Comparison is never safe from applying a measure that is disadvantageous to some participants, flattening incommensurable differences, or oversimplifying complex networks of ideas and influences. These and other pitfalls led Gayatri Chakravorty Spivak, in her 2003 *Death of a Discipline*, to speak of a demise of comparativism as an approach to the human world which divides it into neatly catalogued cultures, generally in translation, within a globalised whole. Instead, she proposed that the field be reshaped into one in which peripheries, local languages, and hybridisation between cultures assume the foreground.

This criticism is not to be ignored, and these pitfalls must be a major concern for a project such as ours. *Comparative Guts*, with its focus on “image” and “body”, attempted to address some of these issues in various ways: by questioning definitions of knowledge and who should be its repositories; disrupting the very concept of “image” as stably given and immediately and objectively evident to (primarily visual) perception; undermining the slicing of cultures into discrete regions and eras; and questioning the mapping of the animal body into recognisable, universal “parts”.

Knowledge of the interior of the body has always been and will always remain a chimaera. This is true today as much as it was centuries ago: despite the claims of modern electronic imaging to offer stable representations of animal bones and viscera, the inside of the body (and its soft parts especially) remain elusive. The guts, artificially coloured and simplified on screen, as software negotiates sonographic, x-ray, or magnetic impulses to translate them into images, may be a visually perceived “object”, but their messy shapes remain decipherable only by medical specialists. Even for professionals, in fact, these images remain highly symbolic. Think of the sonographic representation of a foetus in the womb, the only medical image familiar to most laymen nowadays, and its uncanny relation to a living human baby: no matter how useful the clinical information offered may be, electronic images do not resemble in any way what the actual flesh and blood inside the body is—what it looks and feels like.

The first and only truly trustworthy knower of the body is instead the subject itself, its owner—a human being experiencing his or her life, functions, shape, bulk, and temperature. In the case of guts, this involves feeling full or empty, sensitive, or tense; experiencing nutrition, digestion, evacuation, and pregnancy; and of course illness and suffering. The interface between these two positions—the subject directly feeling the body as its own and “self”, and the observer and interpreter of others’ bodies from the outside (be it as doctor, scientist, layman, artist...)—is the theme of this collection, and the images and objects in these pages aim to continually negotiate their role between these viewpoints.

Beyond divisions

Comparative Guts collapses these and other boundaries: not only the first and foremost, between subjective and objective body, but also largely conventional boundaries between regions of the world, whether linguistically, nationally, or culturally intended, as well as those which separate historical periods from one another. In collecting these multifarious testimonies, the overarching principle was to avoid making the “West”—Europe or the Graeco-Roman tradition, as its self-styled cradle and fulcrum—a privileged place of observation, but to combine, match, and shuffle images together to let first impressions, individual responses, and even chance have their effects.

The traditional separation and implicit ranking of disciplines and cultural contexts (science and medicine, art, biological research, philosophy, religious belief, funerary practices, craftsmanship) are challenged here at the same time. The purpose of an image is ultimately a guess as well as a construct: a medical table or a votive offering can simultaneously be a beautiful art object and a means to a professional or religious end; Hayv Kahraman’s stunning paintings (pp. 206–209) are materially painted on a material produced by microbial activity, flax fabric, in this way *being* life as well as depicting it; Katharina Sabernig’s knitted objects (pp. 90–93) explain, entertain, represent, delight, and—one imagines—offer an experience to the artist and scholar as she brings them into existence, all at once.

The separation between senses also becomes unsafe terrain. Sight is always dominant, of course, when images are involved. But other senses too concur to the representation of our

body: surely smell, touch, and, perhaps counterintuitively, feeling, the essence of the body's first knowledge of itself, the "invisible", proprioceptive body experienced by the blind, but also by all human beings, as we first come alive into this world. The resulting, multi-sensorial—one might say, "synesthetic"—image of the body is expressed and communicated to others through language as much as through gesture, craftsmanship, or dance.

There are geographical regions, time regions, sensorial regions, and regions written on the flesh, the body parts medical books and pharmaceutical prescriptions teach us to map and distinguish. Contemporary biomedicine has accustomed us to classifying the inside of our body into organs, systems, and tissues indicated by precise technical names, parts clearly distinguished by function and position. Comparative Guts also challenges this ultimate prejudice, the illusion of anatomy—a word from Greek, meaning the "cutting" (*anatomein*) or chopping into parts of a cadaver to dismember and extract its components. As anyone who has assisted at an autopsy or worked as a butcher knows, the inside of the body does not resemble a well-fitted puzzle figure, but is a far more obscure and unfamiliar, viscid pulp. Order, names, and functions are introduced by doctrine and culture and do not pre-exist them. Different cultures, readers, and purposes have seen very different worlds inside the animal body and have drawn different landscapes composed of different parts, variously combined, some named, some known but left anonymous, some ignored.

During the course of the creation of Comparative Guts, modern anatomical terminology soon came to seem inadequate and forced, and the absurdity of superimposing modern terms such as "stomach", "intestine", "liver" as a blanket set of definitions on such diverse material rapidly became apparent. For our purposes, "guts" refers to everything inside the lower torso, the organs and parts traditionally linked to nutrition and digestion but also endowed with emotional, ethical, and metaphysical significance, depending on the representation and narrative. A more neutral and original categorisation, visible in the online exhibition, emerged: a sensed, volumetric one. Three categories, "solids", "coils", and "wholes", were created to express the most basic phenomenology of the living body: "solids" for the fleshy organs (such as those referred to in English as the liver and the stomach, experienced as thick and hollow, whether empty or full); "coils" for parts endowed with complexity, folds, and flexibility, experienced as routes along which fluids move or withdraw, and emotions perhaps wash and rage (the intestines, but not them alone); and finally "wholes" (for the guts understood as part of a coherent whole, be it continuous or assembled, the projection of the person as a unity).

Comparison in print

A printed catalogue of course requires order and structure of presentation more than a website does, and this was an additional challenge. On the website, different sections or Histories were displayed to the visitor in a varying, random order, defying chronological or regional grouping. For the printed catalogue, we have opted instead for a value-neutral alphabetical order. If Histories and sections remain unavoidably separated from one another in the printed pages, the conventionality of the arrangement is made as explicit as possible: over the course of our conversations, it became evident that the interconnections, borrowings, associations, and imitations between one area, culture, or even text and others were too intricate to fit a horizontal map or linear chronology. Asian traditions responded to and became interlaced

with Hellenism; the Babylonian world, Ancient Egypt and Classical Greece share common roots and aesthetics; it is the province of art to escape fences and boundaries and express the body as protagonist of change and transfer, be it in immigration, growth, illness, or death (see the contemporary artworks analysed by Brooke Holmes, pp. 194–205). And to pose clear-cut divisions that oppose ancient to late antique, medieval to renaissance, or contemporary to classical, would be equivalent to forcing scholastic pedantry onto life itself.

A final insight—the synesthetic nature of the body—was further explored by the artist, and blind person, Silja Korn (pp. 184–187) and the historians of science and olfactory experts Victor Golubev and Sean Coughlin (pp. 150–157), who proposed a reconstruction of the “smell of guts”. In addition, opening our imagination about the body beyond the visual dimension led to a particularly valued outcome, as we accepted the challenge to attempt an inclusive move: to share the various body images in our collections with a visually impaired public. Thanks to the generous support of the Inklusionsfonds of the CAU University in Kiel, the online exhibition includes provisions for the blind in the form of descriptions of a selection of the images on display.

In conclusion, by offering access to culturally, socially, historically, and sensorially different experiential contexts, *Comparative Guts* allows the reader a glimpse into the variety and richness of embodied self-definition, human imagination about the physiology and functioning of human and animal bodies, our embodied exchange with the external world, and the religious significance of the way we are “made” as living creatures. The deep dive into difference offered here is simultaneously an enlightening illustration of what is common and shared among living beings.

Acknowledgments

I should begin by thanking the participants in *Comparative Guts* who chose the images presented here and wrote the accompanying texts, as well as Angelika Messner of the China Zentrum at the University of Kiel for her insights and cooperation, and in particular her support as Editor of the Chinese materials. I am grateful to the artists who allowed us to publish their work, and to the institutions who gave us permission to print images from their collections. Special thanks are due those who physically made it possible for the book to come into the light (and, before that, for the website to be completed): Christoph Geiger, who designed the digital exhibition and then this volume as well, and Dana Zentgraf, who looked after all aspects of practical organisation, image sourcing, and questions of copyright. Last but not least, I thank the DFG-funded Cluster of Excellence Roots at the CAU in Kiel for generous sponsorship of this project from the start; the Subcluster Knowledge and especially Andreas Schwab for its support; the Inklusionsfonds at the CAU, with Eddi Steinfeldt-Mehrtens as Diversity Commissioner, whom I managed to persuade that body history had the potential to build bridges of inclusion and outreach.





1

3

2

ANCIENT EGYPT

Rune Nyord

Art History Department, Emory University

INTRODUCTION

The Ancient Egyptian culture lasted over 3000 years in and around the Nile Valley in northeast Africa. The river Nile and the fertility brought by its annual inundation strongly shaped the landscape. Most settlements were located on the river's banks, leading to a sharp contrast between the fecund "Black Land" (Kemet) of the Nile Valley and the "Red Land" (Desheret) referring to the surrounding deserts. At the height of its empire in the late Bronze Age, Egypt's sphere of dominion stretched from the Sixth Cataract of the Nile in modern-day Sudan in the south to modern-day Syria in the north.

The long span of its history is divided roughly into three "Kingdoms" when the whole of Egypt was under the rule of a single king, the Old (ca. 2686–2181 BCE), Middle (ca. 2125–1773 BCE), and New (ca. 1580–1069 BCE) Kingdoms. The three kingdoms are separated by periods during which more than one ruler laid claim to kingship over the land, known respectively as the First (ca. 2181–2125 BCE), Second (ca. 1773–1550 BCE), and Third (ca. 1069–664 BCE) Intermediate Period. The time between the Third Intermediate Period and the conquest of Egypt by Alexander the Great in 332 BCE is known as the Late Period.

Surviving Egyptian texts for healing and protection of the body attest to detailed thinking about, and conceptual modelling of, the internal structure and processes of the human body. Similarly, the appearance of internal organs would have been well-known from mummification practices. Yet, depictions of human internal organs are virtually unknown in ancient Egypt. When the hieroglyphic script or related iconography needed depictions of internal organs, notably to write the words for them ideographically, they instead had recourse to animal body parts known through practices of butchery. Thus for example, the sign for the word *qꜥb* “intestine, coil” (fig. 1) likely depicts the animal, rather than human, intestines—although admittedly the high degree of stylization makes this less obvious in the case of this particular organ. In texts and language, the inside of the body, and the processes taking place there, were of immense importance. In healing practices, a system of conduits (*mtw*) was theorized, which linked the different parts of the body, and their proper connectivity and contents were imperative for the patient’s health.

More generally, the inside of the torso was regarded as the seat of thought and emotion, and the ability to access this hidden realm of internality was an important skill for the successful official. The guts were not generally singled out in this “metaphorical” understanding of the inside of the body, but they no doubt formed part of the larger complex. The non-literal qualities associated with the “intestine”-sign (fig. 1) relate mostly to its spatial properties so that “in the intestines” (*m-qꜥb*) is used to mean “inside, in the midst of”, while the wider use of the sign connects it to verbal meanings like “move around”, “turn around”, “reverse”, and so on. The few exceptions from the practice of omitting intestines from imagery are found in the case of butchered animals. There is good, non-pictorial evidence for intestines of animals being used for various purposes, and correspondingly there are a few cases where intestines that have been removed, cleaned, and hung for drying are depicted as part of detailed butchery scenes (fig. 2). However, even in this context, they are not among the typical cuts of meat depicted, perhaps because they lacked prestige in the cultic, and generally elite, context in which such depictions were found. An especially characteristic role of the intestines in ancient Egyptian culture is that, along with other internal organs, they were removed from the body during mummification and placed in so-called canopic jars (fig. 3). In this connection, the individual viscera were each associated with a deity, the god traditionally linked to the intestines being the falcon-headed Qebehsenuef. The purpose of this was to effect the transformation of the body into that of a divine ancestor on the model of the god Osiris.

Hieroglyph from the obelisk of Thutmose III at the Constantinople Hippodrome

Wikimedia Creative Commons (CC BY-NC-SA 4.0)

The hieroglyphic sign F46 depicts coiled intestines, abstracted to the point of forming a regular, oblong spiralling shape. As with other internal organs used in Egyptian iconography, the intestines depicted are almost certainly those of an animal, as would have been familiar from butchery practices. By contrast, human organs, although they would have been known from practices of mummification, were not usually depicted, nor did they form part of the iconography of the hieroglyphic script. The sign is used to write the word *qꜥb* "intestine, coil", a word which is also used in a compound preposition meaning "inside, in the midst of". This hieroglyph also finds use as a so-called determinative to mark various verbs with meanings related to "going around" or "turning".

Wall scene from tomb of King Ramesses III (KV11)

Photo: Matjaz Kacicnik, Theban Mapping Project

The fragmentary wall decoration of this chamber depicts butchery and cooking activities connected to the funeral or mortuary cult of the tomb's royal owner. On the right wall a man is seen butchering a bound ox, while the back wall of the niche shows several men engaged in preparation of meat. To the right of the triangular cuts of meat hung for drying are seen long, thin strips similarly suspended, offering a relatively rare depiction of the intestines of a butchered animal. The rarity of such depictions contrasts with the information coming from other sources indicating that intestines were used for a variety of purposes; their near-omission from the pictorial record is likely due to the intestines not being counted amongst the most prized and prestigious parts of the animal.

Canopic Jar Representing the Deity Qebehsenuef

Photo: Metropolitan Museum of Art

During mummification, the internal organs (excluding the heart, which was generally left in place) were taken out of the body and placed in special containers known in Egyptology as canopic jars. Traditionally, the four canopic jars were connected to four mythological figures known as the Sons of Horus, often reflected iconographically by shaping the stoppers of the jars as the heads of these entities. The resulting compartmentalization and personification of the internal organs formed part of the bodily transformation of the deceased into an ancestor modelled on the fate of the god Osiris (the ancestor of Horus and hence also his four sons). The falcon-headed deity Qebehsenuef depicted here was traditionally connected with the intestines, and the jar carrying his effigy was thus intended to contain the intestines after mummification.



AFRICA

Thomas Cousins

School of Anthropology and Museum Ethnography,
University of Oxford

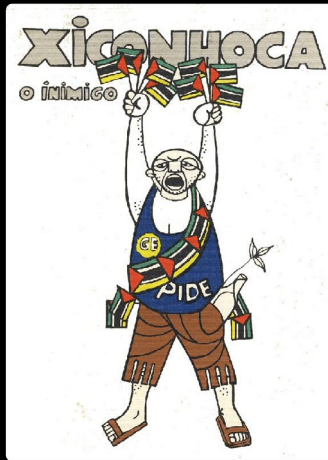
INTRODUCTION

Southern Africa *Umuthi Wenyongo*—medicine (that rebalances) bile

In southern Africa, *inyongo*—bile—is vital to bodily and cosmological wellbeing. Bile is a potent life-giving substance that must be in correct balance at all times—too much and too little are both dangerous states, and are tied to social relations, both with the living and the dead. An imbalance of *inyongo* is a “polluting” state: *umnyama*, literally “darkness of the night.” The darkness is symbolically seen as representing death while daylight represents life. *Umnyama* is a term used to represent death or “near death” and is often translated as pollution because of a lack of a better English word to convey this complex concept. In Zulu and Xhosa cosmologies in South Africa, pollution is seen as a marginal state believed to exist between life and death. It is conceptualized as a mystical force that diminishes resistance to disease and creates conditions of misfortune, disagreeableness, and repulsiveness. A class of popular, commoditized curatives, known as *izifo zonke* (“all diseases”), operate on the gut to rebalance bile, purify one’s blood, and restore strength (*amandla*) and health (*impilo*).

In Southern Africa, symbols and techniques of bodily wellbeing are very old and widely distributed, and have also changed in response to social and political histories of changing societies. In the wake of the HIV epidemic in southern Africa that began during the 1980s, curing and healing involve techniques and substances that “cleanse the body” (*ukuhlanza umzimba*) or “cleanse the blood” (*ukuhlanza igazi*), and rebalance schisms in social relationships. Many afflictions are cured by an enema or by “spewing.” Two types of substance dominate popular curative markets: *izifo zonke* (“all diseases”) that operate by “cleansing the body” through purgative and emetic properties; and “immune boosters” (in English and in vernacular usage). A huge plethora of materia medica, composed of indigenous flora and fauna, as well as synthetic and industrial substances, are creatively deployed by healers, herbalists, and more opportunistic entrepreneurs, and are described as *muthi* (often translated as “traditional medicine”), such as herbs, trees, animal fats and organs. Also popular are “Dutch medicines”, “Chinese medicines”, and “Indian medicines”, along with paraphernalia for use by faith healers, such as purified water, incense and candles, as well as soaps, creams, bath salts, and sexual performance supplements.





All these folk remedies are highly commoditized and standardized, manufactured synthetically in cities such as Johannesburg and Durban. While newly industrialized, these substances recapitulate much older symbols and practices concerning well-being and affliction known as *ngoma* (song, rhythm, or drum of affliction)—a term used in many Bantu languages for a set of healing practices and discourses centered on the interpretation of misfortune and the treatment of affliction. It is no small irony that two brands currently popular in South Africa are named *Impilo* (life) and *Ngoma* (song/drum of affliction)—life in a bottle, the promise of health as that which is purged.

Central Africa: *Nkisi*—power figure

The Bakongo people, from Central Africa, have a complex cosmology, often understood in terms of animist or syncretic religious ideas. While religious ideas have certainly been transforming since the 16th century arrival of Christianizing Europeans, Kongo “power figures” (*nkisi nkondo*) remain well known. *Nkisi* (plural: *minkisi*) is often translated as “spirit” or “holy” (an effect of Christian translators), and understood as a container of sacred substances which are activated by supernatural forces that can be summoned into the physical world. These *minkisi* take a wide variety of forms, from simple pottery or vessels containing medicinal herbs and other elements determined to be beneficial in curing physical illness or alleviating social ills. Sometimes, *minkisi* take the form of small bundles, shells, and carved wooden figures. Thus *minkisi* have the ability to both ‘contain’ and ‘release’ spiritual forces, with both positive and negative consequences for social life.

Nkisi nkondi figures are highly recognizable through an accumulation of pegs, blades, nails or other sharp objects inserted into its surface. Medicinal combinations called *bilongo* are sometimes stored in the head of the figure but frequently in the belly of the figure which is shielded by a piece of glass, mirror or other reflective surface. The glass represents the ‘other world’ inhabited by the spirits of the dead who can peer through and see potential enemies. Elements with a variety of purposes are contained within the *bilongo*. *Minkisi*, each with meaningful postures and gestures, are containers of powerful substances that are packed into body orifices or within a visible medicine pack on the torso sealed with a mirror, thus have the power to protect, heal, or destroy.

Umuthi wenyongo

A bottle of healing medicine manufactured by a company trading as 3Sixty Herbal Health, with a product line called “Ngoma”. “Umuthi wenyongo” is an isiZulu term for “herbal medicine of bile”.

Umuthi wenyongo: these ideas about pollution and purging of the gut are very old in southern Africa, and yet have also been changing rapidly over the last 150 years, in response to colonialism and conquest. These curative commodities, while similar in form over the last century in response to the demands of colonial systems of migrant labour to mines and cities, became hugely controversial in the 2000s in the era of “AIDS denialism” led by the former President Thabo Mbeki.

Nkisi power figure: Mavungu

Held in the Pitt Rivers Museum, Oxford. 1900.39.70. Figure carved of wood and painted, studded with iron nails and implements; a ‘power figure’. [JC 27/9/2001]

Kongo nkisi: *nkisi* are controversially known as “nail fetishes” and famously trouble the Western concept of “animism” and African religion. The concept of the fetish is in fact not at all “traditional” and emerges from the colonial encounter on the Gold Coast in the 16th century. *Nkisi* all have powerful substances stored in an orifice in the “belly” of the fetish, and their usage connects with concepts and techniques across Eastern and Southern Africa that focus on the gut as a central site of intervention into wellbeing, personal, collective, and cosmological.

Mun (Mursi) belly painting

Photographer: Kate Fayers–Kerr

Mun Mursi belly painting: the *Mun* (Mursi) use mud and clay as a technique for grounding self and society in social, political, and cosmological space and order. Fayers–Kerr has persuasively shown how *Mun* painting and ideas about eating earth are closely connected to ideas about the gut, ingestion and digestion, and location. This photograph shows two men applying mud to their bodies (“eating mud”) as part of a ceremony of arriving and adapting to a place (and thus “vaccinating”). The drawing shows children’s conceptual schema of the importance of the belly and its scarification as part of the broader complex of Mursi ideas about eating mud and personhood.

The Mursi (or *Mun* as they refer to themselves) are a Surmic ethnic group in Ethiopia. They principally reside in the Debub Omo Zone of the Southern Nations, Nationalities, and Peoples, close to the border with South Sudan.

"Eating clay" is a common expression for the *Mun* (Mursi) of southwest Ethiopia; people describe activities or people in the same way one would speak of eating food. For example, one's girlfriend or a sexual encounter with someone are often spoken of as being "sweet" or "delicious". To ask someone if they have received their bridewealth payment one asks *Bio wa baku?*, "Have you eaten the cattle?" Or *bio am noi?*, "Who ate the cattle?" Thus, what are called "body arts" or "body painting" glosses over the role of clay in constituting relations with others; in healing action on the body; and also in mediating local experiences of the environment. Vernacular terminologies around "body painting" suggest a fluidity between eating, living, body painting and dwelling in a place.

"In English we speak of consuming culture, art, etc and also of one's energy or vitality consuming or being consumed by something or someone. Likewise, in English we can speak of the *Mun* consuming clay through body painting, consuming goods such as cattle, and consuming someone or something through appropriation or absorption. In particular the absorption and transference of energy captured by the term 'consume' is compatible with the ways in which local bodiliness and personhood involve permeability between other people, places, and experiences of the environment. ... notions of consumption of earth and places have helped to develop an awareness of how locals become consubstantial with their environment. The local blurring of experiences of 'eating clay' and 'eating where one lives' is what inspired ... interest in processes of becoming consubstantial with a community, an earth or a place" (Fayers-Kerr 2013: 7).

Contemporary African art captures several popular tropes of belly, gut, and intestines in social and political life (see figg. 4, 5, 6).

In many parts of Africa, the belly, the gut, and intestines, are important sites of concern for bodily, social, and cosmological wellbeing. Ritual and mundane action directed at the gut seeks to augment powers of all kinds, and suggests an understanding of personal, social, and cosmological wellbeing and affliction that reveals the delicate relations between bodily, social, and ecological orders of life. References to belly, gut, and intestines, are powerful tropes in analyses of political life in Africa. In particular, Jean-Francois Bayart's *The State in Africa: The Politics of the Belly*, uses the Cameroonian term "politics of the belly" to describe patron-client relations in West African politics. Politicians distribute goods – filling the bellies of clients – in return for political loyalty, obviating the need for democracy and instituting alternative and sometimes moral forms of accountability. Nicolas Argenti describes the political history of the Cameroon Grassfields in terms of the "intestines of the state". The palace of the chiefdom of Oku is known as "the intestines of the state" (*əbtcc kətum*; Bah 2004, 436). "Not only in French but also in the autochthonous languages of Cameroon, eating and the belly connote power and its abuses. In Eblam Ebkwo, the language of Oku, as in many of the languages of the Grassfields, being installed as a *fon* (chief) is referred to as 'eating' the throne (*sə jie kətie*), and inheriting or consuming wealth is known as 'eating' it."

In this political cosmology, the belly is therefore the locus of power, and witches are often said to contain their power as an animal or substance residing in their belly or bowels. It is this set of tropes of eating as an economy of power, desire, and venality that lends the palaces of the Grassfields their key metaphor as the intestines or bowels of the state. In more schematic terms, Achille Mbembe's brilliant text *On the Postcolony* (2001) brings together mouth, belly, and phallus into a broader analysis of the body as the principal locale of the idioms and fantasies used in depicting power. What is important is the conjoining of irony, humour, critique, fantasy, of life conditioned and responsive to "commandement", colonial power: "If indeed it is the festivities and celebrations that are the vehicles for giving expression to the commandement and for staging its displays of magnificence and prodigality, then the body in question is first a body that eats and drinks, and second a body that is open—in both ways: hence the significance given to orifices, and the central part they play in people's political humor" (Mbembe 2001: 107). What is particularly striking about images, symbols, and practices relating to the gut across Africa is the richness and sheer diversity of significations that give the gut, and related body parts, such power in everyday life, as well as in religious, political, and cosmological life. While every society across Africa understands the gut to be implicated in moral personhood, bodily wellbeing, and the ordering of collective life, the patterning of related symbols and practices is delicately sensitive to the ecological contexts and historical contingencies of social and cultural change and innovation.

My culture

Oil painting by Themba Siwela, South African artist

Achille Mbembe, in his “On the Postcolony,” showed how public art forms have been important sites of critique and commentary that reveal the form and nature of power and its operations in postcolonial African societies. This kind of analysis of art is important because it undermines the notion that Africans do not have a representational form or tradition through which publics are constituted and politics are contested.

In this light, Themba Siwela’s painting “My culture” is a brilliantly ironic critique of the way in which the use of enemas for many Zulu people in South Africa is a key index of the purity of cultural performance, of Zulu identity, and of the changing mores and ideas about bodily wellbeing and health in the time of HIV and AIDS denialism. Public debate about the place of culture and ideas about ethnicity have been a central feature of public life in South Africa, particularly in KwaZulu–Natal province because of its controversial role in complicating the 1994 negotiated settlement that heralded the end of the system of the legalised racial discrimination known as apartheid.

In South Africa, and in many other parts of southern Africa, many people use enemas and purgatives in both daily techniques aimed at wellbeing and in specialized ritual. In this painting, the South African artist Themba Siwela subjects the Zulu practice of daily enemas to ironic critique.

Stomach infrastructure

In Nigeria, “Stomach infrastructure” is a term that came to prominence following the campaign for the governorship of the province of Ekiti State in 2014, when Ayodele Fayose won a controversial election after promising to provide “stomach infrastructure” by using funds intended for other purposes to end hunger. It is claimed—though not confirmed—that Fayose distributed 80,000 chickens and 100,000 bags of rice as part of his election bid. The campaign, and Fayose’s victory, triggered a debate over whether the primary purpose of government should be to pursue long-term strategies in order to improve public services and grow the economy (i.e. “national infrastructure”) or to satisfy short-term needs by distributing food handouts (i.e. “stomach infrastructure”). It fast became a popular term of ironic critique and characterisation of bad policy and governmental action. This has been a major topic of public debate and political analysis and connects directly to older theories of power and governance in Africa (such as those of Bayart and Argenti). The point is to show how the stomach, gut, belly, intestines, continue to be key sign vehicles for political and social life.

Xiconhoca, the enemy

Cartoon published by the Mozambican Liberation Front's Office of Mass Communications in 1976

Xiconhoca: this figure was created by the post-revolutionary socialist state as a key means of mobilising moral and political critique of corruption in the service of the new postcolonial nation. It had a second life in the era of AIDS and access to HIV treatment in Mozambique as a means of reflecting not only on new forms of corruption, but also the experience of taking anti-retroviral treatment on an empty stomach.

The *Xiconhoca* caricature was an embodiment of the "enemy of the revolution". His key feature was a protruding gut, which emphasized his greed, symbolizing the illegitimate accumulation and corruption that threatened to undermine the newly decolonized nation. Designed and published by the Mozambican Liberation Front's Office of Mass Communications in 1976, the serialized *Xiconhoca* comic satirized the politics of consumption and corruption, providing a vehicle for humour and critique in the hard times that followed a long and bloody civil war. In Katrina Spencers words, "The character's name captures images of violence, trickery, and betrayal: *Xico* coming from an infamous law enforcement officer, *Xico-Feio*, and *nhoca* meaning 'snake' in many indigenous languages in southern Africa".

Argenti, N. 2007. *The Intestines of the State: Youth, Violence, and Belated Histories in the Cameroon Grassfields*. Chicago: University of Chicago Press.

Bah, N. 2004. 'Ntok ebkuo. A Western Grassfields' Palace (Cameroon)' *Anthropos* 99: 435–50.

Bayart, J.F. 1993. *The State in Africa: The Politics of the Belly*. New York: Pantheon Books.

Cousins, T. 2015. 'A Mediating Capacity Toward an Anthropology of the Gut.' *Medicine Anthropology Theory* 2 (2): 1–27.

Cousins, Thomas. 2023. *The Work of Repair: Capacity After Colonialism in the Timber Plantations of South Africa*. New York: Fordham University Press.

Fayers-Kerr, K. N. 2019. 'Becoming a Community of Substance: The Mun, the Mud and the Therapeutic Art of Body Painting.' In Attala, L., Steel, L. and Zinn, K.(eds.) *Body Matters: Exploring the Materiality of the Human Body*. Cardiff: University of Wales Press, 109–133

Mbembe, A. 2001. *On the Postcolony*. Berkeley: University of California Press.

Mudimbe, V.Y. 1988. *The Invention of Africa: Gnosis, Philosophy, and the Order of Knowledge*. Bloomington, IN: Indiana University Press.

Ngubane, H. 1976. 'Some Notions of "Purity" and "Impurity" among the Zulu.' *Africa: Journal of the International African Institute* 46 (3): 274–84.

Walker, R. A. 2009. *The Arts of Africa at the Dallas Museum of Art*. New Haven and London: Yale University Press, 162–163.



MESOAMERICA

Christophe Helmke

Liv Green

Louise Bjerre

Institute of Cross-cultural and Regional Studies
University of Copenhagen, Copenhagen, Denmark

THE AZTEC AND THEIR PREDECESSORS by Liv Green

Mesoamerica is a cultural and linguistic area that geographically spans from northern Mexico all the way down to Costa Rica. The region is characterized by shared cultural and linguistic traits such as a series of ritual calendars, the cultivation of maize, chili, and squash, different writing systems, and the construction of monumental architecture, to name but a few. The most renowned ancient civilizations of the area are the Maya and the Aztec, but other important cultures such as the Olmec, Zapotec, and Mixtec also thrived in this area.

The Aztec are especially known owing to their interaction and eventual defeat by the Spaniards. From the conquest (1519–1521) and the decades leading up to this pivotal period, we have a range of texts written by both Europeans and indigenous people, that extensively describes the Aztec, their customs, and traditions. In the centuries before the conquest, the Aztec empire was one of the largest empires in the Americas. Thus, large parts of Central Mexico and beyond was either directly or indirectly under control and drawn into tributary relations with the Aztec state (ca. 1325–1521 CE).

According to early ethnohistorical accounts, the Aztec traced their cultural inheritance to the Toltec, an earlier culture that had its capital at a place called Tollan. Most scholars today recognize the archaeological site of Tula in Hidalgo, to be the same as the Tollan mentioned in the ethnohistorical accounts. The Toltec state was at its height during the transition from the Epiclassic period (ca. 600–900 CE) into the early Postclassic period (ca. 900–1200 CE). Furthermore, the Aztec had a strong cultural connection to the people who inhabited the site of Teotihuacan, just north of the later Aztec capital. Much of Aztec architecture and religious practices can be directly linked to the cultural inheritance from Teotihuacan via the Epiclassic states that flourished after the collapse of Teotihuacan in the sixth century. The metropolis of Teotihuacan had its heyday during the Classic period (ca. 150–600 CE) and was known by the Aztec as the place where the gods convened to sacrifice themselves to bring about a new sun of the current creation.

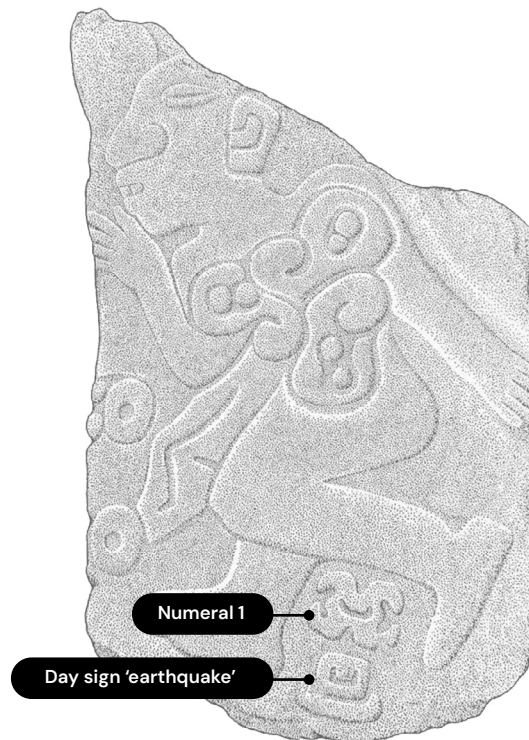




Early Zapotec stone relief of a sacrificial victim with a disembowelled abdomen

Site: San José Mogote; Culture: early Zapotec; Date: Early Preclassic (ca. 600–500 BCE);
Context: Corridor between Structure 14 and 19, Monument 3; Medium: Stone relief;
Figure credit: Drawing by Mark Orsen

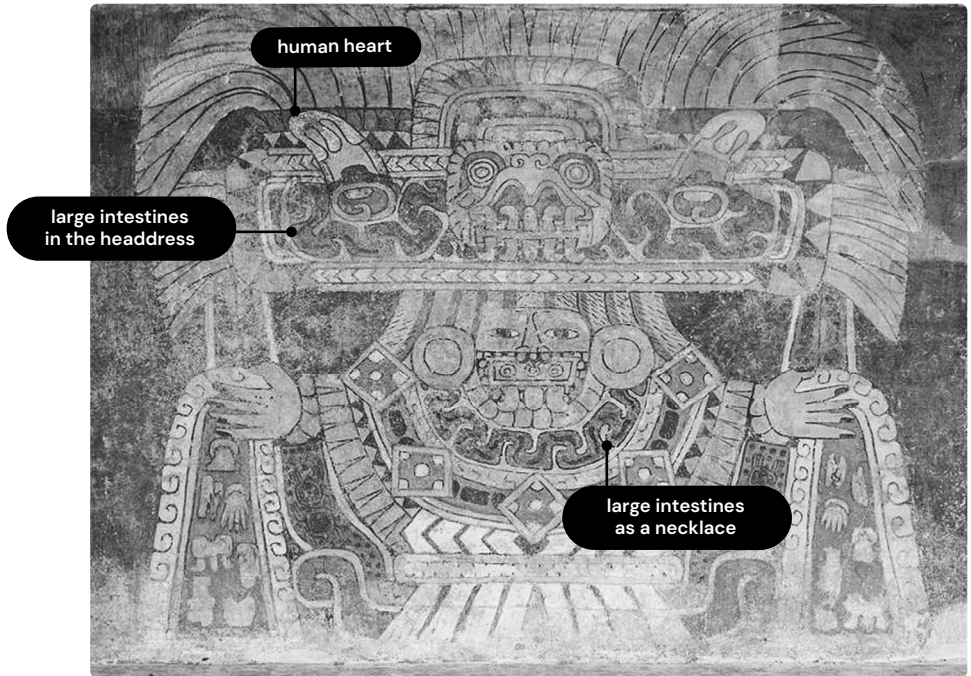
Placed as a step at the head of an hallway, the stone was set with its carved surface upwards. As such, this monument almost certainly served as a step-pingstone, which all visitors would be forced to tread upon, during their entrance. The contorted figure is reminiscent of the so-called *danzantes* motif, seen elsewhere in Oaxaca, which were thought to represent dancing figures. Today, however, it is commonly acknowledged that the individuals portray slain and eviscerated victims. The figure in this case, is naked with scrolls emerging from the central abdominal, illustrating the bowels or guts. The eyes are closed, illustrating an individual that is dead. The two glyphs accompanying the individual at the bottom of the monument, may provide the name of the individual. The lower circular glyph designates the numeral 1, whereas the upper glyph renders the glyph for “movement, earthquake”, thereby providing the reading “1 earthquake”. (Liv Green)



Depiction of a mortuary bundle at Teotihuacan, here adorned with human hearts and intestines

Site: Teotihuacan; Culture: Teotihuacan; Date: Early Classic (ca. 250–550 CE); Context: Tetitla, Portico 11, Mural 3; Medium: Polychromatic mural painting; Archivo del proyecto 'La pintura mural prehispánica en México', Instituto de Investigaciones Estéticas, UNAM. Photograph by Carlos Martínez Rosas Landa, 2019

Long thought to represent one of the salient female deities of the ancient pantheon of Teotihuacan, this depiction is now much better understood as a complex combination of elements of writing, juxtaposed into a glyphic compound. In fact, rather than a deity, this glyphic compound records a particular toponym—perhaps naming the very building that is adorned by this mural, as a type of charnel house. The central figure represents a mortuary bundle, which has been given a living guise, through the greenstone mask, earflares and necklaces, as well as the prominent headdress that adorn the mummy. The mortuary themes are highlighted by the two human hearts that are embedded in either end of the headdress, as is the large intestines that are draped across the headdress, and which also serves as one of the necklaces. The hands that jut out on either side appear to conduct a so-called scattering rite, an emulation of agricultural sowing, in a sign of fertility emanating from death. (Christophe Helmke)



Battle scene at Cacaxtla, showing captives whose entrails are gush out of the severed abdomen

Site: Cacaxtla; Culture: Epiclassic; Date: Epiclassic (ca. 650–850 CE); Context: Building B, western talud; Medium: Polychromatic mural painting; Archivo del proyecto 'La pintura mural prehispánica en México', Instituto de Investigaciones Estéticas, UNAM. Photograph by Ricardo Alvarado / Drawing by Citlali Coronel

This elaborate and colorful mural of a tortuous and bloody battle, is reminiscent in many ways to the murals found at the Maya site of Bonampak. At Cacaxtla, we see a defeated individual cast to the ground at the bottom of the scene. The vanquished individual is depicted almost naked, with the exception of a headdress in the form of a bird. The naked body has been slashed open, with blood dripping on the ground from large open wounds. Furthermore, an open wound along the lower abdomen reveals the guts, spilling out of the person, which are marked by a bright yellow color. In contrast, the attacking warriors are fully clothed, and wearing garments related to spotted felines, quite likely jaguars. These feline and avian warriors possibly represent the different warrior-orders, here locked in the din and death of battle. (Liv Green)



Depiction of an eagle devouring a human heart at the site of Tula

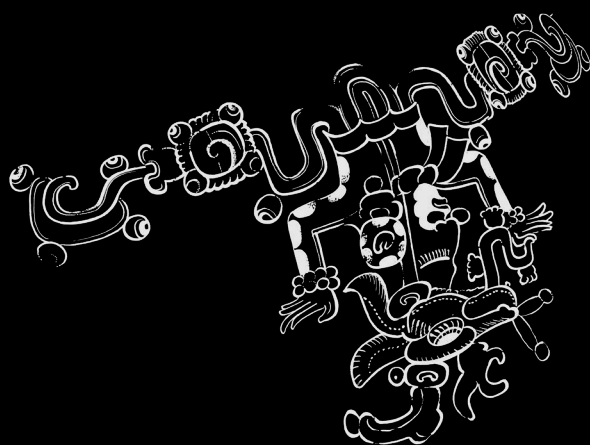
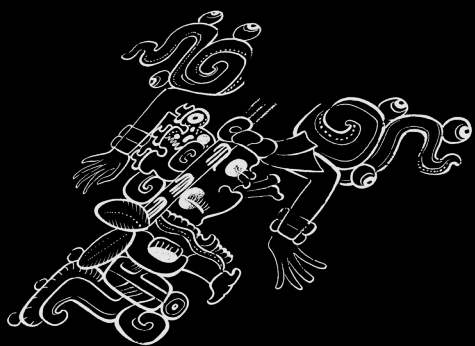
Site: Tula; Culture: Toltec; Date: Early Postclassic (ca. 900–1200 CE); Context: Pyramid B; Medium: Stone relief; Metropolitan Museum of Art, Public Domain

Ornamenting the sides of the imposing Pyramid B at Tula, a wide range of felines, coyotes, and eagles are depicted devouring hearts. The eagle reproduced here, is carved in a low relief on a stone panel, and is seen clasping a stylized heart in its one claw, as it bites down with its beak. Hearts are similarly represented in central Mexican imagery, as seen in the iconography of Teotihuacan (see fig. 2), Cacaxtla (see fig. 3) and Tenochtitlan (see fig. 5). The entire iconographic program of Pyramid B concerns warfare and military orders and this panel fits squarely in those themes. These animals depicted were important totemic animals of war and warriors for the whole of central Mexico, almost serving heraldic functions in the representation of distinctive warrior orders, associated to different predatory animals. The devouring of hearts represents not just predatory acts but spell out the titles of a particular caste of warriors, who were known as the “devourers of hearts”. (Liv Green)

Stylized heart rendered in sheet gold, found in an offering at the Aztec capital Tenochtitlan

Site: Tenochtitlan; Culture: Aztec; Date: Late Postclassic (ca. 1486–1502 CE); Context: Templo Mayor, Offering 167; Medium: Cold-hammer gold with incisions; Photograph by Mirsa Islas, courtesy PTM

The heart occupied a privileged place in Aztec culture. Researchers have often over-emphasised the role and place of hearts in sacrificial rituals conducted, on occasion, by ritual specialists. In so doing, they have often overlooked the vital place occupied by the organ in the ideational landscape of the Aztec and the Nahuatl-speaking populations of Central Mexico. Thus, the heart was and is deemed the locus of humours and moods. In this respect, note the use of *yōl(li)* “heart” in the following words for “happiness”, “enjoyment” and “great contentment” in Nahuatl: *yōl-cēuhtoc*, *yōl-pāquic*, *yōl-pāquilitli*, *yōl-quīzac*, *nel-yōl-quīzalitzli*, *yōl-ahahuia*. Interestingly, one of the golden hearts found in the same offering as that represented here, had been bent and deformed before being interred, perhaps cueing, quite literally, a *yōllo-necuīl*, “bent heart”—as remarked by our colleague Leonardo López Luján who discovered this offering at the base of the great Aztec temple. (Christophe Helmke)





Maya civilization is one of the most renowned of the high cultures of Mesoamerica. The Maya area encompasses the southern parts of Mexico, the entirety of both Belize and Guatemala, and the westernmost parts of Honduras and El Salvador.

The Maya people are best known for their lengthy hieroglyphic inscriptions relating the history and deeds of the elite. This is often accompanied by calendar records that pinpoint these events to specific dates in their ritual calendar. They built spectacular temples and other monumental structures including monuments with elaborate imagery depicting different rituals, inauguration ceremonies, ballgames, and other significant events.

Furthermore, the Maya civilization is also well-known for its great and sudden collapse at the close of the Classic period (250–950 CE). The cause of this collapse is still debated, but it is likely due to a combination of different factors possibly including environmental stresses such as drought, leading to competition over resources and the intensification of warfare. Yet the Maya survive and have passed on their culture and traditions to this day. Today the modern Maya continue to incorporate many of the traditions and cultural traits of their ancestors especially concerning food preparation and traditional dishes, conceptions of the body, and of course more ritual and ceremonial events have survived to present, at times merging these with European culture and religion.

6

Mythic battle between a crocodilian creature and with the entrails spilling out of the defeated humans

Site: Becan; Culture: Maya; Date: Early Classic (ca. 250–400 CE); Context: Structure 9; Medium: Polychromatically painted ceramic vessel; Figure credit: Drawing by Christophe Helmke; Photograph by Jorge Pérez de Lara

The setting is a mythic battle in primordial times, pitting a large reptilian monster against three human figures. The crocodilian monster, with its crested head, its open maw, and elongated claws has thoroughly defeated the on-slaught and has chewed over the human assailants, who still limply wear their headdresses. In grisly fashion, each human is shown defeated, upside down, chewed in half, their entrails spilling out in swirls of blood. The viscera of the central figure terminate in two larger elements that denote some vital organs. This is one of the few scenes that so clearly represent the viscera in Maya art, and still stylised forms permeate the scene. Here we see streams of blood melding with the intestines, and what may represent the kidneys. (Christophe Helmke)

7

Battle scene and their aftermath, in the murals of Bonampak illustrating the mutilation of defeated warriors

Site: Bonampak; Culture: Maya; Date: Late Classic (ca. 800 CE); Context: Structure 1, Room 2; Medium: Mural; Figure credit: Heather Hurst and Leonard Ashby

In this amazingly detailed and colourful mural, we get a spectacular look into the warfare for the ancient Maya. The scene is part of a series of detailed murals covering the walls of three whole rooms within a palatial structure at the site of Bonampak. This war scene depicts warriors dressed in elaborate battle garments equipped with weapons such as long spears often seen perforating the bodies of their enemies. The bloodshed is blatant and permeates the whole scene. The figures defeated in battle were stripped of their garments. Blood is seen dripping from their bodies as spears enter their necks, chests, and backs. In the accompanying mural, also in Room 2, we see the defeated warriors taken as captives, and presented before the ruler Yajaw Chan Muwaan. One of the captives has already been sacrificed and the rest await their fate as blood drips from their hands. (Louise Bjerre)

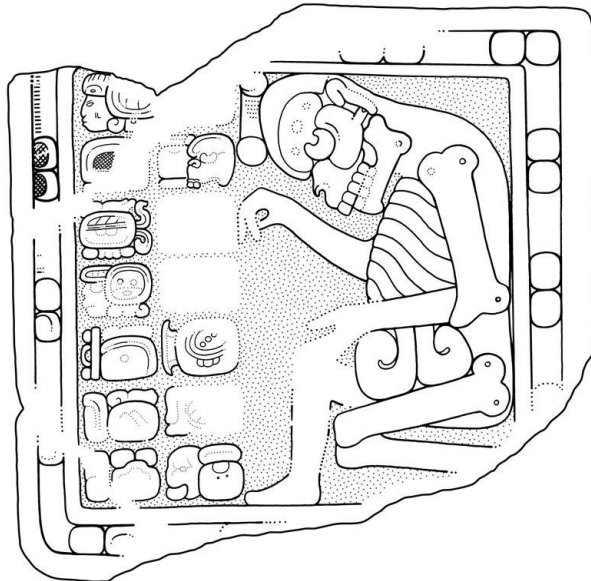
8

Late Classic altar at the site of Xunantunich, depicting a skeletal figure with its putrid guts flowing from the ribcage

Site: Xunantunich; Culture: Maya; Date: Late Classic (849 CE); Context: Altar 1;

Medium: Carved stone monument; Figure credit: Drawing by Christophe Helmke

This altar depicts a skeletal figure, crouching to fit into the surrounding frame. The figure is accompanied by a series of glyphs on its left referring to the exhumation of earthly remains. The features of this skeleton closely resemble those of the well-known death deity described and illustrated in the Postclassic codices. The most salient feature here are the two large scrolls that pour out from the ribcage. These swirls represent the rotten viscera, the intestines, blood, or guts pouring out from the figure's insides. This is a feature of many skeletal depictions in the Classic Period. (Louise Bjerre)



A depiction of a man being attacked and mauled by a jaguar, as his entrails flow from the severed abdomen

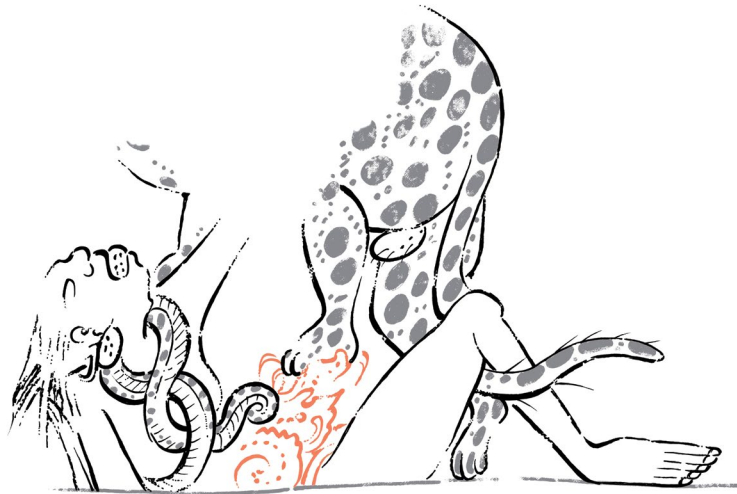
Site: Greater Calakmul area; Culture: Maya; Date: Late Classic (650–750 CE);

Context: Vase BOD32; Medium: Codex-style painted ceramic vase; Figure credit:

Drawing by Christophe Helmke

In the detail of this intricately painted Maya vase, we can appreciate the powerful image of a man being overpowered and mauled by a jaguar. In a paradoxical reversal, the human has become and the prey, and in an almost human gait, the jaguar leaps upon the man. The poor mauled male lies defenceless on the ground, as the jaguar violently tears out his abdomen, from which the entrails pour forth in large scrolls. This ferocious scene is unique in the repertoire of Maya art and shows the entrails as almost fluid and amorphous, as if the organs, tissue and blood were continuous and indistinguishable.

(Christophe Helmke)



A segment of a Maya hieroglyphic text with a stylised glyph for “heart”

Site: Palenque; Culture: Maya; Date: Late Classic (ca. 683 CE); Context:

Temple of the Inscriptions, West Panel, A7–A8; Medium: Carved limestone

monument; Figure credit: Drawing by Christophe Helmke

Much as with other Mesoamerican cultures, the Maya viewed the heart as the locus of moods and humours. Thus rather than just an organ, it was the place where emotional states were generated and resided. In the texts of the Classic period, we see courtiers attempting to placate their kings, by addressing to them with the idiomatic expression *tihmaj aw-ohl*, “inclined is

thy heart". The same expression is also seen in reference to the contentment of the gods, upon the adornment of their altars, at which point we are told *utimiw y-ohl uk'uhuul*, "it inclines the hearts of the gods"—as shown in the glyphic excerpt below. Together these reveal that hearts could be "inclined", when these were said to happy and content. The highly stylised glyph for "heart" is highlighted in the central glyph block. (Christophe Helmke)



COMPARATIVE GUTS IN MESOAMERICA: A SYNTHESIS

by Liv Green &
Christophe Helmke

Unlike other parts of the world, for Precolumbian Mesoamerica we do not have anatomical depictions of the inner landscape of the human body. There is one salient exception in this regard: the human heart. The heart occupied a privileged position in Mesoamerican cultures, which explains its numerous depictions. As seen in the examples from Tenochtitlan (fig. 5), and the glyphic representations in Maya writing (fig. 10), the heart was specifically connected to human emotion, giving rise to many words and expressions, in both Nahuatl and Mayan languages. This metaphorical connection to the organ is key to our understanding of the many depictions and its glyphic references. The heart is also related to themes of warfare and figures prominently in warrior titles of Central Mexico as seen, for instance, at Tula (fig. 4). Death and warfare are the main themes related to Precolumbian depictions of the guts. The innards are usually found depicted as stylized and indistinctive scrolls or swirls emerging from the open or severed abdomen.

The depictions from both western Mesoamerica, as well as the Maya area, occur in scenes of warfare, aggression and emphasize imminent death, as is the case with the eviscerated individual at San José Mogote (fig. 1), and the skeletal figure seen at Xunantunich (fig. 8). In scenes of battle, as illustrated on the murals of both Bonampak (fig. 7), and Cacaxtla (fig. 3), defeated warriors are depicted as wounded, with blood and viscera issuing from their mutilated bodies. Aside from these themes, we also see related depictions of human entities, attacked by large animals, such as that wherein a man is mauled by a jaguar and eviscerated (fig. 9), but the great mythic battle with dismembered figures really stands out in this regard (fig. 6). In sum, the representational conventions of Precolumbian Mesoamerican cultures do include distinctive depictions of the inner organs but yield to the heart's central place, leaving all other entrails to be represented in a highly stylized and indistinct manner. Whether these reveal something as to cultural knowledge or solely reflects cultural representational conventions remains unknown.

COMPARING GUTS AND EAST-ASIAN CULTURES: ON THE WORKINGS OF THE ARS COMBINATORIA

Angelika C. Messner

Bringing together diverse perspectives and ways of knowing and looking at lived gut experiences involves the theme of corporeality. This in turn brings to the fore subtle dissonances that have been discussed in various scholarly contexts. The literature that emphasizes the divergences of the Eastern and Western hemispheres in historical developments, for instance, is enormous. Yet some scholars convincingly argue against holistic generalizations such as Greece here and China there. (1) It is mostly assumed that such generalisations regarding the structure and workings of the body are universally the same. This view is challenged when, as Shigehisa Kuriyama puts it, “we look into history, and our sense of reality wavers.” (2)

The visual approach to medical history and anthropology as an instrument for looking is widely applied when different insights and perspectives on corporeality are combined, in our case to form a fragment of a world alphabet of guts. In addition, scholarship on the history of East Asian historical visual approaches to the workings of the human body is vast and highly differentiated. (3) But whenever during the preparation process for the ‘Comparative Guts’ exhibition we were asked to streamline the short texts for the exhibition, a measure that should apply equally to everyone in the project, a discussion emerged among the scholars working on Asian-derived material. The streamlining process for the Comparative Guts project was thus not easy for them—and good arguments were made for not streamlining at all.

First, many of us confronted the issue of translation. We asked: what does the English term “guts” ultimately denote? Does it merely point to the digestive organs, or does it include hollow organs as much as the solid organs that are crucial in Chinese medical history? How should one translate *wuzang* 五脏 (five *zang*) and *liufu* 六腑 (six *fu*) into English? Renderings of *zang* 脏 and *fu* 腑 into English can differ widely: besides “the five solid vessels – six hollow organs” or “the five storehouses and six hoards digestive organs”, we also can simply translate the terms as “inner viscera”, “organs”, “viscera”, or “five *zang* and six *fu*”. But no one would ever translate them as “guts”.

Sinologists mostly prefer not to translate these terms into English at all. For the ‘Comparative Guts’ exhibition, we agreed to translate. We needed to develop a creative compromise, and the result is impressive.

In addition, there was the issue of overlapping images, in terms of content and time frame. A single image can involve a long stream of entanglements. This is to say that in such cases it can be necessary to provide more than a single date. In other words, detecting several dates of connections in a single image can require offering a long stream of them and not just one. In several meetings among our group of Asian scholars, this issue and the problem of correct geographical specifications and periods were discussed. Here the well-known problem of the dangers of generalisation in the face of a high degree of diversity came to the fore, and with it the dissonances that have to do with the desire to draw comparisons.

Here the question of what it means to engage in comparisons of past and present becomes essential. (4) The difficulty situation with comparison is that “‘comparative history’ is either an oxymoron or a misnomer... Either it proposes to compare the stories of different phenomena by assuming common elements and terms, in which case it is not history; or else it juxtaposes different phenomena described in their own terms and contexts, in which case it cannot venture significant comparisons.” (5)

This is what bothered some of us in the run-up to the Comparative Guts exhibition, and it should come as no surprise that the entire preparation process for the exhibition was accompanied by discomfort in regard to historical comparisons. As promising as the dialogue among scholars working on the same issue in different periods and regions was and is, it quickly became clear that the numerous regionally and historically differentiated contributions barely fit into a single scheme of framework and explanation. We struggled to find an escape from a hegemonic perspective that lies unarticulated in even the most ambitious world histories. As an additive conglomeration of many regional histories, categories like periodisation (such as Dark Ages, Early Modernity, etc.) (6) tend to be grounded on a Eurocentric perspective. The dilemma is even inherent in more recent histories that look instead at the entanglements of individual players (people, countries, regions). The process of tracing paths of connectivity requires scrutinizing them over long periods of time. This must again be done on the basis of exact dates, since only these can reveal embedded positions in the long run. This in turn brings us back to the theme of periodization. Although Comparative Guts was explicitly aimed at doing away with biased frames and perspectives, therefore, it has still inherited some controversial stances. My colleagues and I, working on the Eastern hemisphere, accordingly engaged in some complicated discussions regarding the orientation and gaze of the design of the Comparative Guts website.

Comparison has its dangers. We know that bringing together gut representations from numerous different regions, times, and layers of human cultural production requires that we reflect on the different frameworks behind them. In addition to the problem of periodisation, there is also, for instance, the dichotomy “inner” and “outer”, which has long informed a conceptual background and structured research designs in the Western hemisphere. This does not always work for Chinese historical contexts. When the question arose about which kind of image should be put on the conference poster, from an Asian historical perspective we would have chosen a different one, since from a Chinese perspective, the image used for the poster could seem misleading, although perhaps not from, for example, an early Greek one.

Besides all this and above all else, the exhibition proves that combining images works better than comparing them. Combining the multiple divergent gut realities exposed in this exhibition brings to light ways of nourishing, forms of digestion, and means of transforming food and bodily processes, as well as contexts touching on their spiritual role and their place for gods and ghosts. The exhibition, thus, opens up a viable path for generations to come to engage in the work of comparison or, better said, of combination.

1) See the exemplary discussion of this issue in W. Scheidel, ‘Comparing comparisons.’ In G.E.R. Lloyd and J. J. Zhao, in collaboration with Q. Dong (eds.). 2018. *Ancient Greece and China Compared*. Cambridge: Cambridge University Press, 40–58.

2) S. Kuriyama 栗山茂久. 1999. *The Expressiveness of the Body*. New York: Zone.

3) To mention only the most recent comprehensive contribution: V. Lo 羅維前 and P. Barrett (eds.) with the help of D. Dear, Lu Di 盧笛, L. Reynolds and D. Yang 楊德秀. 2018. *Imagining Chinese Medicine*. Leiden/Boston: Brill.

4) See S. Pollock, ‘Comparison without hegemony’. In H. Joas and B. Klein (eds.). 2010. *The Benefit of Broad Horizons. Intellectual and Institutional Preconditions for a Global Social Science. Festschrift for Björn Wittrock on the Occasion of his 65th Birthday*. Leiden/Boston: Brill, 185–204.

5) See D. R. Kelley. 2001. ‘Grounds of Comparison.’ *Storia della Storiografia* 39: 3–16, 3.

6) On this issue, see B. Mittler and T. Maissen. 2018. ‘Periodization in a global context.’ In T. Maissen and B. Mittler. 2018. *Why China did not have a Renaissance – and why that Matters. An Interdisciplinary Dialogue*. Berlin/Boston: Walter de Gruyter, 3–8.

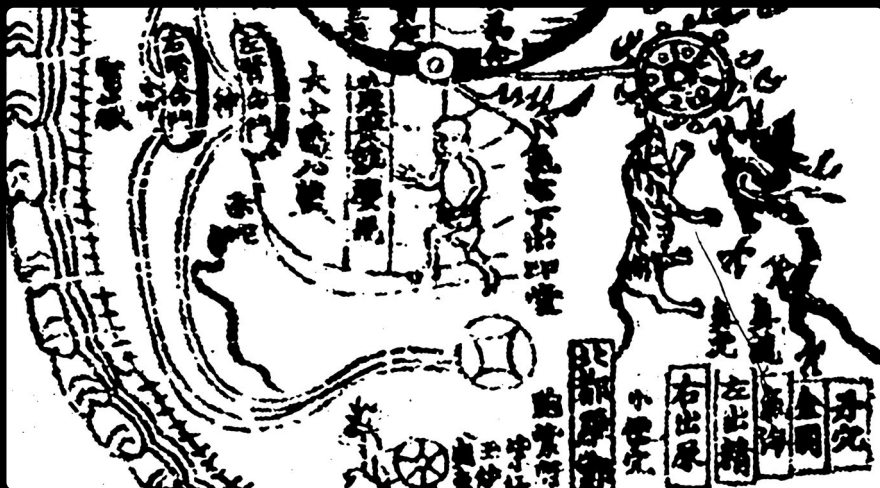


圖 神 脾

神名常在字魂
庭脾之狀如神
鳳主藏魂象如
覆盆色如縞映
黃正掩臍上近
前橫覆于胃脈
出于隱白隱白
左足大指端側
去甲角如韭葉



圖 神

神名丹元字守靈
心之狀如朱雀主
藏神象如蓮花下
垂色如縞映絳生
居肺中肝上對鳩
尾下一寸心脈出
于中衝中衝左手
指端去甲二分許
陷者之中



CHINA

Vivienne Lo

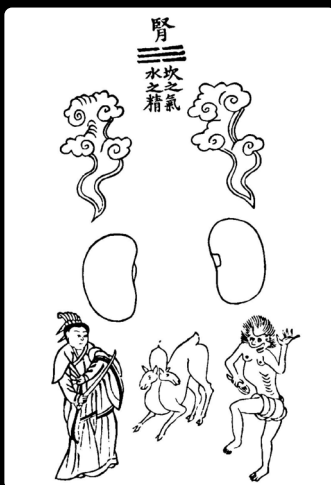
UCL History

INTRODUCTION

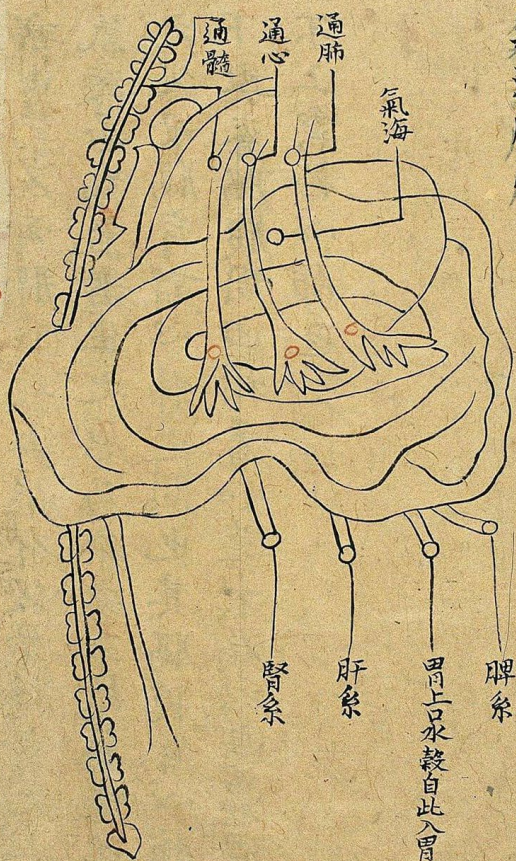
State sponsored anatomical investigations of cadavers were carried out in China on executed criminals in 16 CE between the Western and Eastern Han dynasty, and then again in 1041 CE. In the Han dissection, the human organs were weighed, and their guts measured. Details were then recorded in classical medical treatises such as the *Huangdi neijing* 黃帝內經 (*The Yellow Emperor's Inner Classic*) which was eventually compiled into at least four recensions. In the latter case, the diagrams of the executed rebel fighter Ou Xifan 歐希範 were ultimately integrated into a set of medical illustrations with distinctive Daoist elements, Li Jiong's *Neijing tu* 內景圖 (*Chart of the Inner Landscape*, 1269). Since nowhere in the pre-modern world could deep abdominal dissection be therapeutically practical, anatomical knowledge was reinvented over the millennium between Han and Song (960–1279 CE) for a variety of purposes, according to evolving models of the human body. We can also trace versions of this knowledge through images that travelled west to Central Asia and east to the lands and islands that are now Korea and Japan.

Li Jiong's *Neijing tu* is preserved in the Ming Daoist canon woodblock print of 1436–49. It modelled bones, solid organs and the intestines alongside images of the bureaucrats, animal and other spirits that inhabited the body. These medical maps served as aids for self-cultivators practising breathing meditations and therapeutic movements. They were selectively adopted and adapted to new contexts as they travelled outside China.

In Korea the alchemical traditions of spirit animals found traction in Kim Yemong et al.'s *Ui'bang'ryuchui* 醫方類聚 (*Classified Collection of Medical Remedies*) of 1477 CE for their attractive Daoist and alchemical vision of the internal landscape of the human body. Daoist healing techniques were associated with gentler forms of self-cultivation and therapy, and could convey the sensory and imaginative realms of what happened in the guts through the imagination of working on *qi*.



氣海膈膜



黃帝云。腫中者。神使之官。喜桀出焉。腫中在兩

In contrast, in his late medieval scriptorium in Tabriz, the court physician and statesman, Rashīd al-Dīn (1274–1318 CE), was fascinated by Li Jiong’s images of the organs and included them in his *Tansūqnāma-i Ilkhan dar funūn-i ‘ulūm-i khatā’ ī* (*The Treasure Book of the Ilkhan on Chinese Science and Techniques*), dated AH 713 (1313 CE); but, despite the positive Persian reception of images of the phoenix in the decorative arts, he was not interested in Chinese spirit animals that apparently resided in the body. Did the Chinese images he reproduced of the guts and other anatomical figures travel further west? According to an anonymous manuscript now in the Süleymaniye Library, a group of Byzantine doctors visited Rashīd al-Dīn in Tabriz. They asked him seven questions concerned with different aspects of human physiology, such as the blood and the spirit, and the factors that differentiate humans from animals. They were also interested in the nature of the senses, the animation of the body, the nails, and the hair. Their first question concerned the relationship between the blood and the spirit. Rashīd al-Dīn’s response was that the fundamental principle of life was the motivating force of the spirit on the movement of the blood. This suggests that he probably did understand the Chinese concept of *qi* despite his translation of it as “blood.” Were the Byzantine doctors familiar with Rashīd al-Dīn’s project and its anatomical images from China – two centuries before the innovations in anatomical illustration of Giacomo Berengario da Carpi and Vesalius in Europe?

Akasoy, A., Burnett, C. and Yoeli-Tlalim, R. (eds.) 2013. *Rashīd al-Dīn as an Agent and Mediator of Cultural Exchanges in Ilkhanid Iran*. London: Warburg Institute.

Berlekamp, P., Lo, V. and Wang Yidan 王一丹. 2015, ‘Administering art, history, and science in the Mongol empire’, in A. Landau (ed.) *Pearls on a String: Art in the Age of Great Islamic Empires*. Baltimore and Seattle: Walters Art Museum and Washington University Press, 53–85.

Lo, V. and Barrett, P. (eds.) 2018. *Imagining Chinese Medicine*, Leiden: Brill.

Lo, V. 2018. ‘Introduction’, in V. Lo and P. Barrett (eds.), 1–28.

Lo, V. and Wang Yidan, 王一丹. 2013. ‘Blood or Qi Circulation? On the Nature of Authority in Rashīd al-Dīn’s *Tānksūqnāma* [*The Treasure Book of Ilqān on Chinese Science and Techniques*], in A. Akasoy, et al. (eds.), *Rashīd Al-Dīn: Agent and Mediator of Cultural Exchanges in Ilkhanid Iran*. London: Ashgate 127–172.

Lo, V. and Wang Yidan, 王一丹. 2018. ‘Chasing the Vermilion Bird: Late Medieval Alchemical Transformations in *The Treasure Book of Ilkhan on Chinese Science and Techniques*’, in Lo and Barrett (eds.), 291–304.

Shin Dongwon 신동원. 2018, ‘Korean Anatomical Charts in the Context of the East Asian Medical Tradition’ in Lo and Barrett (eds.), 327–338.

Zhang Qicheng 張其成. 2018, ‘Embodying animal spirits in the vital organs: Daoist alchemy in Chinese medicine’, in Lo and Barrett (eds.), 389–396.

It is only lately that we are beginning to see studies that go beyond essentialising the anatomical traditions of China and the “West”, with the practices of modernity associated with the latter concept. Since the invention of printing in late medieval China there have been many illustrated medical books in black and white which have displayed traditions of visualising the guts. A reflection on the epistemological role of images in China and their afterlives helps us counter those established historiographical discourses associated with hierarchies of modernity and civilisation.

Recurring images based on the dissection of dead bodies travelled east and westwards, crossing medical, religious and social boundaries. It is tempting to attribute to them universal and constant meanings that transcend their original or local circumstances of production, rather than to focus on the virtue inherent in their translatability, their plasticity of signification. Do we really need to talk about authenticity, when it is clear that there were many points of innovation in the history of, for example, the *Chart of the Inner Landscape* of 1269 itself? It images a combination of early Chinese state-sponsored dissection carried out over 1000 years previously and Daoist visualisations of the spirits that lived in the body; and is re-represented according to changing textual and visual authorities that we see in the late medieval Persian and Korean adaptations of the knowledge it displays. The guts of Li Jiong’s images represent the Middle and Lower Cinnabar Fields of inner alchemy. Altogether there were three Cinnabar Fields located in the areas of the forehead (Upper Cinnabar Field), around the heart (Middle Cinnabar Field) and abdomen (Lower Cinnabar Field). These were key to the breathing, meditation, and visualisations of internal practices. These inner spaces mirrored a Daoist pantheon and cosmological divisions, yet do not appear to contradict an anatomical vision of the organs and guts since they were printed together. We also see the spine, the kidneys and various connecting vessels alongside the spirits that lived in the guts: the Red Infant who represented the pursuit of immortality, two of the cosmological animals, the Green Dragon and the White Tiger as well as the *Qi Lun* 臍輪 (navel cakra). It seems that Indian ideas have seamlessly translated into a Daoist chart. These visualisations of the guts achieve a kind of transcendental quality as they are adapted to new circumstances, old images participating in the creation of new forms of knowledge-making as they travel through time and space.

The Lower Cinnabar Field

Li Jiong's *Neijing tu* 內景圖 (Chart of the Inner Landscape, (1269)) Huangdi bashiyi nanjing zuan tu jujie in Zhengtong Daozang 1436–49, Hanfen Lou, Shanghai (Ming edition of the Daoist Canon) Wellcome Library, London, L0034715.
Creative Commons. Attribution–NonCommercial 4.0 International.
Chinese 15th century Daoist image of internal topography. Wellcome Collection.
Public Domain Mark

In this set of images we see a close up of the abdominal area of Li Jiong's *Neijing tu* 內景圖 (*Chart of the Inner Landscape*, 1269). This is a section of the Lower and Middle Cinnabar Fields. The Lower Cinnabar Field is located around the navel, below the diaphragm. The *chizi* 赤子 (Red Infant) signifying the pursuit of immortality hangs below the navel. The kidneys are depicted as the material counterpart to *Ming Men* 命門, the Gate of Destiny. A *Qi Lun* 臍輪 (navel cakra) attaches to the dragon and tiger representing True Yin and True Yang, representing the integration of Indian cultivation practices.

SET 2a+b Huangting dunjia yuanshen jing

黃庭遁甲緣身經

(Book of the Hidden Period and the Causal [Karma] Body of the Yellow Court) DZ 0873

(2a) *Shangqing huangting wuzang liufu zhenren yuzhou jing* 上清黃庭五藏六腑真人玉軸經 (*Precious Scroll of the Zhenren on the Six Receptacles and Five Viscera of the Yellow Court of Shangqing*) DZ 1402; Phoenix of the Spleen, DZ 1402.

Creative Commons Attribution–NonCommercial 4.0 International

(2b) *Huangting neijing wuzang liufu buxie tu* 黃庭內景五藏六腑補瀉圖

(*Chart on the Procedures for Filling and Emptying the Six Receptacles and Five Viscera according to the Inner Landscape of the Yellow Court*) DZ 0432

Vermilion Bird of the Heart, DZ 1402.

Creative Commons Attribution–NonCommercial 4.0 International

In the second two images from the Daoist Canon of 1436–49 we see the organs visualised as birds. There are also animals in other images of this set. This is a development of the animals that appear in Li Jiong's *Neijing tu* 內景圖 (*Chart of the Inner Landscape*, 1269). The individual functions of the organs were characterised by animal spirits, which through their natures expressed a delicate relationship between organic function and states of emotion. The emotions were rooted in the organs. Here we see the Spirit of the Spleen, *Feng* 風: The Phoenix; and similarly the Spirit of the Heart, *Zhu Que* 朱雀: the Vermilion Bird. The Spirit of the Heart, for example, was restless and vulnerable to attacks.

SET 3a–f Kim Yemong et al. *Ui'bang'ryuchui* 醫方類聚, vol. 5, pp. 51–70

(original edition in Kyoto Palace, Japan; microfilm copy in National Library, Korea)
Creative Commons. Attribution 4.0 International

Chinese ideas about the images of the animal spirits, here of the lungs, the heart, the liver, the spleen and the kidneys, all travelled to the lands we know as modern Korea, where *Ui'bang'ryuchui* 醫方類聚 (*Classified Collection of Medical Remedies*) 1477 CE reflects and reinterprets a Daoist vision of the internal landscape of the human body. Once again, we find that the meditative function of the animal images is not inconsistent with the material form of the organ which appears in the upper part of each image.

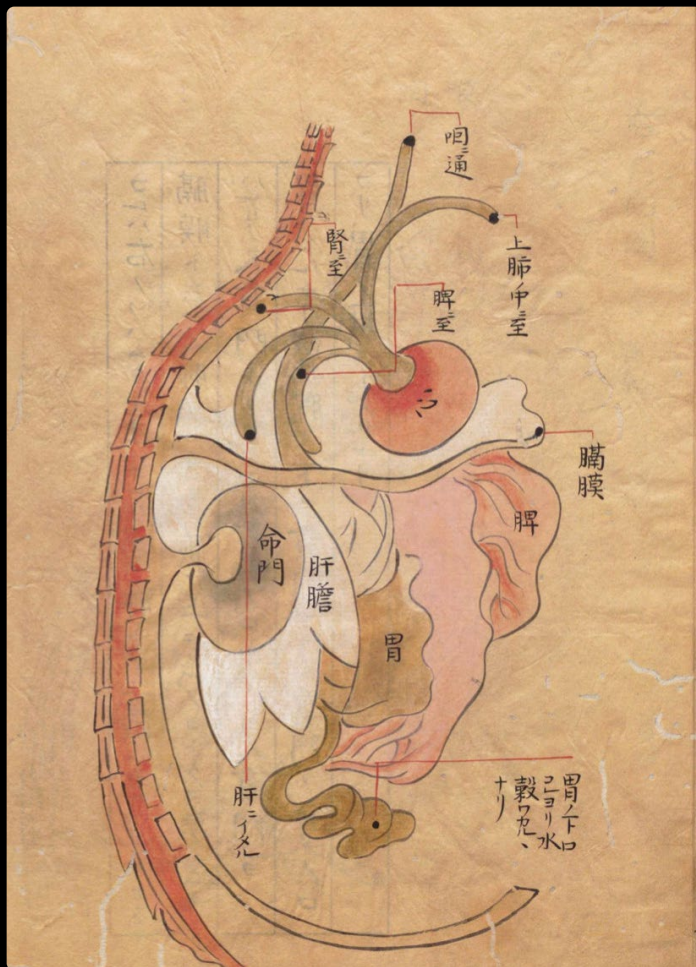
Travelling guts 黃庭遁甲緣身經

(4a) A Qing period manuscript illustration of the *Yuanmen maijue neizhao tu* 元門脈訣內罩圖 (*Internal Visualisation Charts from the 'Primordial Portal' Secret Art of the Pulse*), attr. Hua Tuo, 3rd century CE. This chart shows the position of *Qi Hai* (the Sea of *Qi*, the diaphragm). Library of China Academy of Chinese Medical Sciences; © Wellcome Library, London, L0038697 Attribution 4.0 International (CC BY 4.0)

(4b) RHS 4b: *Tansūqnāma-i ʾIlkhan dar funūn-i 'ulūm-i khatā' ī* (*The Treasure Book of the Ilkhan on Chinese Science and Techniques*); dated AH 713 (1313 CE). Rashīd al-Dīn, Tabriz, 1313, fol. 66b. Attribution 4.0 International (CC BY 4.0)

In the fourth set of images we see anatomical images of the Sea of *Qi* taken from a tradition attributed to Hua Tuo, a renowned physician of the 3rd century CE, here in 4a) a Qing dynasty (1636–1911) copy. It travelled west to be copied into 4b) *Tansūqnāma-i ʾIlkhan dar funūn-i 'ulūm-i khatā' ī* (*The Treasure Book of the Ilkhan on Chinese Science and Techniques*), dated AH 713 (1313). Rashīd al-Dīn, Tabriz, 1313, fol. 66b. The Persian manuscript contains the earliest extant medical images copied from a number of lost Chinese sources. The Sea of *Qi* is mapped on to the diaphragm reflecting a sensory world of alchemical practice grounded in anatomical observation. What attributes of this image facilitated its travel to Japan and Persia?

cf. → p. 46



1a

No title. Communication of the connectors of the five solid vessels with the heart. Kajiwara Shōzen 梶原性全 (1265–1337) *Man'ampō* 万安方, 1315–27, scroll 54. Edo 江戸 period (1603–1868) manuscript. National Archives of Japan



1b

'Illustration of the communication of the connectors of the five solid vessels with the heart', *Wuzang xi yu xin xiangtong tu* 五臟系與心相通圖. Wang Haogu 王好古 (1200–64?) *The Great Teaching of Yi Yin's Decoction Classic Propagated by [Zhang] Zhongjing, Yi Yin tangye Zhongjing guang wei dafa* 伊尹湯液仲景廣爲大法, 1234. Japan, Edo 江戸 period (1603–1868) manuscript. National Archives of Japan

ANATOMICAL IMAGES IN NORTHERN SONG CHINA

Natalie Köhle

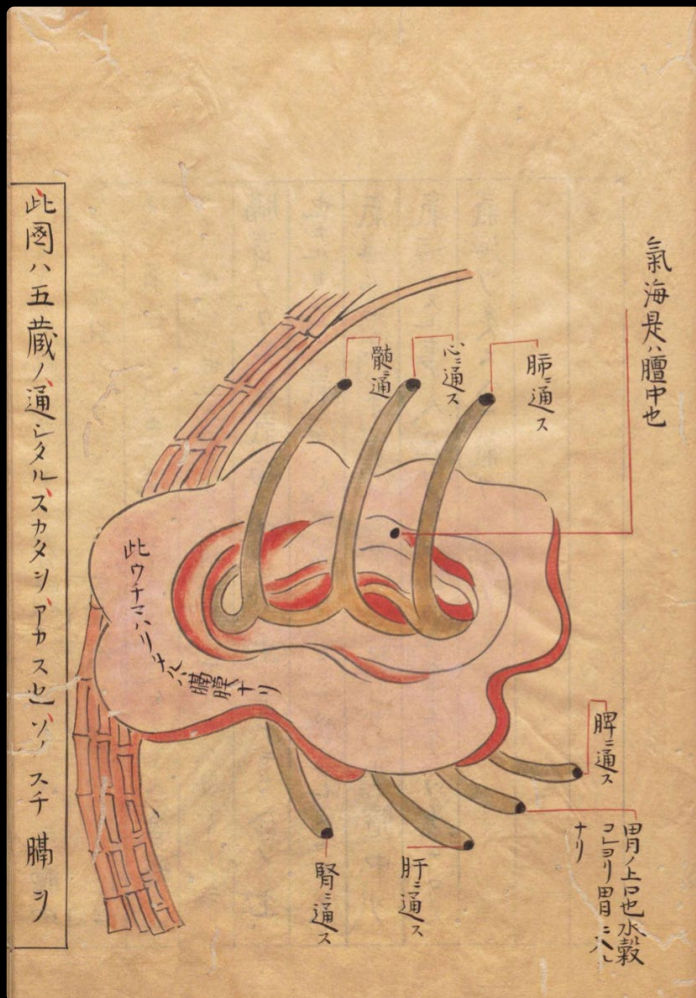
School of History and Philosophy of Science,
The University of Sydney

NORTHERN SONG CHINA

The Song dynasty lasted from 960 until 1279. It is divided into two time periods. The earlier period is known as the Northern Song. It refers to the period from 960 to 1127 when the center of the Chinese empire was in the North-East. The Song emperors were in frequent conflict with their Inner Asian neighbours, and they eventually lost control over the northern part of the empire. Thereupon they withdrew to the south. This later period is known as the Southern Song (1127–1279).

Northern Song China experienced an exponential growth in population and a territorial expansion from the traditional northern heartlands into new territories in the south. These demographic shifts led to major socio-economic changes, such as urbanization, the development of rural market centers, and the onset of inter-regional and long-distance trade. They also spurred cultural innovation in the fields of philosophy, science, and technology.

Not least because of an unprecedented wave of epidemics that had plagued the early Song empire, the Northern Song emperors were particularly interested in medicine. They personally oversaw the collection, standardization, and printing of medical works, and they also established imperially sponsored medical schools. It was in the context of this heightened interest in medicine that the imperial court ordered the renowned physician Yang Jie 楊介 to attend a large-scale, official execution of a group of rebels. Yang Jie, together with an accompanying artist, was tasked with observing the dissection of the rebels' bodies, and with creating *in situ* drawings—or anatomical illustrations—of their viscera.



2a

No title. The sea of *qi* and the diaphragm. Kajiwarra Shōzen 梶原性全 (1265–1337) *Man'ampō* 万安方, 1315–27, scroll 54. Edo 江戸 period (1603–1868) manuscript. National Archives of Japan

2b

'Illustration of the sea of *qi* and the diaphragm', *Qihai gemo tu* 氣海隔膜圖. Wang Haogu 王好古 (1200–64?) *The Great Teaching of Yi Yin's Decoction Classic Propagated by [Zhang] Zhongjing, Yi Yin tangye Zhongjing guang wei dafa* 伊尹湯液仲景廣爲大法, 1234. Japan, Edo 江戸 period (1603–1868) manuscript. National Archives of Japan

cf. → p. 39



3a

No title. The Screen gate. Kajiwara Shōzen 梶原性全 (1265–1337) *Man'ampō* 万安方, 1315–27, scroll 54. Edo 江戸 period (1603–1868) manuscript. National Archives of Japan



3b

'Illustration of the Screen gate that separates water and grains', *Lanmen shuigu mibie tu* 關門水穀泌別圖. Wang Haogu 王好古 (1200–64?) *The Great Teaching of Yi Yin's Decoction Classic Propagated by [Zhang] Zhongjing, Yi Yin tangye Zhongjing guang wei dafa* 伊尹湯液仲景廣為大法, 1234. Japan, Edo 江戸 period (1603–1868) manuscript. National Archives of Japan

cf. → p. 108

Yang Jie's drawings form the basis of the *Cun zhen tu* 存真圖 (*Charts on Preserving the True [Essence]*), a seminal work on the viscera in Chinese medicine and *yangsheng* 養生 (care of life; bodily cultivation), which pairs a series of *in situ* drawings of human viscera with short, explanatory texts. The *Cun zhen tu* is exceptional. For one, there was very little interest in dissection in China before or after the Northern Song. But even globally, the *Cun zhen tu* figures among the earliest anatomical illustrations of the human viscera.

THE CUNZHEN TU 存真圖

The history of the *Cun zhen tu* is intimately connected to Daoist traditions of bodily cultivation. Its illustrations were modelled on a series of preexisting Daoist images of the viscera, and in the centuries following its creation, it was used and disseminated in the context of meditative, alchemical, and longevity practices (cf. → pp. 60–65, 'The body maps of Master Yan Luo'). These strong Daoist connections notwithstanding, it is clear that the *Cun zhen tu* was initially composed by and for physicians.

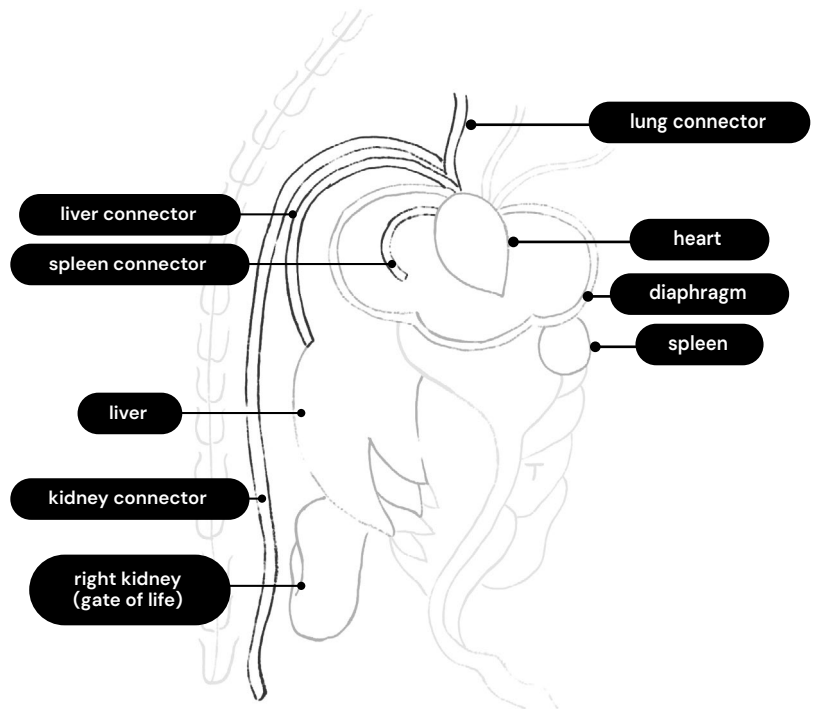
The *Cun zhen tu* belongs to a particular genre of images, named *tu* 圖. *Tu* are technical illustrations that first emerged in the context of Song innovations in science and technology. They are characterized by an intrinsic combination of images with text, and they were intended to transmit hands-on, technical knowledge that could not be easily conveyed by means of textual explanations. In this way, the *Cun zhen tu* does not only depict existing knowledge that was derived from the classics, but also communicates new, empirically gained knowledge, derived from its author's *in situ* observation of the dissected criminals' viscera.

An analysis of the textual component of the *Cun zhen tu* shows that this new knowledge was mobilized to address and clarify contemporary controversies about the position and shapes of the viscera, as well as about the pathways and mechanisms by means of which the viscera are connected and communicate to each other. That is to say, the *Cun zhen tu* is not interested in explaining digestion as the process during which food is turned into digestive and vital fluids; it rather focusses on the structures that hold and guide those fluids: the "connectors", "tubes", "mouths", "gates", and "membranes" that afford communication among the viscera and regulate the flow, retention, and expulsion of fluids and excretions. In short, the *Cun zhen tu* depicts and discusses a structural body rather than a fluid body. While the original *Cun zhen tu* that was created by Yang Jie is lost, its images were preserved and disseminated through copies and excerpts in subsequent Chinese medical treatises (published under different titles by subsequent authors). It is no exaggeration to say that the *Cun zhen tu* has influenced virtually all premodern representations of the viscera in East Asia (see 'Ming–Qing illustrations of the organs', pp. 95–99; 'An example of 17th-century Sino–European cross-cultural medical history', pp. 74–81; and 'Images of the digestive organs in Korea', pp. 52–55). It even attracted attention beyond China: two of the earliest extant reproductions of the *Cun zhen tu* are found in a Persian (see 'Arabic and Persian Materials', pp. 108–113) and a Japanese work (the *Man'ampō*). Indeed, in terms of its subject matter and impact, the *Cun zhen tu* invites comparison with Vesalius's *De humani corporis fabrica* (1543).

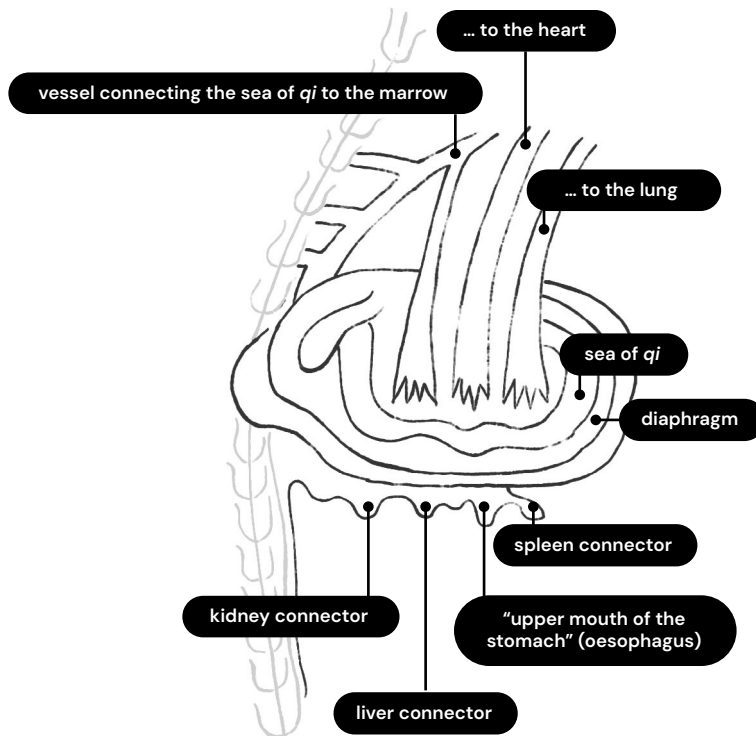
This contribution presents two of the oldest extant copies of the *Cun zhen tu*, contained in the *Man'ampō* 万安方 (Myriad Relief Prescriptions), an important medieval Japanese medical work, composed during 1315–25 by the Buddhist priest and physician Kajiwarra Shōzen 梶原性全 (1266–1337), and in the *Yi Yin Tangye Zhongjing Guang Wei Dafa* 伊尹湯液仲景広為大法 (*Yi Yin's Decoction [Classic] Propagated as Grand Methodology by [Zhang] Zhongjing*, hereafter referred to as *Guang Wei Dafa*, composed by the Northern Song scholar Wang Haogu 王好古 (1200–1264).

Communication of the connectors of the five solid vessels (*wu zang*) with the heart

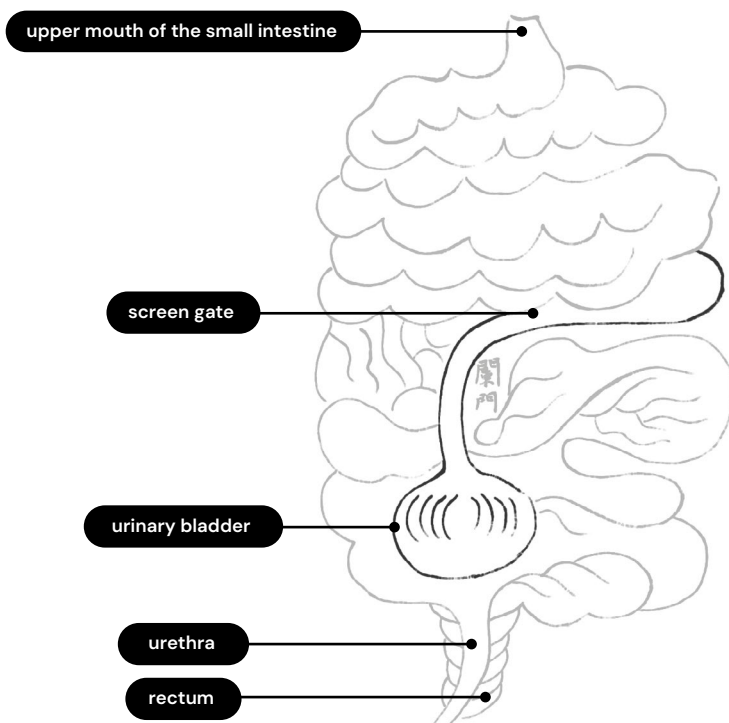
Among the five solid vessels of the body, the heart takes a prominent place. It is the seat of the mind, and the foremost organ among the viscera. This right side view of a human torso offers a graphic representation of the heart's central position. It depicts the "connectors" (*xi* 系) by means of which the heart communicates with the four other solid vessels: lung, kidneys, liver, and spleen. Only one of the connectors, the "kidney connector" (*shen xi* 肾系) is depicted fully: it attaches to the membrane that envelops the spinal fluid, connects the two kidneys, and goes downward from there. In the case of the "liver connector" (*gan xi* 肝系) and the "spleen connector" (*pi xi* 脾系), both of which penetrate the diaphragm, only the upper part is shown extending downward to the gastric cavity, where the liver (represented by a three petalled structure to the right of the torso) and the spleen (represented by a circular lobe to the left of the torso) are located. The diaphragm itself is represented as a white membrane below the heart (*Man'ampō*) / by two parallel lines that form a trefoil-shaped circle (*Guang Wei Dafa*).

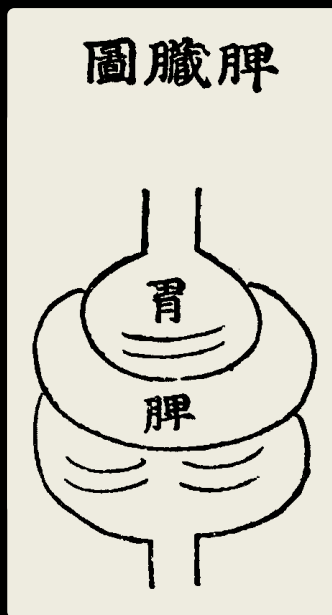


This image zooms in on the anatomical structure of the diaphragm (*ge mo* 隔膜) and the amorphous “sea of *qi*” (*qi hai* 氣海) held to be located above it. The diaphragm extends “like a thin sheet of paper” connected to the spine, ribcase, and the belly, which separates the abdominal cavity from the hypochondrium. It is graphically represented as a pale, flesh-coloured surface (*Man’ampō*) / a circle that is formed by two parallel lines (*Guang Wei Dafa*). The “sea of *qi*”, conceived of as the “origin of *qi* and the basis of life”, is graphically represented as a circle directly above the diaphragm. The diaphragm forms an “impenetrable screen”, which covers the abdominal area and prevents turbid *qi* from ascending to the lung. The “impenetrable screen” has to be traversed by *qi*, food and body fluids, however. This is graphically represented by the vertical vessels, the “connectors”, the “mouth of the stomach” (cardia) and the oesophagus, all of which form passageways that penetrate the diaphragm. If these passageways are obstructed, *qi* and body fluids cannot circulate. This leads to a blockage between the upper and lower parts of the body, which causes sickness.



This image offers a close-up view of the intestinal tract, beginning from the “upper mouth of the small intestine” down to the rectum. It also depicts the urinary bladder and the urethra. The textual inscriptions indicate the location of the third gate that features in the digestive process, the “Screen gate” (*lan men* 闌門). This is the gate that connects the small intestine with the large intestine. It is the site where the remainder of the digested food is separated into “turbid dirt” and “clear water”. Turbid dirt travels from the small intestine to the large intestine and onward to the rectum, from where it is eventually voided as faeces. Clear water flows downwards into the upper mouth of the “urinary bladder” (*pang guang* 膀胱), from where it is voided as urine. The text that accompanies this image in the *Guang Wei Dafa* describes the anatomical structure of the urinary bladder in great detail: it is composed of an outer membrane that envelops an “inner pouch” (*bao* 胞). It also weighs in on a controversy about the physiology of urination: Since the urinary bladder functions as a membrane that envelops the pouch, how could one say that it has an upper mouth?





IMAGES OF THE DIGESTIVE ORGANS IN KOREA

James Flowers

Brain Pool Program, National Research Foundation
Climate-Body Institute, Kyung Hee University, Korea

INTRODUCTION

The Korean Peninsula lies east of China's Shandong and Hebei provinces and west of Japan's Honshu Island. Present day North Korea also shares a land border with China's Liaoning and Jilin provinces, as well as with Russia. Korea sits at the center of Northeast Asia, acting as a node of transmission of ideas and goods between China and Japan. A mostly mountainous land area surrounded by sea to the east and west has historically meant a consciousness of the sacredness of earth and water as mutually constitutive as well as sharing a land border with China, Korea shares close sea links with both China and Japan.

Korea's relationship with multiple Chinese and Japanese configurations has been historically intimate, fraught, and sometimes violent. In cultural terms, Korea shares much in common with China and Japan yet has always maintained a distinct and vibrant tradition of local knowledge production. Rather than thinking of Korea in terms of the configuration of modern nation states, it is more useful to understand Korea on its own historical terms as a key actor in a broader East Asian civilization. Historians also characterize Koreans as recipients of knowledge transmitted from China, including medical ideas. It is more useful, however, to understand Korea as a site of local knowledge production, including medical knowledge, that they shared with and transmitted across East Asia.

Resonant with a shared East Asian civilization, the Chosŏn state declared Confucianism as the state ideology. Therefore, scholars often characterize Confucianism as the major influence on medical ideas in Chosŏn Korea. However, Korean medical texts use mostly Daoist and Buddhist ideas to understand and explain the human body and medicine in general. Furthermore, in general terms, mid to late Chosŏn Koreans understood themselves as the repository of the genuine *chonghwa* 中華 civilization. This helps to explain the Korean insistence on doubling down on earlier East Asian ideas of emptiness of the body and even its invisibility. In terms of the body, the body form and void are mutually constitutive. Void is not nothingness, but rather a part of the oneness of the body and its ineffable connection with the heavens.

In the early Chosŏn period, Koreans drew from Chinese Daoist texts to visualize the body. Korean physicians also referred to images in widely-used Chinese medical texts such as Gong Tingxian's *Wanbing Huichun* 萬病回春 (*Return to Spring from Ten Thousand Diseases*). However, in 1613, Hŏ Chun published the *Treasured Mirror of Eastern Medicine*, the first text claiming Korean originality in visualizing the body with a small number of images characterized by sparse minimalism. At variance with counterparts in China and Japan, Koreans in the Chosŏn period argued that to illustrate the inner body was to miss the point. They moved to more emphasis on the void or the emptiness of the body, by doubling down on Daoist-Buddhist ideas, such that Koreans did not publish any new visual interpretations of the body until the twentieth century. Even if Koreans understood the body as a metaphor for the state, they did not illustrate it. They found written text adequate to explain the inner body as both a site of bodily functions such as digestion, related to production of *ki* and blood, as well as a haven for a host of divinities or spirits. The small intestine, *Hyŏnnyŏng-gong* 玄靈宮 (profound and divine palace), is piled up like leaves from the left of the umbilicus. Fermented food and water in the stomach are transported to the small intestine. Clearness and turbidity are separated at the exit of the small intestine. Waste then enters the large intestine, the *Minyŏng-gong* 未靈宮 (Last Divine Palace). It winds to the right, piled up in sixteen layers. Koreans shared with their Chinese and Japanese counterparts the conceptualization of the key role of the spleen in digestion, coordinating the storing, processing, and excreting roles of the stomach, small intestine, and large intestine. Furthermore, the spleen was in charge of the flesh of the body. Less interested in appearance and physical function, Koreans showed more interest in the spleen and stomach as the center of the body, not only in terms of location but crucially in terms of its role as the center of thought or ideation, the Yellow Court. In this way, Koreans placed more emphasis on the idea of the connection between digestion and thinking than on visual appearance. This understanding of the role of the guts as central to clear and lucid thought, as well as the production of *ki*, continued well into the twentieth century. Linked with Daoist divinities, the guts acted as a metaphor for the human links with the world of spirits and higher ideation.

1

The Spleen

Organ responsible for digestion (from the *Compilation of Medical Prescriptions*)

This image appears in the *Uibang Yuchwi* 醫方類聚 (*Compilation of Medical Prescriptions* 1445). It draws inspiration from the Chinese physician Hu Yin's (fl. 848) *Huangting Neijing Wuzang Liufu Buxie Tu* 黃庭內景五臟六腑補瀉圖 (*Diagram of the inner landscape of supplementing and reducing the five zang and six fu organs*). The Korean image differs, though, in how the phoenix is depicted, also in that it includes trigrams, an inverted basin, and an image of the Jade Maiden. *Uibang yuchwi* explains that the spleen belongs to *kon* 坤 earth and female. Yellow in color, it is shaped like an inverted basin. The phoenix divinity resides in the spleen. It houses thought. The Jade Maiden spirit also resides in the spleen. The spleen is central. It is responsible for digestion. To calm the Spleen spirit one should temper sexual desire. It is responsible for trust, as well as expansive generosity, refraining from resentment towards others and

seeking benefits for oneself, seeking virtue by not coveting money. These are the rules of a secure and calm spleen. The spleen engenders all the things on earth. The spleen engenders the intestines. It engenders righteousness and the *Do* 道 (Dao). To strengthen one's virtue, do not transgress against the earth, feminine principles of the spleen.

2

The Body

Diagram showing the location of the organs responsible for digestion, including spleen, stomach, small intestine, large intestine, and urinary bladder; (from Hŏ Chun, *Treasured Mirror of Eastern Medicine*) Courtesy of the National Library of Korea

In the representative Korean medical text, *Tongui Pogam* 東醫寶鑑 *Treasured Mirror of Eastern Medicine* (1613), Hŏ Chun explained the body, in Daoist and Buddhist conceptual terms, as a haven for thousands of divinities and spirits. Accompanying the illustrations attributed to Hŏ, his writing draws on the ideas of Chinese physicians Sun Simiao and Zhu Danxi to explain the body's configuration. In doing so, he argued that each part of the body corresponds to the movement of the heavens. The body was also a metaphor for the country. Drawing on the Chinese text, the *Baopuzi* 抱樸子, Hŏ explains that the chest and abdomen are the royal palace. He also draws on the *Inner Canon of the Yellow Emperor* (黃帝內經) to explain that the spleen and stomach are equivalent to the storage where the five tastes are emitted.

3

The Spleen and Stomach

from Hŏ Chun, *Treasured Mirror of Eastern Medicine*
Courtesy of the National Library of Korea

The spleen helps stomach *ki* 氣 in digesting food and water. The stomach receives food while the spleen is responsible for digesting food. The five viscera and six bowels all receive *ki* from the stomach. Food passes through the stomach to the intestines. Located in the center of the body, the spleen resembles a horseshoe, scythe, or an upside-down jar. It emulates the shape of earth. It guards the viscera and bowels. The spleen houses blood and warms the five viscera. It is the Yellow Court, where the spirit (*hon* 魂) stays, and where thought stays, meaning it governs the storing of ideation. The spleen spirit is *Sangjae* 常在 (constantly existent), alias *Honjŏng* 魂停 (spirit court). It wears yellow silk clothes. The stomach is the market as well as a huge storage place and rice container. It is also the sea of food and water.



1

3

2

4

CHINA AND JAPAN IN THE MODERN PERIOD

Che-chia Chang

Institute of Modern History,
Academia Sinica

INTRODUCTION

China is located in East Asia, and its latitude spans cold, warm, and tropical regions, and its external land or sea traffic is prosperous. Since the beginning of its writing system more than 3,000 years ago, it has continued to record the exchanges and struggles with surrounding civilizations, and has gradually grown into a multi-ethnic power. In addition to its rich experience in interacting with other cultures, China also has a high degree of religious tolerance, whether it is native Taoism (officially started in the 2nd century) and Shamanism, or Buddhism from India (introduced in the 1st century BCE), Islam from the Middle East (introduced in the 7th century), and Christianity from the West (in which Nestorianism was first introduced in the 7th century), all coexisted and flourished in China, leaving behind a huge amount of historical documents and images. Not only that, China is also an exporter of religions. In particular, Buddhism, whether Indian or Sinicized, was introduced to Korea (from the 4th century onwards) and Japan (from the 6th century onwards) using China as a springboard, and had a profound impact on the cultures of these regions. Although some historical materials have been lost in China, we can still know the grand occasion through the preservation of Korea and Japan.

Many monks utilize medicine as a mean for religious purposes, so some images of internal organs appear in this context. Of the images selected this time, two were determined to be made to teach medical doctrines, and the images serve as powerful visual aids to make the meaning of the text clearer. Fig. 3 faithfully reproduces the painting details and graphic correspondence of Western anatomy books (Saunders & Lee, 1981). Although the original intention was to show the emperor alone, the Jesuits also expected that his Majesty would order it to be published throughout the Empire. A manuscript in fig. 2 suggests that the scroll is the product of an esoteric trend, and the student who asked to accept it must never show it to anyone other than his future successor. However, the relationship between the viscera and cosmic elements depicted in the picture scrolls is in line with the mainstream theory without much peculiarity. Therefore, some scholars believe that it mainly plays a role in ritual medicine (Triplett, 2015). Scholars also suggest that fig. 1 has played its role in a ritual (Robson, 2014). To hide the viscera model inside the Buddha statue forever, it is assumed that only the moment it is placed will be seen by others. Even so, reverently crafted models should still reflect the visceral image in the maker's mind. Surprisingly, this case is different from the case of the orthodox internal organs, making one wonder whether other versions of the human body view are circulated among the people. Only fig. 4 is the one where the intestines appear alone. This image is open to viewing in the public sphere. Intestines do not have the same priority as the five internal organs in Chinese medical traditions. But it is no less active in the everyday language of the people. The word "entrails all cut" is said to have originated from the actual anatomical observation of a mother monkey who lost her beloved child in the fourth century, and is used to describe extreme grief. The story in fig. 4 takes this rhetoric in another direction. The hero annihilated the enemy through excruciating pain, so his bravery deserved to be a god.

1

The Buddha's Guts

Digital rendition by Stella Thumiger after 'The viscera models in the statue of Sakyamuni', Seiryōji Monestary, Kyoto (985)

In Medieval China, it was customary to put viscera models in Buddha statues. Some of them are still extant today. This one is the representative, which was brought to Japan from Taizhou, Zhejiang in 985, and is the oldest extant organ model. This group is made of silk, fully colored. From the relevant inscriptions, we know the donators of the model are three nuns with names and seven anonymous women, but no other information available. Compared with the Chinese orthodox internal organs, neither the content nor the color match. There is no distinction between the large bowels and small intestines. Its background color is white, and it is covered with blue spots, as if the food being digested were flowing through it.

The Dissected Horse

(15th century?) Pictorial Scroll of Hippiastry, Azabu University, Tokyo

Buddhist monks introduced veterinary medicine to Japan, and they also infiltrated animal medicine with religious connotations. There are several different schools of hippiastry painting scrolls in Japan, with slightly different contents, but they all include anatomical diagrams of the internal organs of horses, and at the same time establish links with the Five Phases of China and the Five *Mahābhūta* of India. The dissected large bowels and small intestine are painted in red and white respectively according to the theory of the Five Phases of Traditional Chinese Medicine. It shows that both human and horse bodies operate based on the same cosmic theory, and that Chinese and Indian concepts can coexist in harmony.

Manchu face, Universal body

(Early 18th century) *Ge ti ciowan lu bithe*, or Manchu Anatomy (based on Thomas Bartholin, *Anatomia*, 1684), Muséum National d'Histoire Naturelle, Paris

The Jesuits actively persuaded the Kangxi Emperor to study anatomy. They hoped that he would convert to Christianity while marveling at the wonders of the various parts of his body, impressing the mystery of God's creation. When court painters copied Western anatomical diagrams as part of their textbooks, they added a head with Manchu face to the figure explaining the peritoneum attached to the intestines. Perhaps this is because some opponents try to dissuade the emperor by arguing that anatomy is not worth learning because Westerners and Chinese have different organs. This image conveys the message that although the races are different, the truth is one and the same.

A Brave Warrior with Guts

(1991) 'Luo Tong Sweeps the North', Caiyuan dong'an'gong Temple, Magong; CC BY-NC-SA 4.0

Wall painting is an adequate to transmit the religion's value. This painting in a Taoist temple depicts a scene before the heroic sacrifice of a fictional warrior. When General Luo Tong joined Emperor Tang Taizong's (reign 626–649) expeditionary force, he encountered a formidable enemy. His opponent pierced his body. Luo burst in the middle and his inward parts gushed out. However, regardless of his injury, Luo Tong quickly bandaged the intestines that flowed out after returning to the camp, and immediately mounted the horse again to challenge his foe. The other party was frightened at his bravery and died under his spear. Admiring Luo Tong as a dreadnought, the people deified him and set up temples to worship him. This story has also engendered an idiom, "fighting with coiled guts", to describe the fearless spirit of struggling to the end.

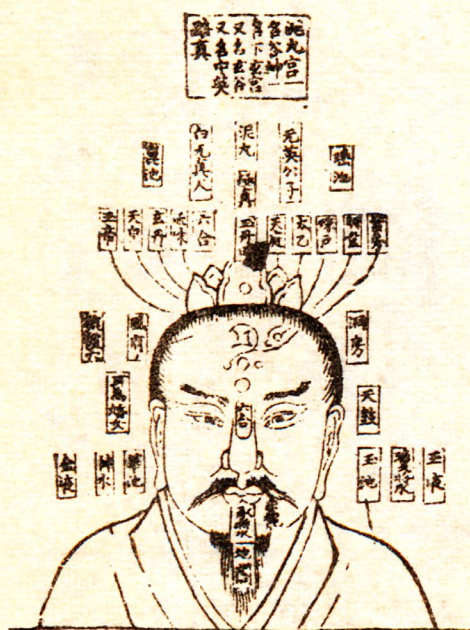
煙蘿子朝真圖



'Master Yan Luo's map of courting the perfected' (*Ti ke ge*, 2b)

- | | | |
|---|------|--|
| 1 | 泥丸真宮 | palace of the mud ball/ <i>nirvāṇa</i> (brain) |
| 2 | 七魄神 | spirits of the seven <i>hún</i> (soul aspects) |
| 3 | 三尸神 | spirits of the three corpses |
| 4 | 前朱雀 | in front: vermillion sparrow (south) |
| 5 | 右白虎 | to the right: white tiger (west) |
| 6 | 流珠 | flowing pearls |
| 7 | 左青龍 | to the left: greenblue dragon (east) |
| 8 | 後玄武 | at back: dark warrior (north) |

煙蘿子首部圖



'Master Yan Luo's map of the head part' (*Ti ke ge*, 2a)

- | | | |
|---|------|--|
| 1 | 泥丸宮 | palace of the mud ball/ <i>nirvāṇa</i> (brain) |
| | 名谷神 | also named valley spirit, |
| | 名下玄宮 | lower obscure palace, |
| | 又名玄谷 | or obscure valley, |
| | 又名中英 | or central florescence |
| | 路真 | of the walk to perfection |

Gut Aspect

- | | | |
|----|----|-----------------------------|
| 25 | 金液 | golden juice |
| 26 | 神水 | spirit waters |
| 27 | 華池 | blossom pond |
| 28 | 玉池 | jade pond |
| 29 | 瓊漿 | <i>qióng</i> -jade bouillon |
| 30 | 玉液 | jade juice |
| 31 | 承漿 | bouillon (saliva) catcher |

THE BODY MAPS OF MASTER YAN LUO

as used in meditation, anatomically corrected
by superintendent Zhu

rodo pfister

Research Institute for the History of Afroeurasian Life Sciences (RIHAELS),
Basel, Switzerland

INTRODUCTION

Songs of the Bodily Husk (*Ti ke ge* 體殼歌) is a composite text attributed to a spurious 10th century CE figure, Master Yan Luo 煙蘿子 of the Yan 燕 family. He is said to come from the Wangwu region (in today's northern Henan), known as the author of lost texts on Daoist breathing and meditation techniques, as well as being the creator of the extant body maps under discussion. The work was printed in 1445/1446 CE in the *Daoist Canon*, fasc. 125, no. 263, juan 18: 1a–10b. In a later version the illustrations are redrawn, and appear with the title *Songs of the Bodily Husk of Master Yan Luo* (*Yan Luo zi Ti ke ge* 煙蘿子體殼歌) in *Daoist Texts Outside the Canon*, vol. 9: 373–378.

The source unites twenty-five sections: a rhymed preamble (§1), two poems (§§2–3), six body maps (§§4–9), the *Treatise on the Inner Realm by Superintendent Zhu* (*Zhu ti dian nei jing lun* 朱提點內境論), which includes critical comments on the body maps (§10), a meditation manual and instruction called *Master Yan Luo's Guideline on Inner Observation* (*Yan Luo zi nei guan jing* 煙蘿子內觀經) (§11). Short elucidations treat topics of physiological alchemy (*nei dan* 內丹), the head and brain (§§12–14, 20–24), or give summary treatises on the five storehouses (§§15–19). Talisman illustrations conclude the text (§25).

Several kinds of knowledge fields mingle, interact and lead to new questions. The self-cultivation practice called 'inner observation' (*nèi guān* 內觀) had opened a profound and detailed inner world, each adept could relate to in their practice.

The body maps are profusely labelled. More than 110 labels enable one to learn a linguistic and visual glossary of technical terms. It thus emerges a thick intertextual network referencing aspects of self-cultivation techniques that help to prescriptively structure one's bodily awareness. Terms used in medicine only in part overlap with everyday words common for animal and human body parts.

Two emic categories classify the body map series: four are of the 'Maps of Master Yan Luo' (*Yan Luo zi tú* 煙蘿子圖) type, two are 'Five Storehouses Maps' (*wǔ zàng tú* 五臟圖). Both kinds of illustrations were used in visualisation exercises in order to guide one's bodily awareness. Painted on hanging scrolls these images even became lifestyle objects, found in the households of literati and officials.

Superintendent Zhu is keenly aware of the clash between field dissection of dead bodies and inner observation of one's own experiences, as he asks rhetorically:

**“How can one tell apart the foot *jué yīn* [channel]
being subjected to a disorder—assuming the tongue
rolls up and the testicles shrink [this being symptoms
of the diseased channel]—compared to the fright of
knife and saw [used in dissection]?”**

Nevertheless, he corrected the drawings, when necessary, and pointed in his *Treatise* to several controversial points arising in his time. Some problematic points appear marked in black colour on the six charts.

The above features make of the body maps in the *Songs of the Bodily Husk* a unique documentation of human curiosity.

A, B

Master Yan Luo's head maps • frontal view and southwards looking

Songs of the Bodily Husk (*Ti ke ge* 體殼歌), in *Daoist Canon* (*Zhengtong dao zang* 正統道藏), fasc. 125, no. 263, juan 18: 2a, 2b. Public domain; color scan.

The two topographical body maps of the head (A, B) depict a gendered, male living body; they show head and shoulders of a mustachioed and bearded man with long earlobes, wearing a *vajrasattva* crown and clothes.

In the profile view from the right (B) the feeling of oneself in space or proprioceptual orientation is indicated by means of the four animals of the cardinal directions (B|4, 5, 7, 8). The adept thus looks south like the ruler on the throne. Since old, to rule a state is likened to ordering one's bodily self (*zhi shen* 治身). Arranged around the head—the “perfect palace of the mud ball” (the brain, B|1, A|1), and the spirits of the “seven *hún* (soul aspects)” (B|2), and of the “three corpses” (B|3) convey by their arrangement a sense of orientation in the personal and peripersonal space just as it emerges in the ego's bodily awareness, or feeling of oneself (*Selbstgefühl*).

Maps of the inner sceneries • from the left and the right side

Songs of the Bodily Husk (Ti ke ge 體殼歌), in *Daoist Canon (Zhengtong dao zang 正統道藏)*, fasc. 125, no. 263, juan 18: 2b, 3a. Public domain; color scan.

Superintendent Zhu's Corrections

The two side views of the body maps show four white leaves attached to the trachea (C|1), which form together the lungs. Likewise the liver lobes are depicted as leaf-like forms in black, four of which are positioned at the right side of the ego, and three at the left, they enclose the heart, which is placed in the centre (C|4).

Superintendent Zhu introduces the notion of anatomical liver variation, saying "there are livers with single lobes, with two lobes, or with three lobes", and adds that "its seat is at the right side" of the body.

The black band seems unlikely to depict the diaphragm. Zhu writes: "Below the heart is a separating membrane (diaphragm) that is attached on all sides to spine and flanks. [...] Under the separating membrane are spleen, stomach, liver and gallbladder."

The focus of the depiction shifts in this series from the head to the torso, but the digestive system as such is not foregrounded: Digestion is seen as having disruptive character. If an adept does not fast before exercises for some time—a noisy belly, sensations of fullness, or pain are all unwanted sensations during meditative exercises. But saliva is swallowed during late nightly hours; it brings fluids to the abdomen, and one visualises the "stomach spirit" (D|11) as receiving these nourishing saps.

The inner sceneries reveal elements of postulated inner circulation (the "marrow way" C|13 and D|8), the male urogenital system (e.g. "urinary bladder" D|17, "jade spring" D|19, or the "drinking turtle" C|19 and D|22), and the alchemical body of one's "inner scenery"—like the "child" (D|13), or the "lower cinnabar field" (D|16).

The body map is thus made ready to familiarise oneself by mere-exposure effect with the details of one's inner sceneries before one enters meditative states of consciousness.

Master Yan Luo's body maps were painted on hanging scrolls, and in this form became a lifestyle object to be seen in official and literati households. Su Shi's poem of a mountain stroll with female entertainers artfully contrasts such a scroll that depicts one's inside, with the feminine and colours of outside appearances.

遊張山人園

Travel to Zhang's Mountaineer Garden

壁間一軸煙蘿子，
盆裏千枝錦被堆。
慣與先生為酒伴，
不嫌刺史亦顏開。
纖纖入麥黃花亂，
颯颯催詩白雨來。
聞道君家好井水，
歸軒乞得滿瓶回。

On the wall one scroll • a Master Yan Luo,
in pots a thousand bouquets • brocade blankets pile.
Being used to join masters • and act as wine companions,
yet unsuspecting the regional inspector • to open up as well.
Slenderly entering the wheat • the citron daylily's muss,
whispering winds blow up poems • hundred showers of rain fall.
Hearing the Daoist gentleman's home • being fond of spring water,
the carriage returns at the request • to bring back the bottles' full.

(*Dongpo quanji* 9: 9a-b)



圖之側右境內



'Map of the inner sceneries
from the right side' (Ti ke ge, 3a)

- 8 髓道 marrow way (along the spine)
- 11 胃神 stomach spirit
- 17 尿胞 urinary bladder
- 19 玉泉 jade spring

圖之側左境內

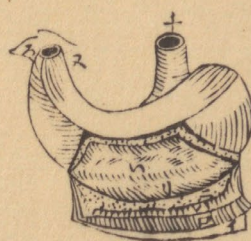


'Map of the inner sceneries
from the left side' (Ti ke ge, 2b)

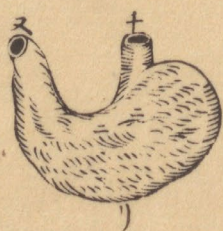
- 13 髓道 marrow way
- 16 左出精 (seminal) essence is emitted at the left
- 19 飲龜 drinking turtle (in circle)
- 22 紫府 purple hoard

腸胃篇圖

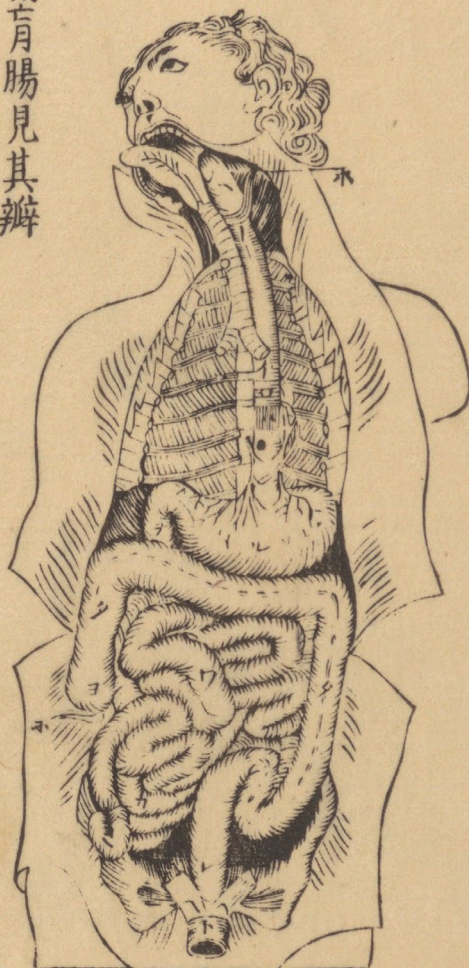
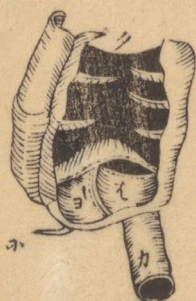
剥胃



胃全形



開育腸見其辨



JAPAN

Hisa Kuriyama

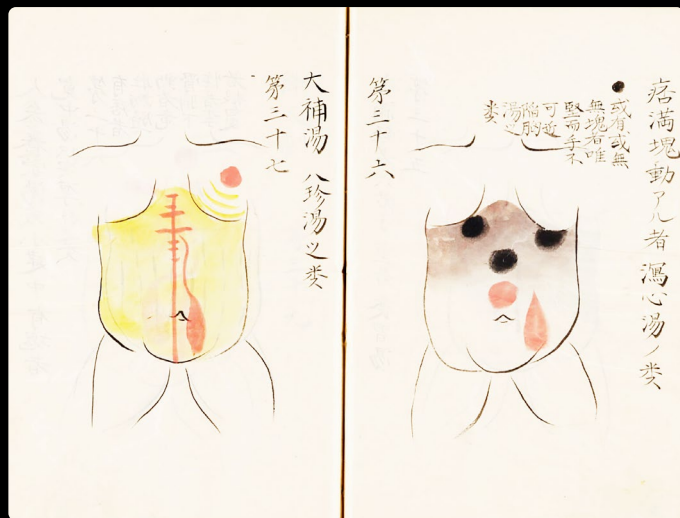
Harvard University

INTRODUCTION

Surviving stone tools suggest that the Japanese archipelago was inhabited as far back as 30,000 BCE; the rope-patterned pottery of the oldest local cultures studied by archaeologists date from around 4000 BCE. Written documents in Japanese appear only much later: the first books, the *Kojiki* and *Nihon shoki*, were compiled a few decades after the founding, in 710 CE, of Nara as the first capital of a centralized Japanese state.

The *Kojiki* and *Nihon shoki* were transcribed using Chinese characters. Nara, for its part, was laid out according to Chinese principles of fengshui and designed to mirror the Chinese city of Chang'an. Thus, from the first books and first capital we find a pattern that would long endure: up through the mid-nineteenth century, practices learned from China exerted broad sway over Japanese life. But then, in 1868, a radical reorientation: the reformers of the Meiji Restoration turned away from ancient Chinese precedents and pushed instead for new institutions fashioned on Western models, pursuing a future that would soon be dubbed modernity.

The understanding of the human body evolved in parallel with this history. The earliest Japanese medical text, the *Ishimpō* (医心方, 984), was a compilation of extracts from Chinese works, and until the late nineteenth century the tradition of the foundational classic of Chinese medicine, the *Huangdi neijing*, defined the scholarly mainstream in Japan. But in 1874, Meiji rulers decreed that future doctors would all have to be trained in Western medicine, and soon, even schoolchildren began to learn the rudiments of Western anatomy. For centuries, Japanese had had subscribed to Chinese beliefs about the *wuzang liufu* 五臟六腑 (five solid and six hollow viscera) as the core of personal being. By the early twentieth century, such beliefs sounded distinctly quaint.

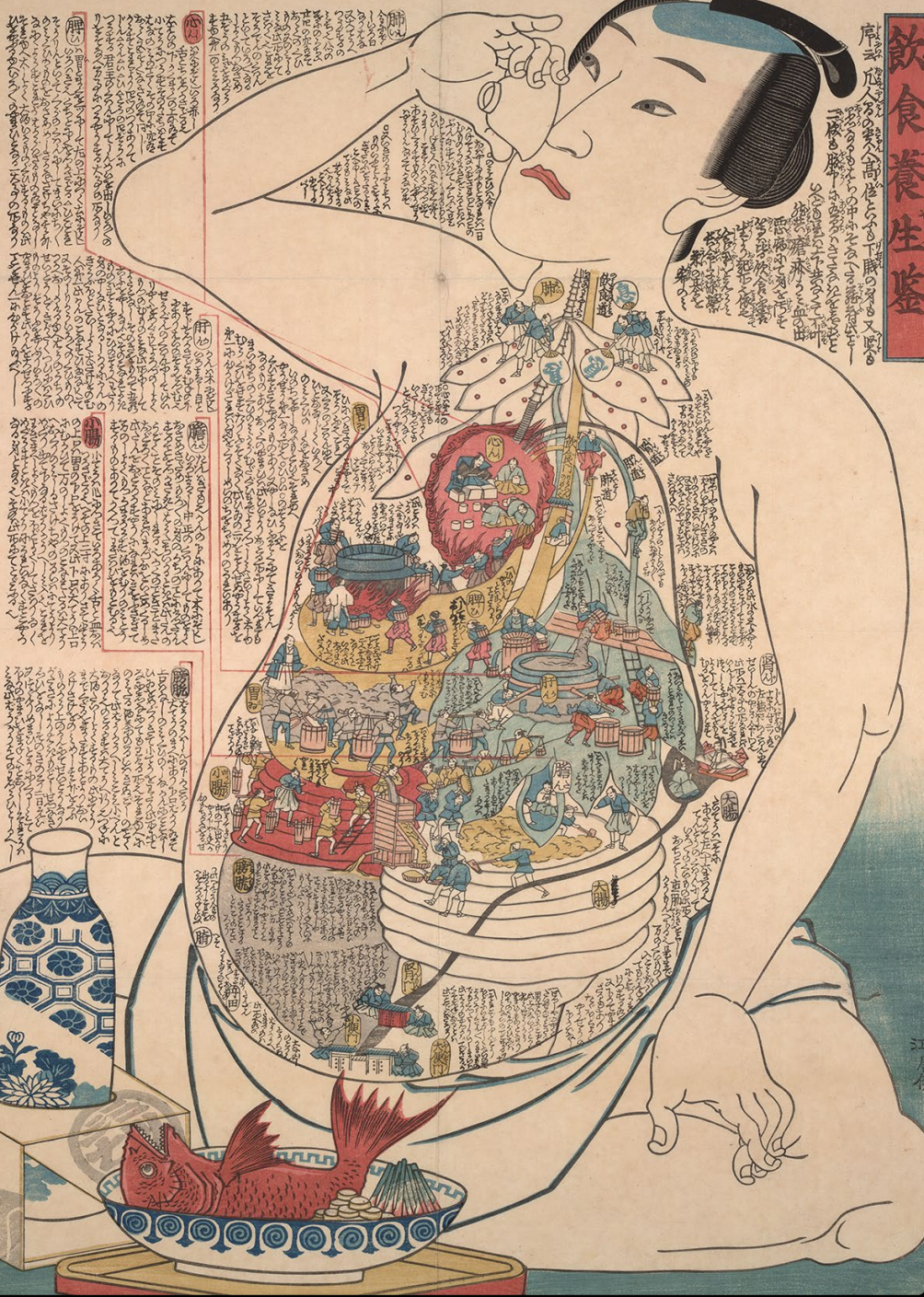


飲食養生監

府の諸人の飲食養生監と云ふ下腹の事又云ふ
 飲食の事なりの中をなす事柄を説く
 三條も腹の事なりを説く事柄を説く

飲食の事なりの中をなす事柄を説く
 三條も腹の事なりを説く事柄を説く

飲食の事なりの中をなす事柄を説く
 三條も腹の事なりを説く事柄を説く



Historians today refer to the period just before the Meiji Restoration as early modern Japan (1603–1868)—a name that reflects, in part, how Japanese attitudes and practices had begun to diverge from traditional models even before the modernizing reforms of Meiji times. And indeed, public interest in Western ideas of the body was sparked as early as 1774 by the publication of Sugita Gempaku's illustrated translation of a Dutch anatomical manual (fig. 1). As the work commonly credited with launching Western Studies in Japan, Gempaku's *Kaitai shinsho* may be the only title in medical history known to nearly all Japanese today. Yet the other illustrations featured here spotlight how the perspective of Western anatomy long remained a mere curiosity—how the Japanese imagination of the guts remained, up into Meiji times, centered on the traditional *wuzang liufu*. But these illustrations also show how the *wuzang liufu* were already being reimagined in non-traditional ways. (figg. 2, 3, 4, 5) The reimagination of the guts in early modern Japan owed above all to the country's transformation into “an economic society”—a society in which the management of nearly all matters, from the conduct of government to the care of the self, was inevitably entwined with the need to grapple with the powerful new sway of money. (1) The lofty moral and metaphysical abstractions of the ancient Chinese past, which emphasized human embeddedness in the cosmos, seemed increasingly irrelevant. In the highly urbanized culture of early modern Japan—by the start of the 18th century, the city of Edo (present-day Tokyo) already counted a million people—the dynamics of a person's inner life were more readily conceived in terms of the characters and activities that dominated life in the surrounding commercial world: merchants and laborers, courtesans and actors, counting money, earning money, indulging in feasts and entertainment.

1) On the notion of an economic society and its rise in Japan, see Hayami, A. 2018. 'The establishment of economic society and the Edo period', in A. Hayami. 2015. *Japan's Industrious Revolution; Economic and Social Transformations in Early Modern Japan*. Berlin: Springer.

2) Kuriyama, S. 1992. 'Between eye and mind: Japanese anatomy in the eighteenth century,' in C. Leslie and A. Young (eds.) 1992. *Paths of Asian Medical Knowledge*. Oakland: University of California Press.

3) On the belly as the site for experiencing the new world of money, see Kuriyama, S. 1997. 'The historical origins of katakori,' *Japan Review*, 127–149; and Kuriyama, S. 2015. 'Money as a humour,' in P. Horden and E. Hsu (eds.), *The Body in Balance: Humoral Medicines in Practice*. Oxford: Bergahan Books.

Sugita Gempaku's *Kaitai shinsho*

解体新書, "New Book of Anatomy"; 1774, Library of Kyoto University

Sugita Gempaku undertook his epoch-making translation of a Dutch anatomical manual before he could read Dutch. This point is key: What persuaded him of the manual's truth was not its text, which he initially couldn't comprehend, but rather, its images, and more specifically their style. For him, the eye-opening encounter with the realism of European anatomical plates—a style of picturing designed, as he saw them, to "copy things as they truly are" (*shashin* 写真)—was an experience akin to enlightenment. The appeal of this new style lay above all in this: it mirrored precisely the outlook needed in the new world of hard economic facts—a practical, realistic outlook that refused the religious and metaphysical speculations of the Chinese past and looked at the viscera as tangible things, right there, before the eyes. (2)

Manase Dōsan 曲直瀬道三, *Hyakufuku zusetu*

百腹図説, "Illustrated Explanations of a Hundred Bellies"; n.d.

Nothing more directly translated the early modern stress on practical, tangible realities than the Japanese innovation known as *fukushin* 腹診 (abdominal inspection). Whereas Chinese doctors had relied chiefly on feeling the pulse at the wrist to diagnose diseases, Japanese advocates of *fukushin* claimed that palpating the belly offered a more direct and reliable way to know a person's condition. Since life was rooted in the *wuzang liufu*, the surest way to assess disruptions to life was to probe the surfaces right above them. In *fukushin*, the light, delicate touch of the pulsetaker interrogating fleeting flickers at the wrist gave way to the firm pressures of the masseur seeking more stable, graspable, unequivocal signs on the belly, evoked here by different colors: characteristic patterns of hot and cold, tenseness and flabbiness, as well as in telltale maps of lumps and nodules. (3)

Shiba Zenkō, *Jūshi keisei hara no uchi*

十四傾城腹の内, "Inside the bellies of fourteen courtesans"; 1793

The economic society of early modern Japan not only shaped ways of seeing (fig.1) and touching (fig.2) the guts, but also transformed the imagination of their contents. The title of this work of popular fiction parodies the *Jūshi kei hakki* (十四経發揮), a famous Chinese treatise on acupuncture. Its main characters are the *wuzang liufu*, but these viscera are no longer nodes in the cosmic schemes of yin and yang and the five phases; nor are they associated with Daoist divinities. They have, instead, become personified as merchants. Here, the liver, gallbladder, and stomach cluster around the defining activity of commercial life: the inspection of the ledger. Meanwhile, the black and white figures seated on the left represent the one notable echo of Chinese religious beliefs: they are *mushi* 虫, insect-spirits, whom contemporary Japanese blamed for sudden pains and unruly passions.

Inshoku yōjō kagami

飲食養生鑑, "Mirror of Dietary Regimen"; ca.1850, University of California, San Francisco

This popular print proffering advice on food and health highlights another major theme of early modern economic society—an intensified emphasis on hard work, which the economic historian Akira Hayami termed the "industrious revolution." (4) But it also illustrates two more subtle developments.

One is the influence of Western medicine. Although the guts depicted here are not anatomical organs but the *wuzang liufu*, they do import one notable trait from contemporary European imaginings about the guts: they are full of excrement, and they stink. (5)

The other is the rise of a keen interest in the living voice. The inscriptions inside the body record the complaints and joking remarks shared by the *wuzang liufu*. This was another remarkable feature of the guts reimagined in urbanized Japan: the viscera now spoke, and quite volubly. (6)

Those interested in examining this image in greater detail can do so online, in the special collections of the University of California, San Francisco.

Kinrai ryūkō kabuki uwasa kenbutsu no hara

A Belly-Survey of the Kabuki Actors Most Talked About Today, late 19th century

(飲食養生鑑, "Mirror of Dietary Regimen"; ca.1850), University of California, San Francisco

It is hard, today, to appreciate the glamor of Kabuki actors in early modern Japan. The top stars were celebrated like the movie stars and sports heroes of our own age, their names more widely known than those of the political elite. Their aura was enhanced by their relative inaccessibility: going to see Kabuki plays in person was expensive. In an age before television and radio, these actors were thus known to the vast majority of the population only through word of mouth and a flood of prints and books, which reproduced their looks and reported how they posed and gestured as they recited their trademark lines. Chinese prints had often associated the viscera with Daoist divinities. In the culture of commercial fame in Japan's economic society, Kabuki actors became like gods.

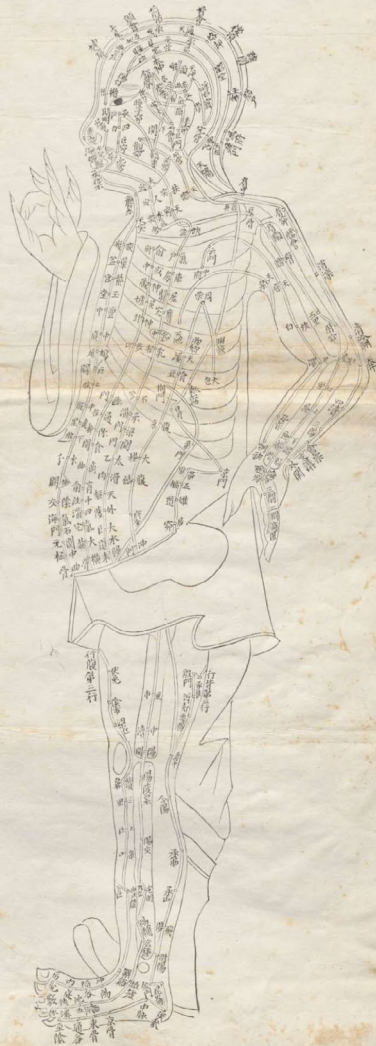
4) Hayami, A. 2015. 'The rise of industriousness in early modern Japan,' in A. Hayami, *Japan's Industrious Revolution; Economic and Social Transformations in Early Modern Japan*. Berlin: Springer

5) Kuriyama, S. 2020. 'Life and excrement; the reimagination of flow in Edo Japan (1603–1868)', in N. Köhle and S. Kuriyama (eds.), *Fluid Matter(s); flow and the transformation in the history of the body*. Canberra: Australia National University Press.

6) On the interest in capturing live speech in nineteenth century Japan, see Jacobowitz, S. 2016. *Writing Technology in Meiji Japan; a Media History of Modern Japanese Literature and Visual Culture*. Boston: Harvard University Press and Yasar, K. 2018. *Electrified Voices; How the Telephone, Phonograph and Radio Shaped Modern Japan 1868–1945*. New York: Columbia University Press.

側人明堂圖

經古肺之原出於太淵心之原出於太陰肝之原出於太衝脾之原出於太白腎之原出於太溪心之原出於兌骨脾之原出於坵墟胃之原出於衝陽三焦之原出於陽池膀胱之原出於京骨大腸之原出於合谷小腸之原出於腕骨是十二經之原又不可不知也



臟腑明堂圖

經言心者君主之官也神明出焉肺者相傳之官治節出焉肝者將軍之官謀慮出焉膽者中正之官決斷出焉腹中者臣使之官喜榮出焉脾者倉廩之官五味出焉大腸者傳導之官變化出焉小腸者受盛之官化物出焉腎者作強之官伎巧出焉三焦者決瀆之官水道出焉膀胱者州都之官津液藏焉氣化則能出矣凡此十二官不得相失也



腦者髓之海諸髓皆屬於腦故上至腦下至尾骶皆主之

腦中名氣海在兩乳之間為氣海

膈原在心部之下與胃腸相連而相

貫注於心膈能升降出入大腸

心者神明之主也

人之五臟六腑百骸九竅皆賴其氣以通氣者相續無有間斷今相續

七情之害少有心云小者分門也而上下也七情也皆在十四

AN EXAMPLE OF 17th-CENTURY SINO-EUROPEAN CROSS-CULTURAL MEDICAL HISTORY

Marta Hanson

Max-Planck-Institut für Wissenschaftsgeschichte

INTRODUCTION

These five images are all concerned with the work of specific Jesuits to introduce Chinese medicine to Europeans in the second half of the seventeenth century, in terms of bringing to Europe Chinese medical texts (figg.1,2) and reproducing body images in them (figg. 3,4,5). The earliest record of Chinese images of the human body moving west started over 300 years earlier with the Persian polymath, physician, and historian, Rashīd al-Dīn (1247–1318), who commissioned a Persian translation of Chinese medical texts. The resulting *Tānksūqnāma-yi Īlkhān dar funūn-i ulūm-i khitāyī* (The Treasure Book of the *Ilkhān* on Chinese Science and Techniques, 1313: *Tansūqnāma* for short) is partly extant today in one manuscript at the Aya Sofya Library in Istanbul.

There is no extant evidence, however, of continued engagement with anatomical images in either direction, or further West, until the seventeenth century. Jesuits were involved in translating European anatomy into Chinese, starting with Johann Schreck's (1576–1630) *Abstract of the Western Theory of the Human Body* (*Taixi renshen shuogai*, 1625), and even into Manchu by the 1720s. Jesuits also translated Chinese body images into Latin in the *Specimen medicinae sinicae* (A Sample of Chinese Medicine, 1682).

Zhang Jiebin's *Classified Canon, Illustrated Wing* (1624) was the main Chinese source text for the *Specimen's* images of Chinese medical concepts of twelve viscera-channels. The two images of the Chinese "viscera man" (figg.1,2), however, come from two other medical texts that the Flemish Jesuit Philippe Couplet (1623–1693) may have given to the German Christian Mentzel (1622–1701), personal physician to the Great Elector Friedrich Wilhelm of Brandenburg (1620–1688) and curator of his Chinese collection, who was interested in Chinese medicine. Mentzel, in fact, appears to have also drawn the Chinese "viscera man" (fig.3) as means to learn Chinese concepts of human viscera depicted as well in the manuscript (fig.4) and printed (fig.5) versions of *Specimen medicinae sinicae*. Chinese conceptions of a three-valve heart and the reproductive role of kidneys were successfully translated (figg. 3,4,5), despite differing from contemporary European understandings of the heart and kidneys. The Chinese guts, by contrast, are visually and textually commensurable with European understandings of guts being located in the lower abdomen and having a transporting role.

The Chinese debated what viscera were contained with the human body, where they were located, and what functions they carried out. Various depictions of the “viscera man,” a conventional side-body view of a “see-through” human body with head and viscera but no limbs, provide evidence of these debates. In one version (fig. 1), a three-valve heart dominates the upper section with a valve-tube going (from top down) to the kidneys, liver, and spleen. Another viscera-man from the same period (fig. 2), by contrast, depicts a one-valve heart. Furthermore, the guts dominate the lower part of all “viscera man” images, but they are depicted and discussed differently. The guts could be drawn like floating clouds across the entire abdomen (fig. 1) or resemble a large sac between the small intestine above and the bladder below (fig. 2).

Different types of metaphors were also deployed to explain visceral functions. Whereas the bureaucratic metaphor dominated in some descriptions of the “viscera man” (fig. 1), the hydraulic metaphor dominated in other ones (fig. 2). Although different metaphors are not obvious in different “viscera man” images, they nonetheless informed different emphases in textual descriptions. The bureaucratic metaphor portrayed the guts as the ministry of transportation through which transformed substances moved (fig. 1). The hydraulic metaphor, however, emphasized the course of the internal tract that links the large intestine with the lungs in a yin-yang pair and the guts’ materiality (fig. 2). In the average human, the guts weigh two *jin* (1 *jin* = 0.5 kg) and 12 *liang* (1 *liang* = 50g) and are two *zhuang* and one *chi* long (1 *zhuang* = 3.3 m, 1 *chi* = 0.33 m), two and a half *cun* wide (1 *cun* = 3.33 cm) wide, and eight *fen* in diameter (1 *fen* = 0.33 cm).

Remarkably, the three earliest known European interpretations of the Chinese “viscera man” are all extant today and are related to *Specimen medicinae sinicae* (1682), the first printed Latin translation of Chinese medicine exemplifying Sino-European cross-cultural exchange. Whereas Christian Mentzel (1622–1701), personal physician to the Great Elector Friedrich Wilhelm of Brandenburg (1620–1688) and curator of his Chinese collection, drew one sketch (fig. 3), the artists of the other two drawings, one (fig. 4), in the only known manuscript of *Specimen*, and one (fig. 5), in the printed *Specimen*, remain unknown. All three sketches preserve Chinese medical conceptions depicted in the Chinese source (fig. 1). The three-valve heart did not align, for example, with the four-valve heart understood in Europe since Harvey’s 1628 publication on the heart’s role in the circulation of the blood (figg. 3, 4, 5). Mentzel also recorded the Chinese conception of the kidney’s role in reproduction—“Kidneys, or the sites where the mass of the seeds (or semen) are”—in Latin *Renes seu loca ubi seminum congeries* (fig. 3). He took the Latin from the printed *Specimen*’s “viscera man” (fig. 5). By contrast, the Latin phrases—*parva intestina* and *magna intestina* (figg. 3, 4, 5)—clearly designate the cloud-like formations across the abdomen as the small and large intestines situated between the stomach (*Stomachus*) above and bladder (*ureteres*) below. At this level of abstraction, the guts appear to have not needed any further translation.

Hanson, M. and Pomata, G. Forthcoming 2024.
'A Sample of Chinese Medicine for 17th-Century Europe: SBB-Berlin Ms. lat. fol. 95.' In *Sammellust und Wissensdrang – Vier Jahrhunderte Asiatica in Berlin (Connoisseurial Passion and Thirst for Knowledge – Four centuries of Asiatica in Berlin)*. Berlin: East Asia Department, Staatsbibliothek zu Berlin.

Hanson, M. and Pomata, G. Forthcoming 2024.
'A Glimpse into the Making of *Specimen Medicinae Sinicae*: SBB-Berlin Ms. sin. 11.' In *Sammellust und Wissensdrang – Vier Jahrhunderte Asiatica in Berlin (Connoisseurial Passion and Thirst for Knowledge – Four centuries of Asiatica in Berlin)*. Berlin: East Asia Department, Staatsbibliothek zu Berlin.

1

'Enlightened-Hall Diagram of the Viscera', in 1597 reprint of a 1565 Yixue gangmu, preserved in Ms sin. 11, part 1

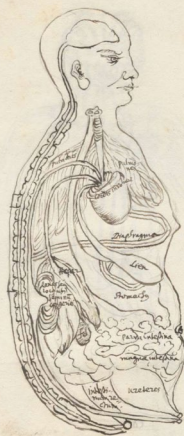
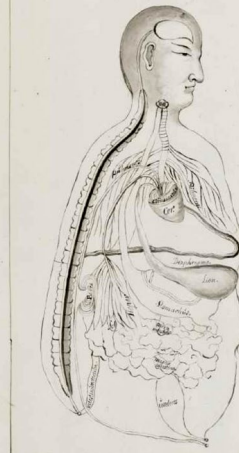
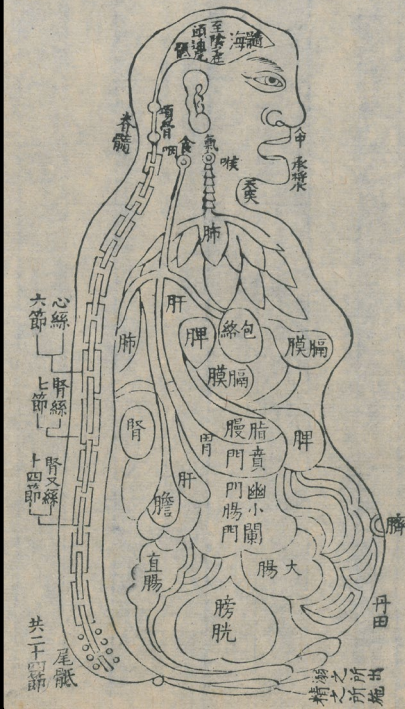
(Zangfu Mingtang tu 臟腑明堂圖). This fold-out plate (ca. 79cm × 58cm) of a "Viscera Man" has been inserted into a manuscript (ms. sin. 11) preserved in Biblioteka Jagiellońska Kraków, Poland, digitalized by the Staatsbibliothek in Berlin

In this 1597 reprint of a "viscera man," the large intestine is distributed directly under the small intestine across the lower belly like floating layers of clouds above the balloon-shaped bladder. The quotation above the image deploys a bureaucratic metaphor of how the viscera function. This body-state metaphor dates to the founding theoretical text of Chinese medicine, the *Inner Canon of the Yellow Emperor* (ca. 1st century BCE), which is quoted in the above passage. The twelve visceral systems form a bureaucratic hierarchy, each with a distinct ministerial function. Whereas the cardiac system is the office of the monarch and issues consciousness, for example, the small intestine is the office of reception which transforms things and sends them out. The large intestine is the office of transportation paths from which the transformed things originate. In other words, as the "transportation ministry," the guts are where things are moved on.

萬病回春
側身人圖

卷之一

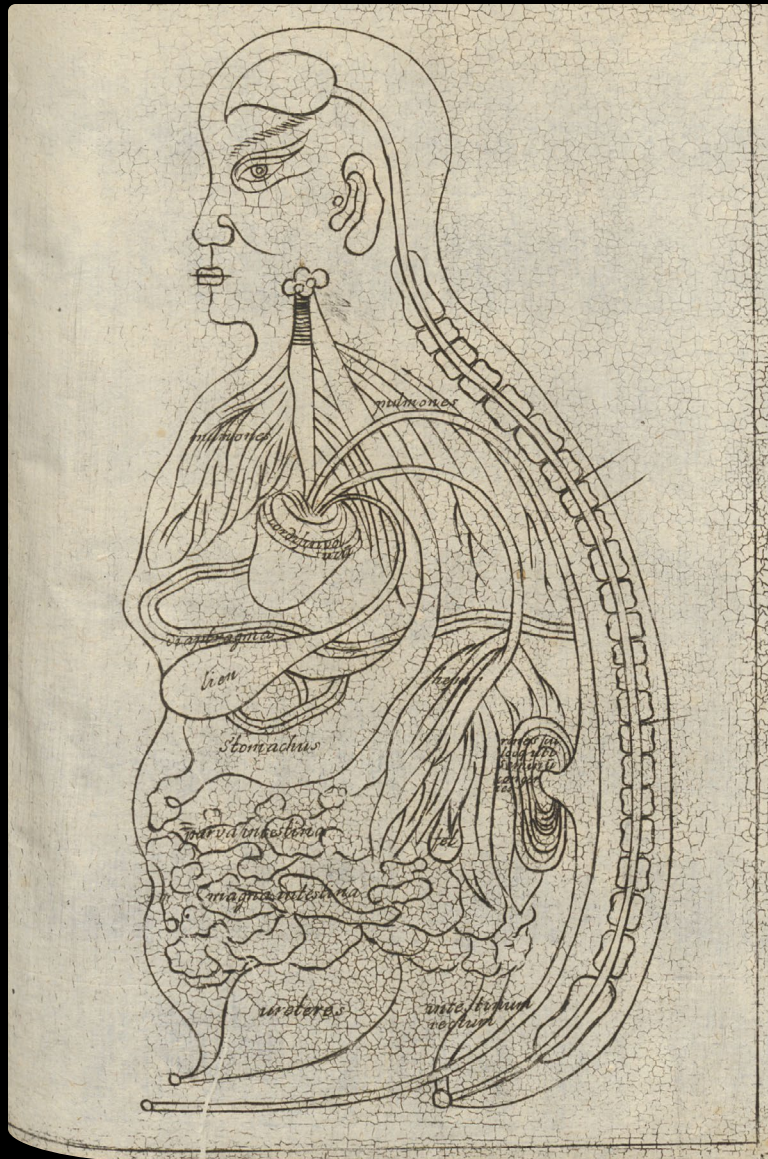
三五



2

3

4



'Diagram of Man's Side-Body' in 1597 reprint of Wanbing huichun

(*Ceshen ren tu* 側身人圖). This version of the "Viscera Man" was printed in a 1597 reprint of the Chinese medical text *Myriad diseases 'Spring Returned'* (i.e., 'cured') (*Wanbing huichun* 萬病回春) that is preserved in the Staatsbibliothek in Berlin

This 1597 reprint of a "viscera man" depicts the viscera as flat and static, like organ-board positions in the classic "Operation" game. The accompanying text, however, applies a hydraulic metaphor, which dates to the *Inner Canon of the Yellow Emperor* (ca. 1st BCE), to define the course of flow of *qi* through each viscera's tract. The guts are associated with the "Hand-yang brightness" tract and, with the lungs, form a yin-yang pair. *Qi* flows from Lung point 1 (radial side of index finger's tip), moves up the arm and connects to the lungs, and then continues upward to the nose's opposing side where the tract ends at Lung point 20. The tract's materiality is also given in weight and size. This text defines the guts using a fitting homonym: "Intestines (*chang* 腸) are unimpeded (*chang* 暢). [They are] where stomach *qi* smoothly flows and sedimentary filth is disposed."

Ca. 1681 Ms sin. 11, part 3 by Christian Mentzel

The personal physician to the Great Elector Friedrich Wilhelm of Brandenburg and curator of his library, Christian Mentzel (1622–1701), sketched this "Viscera Man" based on a Chinese source (Image 1). Both Mentzel's sketch (Image 3) and the printed 1597 original (Image 1) are included in the same manuscript (ms. sin. 11), which is preserved in Biblioteka Jagiellońska Kraków, Poland

The personal physician to the Great Elector Friedrich Wilhelm of Brandenburg and curator of his library, Christian Mentzel (1622–1701), sketched this "Viscera Man" based on Chinese sources (fig. 1) and an earlier European sketch (fig. 4) and printed version (fig. 5). Both Mentzel's sketch (fig. 3) and the 1597 printed original (fig. 1) are included in the same manuscript (ms. sin. 11) that is digitalized by the Staatsbibliothek in Berlin. This manuscript's significance lies in its role in making the *Specimen medicinæ sinicæ* (1682), the first translation into Latin of Chinese medical texts. This sketch was never published, however, nor is there any evidence that it was ever intended to be published. Rather it represents a late-seventeenth-century German physician's effort to learn Chinese concepts of viscera via drawing.

Ca. 1660s–1681c. Lat. Fol. 95, unknown artist

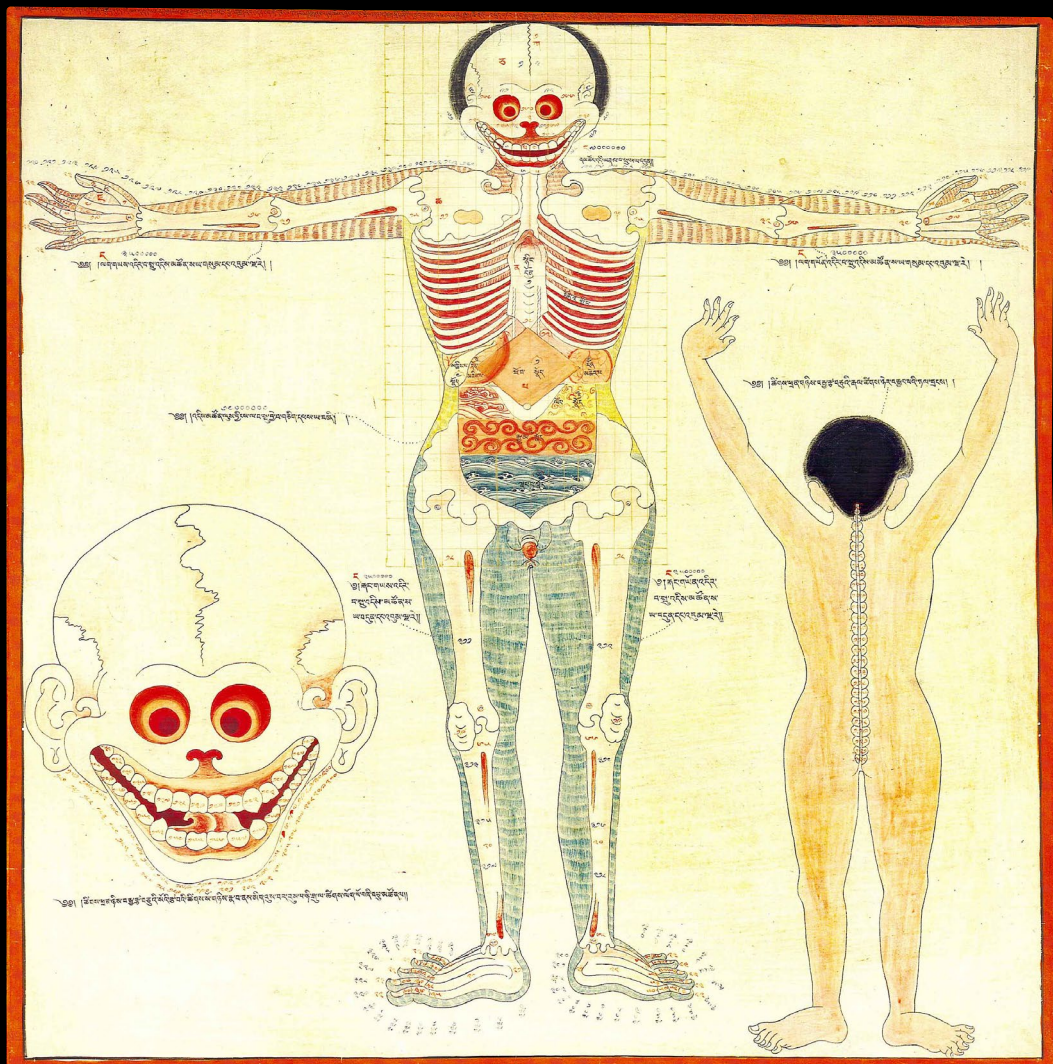
This sketch of the “Viscera Man” was also based on a Chinese source (fig. 1), however, the artist remains anonymous. It was included in the only known extant manuscript (Ms. Lat. Fol. 95 preserved in the Staatsbibliothek in Berlin) of the 1682 printed *Specimen Medicinae Sinicae*. It illustrates significant differences between the manuscript and printed versions

This sketch of the “Viscera Man” was based on a Chinese printed version from 1597 (fig. 1) and is included in the only known extant manuscript of the *Specimen Medicinae Sinicae* (1682), the first translation into Latin of Chinese medical texts. Although the artist is anonymous, they clearly drew in a European style as one sees from the more three-dimensional version of the face, diaphragm (*diaphragma*), heart (*cor*), and spleen (*lien*). The Latin phrases – *parva intestina* and *magna intestina* – clearly designate the cloud-like formations across the abdomen as the small and large intestines situated between the stomach (*Stomachus*) above and bladder (*ureteres*) below. At this level of abstraction, the guts appear to have not needed any further translation.

1682 Specimen Medicinae Sinicae, unknown artist

This “Viscera Man” was also based on a Chinese source (fig. 1) but was printed in the 1682 *Specimen Medicinae Sinicae*. The anonymous artist retained the Chinese original’s flat rendering (fig. 1) rather than the three-dimensional rendering of Christian Mentzel’s sketch (fig. 3) and the sketch (fig. 4) in the *Specimen*’s only extant manuscript (Ms. Lat. Fol. 95), which is preserved in the Staatsbibliothek in Berlin

This sketch of the “Viscera Man” is included in the printed *Specimen Medicinae Sinicae* (1682), the first translation into Latin of Chinese medical texts. The anonymous artist retained the flat rendering of the Chinese original rather than the three-dimensional rendering found in the *Specimen*’s only extant manuscript (fig. 4), which is preserved, along with the printed version (fig. 5), in the Staatsbibliothek of Berlin. The Latin phrases – *parva intestina* and *magna intestina* – as also in fig. 4, clearly designate the cloud-like formations across the abdomen as the small and large intestines, respectively. They are situated between the stomach (*stomachus*) above and bladder (*ureteres*) below. No other Latin phrases here further define the guts suggesting a straightforward one-to-one translation uncomplicated by the bureaucratic or hydraulic metaphors present in the Chinese original drawings of the “viscera man” (figg. 1, 2).



TIBETAN MEDICINE

Tawni Tidwell

Katharina Sabernig

University of Wisconsin–Madison

University of Applied Arts Vienna

INTRODUCTION

Tibetan medical culture historically extended from the northernmost regions of the Indian subcontinent across the Tibetan Plateau and Central Asia to encompassing both Mongolia and Siberia, as well as Bhutan, Nepal and parts of mainland China regions. The initial transmission of Buddhism to Tibet catalyzed extant indigenous medical practices with a bewildering plethora of scholastic development integrating both medical and Buddhist philosophical thought transmitted from India. Emperor Songtsen Gampo (Srong btsan sgam po, ca. 650 CE) invited physicians from India, China, and Persia to his court, including a doctor named Galenos, reputedly associated with the school of medicine of historical physician Galenos of Pergamon (ca. 129–216 CE). The next centuries marked lively transfer of medical knowledge from neighboring geographic regions. The first original Tibetan medical texts emerged by early second millennium, followed by vibrant commentarial traditions and major schools of interpretation.

The authoritative *Four Tantras* (*Rgyud bzhi*) treatise, compiled by now recognized founder of the medical tradition Yutok Yönten Gönpo (G.yu thog yon tan mgon po, 1126–1202) in the 12th century, provides the foundational theory and practice. Its most famous commentary *Blue Beryl* explicates descriptive nuance. Under the Fifth Dalai Lama (1617–1682) and his Regent Sangyé Gyatso (Sangs rgyas rgya mtsho, 1653–1705), the late seventeenth century became the Golden Age of Tibetan medicine. The first major monastic medical college Chakpori (Lcags po ri, lit. Iron Hill) was established near the Potala Palace and 79 Tibetan medical paintings—known as medical thangkas—were commissioned, colorfully illustrating *Blue Beryl* medical content, thus providing a visual standard to accompany the scholastic standard. A couple paintings (e.g., fig. 8) also illustrate key points distinct from *Blue Beryl* as explicated in *Medical Arts of the Lunar King* (*Sman dpyad zla ba'i rgyal po*), known in Sanskrit as *Somarāja*, thought to have been a Chinese medical treatise translated into Tibetan in 8th century CE during the imperial period by Emperor Trisong Detsen, the Chinese monk Hashang Mahāyāna, and the great Tibetan translator Vairocana. Some argue that the text has Tibet origins from circa 11th century since it integrates classical Chinese medical content (e.g., dyadic pulse theory) alongside Indian Āyurvedic content (e.g., three *doṣā* descriptions, numerous Sanskrit words) and Tibetan indigenous knowledge (e.g., endemic plants).

These influences demonstrate the syncretic origins of the Tibetan medical tradition. Continuing its position as one of the five great knowledge fields in India, medicine in Tibet played a prominent role in monasterial education thereafter, propagated most prominently through numerous monastic medical colleges and family-based medical houses across the Tibetan Plateau, Mongolia, and Buryatia. After a long period of consolidation, the early twentieth century brought a focus on public health and modernization. Yet the Cultural Revolution abruptly ended such developments until the 1980s when revival and partial reinvention was allowed with biomedical partnerships in research and clinical care, yet still censoring Buddhist-related content. Today revitalization efforts in Tibetan medicine seek to restore insights from Buddhist contemplative practice, regenerate traditional lineage practices, and continue research exchanges with conventional biomedicine.

Here throughout fig.1–8: 20th century reproduction of 17th century CE painting.
Held in Ulan-Ude, Republic of Buryatia, Russia

1

Anatomy of the gut, anterior view

This painting displays an enumeration of body part components (e.g., bones, vertebrae, joints, etc.) and diagrams the proper associated relational measures in anterior view using a quadrant grid. The abdominal quadrant covers 12×8 cubits in which the stomach (*pho ba*) is illustrated as an upright square standing on its lower corner. The number “1” signifies its primary place among the six vessel organs. A flexed white crescent cups the bottom corner of the square. Left of the stomach, the gallbladder is depicted as a tear-dropped shape with a background mass labeled as the liver. On the right, a bulbous oblong shape is noted as the spleen. Below, a band with stylistic swirls depicts the coiling small intestine (*rgyu ma*) with left and right lateral regions depicting the “blood colon” (*khrag long*) and “microorganism colon” (*srin long*) as ascending and descending colon, respectively. (Tawni Tidwell)

2

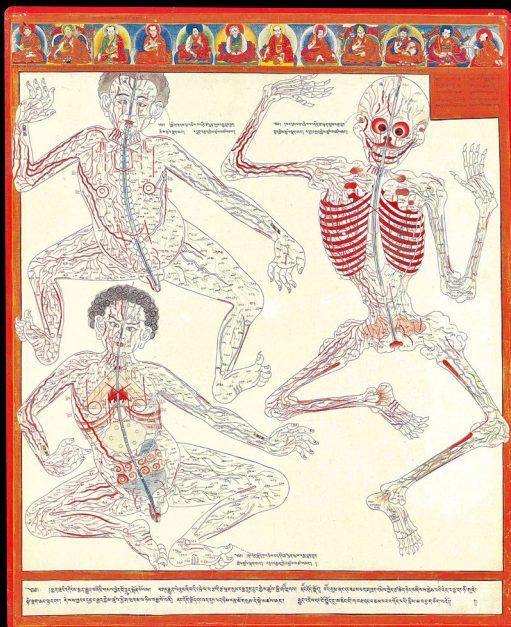
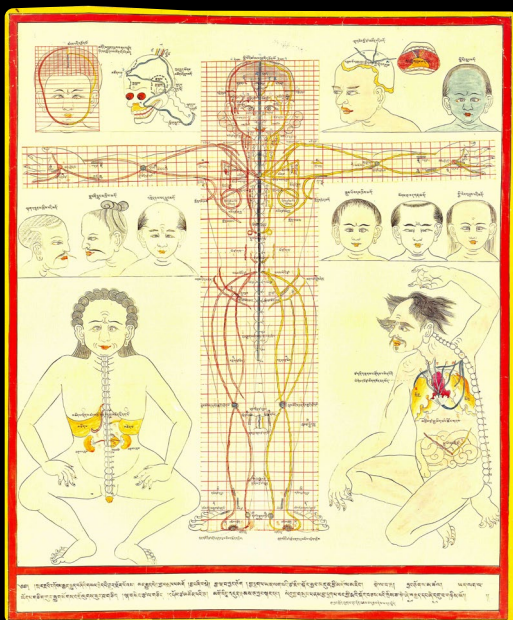
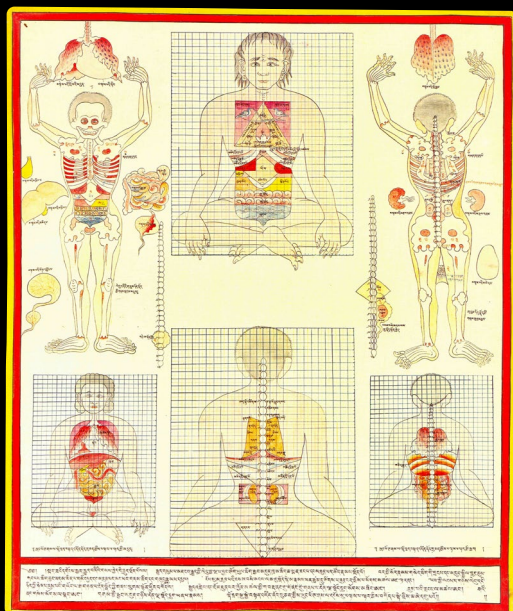
Location of internal organs on modular grid

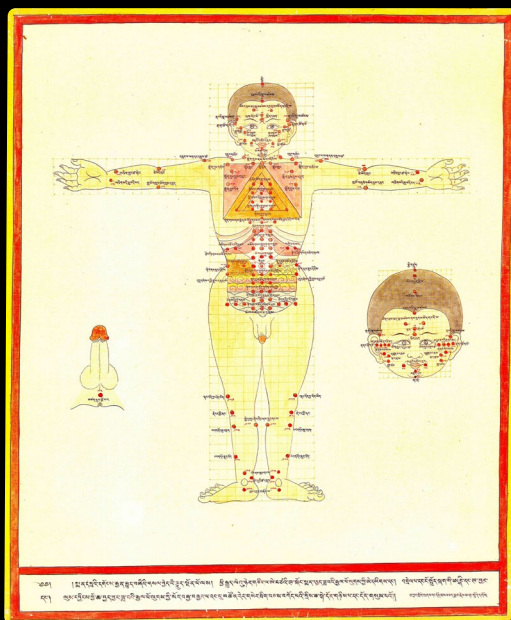
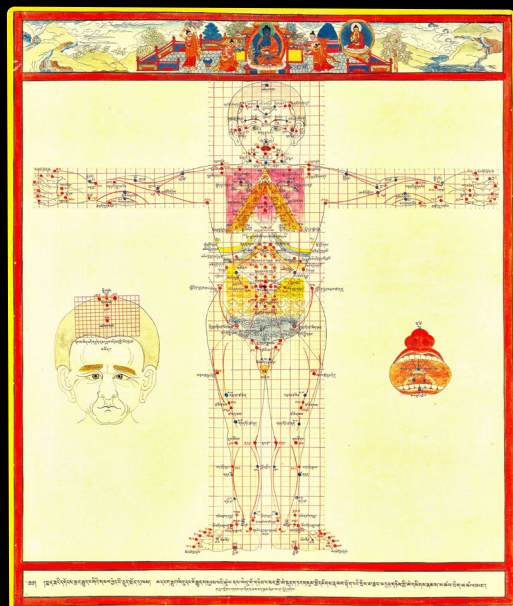
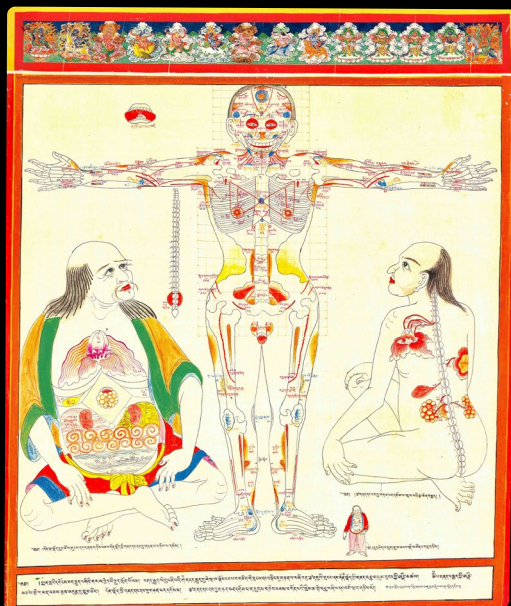
The central figures present the anterior and posterior views of the proper positions and proportions of anatomical structures from a theoretical perspective in relation to the spine by means of the Tibetan tradition of topographical lines on modular grid. The upper left figure demonstrates the musculoskeletal system in anterior view; the heart surrounded by the lungs is depicted “as seen” through the examination of dead bodies. On its left, one can see the liver, stomach, and gallbladder. On its right, small and large intestines are presented whereby a direct connection between the small intestine and the urinary bladder is displayed. The upper right figure presents the upright posterior view visualizing the lungs, kidneys, and spleen, as well as anus drawn between the legs as a swirling circle. The isolated spine next to the figure depicts the reproductive organs and kidneys as they lay nested behind the stomach. (Katharina Sabernig)

These Tibetan medical paintings can be understood as an extension of a broader iconographic painting tradition known as *thangka* originating in Indic Hindu and Buddhist cultures as a support for visualizing the ideal form in contemplative and yogic practice for soteriologically transformative aims. Similarly, these anatomical *thangkas* illustrate ideal medically functional forms vis-à-vis prescribed anatomical metrics (figg. 1, 2) and metaphor-based descriptions (fig. 3). Quotidian details of facial expressions, householder and monastic contexts, and environmental and social ecologies (figg. 3, 4, 6, 8) represent naturalistic content physicians should understand to help patients cultivate health. The dual aims of the physician to support patient mundane wellbeing and salvific mind-body transformation are illustrated (e.g., coarse-subtle channel structures, figg. 4, 5; tri-color fingernails symbolizing three *kāya* bodies of Buddhahood, fig. 6). Smaller medical drawings had been made in texts much earlier in Tibetan history to illustrate medicinal plants, critical treatment points, and anatomical details. However, Desi Sangyé Gyatso's 17th century 79-painting commission formalized a new tradition of *thangka*. As visualized by the series, the most critically relevant structures for health and healing from the Tibetan medical perspective are the guts, channels, and their related interplay. The three gastrointestinal chambers and functional phases most critical to digestion—stomach, intestines, and colon—as well as the most relevant associations to liver and gallbladder are illustrated (figg. 1, 2, 4, 5, 6). Cupped hands (fig. 3) illustrate a measuring technique for proper amounts of fluids, including urine and faeces, normally produced by the body as described to be in proportion to an individual's anatomy. Paintings detailing major and minor vasculature (figg. 4, 5) and treatment points (fig. 7, 8) provide important visual supports to key paradigms for the gut, namely that all chronic disease results from impairment to the gut's qualitative function of accessing nutrition and removing waste product.

Disruption to normal metabolic processes, particularly when waste product enters the nutritional stream, known as *dangma mazhuwa*, can develop into innumerable chronic conditions. Invariably such conditions involve poor synchronization of liver function and poor blood quality, at times therapeutically resolved through venesection of key points (fig. 7). Impaired gut function can also give rise to cancers and other neoplasms, edema disorders, ascites, arthritis types, and chronic inflammatory conditions like asthma, psoriasis, atopic dermatitis, and various gastrointestinal conditions. Moxabustion, or burning herbs on designated points (figg. 7, 8), is administered for a number of gut conditions, particularly those that are cold-natured. The gut interconnects with every part of the body through a rich channel network (figg. 4, 5)—blood, neural, lymphatic and interstitial. This vast integrated complex facilitates the body's development, maintenance, and healing activities, as well as subtle associations with mind (esp. fig. 4).

With the later spread of Buddhism towards the north, various medical schools were established in Mongolia and Buryatia, copies of the set were reproduced, and regional forms of visual interpretations emerged. In early twentieth century, shortly before the Stalinist purges began, a new school of artistic interpretation developed, particularly in Buryatia, based on integrating the Tibetan medical traditional approach with biomedical concepts. During the last two decades, a number of modern anatomical atlases have been published in Tibetan and Chinese-Tibetan. Contemporary renditions (figg. 9, 10) represented by knitwork result from an interdisciplinary art project merging historical terms and neologisms with different modes of anatomical presentation by coauthor Katharina Sabernig.





Body metaphors including guts

The musculoskeletal system is likened to the architecture of a Tibetan temple, while internal organs, differentiated as solid (vital) and hollow (vessel) types, use different illustrative metaphors. The group of solid viscera include the heart, lungs, liver, spleen, and kidneys, each being individually likened to male and female representatives of the Tibetan royal family and entourage. The heart is likened to the king, surrounded by lobes of the lungs which represent ministers, princes and princesses. The liver is likened to a senior queen, the spleen to a junior queen. The large and small intestines are considered servants of them (liver and spleen). Hollow viscera are mainly equated with different pouch-like objects of everyday life: the stomach to a cooking pot, the gallbladder to a sachet full of spices, the urinary bladder to a bucket, and the vesicle for reproduction *samseu* (*bsam se'u*) to a treasury full of gems. (Katharina Sabernig)

Major connecting blood vasculature of body including gut with related vulnerable points

Explicated in high detail in the traumatology section of the *Four Tantras* as developed from early military medical manuals, this painting depicts major blood vessels of the upper and lower abdomen, head, neck, and extremities. Major wound types are also noted. Blood vessels of the head and aortic path adjacent to the spine are shown in azure color, those of the neck in arsenic yellow, those of the trunk in vermillion, and extremities in black with Tibetan alphabetical symbols. Vessels on the figure's right side are in red and left side in yellow; capillary beds demonstrating arterial-venal transition are grey circular swirls. Blood vessels specific to the gut and other vessel organs are illustrated on both sides. Internal blood vessels perfusing blood to small and large intestine are diagrammed specifically. Radial artery for pulse analysis is labeled "observation vessel" (*blta rtsa*) and ulnar for assessing longevity is called "la vessel" (*bla rtsa*). (Tawni Tidwell)

Minor connecting blood vasculature of body including gut

The *Four Tantras* details specific enumerations of minor channels illustrated here in anatomical layout with important physiological functions. There are 360 interconnecting channels as they relate to skin and muscle tissue, vital and vessel organs, bones and bone marrow. Twenty-four major blood vessels develop muscle tissue with each of their 120 small branching vessels (black). Another 234 small branches connect with muscle and skin externally and two sets of 233 branches connect to vital and vessel organs internally and bone medially. These vessels (vermillion) number 700 total. The vast network of vasculature emphasizes the guts' primary role in systemically developing,

nourishing, maintaining and healing the body through propagating nutritional essences to and expelling waste products from all bodily constituents through this network. Vessels are enumerated and labeled as they relate to each region of the vital and vessel gut organs. Major blood vessels are sketched for anatomical proximity and relation. (Tawni Tidwell)

6

Guts depicted as vulnerable part of the body

Tibetan medicine recognizes specific vulnerable body parts to which trauma is described to be terminal or at least treated with difficulty. All critical internal organs are defined as vulnerable, the left figure in this painting presents the anterior view of the trunk depicting mainly hollow organs, the right figure mainly solid organs from posterolateral view. The colors of the organs in the left figure are associated with the colors of the five elements; the orange-colored small intestine is associated with fire, the blue urinary bladder below with water. Special attention is also paid to vital channels supplying organs, demonstrated by the central image. The names of these channels are metaphorical, often taken from animal parts or nomadic life. For example, the two channels of the liver are called "Stag Antlers" and "Deer Antlers." The two vulnerable blood vessels of the stomach are called "Snake Eye" and "Donkey Saddle Strap." (Katharina Sabernig)

7

Treatment points for moxibustion, venesection, and surgery

This painting depicts the anterior view for the three types of external therapy treatment points: moxibustion, venesection, and surgical puncture. Moxibustion points are vermillion numbers and lines, venesection points are blue lines with black numbers, and surgical puncture points are golden lines with azure numbers. Moxibustion is particularly indicated for gut conditions, such as indigestion; metabolic syndromes; poor metabolic capacity; abnormal growths including benign and malignant tumors; colic; neurovascular conditions; and edema conditions. Nineteen vermillion points on the abdomen represent these key gut-related points. Since venesection is indicated primarily for hot disorders, and the gut is overall a cold-natured organ, only a few bloodletting points are used for gut-related conditions, such as acute intestinal infection and liver, gallbladder, and blood compounded conditions. Among surgical points related to the gut are left and right lateral azure points on upper abdomen; and small and large intestinal points on both ankles and foot arches. (Tawni Tidwell)

appendices epiploicae

རྩྱ་ཚེལ་འབྱུང།

a. et v. mesenterica superior

རྩྱ་དར་སྒང་གི་འཕར་ཚྲོད་རྩ།

a. et v. colica media

འོང་གའི་འཕར་ཚྲོད་རྩ་བར་མ།

a. et v. colica dextra

གཡས་ཀྱི་འོང་གའི་འཕར་ཚྲོད་རྩ།

a. ileocolica

རྩྱ་སྒྲིང་འབྲུག་མཚམས་འཕར་རྩ།

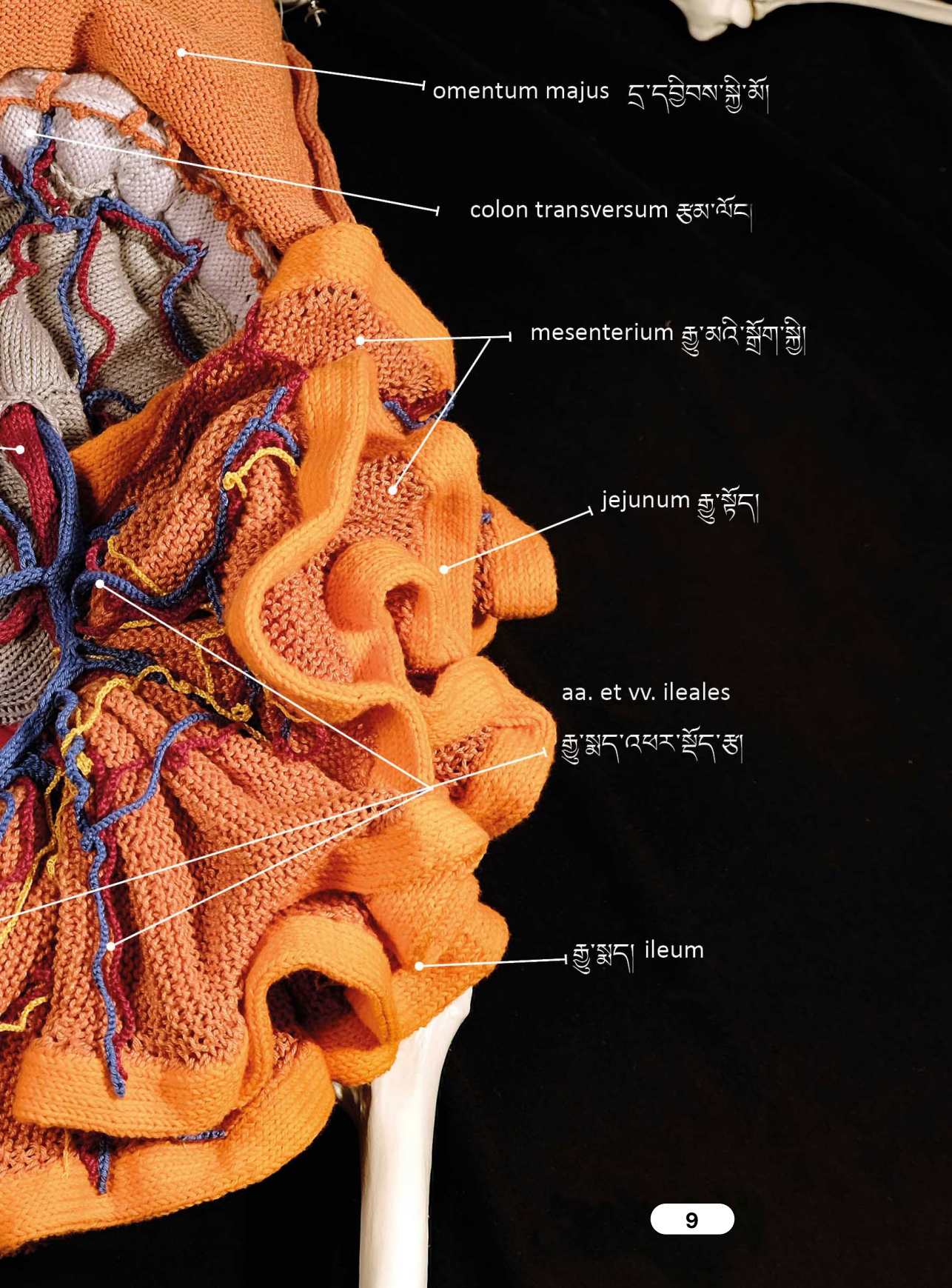
caecum

འོང་རྫོད་ལྷག་གི་མགོ།

appendix vermiformis

རྩྱ་ལྷག

© Katharina Sabernig



omentum majus ཏ་དབྱིབས་སྒྱེ་མོ།

colon transversum རྩམ་ལོང།

mesenterium རྩུ་མའི་སྒྲོག་སྒྱེ།

jejunum རྩུ་རྩོད།

aa. et vv. ileales

རྩུ་ཕྱད་འཕར་ཕྱོད་ཅ།

རྩུ་ཕྱད། ileum

Moxibustion points according to *Medical Arts of the Lunar King*, Sowa Rigpa intersections with Chinese and Indian medical canons

Moxibustion is a treatment particularly indicated for metabolic conditions (*ma zhu ba*) and weak digestive fire (*me drod nyams pa*) in Tibetan medicine. It also provides therapeutic applications for abnormal masses and edema conditions. This painting illustrates the ventral moxibustion points explicated in *Medical Arts of the Lunar King* (*Sman dpyad zla ba'i rgyal po*), known in Sanskrit as *Somarāja*, though thought to have been a Chinese medical treatise translated into Tibetan in 8th century CE or an integration of classical Chinese medical, Indian Āyurvedic, and Tibetan indigenous content from the 11th century. The moxibustion points illustrated on the abdominal region treat gut conditions mentioned above and represent an integrative perspective from these three influences. Some regions in contemporary times apply these points in clinical practice more commonly today than those exclusively from the *Four Tantras*. (Tawni Tidwell)

Reproduced artwork detailing small and large intestines with Tibetan and Latin labels

Reproduced artwork detailing small and large intestines with Tibetan and Latin labels. Contemporary knitwork. © Katharina Sabernig

Tibetan classical medical vocabulary is already rich in anatomical terms. When encountering biomedical concepts, new terms were coined in the Tibetan language. Nevertheless, many historical terms were incorporated into biomedical anatomical terminology. Examples for the inclusion of such historical terms are “blood colon” (*khrag long*) for ascending colon, “nourishment colon” (*rtsam long*) for transverse colon, and “microorganism colon” (*srin long*) for descending colon. Regarding the small intestine, we find the classical terms “upper intestine” (*rgyu stod*) for the upper part of the small intestine (jejunum) and “lower intestine” (*rgyu smad*) for the lower part (ileum). Tibetan paintings depicting body parts are colorful and sometimes show a marked sense of humor. Inspired by the playful and pleasing way of demonstrating the interior of the body, this image presents a knitted version of the detailed structures of the small and large intestines that has been created by contemporary artist and present coauthor. (Katharina Sabernig)



10

Knitted artwork of guts based on Tibetan medical painting at Atsagat Monastery, Republic of Buryatia, Russia

Knitted artwork of guts based on Tibetan medical painting at Atsagat Monastery, Republic of Buryatia, Russia. © Katharina Sabernig

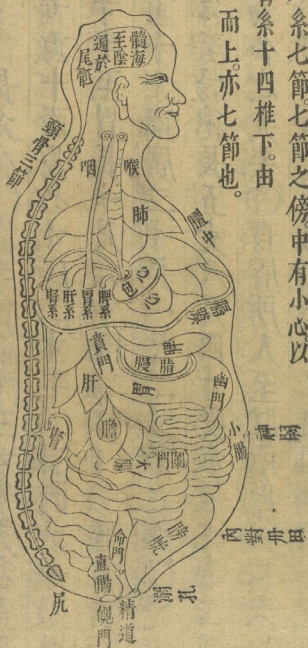
In Buryatia, an ethnically Mongolian region belonging to Russia, Tibetan medical knowledge encountered biomedical knowledge in the early twentieth century. The Buryat medical scholar Dondub Endonov (1870–1937?) authored a set of medical paintings that sought to unite tradition and modernity. Most paintings were based on the set of the Tibetan medical paintings stored today in the Buryat capital Ulan-Ude, but incorporated modern anatomical representations of structures. The knitted objects and the arrangement are inspired by one of the Endonov paintings that have no antecedent in the *thangka* series, but illustrate Tibetan medical knowledge in a unique way. For example, in the *Four Tantras*, it is stated that the liver and stomach are interconnected with nine channels, here shown in red. Another singular feature is a connecting channel between the kidney and the small intestine, symbolizing the physiological significance of the interaction between the two organs (knitwork by present coauthor). (Katharina Sabernig)

任督解

任督二脉爲人身陰陽之綱領。任行於腹。總諸陰之會。故爲陰脉之海。督行於背。統諸陽之綱。故爲陽脉之海。二脉皆起於會陰。啓玄子曰。甲乙經圖。經以任脉循背者。謂之督脉。自少腹上者。謂之任脉。亦謂之督脉。則是以背腹陰陽。別爲名目耳。然衝脉亦起於胞中。金足少陰而上行。是任脉督脉衝脉。乃一源而三岐者。故人身之有腹背。猶天地之有子午。任督之有前後。猶二陸之分陰陽也。

內景圖

心系七節。七節之傍。中有小心。以腎系十四椎下。由下而上。亦七節也。



舊圖有精道循脊背。過肛門者。甚屬非理。而且無子宮命門之象。皆大失也。今改正之。

MING-QING ILLUSTRATIONS OF THE ORGANS

Yi-Li Wu

Women's and Gender Studies and History,
University of Michigan, Ann Arbor (USA)

INTRODUCTION

The images in this group circulated in medical texts produced and printed during the late Ming (1368–1644) and early-to-mid-Qing (1644–1912) periods of China. The Ming dynasty came to power after the overthrow of the Mongol Yuan dynasty by Han Chinese rebels. The founding Ming emperor reasserted Chinese cultural models within the empire and re-established tributary relations with neighboring states. Key characteristics of Ming-era society included sustained population growth, accelerating commercialization and the emergence of a wealthy urban merchant class, the expansion of the educational system and the popularization of literate elite norms, and a burgeoning print culture. This fostered the wide production of medical and medicine-related texts aimed at amateur and expert readers alike. The Manchu conquerors who established the Qing dynasty inherited these dynamics. Simultaneously, they created a far-flung multi-ethnic empire that greatly surpassed Ming boundaries, notably expanding into the northwest and southwest regions. While claiming legitimacy as universal rulers of “all under Heaven,” they also actively promoted Chinese elite norms of scholarship and rulership. During the late nineteenth century, intensifying Euro-American imperialist expansion and Chinese elite frustration with the seeming impotence and corruption of the court gave rise to a nationalist, revolutionary movement. In the decades following the overthrow of the Qing and the founding of the Republic of China in 1912, reformers hotly debated whether and how older medical beliefs should be part of a modernizing society.

Diagram of the inner landscape

from Zhang Jiebin (1563–1640), *Illustrated Wing of the Classified Canon*

(*Leijing tuyi*), woodblock edition, preface dated 1624

Harvard Library, © [2021] President and Fellows of Harvard College, licensed under a Creative Commons Attribution 4.0 International License

In his magnum opus, *The Classified Canon* (*Leijing*), the physician Zhang Jiebin reorganized the contents of the *Yellow Emperor's Inner Canon* by topic. In two companion works (“wings”), he also discussed contemporary medical doctrines and debates. In this image, Zhang revised a standard depiction of the internal organs to rebut the prevailing idea that the Gate of Life (*ming-men*) corresponded to the right kidney. Zhang believed that the Gate of Life corresponded to the “Child Palace” (*zigong*), which took the form of a womb in women and served as a reservoir of generative vitality in men. While other illustrations depicted the bladder adjacent to the rectum, Zhang inserted this new Gate of Life between them. Furthermore, while other authors depicted the “Pathway of Essence” (*jingdao*) as a conduit running down the backbone and transversing the anus, Zhang depicted it as a passage descending from the Gate of Life. (For an alternate version, see the 1597 reprint of *Wanbing huichun*, “Diagram of Man’s Side-Body” on page 80).

GUTS AND CLASSICAL CHINESE MEDICAL COSMOLOGY

Classical Chinese medical cosmology taught that the origin of all vitality and materiality in the human body was *qi*, endowed at conception and subsequently derived from food and drink. A core concern was thus how to understand the internal organs that produced and circulated *qi*. “Inner landscapes” (fig. 1) helped readers to visualize the placement of all the organs in the body’s trunk and the pathways that connected them to each other.

The ancient medical classic, the *Yellow Emperor's Inner Canon*, used political metaphors to distinguish two types of vital organs. The “depots” (*zang*) were the heart, kidney, liver, lungs, and spleen, responsible for storing vitalities. They were envisioned as lying more deeply in the body’s interior and were hence *yin*. The “palaces” (*fu*) were the large intestine, small intestine, bladder, gall bladder and “Triple Burner” (*san jiao*, an organ unique to Chinese medicine), the organs responsible for transporting vitalities. Envisioned as relatively exterior, they were *yang*. Doctors also placed the organs into *yin-yang* pairs, for example, the heart (fig. 2, 4) with the small intestine, the lung with the large intestine, and the spleen with the stomach. Thus, while the immediate organs of digestion were the spleen and stomach (fig. 3), their healthy functioning depended on the well-being of the ensemble of organs.

The interest in the internal organs even led to three official dissections of rebels, one during the 1st century and two in the mid-11th and early 12th centuries (for an image from the latter as reproduced by Rashīd al-Dīn in Persia, see “Travelling guts”, page 43). Some individual doctors also made opportunistic observations of people executed for crimes and exposed corpses. As an ensemble, the images here exemplify the urge to visually depict the organs. They also show that debates about the body were carried out in pictures as well as in words.



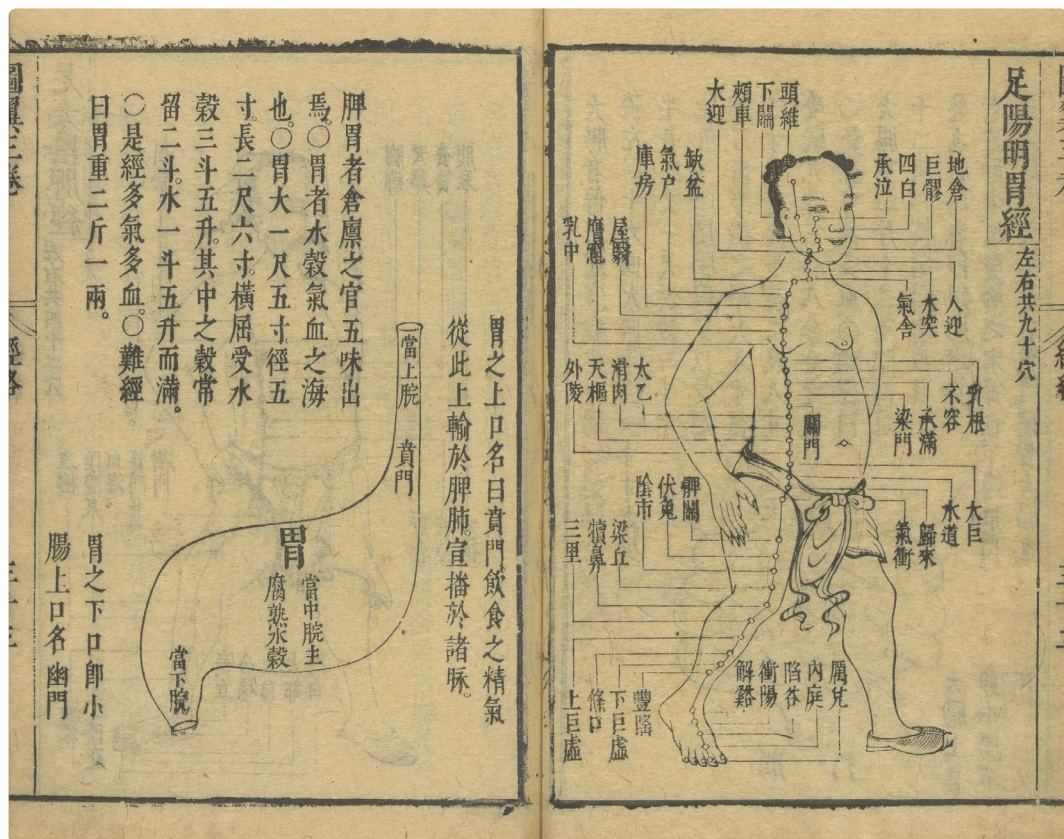
2

The hand lesser yin heart channel

from Zhang Jiebin (1563–1640), *Illustrated Wing of the Classified Canon* (*Leijing tuiyi*), woodblock edition, preface dated 1624

Harvard Library, © [2021] President and Fellows of Harvard College, licensed under a Creative Commons Attribution 4.0 International License

In writings on acupuncture, it became common to pair an image of an internal organ with an image of its channel's pathway. Of particular note here is how Zhang visually depicts the classical saying that the heart has four "connectors" (*xi*) that lead into the other four depot organs. To the bottom right are the connecting pathways connecting the heart to the kidneys, the liver, and the spleen. But Zhang explains that "the connector to the lung is the lung tube." This differs significantly from the image published earlier by Wang Qi (fig. 4). The text in the upper part of the page starts by reminding the reader that the heart is the sovereign organ and the source of the psyche. It then describes the heart's physical attributes and position (beneath the "lung tube," above the diaphragm, and attached to the "fifth vertebrae of the back") and other details about its role in the body.



3

Diagram of the stomach

from Zhang Jiebin (1563–1640), *Illustrated Wing of the Classified Canon (Leijing tuyi)*, woodblock edition, preface dated 1624

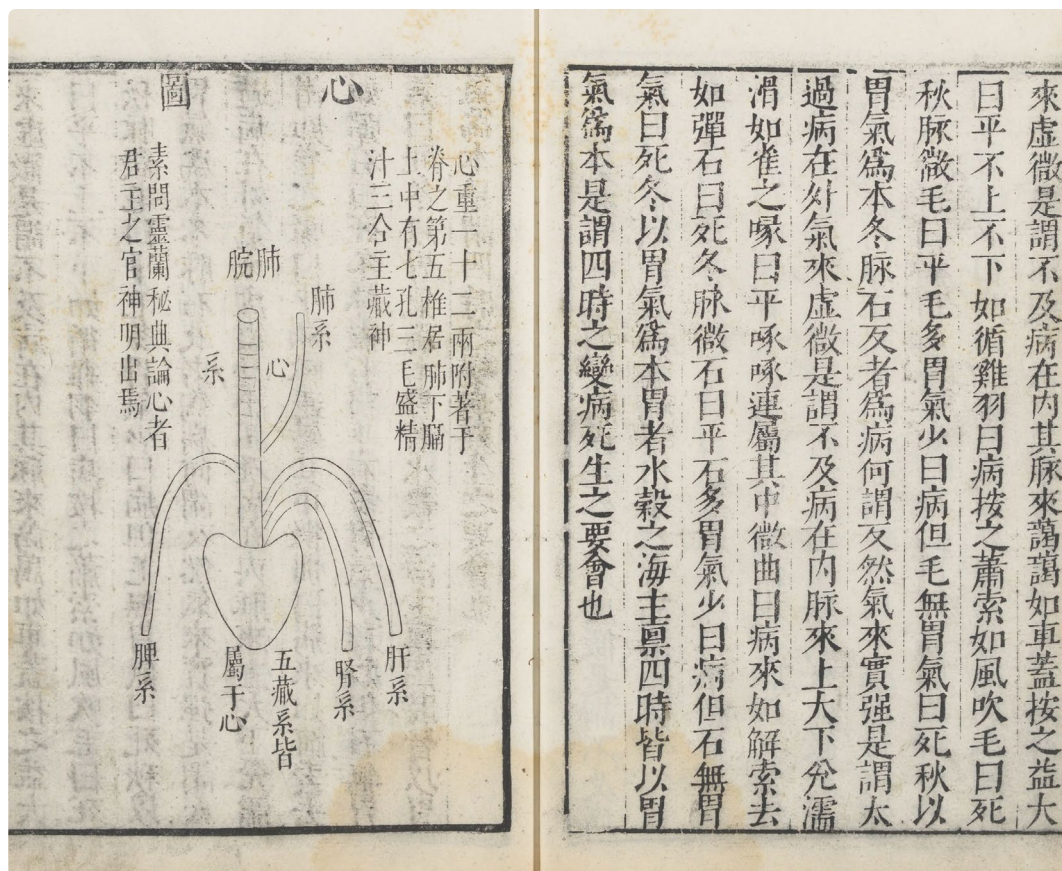
Harvard Library, © [2021] President and Fellows of Harvard College, licensed under a Creative Commons Attribution 4.0 International License

This image of the stomach accompanies Zhang's illustration of the pathway of the Foot Yang Brightness Stomach Channel. The upper text begins with classical descriptions of the stomach as a "granary," "the origin of the five flavors" and a "sea of fluids and grains, qi and blood." Next come descriptions of its dimensions, weight, and capacity. The text on the stomach and to either side of it explains the organ's function and physical relationship to other organs; fluids and grains are "fermented and ripened" in the center part of the stomach; the upper orifice is called the "rushing gate" and refined *qi* from food and drink is transported from there into the spleen and lungs, which then spread *qi* into the pulse vessels; and the lower orifice of the stomach is called the "dark gate" and is simultaneously the upper orifice of the small intestine.

Diagram of the heart

from Wang Qi (*jinshi* degree holder of 1565), *Collected Diagrams of Heaven, Earth, and Man* (Sancai tuhui), Chongzhen reign (1628–44) reprint of 1609 edition; Harvard Library, © [2021] President and Fellows of Harvard College, licensed under a Creative Commons Attribution 4.0 International License

This famous encyclopedia was a collection of illustrations of myriad aspects of the “three realms” of Heaven, Earth, and Man. Acupunctural images and images of the organs appear in its chapters on the human body. This rendering of the heart (left) shows four “connectors” going from the heart to the lungs, liver, kidney, and spleen. The tracheal tube is labelled “heart tube” and the space above that is labeled “cavity of the lung”. When the *Imperial Encyclopedia* of 1726–28 provided illustrations of organs in its section on medicine, it used this image of the heart with four connectors. By contrast, the *Golden Mirror of the Orthodox Lineage of Medicine* compiled by the Imperial Medical Academy in 1742 used the heart with three connectors found in the work of Zhang Jiebin. (See fig. 2)



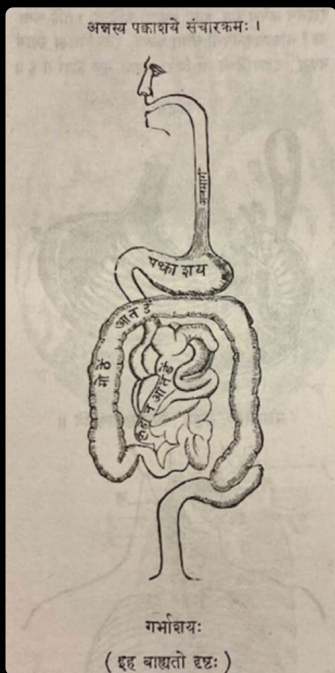
YOGA AND AYURVEDIC MEDICINE IN SOUTH ASIA

Jason Birch

SOAS University of London

INTRODUCTION

India is considered to be part of South Asia, which is a group of countries bounded by the Indian Ocean in the south and the Himalayas, Karakoram, and Pamir mountains in the north. Indian religion and medicine have rich textual traditions that began more than two millennia ago. Structured lists of bodily constituents, humoral theories of physiology and disease, medicines and prescriptions on healthy living emerge from the scriptures of religious traditions that are now referred to as Hinduism and Buddhism. By the time the earliest Sanskrit medical texts were composed, these rudimentary ideas had developed into sophisticated systems of medicine generally known as *Āyurveda*, a term which means “knowledge (*veda*) for longevity (*āyus*)”. Two of the most important works, the *Carakasamhitā* (circa 2nd CE) and *Suśrutasamhitā* (re-compiled in 6th CE), document the teachings of longstanding medical traditions that evolved in organised cosmopolitan societies with medical institutions. Some of their ideas anticipate the modern development of hospitals, surgery and the management of epidemics.





In premodern India, the guts were the site of digestion and digestion was conceived as a process of cooking. In fact, the Sanskrit words that are commonly translated as digestion literally mean “cooking” (*pācana*) or “burning” (*dīpana*), and the process relies upon the body’s fire (*agni*), which is located in the abdomen. The cooking begins as the food descends from the stomach, which is called “the receptacle of raw food” (*āmāśaya*), and finishes in the intestines, “the receptacle of cooked food” (*pakvāśaya*). The cooking process produces nutrient fluid (*rasa*) and waste (*mala*). Nutrient fluid is further transformed by heat in the body to produce six other bodily constituents, namely, blood, flesh, fat, bone, marrow and generative fluid. Bodily winds (*prāṇa*) of various kinds move the food through the body, fan the fire, distribute nutrient fluid and expel the waste. The cooking of each bodily constituent produces different waste materials, ranging from phlegm and sweat to urine and faeces. If the ratio of waste to nutrient fluid is appropriate, the humours (bile, wind and phlegm) are balanced and health is maintained. If the balance of the humours is lost, disease ensues. An Ayurvedic physician can treat disease by prescribing medicines, diets and other treatments that balance the humours and strengthen the patient’s digestive fire so that the ingested food is properly cooked.

1

A human anatomical figure

Drawing, Nepalese, ca. 1800 (?); Source: Wellcome Library no. 574912i
Wellcome Collection. Public Domain Mark

Although India has thousands of manuscripts of premodern medical texts, only a handful contain anatomical illustrations. Text was crucially important for transmitting medical teachings. Figure 1 combines text with an illustration of the body and its internal constituents. Although produced in Nepal, the work has been influenced by Tibetan traditions of illustrating bloodletting points. The text consists of excerpts from a sixteenth-century medical text called the *Bhāvaprakāśa* (“Bhāvamiśra’s Explanation”). The excerpts expatiate on the body’s external and internal parts, such as the winds, humours, tubes, receptacles, sinews, orifices and so on. Many of these are labelled in the illustration itself. In particular, the fire (*agni*) and the receptacles of the digestive system are depicted and labelled, including the intestines (*pakvāśaya*) and receptacles of faeces (*malāśaya*) and urine (*mutrāśaya*). Also represented are the places of nutrient fluid (*rasasthāna*) and semen (*śuklasthāna*), the final nutritive element of digestion. One curious feature of the illustration is the man’s open eyes, which suggest he is alive. However, the exposure of the internal organs and tubes is similar to a post-mortem dissection of a body. (1)

2

Indian anatomical painting

ca. eighteenth century, western India. An old-Gujarati manuscript (circa 1900?).
(Wellcome MS Indic d 74. Photo Wellcome Library, London.) Source: Wellcome
Collection CC BY-NC-SA 4.0

Premodern anatomical images in India were influenced by Persian drawings on anatomy, particularly during the Mughal dynasty's reign in north India from the sixteenth to eighteenth century. This figure depicts the veins, arteries and intestinal tract in the manner of Persian drawings. The body's position with the legs splayed and the hands on the inner thighs is very similar to anatomical images from the *Taṣrīḥ-i Maṣū'irī tradition*, which included many of the observations of Galen. However, the labels within the figure and text surrounding it, which consist of Sanskrit and Gujarati, overlay tantric ideas onto the anatomical body. In particular, flower-like cakras have been added along the central axis of the body, as well as the 'aperture to Brahma' (*brahmarandhra*) above the head. The text describes a system of six cakras, sixteen bodily supports (*ādhāra*), three meditative gazing points (*lakṣya*) and five voids (*vyoman*) in the body, which all facilitate the practice of yoga. (2)

3

Food's course of movement in the intestines (engraving)

Anglicized Bibliographic data:

The Śārṅgnadhara-saṃhitā by Paṇḍit Śārṅgadharācārya, son of Paṇḍit Dāmodara with the commentary Aḍhamalla's Dīpikā and Kāśīrāma's Gūḍhārtha-Dīpikā. Ed. Paṇḍitaparaśurāmaśāstri. Bombay: Pāndurang Jāwājī, Nirṇaya-Sāgar Press, 1931

Sanskrit Title and Author in Roman font:

śrīmatpaṇḍitadāmodarasūnu-śārṅgadharācāryaviracitā.
 śārṅgadharasaṃhitā. bhiṣagvarāḍhamallaviracitadīpikā-
 paṇḍitakāśīrāmavaidyaviracita-gūḍhārthadīpikābhyāṃ ṭīkābhyāṃ saṃvalitā.
 vedavācaspatyabṛhadabhidhānapraṇetrā vidyāsāgara-paṇḍitaparaśurāmaśāstriṇā
 saṃśodhitā.

Source: Wellcome Library; Photographer: Ed Bishop

Illustrated editions of Sanskrit Ayurvedic texts are common today but they did not begin to appear until the early twentieth century. Figure 3 is an illustration of the intestines (*pakvāśaya*) in Paṇḍitaparaśurāmaśāstri's edition (1931) of a fourteenth-century Sanskrit text called the *Śārṅgadharasaṃhitā*, which is a relatively short, well-organized compendium. The author Śārṅgadharā states that he composed this text so that short-lived, dim-witted people had access to the bare essentials of the entire canon of medical literature. Various anatomical illustrations adorn Paṇḍitaparaśurāmaśāstri's edition, which juxtaposes western style engravings with columns of Sanskrit text in Devanagari font. Figure 3 accompanies a passage of the *Śārṅgadharasaṃhitā* on the seven receptacles of the body, which are those of phlegm (chest), raw food (stomach), fire (abdomen), wind (between the navel and right lung), faeces (colon), urine (bladder) and life blood (in the chest). Ironically, the receptacle of cooked food (intestines) illustrated in the book is not included among Śārṅgadharā's seven receptacles. (3)

Rāja Mandhata

Nurpur, Himachal Pradesh, India ca. 1690–1700. Source: Cleveland Museum of Art CCO 1.0 Universal (CCO 1.0)

The yogic body was configured in different ways by various traditions. The abdomen was thought to be the seat of fire in the body, and it could be stimulated by the practice of physical yoga postures, such as the Siddha's Pose (*siddhāsana*) depicted in this figure. The heel of the lower leg presses against the perineum and pushes up the normally downward moving wind to fan the abdominal fire. As gestured by his right hand, the king is practising breath retentions (*prāṇāyāma*), which could be done while applying internal muscular locks to generate intense heat in the body. In some yogic traditions that worshipped the god Śiva, the abdominal conflagration brought about by yoga was thought to burn and thereby awaken the serpent goddess called Kuṇḍalinī, who remains asleep while coiled around a bulb (*kanda*) in the lower abdomen, her mouth blocking the lower aperture of the yogi's central channel. By waking her, the aperture is opened and the yogi can proceed to move the breath (*prāṇa*) and Kuṇḍalinī herself into the central channel. However, as depicted in Figure 3, the channel is blocked by three knots (*granthi*), the first of which is at the navel and represented by the God Brahmā, here with multiple faces and arms. Intensive yoga practice was supposed to push the breath and Kuṇḍalinī so forcibly up through the central channel that they pierce and clear the knots. When Viṣṇu's knot in the throat and Rudra's knot between the eyebrows had been pierced, the yogi enters a profound state of meditation in which the body, mind and breath become still. Textual and visual evidence of kings engaged in yoga is rare. This figure portrays Rāja Mandhata as a serious practitioner who would have no doubt patronised yogis and protected the lay communities that supported them. (4, 5)

The Navel Cakra (maṇipūṛaka) with intestines

Provenance: Printed book, Bihar, undated (1903)

Anglicized Bibliographic data

The Śaṭcakranirūpaṇacitra with the Bhāṣya and Bhāṣāṭīkā by Svāmihamsasvarūpa. Bihar: Trikutivilas Press Muzaffarpur.

Sanskrit Title and Author in Devanagari font

स्वामिहंसस्वरूपकृतम् षट्चक्रनिरूपणचित्रम् | भाष्यसमलंकृतं भाषाटीकोपेतञ्च |

Sanskrit Title and Author in Roman font

Svāmihamsasvarūpakṛtam

Śaṭcakranirūpaṇacitram: bhāṣyasamalaṅkṛtaṁ bhāṣāṭīkopetañ ca

Source: Wellcome Library, manuscript number, Sanskrit 391.

In the late nineteenth and early twentieth century, Indian gurus and authors began to map the medieval yogic body of cakras, lotuses and channels onto the anatomical body of modern science. In 1889, Major Basu, a general editor for the Bombay Theosophical Society, published two essays in which he equated cakras with various ganglia and plexuses of the nervous system. Many other interpretations followed, including Swami Hamsasvarupa's illustrated Hindi translation of a Sanskrit work called the *Ṣaṭcakranirūpaṇa* ("Explanation of the Six Cakras"), which was published in 1903. Traditionally located in the region of the navel, the cakra called *maṇipūraka* is identified in Figure 5 with the epigastric plexus, which is represented by the illustration of the intestines in the top right corner. The cakra itself has ten petals in the colour of heavy rain clouds. Each petal contains a seed syllable called a *bīja* mantra. Within the circle of petals is an orange triangle representing the body's region of fire, which is covered by its own seed syllable "raṁ" in red. The fire is mounted on a ram (*meṣa*), and two deities named Rudra (a form of Śiva) and Lākinī are depicted within the fire's seed syllable. Various channels (*nāḍī*) radiating from the navel cakra are represented as blood vessels. In premodern traditions of Tantra and yoga, cakras were visualised as lotus-like centres positioned along the central channel of the body, which extended up to a point twelve finger-breaths above the head. The number of cakras could range from four or six to nine or more in different conceptions of the yogic body. By meditating on cakras, a yogi gained various supramundane powers. For example, the *Ṣaṭcakranirūpaṇa* states that by visualising the navel cakra in the way it describes the yogi acquires the power to preserve or destroy the world and Sarasvatī, the goddess of eloquent speech, music and learning, abides in him forever. A fragment of a larger sixteenth-century work called the *Tattvacintāmaṇi*, the *Ṣaṭcakranirūpaṇa* was translated into English by a British Indian judge named Sir John Woodroffe and his Bengali collaborator Atal Bihari Ghosh in 1924. His publication, which included pictures, helped to popularise the six cakra model in New Age religions and modern yoga schools. (6,7)

1) Wujastyk, D. 2008. 'A Body of Knowledge: the Wellcome Ayurvedic Anatomical Man and his Sanskrit Context', *Asian Medicine*, 4: 201-248.

2) Wujastyk, D. 2007. 'A Persian Anatomical Image in a non-Muslim Manuscript from Gujarat', *Medical History* 51: 239.

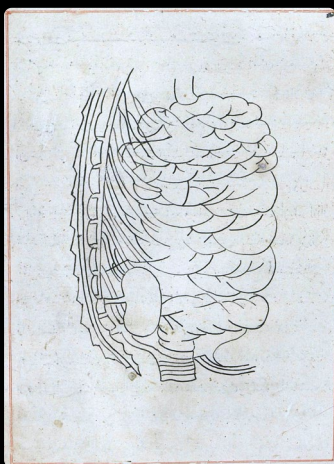
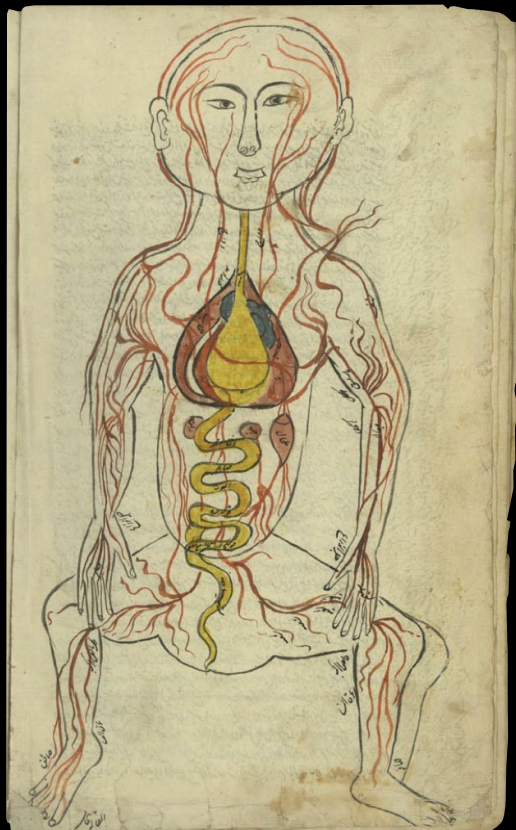
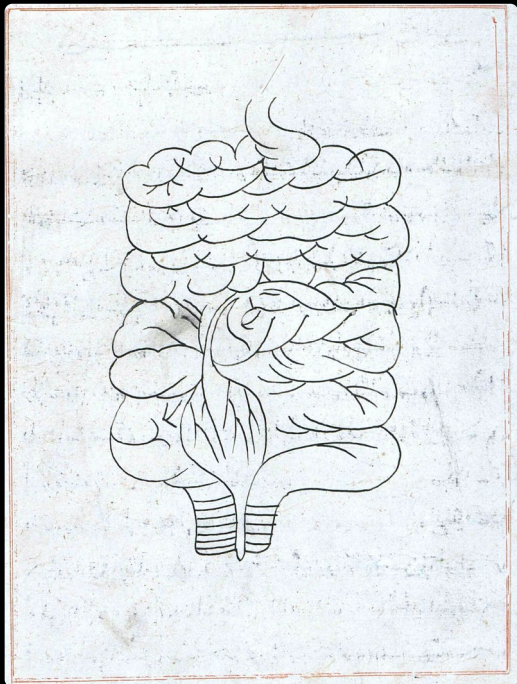
3) Pheasant Lust, G. 2018. 'Finding Provenance, Finding Purpose: An Analysis of the Skeleton on Page 41 of Parasurama Shastri's 1931 Edition of the Sarngadhara Samhita.' University of Alberta, HIST 488/698 Essay.

4) Diamond, D. 2013. *Yoga: The Art of Transformation*. Washington D.C.: Arthur M. Sackler Gallery Smithsonian Institution.

5) Hargreaves, J. 2020. 'Visual Evidence for Royal Yogins., in *The Luminescent*. Retrieved from: <https://www.theluminescent.org/2020/08/visual-evidence-for-royal-yogins.html>

6) Avalon, A. (Sir John Woodroffe). 1924. *The Serpent Power: Being the Shat-Chakra-Nirupana and Paduka-Panchaka: Two Works on Laya Yoga*. Madras: Ganesh and co.

7) Singleton, M. 2010. *Yoga Body: The Origins of Modern Posture Practice*. Oxford: Oxford University Press.



ARABIC AND PERSIAN MATERIALS

Ignacio Sánchez

Escuela de Traductores de Toledo,
Universidad de Castilla-La Mancha

INTRODUCTION

The terms Islamic or Arabic medicine are, as often noted, misleading. Many of the physicians who lived and worked in pre-modern Islamic societies were neither Muslim nor Arab, and the shortcomings of defining multi-ethnic and culturally varied regions in religious terms are obvious, let alone its ideological implications. (1) Yet, the use of anatomical representations in the medical traditions developed in the Islamic world is determined, to a great extent, by religious concerns.

The Arabic term for anatomy—later adopted in Persian and Ottoman Turkish—is *tashrīḥ*, which literally means “dissecting”. Ironically, the medieval sources contain very little references to human dissection, since this practice was regarded as contrary to religious principles. (2) The anatomical paradigm to which these physicians adhered was Galenic and the opinions of Galen were rarely questioned. As Maimonides said when discussing Galen’s works on anatomy, no physician had practiced dissection after him. To this limitation, with obvious consequences for the knowledge of the internal organs, we should add yet another religious constrain: the prohibition of human representation, defended by a relevant number of Muslims scholars.

As a consequence, anatomical representations in pre-modern Islamic societies are rare. Most of them are connected to a single pictorial tradition inaugurated by Manṣūr ibn Ilyās in the 14th century and were used in medical works that were produced and circulated in the Eastern Mediterranean and Middle Eastern Islamic lands.

1) Pormann, P. and Savage-Smith, E. 2007. *Islamic Medicine*. Edinburgh: Edinburgh University Press.

2) Savage-Smith, E. 1995. ‘Attitudes towards Dissection in Medieval Islam,’ *Journal of the History of Medicine and Allied Sciences* 50/1: 67–110.

The first example of anatomical illustrations in an Islamic milieu was a Persian translation from Chinese, the *Tansūqnāma*, commissioned by the Mongol vizier Rashīd al-Dīn in 1313 (figg. 1, 2). A second anatomical work written in Persian by Manṣūr ibn Ilyās, which included full-page representations of the human body, was also composed in 1386 for a Timurid ruler (figg. 3, 4). Prior to the 14th century we only find a few schematic representations of the eyes and the brain ventricles that use geometric forms. (1) The *Tansūqnāma* has survived in a unique manuscript and did not seem to have been copied or originated any textual or pictorial tradition.

In contrast, the second of the aforementioned works, the so-called *al-Tashrīḥ al-Manṣūrī*, became a model for later representations of both human and animal bodies, not only in the Islamic Mediterranean and Middle Eastern lands, but also South Asia and the Tibet. This tradition is known as the *Fünfbilderserie* ("the Five-images series"), since it usually includes five illustrations representing the silhouette of a "flat man", as seen from above, and depicting arteries, veins, nerves, bones, and muscles respectively. Some sets of illustration sometimes include a representation of a pregnant woman with the foetus in the womb (fig. 4). The origin of these illustrations has been traced back to 12th century Europe (2) In addition to the exceptional illustrations taken from Chinese works in the *Tansūqnāma*, the only representations of the internal organs that have come down to us from pre-modern Islamic lands are those belonging to the *Fünfbilderserie* tradition. The success of this pictorial model went beyond the works on human anatomy and similar designs were later used in the illustration of veterinary works (fig. 5). Neither the *Tansūqnāma* nor *al-Tashrīḥ al-Manṣūrī* have been edited or properly studied. The use of these visual representations and their relationship with the anatomical or veterinary texts they accompany also awaits a proper research. The depiction of the internal organs in the figures copied from Chinese sources in the *Tansūqnāma* is realistic and their position within the body roughly accurate. In the *Fünfbilderserie* tradition, the depiction of the anatomical parts is rather schematic, although their position is in general accurate. The organs that participate in the digestion of food according to the Galenic medical tradition are often drawn in the same colour. In general, the guts are not of special symbolic or metaphorical significance in the cultural traditions conveyed by these texts, in contrast with other organs such as the brain, the heart and the liver. (3) On these traditions see Emilie Savage-Smith (2007), Ynez Violé O'Neill (4) (1977), and Andrew Newman (1998) (5).

1) Pormann, P. and Savage-Smith, E. 2007. *Islamic Medicine*. Edinburgh: Edinburgh University Press.

2) Savage-Smith, E. 1995. 'Attitudes towards Dissection in Medieval Islam,' *Journal of the History of Medicine and Allied Sciences* 50/1: 67–110.

3) Savage-Smith, E. 2007. 'Anatomical Illustrations in Arabic Manuscripts', in A. Contadini (ed.), *Arab Painting: Text and Image in Illustrated Arabic Manuscripts*. Leiden and Boston: Brill, 147–159.

4) O'Neill, Y.V. 1977. "The *Fünfbilderserie* – A Bridge to the Unknown" in *Bulletin of the History of Medicine* 51, 538–549.

5) Newman, A. 1998. 'Taṣrīḥ-i Manṣūrī: Human Anatomy between the Galenic and Prophetic Medical Traditions', in Ž. Vesel, H. Beikbaghban, and B. Thierry de Crussol des Epesse (eds.), *La science dans le Monde Iranien à l'époque islamique*. Tehran: Institut Français de Recherche en Iran, 253–272.

Frontal illustration of the small and large intestines and the bladder (f. 69v)

Tansūqnāmah-i Īlkhān dar funūn-i 'ulūm-i Khatā'ī (Ilkhan's Treasure Book on the Branches of the Chinese Sciences). Istanbul MS Aya Sofya 3596. Tabriz, 1313.

This illustration occurs right before the beginning of the sixth section of the book (f. 70r) describing the connection of the veins and the ducts of the kidneys with the intestines and the bladder. cf. → The Screen gate, p. 51

The *Tansūqnāmah* is a Persian adaptation of a Chinese medical work—or works—commissioned by the Mongol vizier, physician and man of letters Rashīd al-Dīn (d. 1318). This treatise, which has survived in a unicum manuscript, contains anatomical illustrations copied from Chinese sources that do not have any parallel in the anatomical tradition developed in the Islamic world.

Illustration depicting a right lateral view of the body (f. 72r)

Tansūqnāmah-i Īlkhān dar funūn-i 'ulūm-i Khatā'ī (Ilkhan's Treasure Book on the Branches of the Chinese Sciences). Istanbul MS Aya Sofya 3596. Tabriz, 1313.

The image closes the sixth section. It shows the spine, the right kidney, the intestines, and the bladder.

Representation of a man with the distribution of the blood vessels and the internal organs (f. 13v)

Manṣūr ibn Ilyās (fl. 14th century), *Tashrīḥ-i badan-i insān*. Images from: Teheran MS Majlis 7430. Undated. Reproduced by kind permission of the Syndics of Cambridge University Library

The illustration depicts the heart, lungs, liver, esophagus/larynx, stomach, intestines, kidneys, and spleen. The organs involved in digestion are coloured in yellow.

This treatise by Manṣūr ibn Ilyās, composed in 1386 and extant in numerous copies, is the first original anatomical work written in Islamic lands featuring representations of the human body to illustrate the chapters on bones, nerves, muscles, veins and arteries. It has been argued that these illustrations are of European inspiration, following the model of the so-called *Fünfbilderserie*, a collection of five illustrations in which different anatomical features are represented in images of the human body as seen from above.

Manṣūr ibn Ilyās' treatise usually contains five illustrations, but this number may vary from manuscript to manuscript. The intestines, together with other internal organs, are always represented in the two illustrations depicting the distribution of veins and arteries along the body. One of these two images is sometimes repeated to represent a woman with a foetus in her uterus.

Representation of a woman with the distribution of the blood vessels and the internal organs (f. 15v)

Manṣūr ibn Ilyās (fl. 14th century), *Tashrīḥ-i badan-i insān*. Images from: Teheran MS Majlis 7430. Undated. Reproduced by kind permission of the Syndics of Cambridge University Library

This image represents the heart, lungs, liver, esophagus/larynx, stomach, intestines, kidneys, and spleen. As in the male representation, the organs involved in digestion are coloured in yellow. This illustration also depicts a foetus inside the womb. Female representations do not appear in the European Fünfbilderserie and seem to be proper of the Iranian tradition.

Anonymous, *K. Sharḥ al-Maqāma al-Ṣalāḥiyya fī l-Khayl wa-al-Bayyṭāra*

(Commentary on the Maqāma Ṣalāḥiyya on Horses and Veterinary)
Istanbul University Library MS 4689 – Egypt, 15th century

Hippiatry has a long tradition in Islamic literature. Works dealing with horses may adopt different literary genres and cover a wide range of disciplines, from veterinary sciences to the art of riding. As with treatises on human anatomy, the anatomical depictions of the body of animals are a late development. Several hippiatric manuscripts have illustrations featuring the internal organs that seem inspired by the graphic model of Manṣūr ibn Ilyās' anatomy, i.e. with flat representation of the body and its organs as seen from above. This illustration (fig. 5) belongs to the Mamluk *K. Sharḥ al-Maqāma al-Ṣalāḥiyya fī l-Khayl wa-l-Bayṭāra*, an anonymous commentary of a didactic poem on horses written in late 13th century. The image depicts the flat silhouette of a horse seen from its back, with representation of some internal and external body parts, namely the heart, lungs, spleen, intestines, kidneys, testicles, penis, loins, and things. The depiction of the intestines in this case is rather geometrical, but other illustrations of horses have figurative representations.



HUNTER-FISHERS OF NORWAY

Charlotte Damm

Dept. of Archaeology, History, Religious Studies and Theology,
Arctic University of Norway

INTRODUCTION

In northern Scandinavia a subsistence based on hunting and fishing persisted long after farming and domesticated animals were introduced in Central Europe and the southernmost parts of Scandinavia. In Norway this foraging population predominantly lived in coastal regions where fishing and sealing made up a major part of their diet, although hunting of particularly deer (red deer, elk, reindeer) and other terrestrial mammals was also pursued. Their tools were made of various types of stone, but the soft reddish sandstone usually referred to as slate was used extensively for both knives, arrowheads and spearpoints.

It is generally assumed that these hunter-fishers had an animistic world view, where animals and other beings had spirits like humans, and where significant forces could reside also in natural features such as rapids, northern lights etc. There are also indications that according to their worldview non-human beings might reside in other parallel worlds such as in water, inside cliffs and in the sky, and that some beings, possibly also humans, were able to travel between such worlds. There is overall a particular interest in outer appearance, perhaps linked to the understanding that beings may transform through makeshifts, with for example humans taking on the hide of animals.

While some rock art is known from earlier periods (9000–5000 BCE) there is a particularly rich rock art record from about 5000 BCE onwards. The motifs focus on large mammals, in particular deer, but in some areas also bear or marine mammals. Hunting scenes with bow and arrow or spears are common in some areas.

The earliest images are often large, sometimes even natural sized, and portray the animals through an outline, with just ears or antlers added. While some images in the later phases are also quite large (figg. 1, 5), the size typically decreases while more details are added, and the motifs become more stylized (figg. 3, 4).



Human figures in the northern rock art are nearly always simple stick figures with just lines for torso, arms and legs. In the few cases where human figures are more elaborate, details do not appear to correspond to guts of any kind, although occasionally they could represent human skeletons showing rib cases. In contrast to this, animal figures often show more details and internal patterning, also beyond what may be required to identify the species. In some cases, these indicate external markings such as hide colour, thus identifying age, sex, and even individual animals (Skandfer 2021). It has also been argued that the patterning could be linked to a totemic organisation, with different patterns for different clans or regions, springing from a cultural concern not with outer appearance and relations between species, but with internal human sociality (Fuglestad 2018). Markings indicating guts are rare. The most common feature is the so-called lifeline, a line running from the mouth of the animal to a shape in the front part of the torso (figg. 1,4). In an animistic world view, where humans and animals may travel between different worlds it is often one of several souls which make these travels. The lifeline could indicate the existence of such an extra soul or life force in master spirits, which in northern indigenous groups are typically bears or deer. While the emphasis is on external features and outer appearance, esophagus, stomachs and intestines occur in some case (figg. 2,3,4). In a very few cases more extensive anatomical details are suggested (fig. 5). The hunters would certainly be familiar with the guts of elk and reindeer, but since the anatomy is not correct in all details and only certain parts are included, we must assume that the selected organs have cultural significance.

Several scholars stress the ambiguity often found in the images. Such ambiguity may also pertain to the porpoise with either guts or lifeline. Concern with the stomachs of the deer may point to an interest in the differences between ungulates and humans, but depictions of heart, stomach (with contents?) and intestines could also point to the practice of haruspicy, taking omens from animal entrails.

1

Rock carving of brown bear with lifeline

ALTA, NORTHERN NORWAY; Photo: Charlotte Damm

This bear, a large, more than one metre long figure, is portrayed through the outline of the animal's profile only. The only other visible feature is a line running from the snout to an oblong circle located in the front part of the torso, interpreted as a "lifeline". The oblong circle, possibly the heart, would represent the location of the soul or spirit of the animal. This animal life force is perhaps identified in live animals with the misty breath or the blood which comes from the mouth or snout of a dying being.

Slate knife with two porpoises engraved

FOUND AT TEKSDAL, CENTRAL NORWAY; Photo: Per E. Fredriksen,
NTNU University Museum (CC BY-NC-SA 4.0)

This single-edged knife of reddish-brown slate or sandstone bears three engravings of fish or porpoises, two on one side (shown here) and one on the back. All three display the same internal patterning, a line running from the mouth to a square geometrical figure inside the body. The line is crossed by a series of smaller lines at an oblique angle to the main line. Although this is not an anatomically correct representation of neither a fish nor a porpoise, it can perhaps be interpreted as the representation of the animal's oesophagus leading to its stomach, while the oblique lines may indicate fishbones or ribs. The total length of both blade and handle is 15.5 cm.

Rock carving of elk with lifeline and guts

ALTA, NORTHERN NORWAY; Photo: Karin Tansem, VAM, Copyright
© World Heritage Rock Art Centre – Alta Museum (CC BY-NC-SA 4.0)

Only a few of the rock art images in northern Norway display a patterning that is likely to represent guts in an unambiguous way. This male elk is one of the few exceptions. In this figure, a line leads (probably) from the mouth to a point just behind the front leg. This is similar to the drawing of the lifeline seen in some other images. The vertical lines in the front half of the torso may represent the ribs of the animal and in the back part of the torso first a circle can be seen, possibly representing the stomachs (or the uterus), and behind it are a set of lines and a circle that could represent the intestines. The engraving has been enhanced with chalk.

Rock carving of reindeer with intestines

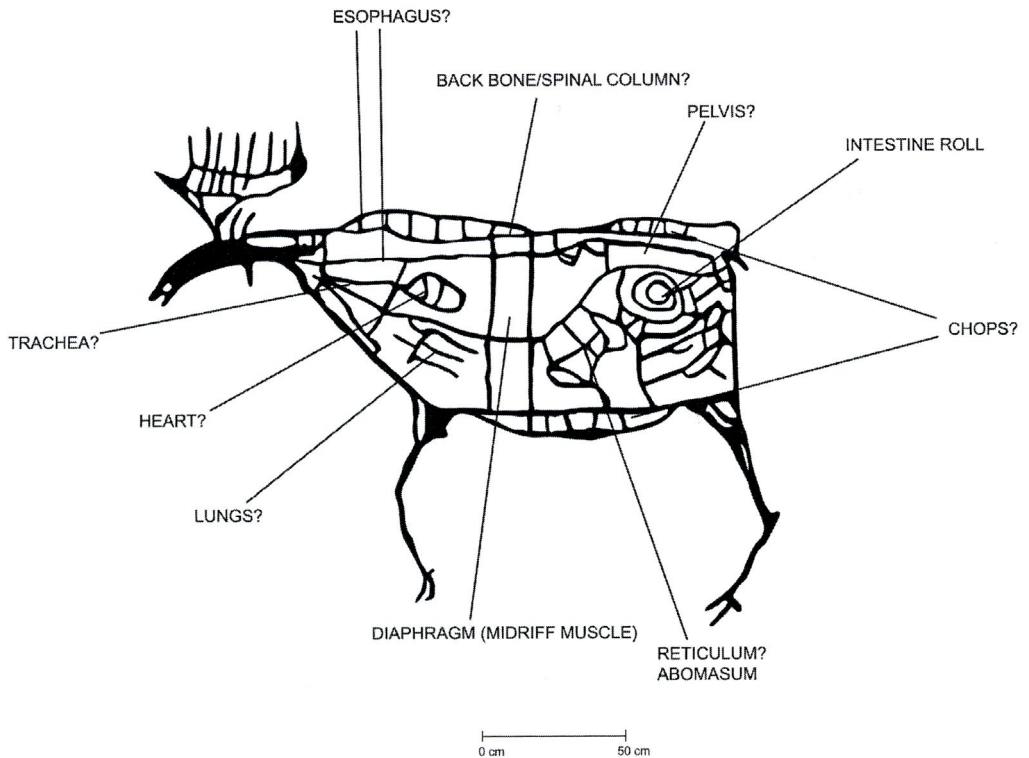
ALTA, NORTHERN NORWAY; Photo: Karin Tansem, VAM, Copyright
© World Heritage Rock Art Centre – Alta Museum (CC BY-NC-SA 4.0)

The large antlers indicate that this is a reindeer bull. The vertical lines in the front part of the torso may represent the ribs and the complex set of lines and circles in the back part of the torso may illustrate the intestines. The engraved parts of the images have been painted red to make it more visible to the public. At the time when the drawing was originally made, the rock surface would have had the natural reddish-brown colour caused by iron film (Tansem & Storemyr 2021), and the engraved lines would have stood out as greyish in colour, almost the opposite of what we experience by looking at this photo. The carving is ca. 25 cm long.

Drawing of rock carving of an elk with numerous anatomical parts depicted

ÅSKOLLEN IN SOUTHERN NORWAY; from: *Rock Art and the Wild Mind. Visual Imagery in Mesolithic Northern Europe*. Ingrid Fuglestad, Copyright © 2018, London, Routledge. Figure 5.2, page 192. Reproduced by permission of Taylor & Francis Group

A few rock carvings in southern Norway, including this of an elk bull with large antlers, display extensive internal patterning that may represent organs. The part most often seen is the line going to what is interpreted as the heart. Here also the trachea and the lungs appear to be marked. In addition to the roll of intestines also several of the four stomachs found in all ruminants, including cervids, are indicated.



Fuglestad, I. 2018. *Rock Art and the Wild mind. Visual Imagery in Mesolithic Norway*. London: Routledge.

Skandfer, M. 2021. 'The Appreciation of Reindeer: Rock Carvings and Sami Reindeer Knowledge', in I Gjerde, J.M. & Arntzen, M.S. (eds.) *Perspectives on differences in Rock Art*. Sheffield: Equinox, 113–128.

Tansem, K. & Storemyr, P. 2021. 'Red-coated rocks on the sea-shore: The esthetics and geology of prehistoric rock art in Alta, Arctic Norway'. *Geoarchaeology* 36(2), 314–334.



GREENLAND GUTS IN RITUAL, MYTH AND DAILY LIFE

Brigitte Sonne

Department of Cross-Cultural and
Regional Studies, University of Copenhagen

Ulla Odgaard

Independent project researcher –
archaeology and history of religion

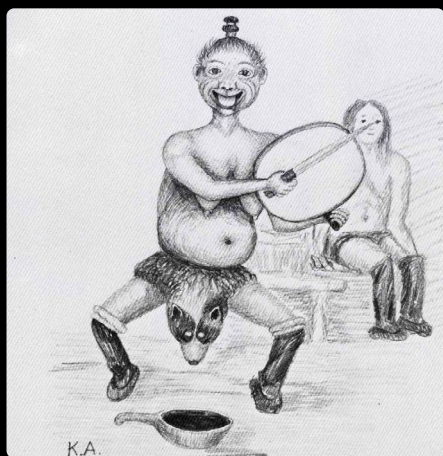
INTRODUCTION

Greenland is the world's largest island with approximately 75% covered by ice. It measures 2600 km from north to south and has an arctic climate with below 10°C in the warmest month. Protected fjords in South Greenland have subarctic conditions. The landscape is characterized by mountains, valleys, rivers and fjords; important game animals are caribou, muskox and, in the past, also polar bears; the marine fauna includes seals, walrus, whales as well as fish. First inhabitants of Greenland were the Paleo-Inuit (2500 BCE–1100 CE), rooted in Stone Age cultures of North-eastern Siberia.

The Paleo-Inuit were not directly related to the later Inuit culture, and they had already left Greenland, except for the North-west region, when the Thule people arrived. Before the Thule culture, the Viking Norse established two settlements in Southern Greenland, around 1000 CE. They belonged to the Nordic farming and trading culture, and disappeared from Greenland in the mid-15th century, probably due to collapsing networks. Contemporary Inuit Greenlanders are descendants of the whale hunting Inuit Thule culture, which originated in Alaska and spread from there to Northern Greenland around 1200 CE. During the following centuries, using big skin boats, kayaks, and dog sledges, they made their camps all around the coast of Greenland. Culturally, close ties to the Inuit of Canada and Alaska are maintained, sharing the same heritage of traditional myths and worldviews. In 1721 a Danish/Norwegian priest set out to find the successors of the Norse in Greenland. Instead, he found the Inuit, and he started a mission among them. Later Greenland became a Danish colony, gaining home rule in 1979 and autonomy in 2009 but is still part of the commonwealth with Denmark and Faeroe Islands. Human population is today 55.000.



Nº 1. Nihũũ tupitdlissaa tupagvårdlugo towiká.
 En tupitak som suger sig till en af hantarna
 som har land den (se Nihũũ Sagn Nihũũ og "Estimale" (Nihũũ))





The Inuit were hunters, primarily of sea mammals. They knew all details of the animal interior from cutting up the killed body for use. They used flesh, heart, liver, blubber, skin, guts, and bones for food, clothing, heating (the blubber), tents, boat covers, tools and utensils. The interior of human bodies was considered and known to be identical, if only cut up in case of murder. In that event the pieces were widely spread, and a part of the liver eaten by the murder(s) in order to prevent the soul from avenge. Thus, the interior of the human body was no mystery, if invisible to the ordinary eye in daily life. Only shamans, who “could see what was invisible to others” and in possession of an inner light, *qaamaneq*, were, when in trance able to look into another person’s body as well as into “the Other World” of the spirits and dead humans.

Among the guts, the lungs were indispensable to all live beings. Breath was the sign of life, its disappearance of death. The Lung-Eater living in a star close to Moon lived from the lungs of dead humans going to the heavenly realms of death, one in heaven, the other below the sea. Breathing was indispensable to the animals as well. Thus, the sea mammals living mostly in the invisible, airless other world of the sea had to surface at intervals into this world for a breath. In both this and the other world aggressive animals and spirits were feared. The rare birth in its caul, a *pooq*, made the child immune to aggressive beings, protected as it was in the *pooq*, meaning “mother” in the language of the Other World. The gutskin-anorak had a similar effect in both ritual and myth.

1

***Tupilak* carving**

Tupilak carving, ivory, Greenland. Before 1962; Photo: Ole Woldbye, Danish Arctic Institute

A *tupilak*, today a tourist object and awkwardly considered to have been an auspicious talisman, was an object meant to do nothing but harm. Most *Tupilaks* were put together by bones from various animals, stuffed with sod and wrapped up in skin, to be sent to a personal enemy, who, mistaking it for a seal at sea, would harpoon the *tupilak* and be drown. The *tupilak* could kill in other ways as well. But to create a *tupilak* and sending it along in order to kill an enemy was a risky affair, for one’s opponent may be stronger in magic means than the maker, and return the *tupilak*. If so, the recurrent *tupilak* would either turn the maker insane or make him fatally sick, or kill him by eating his or her entrails.

2

Traditional *tupilak*

Water colour, Aron from Kangeq, Greenland, today stored in the Ethnographic Museum in Oslo (Oslo University); Photo: Alexis Pantos/@Museum of Cultural History, University of Oslo

A *tupilak* was an artificially crafted object used for sorcery. It was meant to hurt the person to whom it was sent. It resembled a seal in size and features and was made of bones from various animals plus sometimes the skull of a child, filled with peat and covered with skin. The *tupilak* was brought to life by magic songs and made to grow by suckling the genitals of its maker. The transformation of the *tupilak* into an auspicious talisman as nowadays sold in shops feels nothing short of absurd. The production of miniature *tupilaks* carved in bone and sold as souvenirs, which began in the early years of the twentieth century, is responsible for this misleading trivialisation of the tradition.

The Entrail Snatcher

Drawing by Kårale Andreassen, today stored at the National Museum of Denmark;
Nationalmuseum, Denmark; Photo: Jesper Kurt-Nielsen, CC BY-SA 2.0

The Entrail Snatcher or Lung eater, named *Nalikkatteeq*, was said to eat the lungs of the deceased humans, who passed by her on their way to the heavenly realm of death. With the advent of Christian missions, which promised blessed singing in heaven, the shamans had to find out how the dead were capable of breathing up there. Earlier, prior to the establishment of Christian missions, *Nalikkatteeq*, which means literally “big crotch”, was a mythological double-sexed figure endowed with the power to turn over the pillar supporting the heavenly vault. According to myth, she would cut out the lungs of the shaman who could not resist laughing at her frivolous dancing. During ritual, appearing as a masked figure in a similar way she hits violently those who burst into laughter at the sight of her dancing.

Gut skin parka

today stored at the National Museum of Denmark, Source: Nationalmuseum, Denmark;
File ID: ES-49677 Photo: Roberto Fortuna, CC BY-NC-SA 4.0

This girl's parka is from Eastern Greenland and was acquired by the National Museum of Denmark in 1854. Survival in the Arctic requires extremely well-made clothing. The skill of producing watertight, lightweight clothing goes back a long way in the history of the Inuit. The material used is seal guts, which were emptied, dried, and cut up in long strips that were then sewn together. This type of clothing, a kind of raincoat-cum-windbreaker, also served as winter underwear for adults. For its use as underwear for small children in East Greenland, the prominent idea may have been that it provided protection against hostile non-human beings. In the traditional Inuit system of thought, transparent intestinal skin can symbolize a boundary between this and the supernatural world. If you are dressed in gut skin, you will thus be protected from evil spirits; and sometimes the *angakkuqs* (shamans) would wear a gut skin parka during seances.

Towing bladder / hunting float

keeping a hunted whale floating. Photo: Bodil Begtrup, Danish Arctic Institute

This important hunting implement, when hunting seals from a kayak is, despite of the name, usually made from the stomach of a narwhal or, if this is not available, from waterproof seal skin. Its length is usually 35–50 cm. At the open end it is heavily lashed with sinew thread to a mouthpiece or nozzle, through which the hunter can blow up the device. Attached to the line of the harpoon, the air-filled float will make the harpooned seal come to the surface. Spiritually, or symbolically the hunting float could be somehow connected to the human stomach. If a hunter's wife was pregnant, for example, the air should be let out out of the hunting float during a thunderstorm, or her stomach could explode.



2

1

3

MESOPOTAMIA

Maddalena Rumor

Case Western Reserve University

INTRODUCTION

Mesopotamia is the geographic region roughly corresponding to modern Iraq, parts of Syria, South-Eastern Turkey and Western Iran. The name itself, a Greek designation meaning “between the rivers,” defines the most salient characteristic of the area: the alluvial plain created by the course of the Euphrates and Tigris rivers from Eastern Turkey to the Persian Gulf. This two river’s valley witnessed some of the very first permanent settlements in human history from ca. 8,000 BCE. Over the course of several millennia it was inhabited by different groups of peoples of distinct cultural, ethnic and linguistic origins.

In the 4th millennium BCE one of these, the Sumerians, created a highly complex civilization in the south of Mesopotamia, arguably the first civilization in human history. Using the new tool of writing, they began to record their language, something that humans have been doing ever since. Many of those inscribed objects still survive, allowing scholars to reconstruct the history of this region using original sources, a unique circumstance in the study of ancient societies. What emerged is a long and complex history spanning three millennia. Babylonians dominated the scene in the first half (Old-Babylonian period) and, to a certain extent, also in the second half (Middle-Babylonian period) of the second millennium BCE, interwoven in a network of international relations with their neighbors outside of Mesopotamia. The Assyrians, in the north, controlled the region in the first four centuries of the 1 millennium BCE (Neo-Assyrian period), but their empire fell in 612 BCE, when the last Mesopotamian dynasty of kings, the Neo-Babylonian dynasty, destroyed their capital, and reorganized the land into an empire (6th century BCE). At the end of the 6th century BCE the Persian Cyrus entered Babylon and from that time on the land between the rivers was led by non-native rulers.

In ancient Mesopotamia, the inside of the human body was never the object of autopsy or dissection for the purposes of research, and thus internal (human) anatomy remained unexplored for the entirety of its history. As a result, visual representations of human organs are completely absent from the record. While there seems to have been a rather general sense of where these organs were located, and with what diseases they were associated, the anatomical terminology used for the abdominal area is often vague and ambiguous (fig. 3).

Animal anatomy, on the other hand, was much better known from the autopsy of sacrificial sheep, and its extensive terminology reflects the depth of that knowledge. Clay models (fig. 1), figurines (fig. 2), or drawings have been found all over Western Asia that were used to teach extispicy, a science which was central to the life of the State, for it assisted a number of important decisions, predicting, for example, when it was time to prepare for impending danger, such as war, draught or even epidemics. Abnormal features within the entrails of a sheep were recorded and studied by diviners (*bārû*, lit. “examiners”), as they were believed to carry divine messages regarding the future. The scrutiny usually began from the liver, proceeding to the entire exta, including the stomach and intestines. The regular conformation of these, as well as the meaning of any irregularity therewith, would be taught to the apprentice diviner by means of clay models (fig. 1) or illustrations. In rare cases such irregularities could even create fantastic shapes resembling mythological figures (fig. 2), or animals (scorpions, dogs etc.), which would have conveyed special significance, and thus be recorded. Some general principles were involved in the interpretation of the exta that carry particular cultural significance. For example, the attribution of positive value to the right side (or negative to the left) is evident in the reading of these organs. Similar principles also governed medical omens, suggesting a possible connection between human medicine and divination. Such connection, however, remained on the structural level, and an influence on the knowledge of human internal anatomy remained negligible.



2

back view

1

top view

3

tīrānū

Clay tablet representing a conical model of *tīrānū*, sheep entrails. Yale Babylonian Collection, New Haven, Connecticut (Museum Number: YBC 3000; or CDLI no. P290764), side and top view; Photos: Yale Peabody Museum of Natural History; CC0 1.0 Universal (CC0 1.0)

The clay model YBC 3000 is a plastic rendering of *tīrānū*, sheep entrails, and shows one single coil spiraling in a way to create a conical shape. A number of three-dimensional renditions, as well as two-dimensional drawings and incisions, of the viscera have been found throughout Western Asia, dating as early as to the mid-3rd millennium site of Ebla, in northern Syria. These representations sometimes include an inscription, either on the same face of the tablet or on the back, that explains the meaning of the particular figure illustrated.

Models of entrails, such as this one, are generally understood to have served as instructional tools in the teaching of extispicy. Before and after a sacrifice, a diviner would examine the body of the sacrificed animal (usually a sheep) and note any peculiar or irregular aspect of its viscera, most often in the liver, but also in its lungs, stomach and intestines. Any of those irregularities, ultimately generated by the gods, was believed to carry special meaning, and could be interpreted to predict future events. It was the work of the diviner to study and interpret them in order to assist the king in the running of the country.

Mask of Huwawa

Clay tablet depicting the face of the demon Huwawa (Humbaba), also rendering the intestines of a sheep inspected for divination. British Museum, London (Museum Number: BM 116624), obverse and reverse; Photos: © The Trustees of the British Museum; CC BY-NC-SA 4.0

The coils of intestines reproduced on *tīrānū*-models could take various different shapes, most often rendering single or multiple spirals, but occasionally also the figures of dogs, scorpions, or sometimes even more complex forms. The clay tablet BM 116624, found in Sippar (near Baghdad, Iraq), and possibly dated to the Old-Babylonian period, represents perhaps the most famous and fantastic example of these *tīrānū*-models. On the obverse it features the face of Huwawa, a demon known from the epic of Gilgamesh, as guardian of the mythological cedar forest. The shape of the demon's face is obtained by wrapping a long coil of sheep intestines in such a way as to create the features of a mask. The inscription on the reverse explains that this pattern was found on the sacrificed body of a sheep by Sargon of Akkad, and predicted to him the growth of his dominion. It reads:

"If the coils of the colon resemble the head of Huwawa, (this is) an omen of Sargon who ruled the land. If..., the house of a man will expand. [Written by] the hand of Warad-Marduk, diviner, son of Kubburum, diviner."

ŠÀ, *libbu*

Detail of sign ŠÀ from AO 29561 (CDLI P005337)

Photo: Louvre Museum, Paris, France; CC BY-SA 3.0 DE

The cuneiform sign ŠÀ, *libbu* in Akkadian, is a general term used to refer to the internal organs of the body, both animal and human. It is translated with “heart” (the original pictogram from which the sign developed probably depicted an animal heart), but also with “abdomen,” “belly,” “womb,” etc. and was considered to be the seat of emotions, as well as of thought and will. In combination with other signs, it also referred to notions more specific to the guts. For instance, when used in the plural (ŠÀ.MEŠ), it was equivalent to Akkadian *qerbū*: “insides,” or “intestines” (which can be swollen, hurt, red, constipated, etc.); when used with the determinative for flesh (UZU.ŠÀ) the logogram meant instead *irrū*, which we understand as “bowels” (that can rumble, prolapse, evacuate, etc.). In other contexts, the sign simply pointed to the idea of “inside” or “center.”



ROMAN-ETRUSCAN MATERIALS

Jane Draycott

Ancient History, University of Glasgow

INTRODUCTION

In antiquity, Italy was a very diverse region, inhabited by many ethnically, culturally, and linguistically distinct groups. The Etruscans and the Romans were two of these groups, and were located in Central Italy (equating to roughly the regions of Tuscany, Umbria, and Lazio today) in the period spanning the first millennium BCE and the first five centuries CE. Etruscan civilisation seems to have arisen in the ninth century BCE, becoming the dominant culture in Italy by the middle of the seventh century BCE, and in the following centuries, the Etruscans exerted a heavy influence upon their Roman neighbours, with a dynasty of Etruscan kings ruling Rome from the foundation of the city in 753 BCE until the monarchy was abolished, the royal family expelled, and the Republic founded in 509 BCE. Over the course of the next four centuries, Roman political, military, cultural, and linguistic influence expanded and Rome came to dominate the Italian peninsula. By the late first century BCE, the Etruscans, along with the rest of the Italic peoples, had been absorbed into what had become the Roman Empire, with a sphere of influence extending from northern Europe down to north Africa, and from western Europe across to the Near East. There were close connections between the Italian peninsula and Greece and the Near East throughout this period, and these are attested in both the literary and archaeological records.

GUTS IN ROMAN-ETRUSCAN MATERIALS

While anatomical votives representing the external body had been used in Classical Greece, anatomical votives representing the internal body were an Etrusco-Italian innovation. This may have been due to the Etruscans and Romans having a different, more positive attitude towards the interior of the body than the Greeks, who viewed it with a degree of disgust. It may also have been due to an increased understanding of the interior of the body due to the use of vivisection and dissection in medical research in Hellenistic Alexandria (fig. 4), or the widespread practice of animal sacrifice and haruspicy in religion in Central Italy (fig. 1).

However, despite the increasing level of knowledge regarding the interior of the body in the last few centuries BCE, as attested by writers of medical texts such as Celsus, artistic depictions of it remained neither entirely consistent nor entirely accurate.

There was a wide variety of representations of the internal organs including the trachea, heart, lungs, liver, spleen, intestines, and even the uterus, as well as other bodily features such as muscles and bones ranging from schematic and stylised to more anatomically correct and precise, although some were more akin to animal than human innards. Some votives come in the form of a complete or truncated torso with a tear-drop or oval opening (fig. 3), others in the form of a plaque, and others incorporate more creative approaches such as playing with perspective or incorporating human/animal hybridity (fig. 2). While they may refer to the literal opening of the body, such as that done by medical practitioners for the purposes of surgery, they may also refer to the figurative opening of the body, such as that done by the gods for the purposes of divine healing. These votives may take the form of male or female bodies, they may be clothed or unclothed, with the larger, more detailed, more individualised examples thought to have been dedicated by wealthier suppliants.

1

The 'Piacenza Liver'

Municipale Museum of Piacenza; CC0 1.0 Universal (CC0 1.0)

This Etruscan bronze life-size model of a sheep's liver was discovered in a field near Gossolengo in Piacenza in Italy in 1877 and is thought to date from the late second or early first century BCE. Although its precise purpose is not fully understood, it is considered to provide important information about the Etruscan practice of haruspicy, specifically the type known as hepatoscopy, which predicted the future using the shape and position of the liver lobes of a sheep. It offers a different yet complementary perspective on the fragmentary references to the practice found in ancient Latin literature (most Etruscan literature has not survived). The model liver is inscribed on the front and the back, and since the inscriptions are oriented away from rather than towards the haruspex, it may, in fact, have been a teaching model for students of haruspicy. It is divided into sixteen sections reflecting and representing the Etruscan cosmological system, first into quadrants, and then with each quadrant then further divided into quadrants, each one corresponding to one of the gods, whose name is engraved within it. For the haruspex examining the liver, if the right god were to be present in the right place, the outlook would be favourable.

2

A polyvisceral plaque

Museo Nazionale Etrusco Di Villa Giulia

This Etruscan polyvisceral plaque from Tessennano in Latium in Italy is thought to date from around 400 BCE. Anatomical votives like these were deposited in sanctuaries and temples as offerings to the gods, generally interpreted as a gesture of gratitude for some manner of divine intervention such as the healing of an ailment or injury. This is one of only two examples to depict the

trachea in the form of a snake in addition to the more standard depiction of internal organs such as the stomach and the intestines, although these are impressionistic rather than anatomically correct. This representation is not fully understood, but it may be a reference to Asklepios/Aesculapius, the Graeco-Roman god of healing and medicine, who was particularly associated with snakes, or a belief that there were snakes lurking inside the human body, or even an understanding of animal/human hybridity.

3

A female “open torso” figurine

Nottingham Castle Museum

This female figurine was discovered at the sanctuary of the Graeco-Roman goddess Artemis/Diana Nemorensis at Lake Nemi in Italy in 1885. It was excavated and recovered from a sacred pit where it had been ritually disposed of sometime in antiquity after it had ceased to be required in the temple. It is thought to date from the period of the fourth to the second centuries BCE, and is unique in that the woman is depicted draped in robes yet with an incision in her torso revealing a selection of her internal organs. The combination of the clothing and the posture may indicate that it is intended to represent a living woman, with the dissected torso a thank offering for the healing of an ailment or injury. Alternatively, it may have been intended to recall animal sacrifice, as human sacrifice was an important part of the Sanctuary's mythical foundation narrative and a form of it was actually practiced there, with the Rex Nemorensis, the priest of the cult, fighting challengers to the death to maintain his position.

4

A fresco, Catacomba di Via Dino Compagni

© foto Pontificia Commissione di Archeologia Sacra

This fresco from the hypogeum of Via Dino Compagni in the Via Latina Catacomb in Rome dates to the fourth century CE. It shows a large group of men looking down upon a nude male figure with either a wound or a surgical incision in his abdomen. One of the seated men is pointing towards the recumbent man with a stick while the others are in discussion, and it has been suggested that this scene depicts an anatomy lesson involving a dissection, in which the man with the stick is pointing out the internal organs of the recumbent man to the rest of the group. While human vivisection and dissection was practised in Alexandria during the Hellenistic period, it does not seem to have been widely practised elsewhere in the ancient Mediterranean, or in later centuries. This led physicians to have to resort to animals such as apes for their information regarding the interior of the body instead, causing misunderstandings to arise.



GRAECO-ROMAN ANTIQUITY

Robin Osborne

Ancient History, University of Cambridge

INTRODUCTION

The “Greece” referred to when we talk about “Archaic”, “Classical” and “Hellenistic” Greece is somewhat variably defined. Its core is the Greek mainland south of Mount Olympus along with the islands of the Aegean and Ionian Seas and Crete. But the west coast of Anatolia had a number of Greek cities, and during the archaic period Greeks settled around the coast of South Italy, in Sicily, on the north coast of the Aegean, and round the coast of the Black Sea. In temporal terms Archaic Greece runs from the eighth to the sixth century, Classical Greece encompasses the fifth and fourth centuries, and Hellenistic Greece the third, second and first centuries BCE. Culturally the Greece of the Archaic period was relatively diverse, with distinctive styles of pottery painting in different areas, but there was nevertheless much communication between different cities, and sculptural types and styles even in the Archaic period are relatively homogenous. The most widely distributed pottery in the seventh century was Corinthian, and this was particularly popular in Greek cities of Italy and Sicily.

During the sixth century Athenian pottery came to take the largest market share, and was extremely popular not simply in Greek cities but beyond, into the Etruscan world. Athenian pottery maintained its wide distribution during the fifth century but after that painted pottery lost its appeal and importance. During the Hellenistic period, as a consequence of the conquests of Alexander the Great, Greek culture, including Greek language use, became prevalent in much of the near east and familiar as far east as Afghanistan.





The images shown above are as close as we get to the display of guts in Greek imagery. The animal liver is shown (fig. 2) in the very particular context of the examination of the sacrificial victim in order to determine whether the omens for battle are good. Otherwise, even in the case of animals, what is shown is the tail or a leg or unidentifiable meat wound round a spit. We never see any other organ. In the case of humans, despite the graphic descriptions offered in the *Iliad* of the passage through the body of spears and the consequent rupture of the innards, all that ever emerges from wounded bodies is blood (figg. 1, 5). The body may be divided—torn apart in the case of Pentheus (fig. 3) or classified for the purpose of isolating a part affected by illness, in the case of votives (fig. 4)—but no hint is ever given that this body contains a complex of organs. It cannot have been the case that Greeks were unaware of the inner parts of the body. For all that they did not practice human dissection in the classical period, they were familiar enough with the innards of animals from butchery practices. So this avoidance of representation of the inner parts of the body must have been studied.

It is important that this avoidance of representation of what is inside the human body is indiscriminate. It is not that certain parts of the innards are acceptable for display, other parts unacceptable. The only exception made is for the liver of sacrificial animals. Otherwise no curiosity is shown for what is inside the body. This contrasts not simply with Homeric epic, but also with the medical writings, largely of fifth- and fourth-century date, gathered under the name of Hippokrates. These writings are very various but include works such as the short *On Anatomy*, and the *On Flesh* that show detailed knowledge of the innards. But when it came to visual representation, Greeks seem not to have wanted to think about internal organs and guts. The body is “as seen”, not conceived of as a structure containing vital parts that is then covered with flesh, but simply as the flesh itself. The presence of blood that comes out of the body when the flesh is pierced is as much as any Greek painter or sculptor was prepared to acknowledge. Doctors were interested in the illnesses particular to women and the anatomical differences from which they resulted, but for those producing images, the differences between men and women were skin deep. For all the vaunted naturalism, or even “realism”, of Greek art, what artists were interested in was merely the effect of the real.

1

Athenian red-figure krater signed by Euphronios

death of Sarpedon ca. 500 BCE; Cervetri, Museo Nazionale Cerite

Photo: Jaime Ardiles-Arce, CCO 1.0 Universal (CCO 1.0)

This pot has become particularly famous because it was illegally excavated and then acquired by the Metropolitan Museum in New York. The Met. subsequently agreed that its acquisition had been inappropriate and the crater was returned to Italy. The pot is signed by the potter Euxitheos and the painter Euphronios, and is an outstanding example of Athenian late sixth-century red-figure pot painting.

The scene is taken from book 16 of Homer's *Iliad* where after Zeus' own son Sarpedon, the lord of the Lycians, has been killed by Patroklos and despoiled of his armour by the Greek troops, Zeus commanded Apollo to go and rescue Sarpedon, cleanse him of blood and have Sleep and Death carry him home to Lycia for burial. The image shows Sleep and Death carrying off Sarpe-

don, blood still pouring from his wounds, accompanied not by Apollo but by Hermes, who escorts the souls of the dead to Hades, and with a sort of guard of honour of soldiers flanking the scene.

The body of Sarpedon is huge and its anatomy rendered in almost unparalleled detail, but despite the blood pouring out, the flesh is merely cut, with no indication of the innards of the body being exposed. This despite the fact that the *Iliad* explicitly describes not only the way in which Patroklos' spear 'struck where the beating heart is closed in the arch of the muscles' (*Il.* 16.481, ἀλλ' ἔβαλ' ἐνθ' ἄρα τε φρένες ἔρχεται ἀμφ' ἀδινὸν κῆρ) but how when Patroklos 'dragged the spear out of his body... the midriff came away with it (ἐκ χροὸς ἔλκε δόρυ, προτὶ δὲ φρένες αὐτῷ ἔποντο), so that he drew out with the spearhead the life of Sarpedon' (*Il.* 16.503–5).

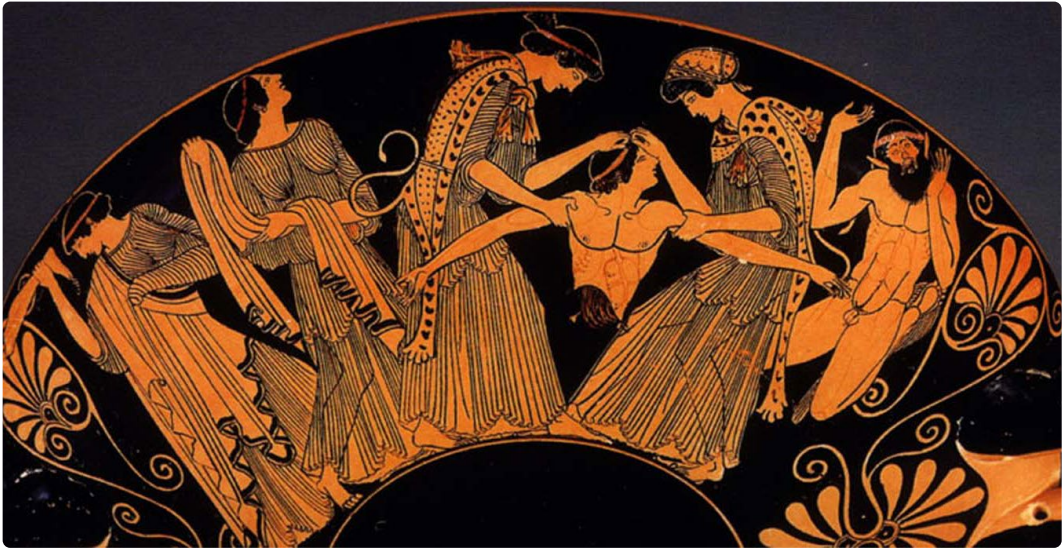
2

Athenian red-figure cup attributed to Oltos

examination of the liver of a sacrificial victim ('hieroscopy'), ca. 500 BCE

Photo: Governatorato SCV–Direzione dei Musei

Representation of warfare is a feature of Greek painted pottery from the earliest figurative images from the eighth century BCE. In the second half of the sixth century and into the early fifth century Athenian pot painters became interested in showing a very wide range of what soldiers do in war, beyond the actual fighting. A series of black-figure images, and a small number of red-figure images, show the examination of the liver of an animal sacrificed in advance of battle to discover whether the omens for battle are good. We know about the examination of victims' livers from literary accounts, and Greek armies included *manteis* ("seers") skilled in the art of divination so that expert interpretation could be offered. The images take a very similar form in each case. The liver, large, amorphous and often dangling, is held out by a person whose relatively small stature signals enslaved status as well as youth. It is inspected by a soldier in full armour, carrying a shield. The shields bear various devices, including bucrania and a human leg: in this particular case the choice of a cow as a shield device reminds of the bovine victim sacrificed. Frequently, as here, behind the figure carrying the liver is an old man – in this case the old figure is named Nestor and the scene thus given an *Iliadic* setting. Most representations are on amphoras, this one is on a cup attributed to Oltos and dating to around 500 BCE.



3

Athenian red-figure cup attributed to Douris

death of Pentheus (detail), ca. 480 BCE

Photo: 2023@photo Scala, Florence, Kimbell Art Museum, Fort Worth, Texas /Art Resource, NY/Scala, Florence

The death of Pentheus is most familiar in the description given by Euripides in *Bacchae*. There a messenger speech describes how Pentheus' mother, Agave, and the other Bacchantes tore his body apart: "One of them was flaunting a severed arm, another held a foot still shod for hunting, his ribs were being bared by clawing nails, and all with bloodied hands were playing games by tossing hunks of the flesh of Pentheus" (Euripides, *Bacchae* 1133–6, trans. Gibbons and Segal). The tearing apart of Pentheus appears on a small number of Athenian pots from the end of the sixth century until late in the fifth century. This cup attributed to Douris and painted around 480 BCE, three-quarters of a century before Euripides' play, is both the best preserved and the most graphic of the scenes. It is notable on the one hand for the inclusion of satyrs (one on the other side of the cup playing the double aulos next to a seated Dionysos in front of whom are two maenads with a lower leg and a thigh of Pentheus; one of this side frontal-faced and dancing), and on the other for the indication of blood pouring out of the upper part of the torn-apart body. But it appears that it is indeed blood that we have here, rather than innards.

4

Marble votive relief

showing votive body-parts, fourth-century BCE

from Asklepion at Athens Notwendige; Votive Relief – Acr. 7232

© Acropolis Museum; Photo: Constantinos Vasiliadis

A number of Greek sanctuaries, and in particular sanctuaries of healing god Asklepios, have yielded dedications of votive body-parts. These include arms and hands, legs and feet, eyes, ears, breasts, genitals, and sections of torso, but they include no internal organs. In this they contrast strongly with the anatomical votives found in Italy. This fourth-century relief, from the Asklepieion at Athens, shows a worshipper kneeling (itself a rather rare attitude for Greek worshippers) in front of a statue of a male figure wearing an animal skin (perhaps some manifestation of Herakles). Behind the woman are various votive body parts, arranged to more or less reconstruct a whole body. We have lower limbs at the far right, the thighs and abdomen above them to the left, and then arms above to the right, and the upper torso and head above to the right. It is as if a body has been chopped up. Or rather, it is as if a statue has been chopped up. For there is no hint here that these parts might contain anything by way of organs. What is more, it is unclear whether these are parts of a man or a woman. The upper legs and abdomen are certainly those of a woman, but is the upper body a woman's seen from the back—the head is very like the head of the kneeling woman—or a man's? The absence of guts here says something about attitudes to divine healing: votives do not point to what may be the cause of the malady that needs healing, they point to the part of the body where the effect of the malady is felt. The god is left to do the diagnosis.

5

Roman marble version of a dying Gaul

the original was part of a major sculptural display on the Athenian Acropolis of Attalid Greeks fighting Gauls in Asia Minor, Gods fighting Giants, Greeks fighting Amazons, and Greeks fighting Persians in the Persian Wars, ca. 200 BCE
Naples Dying Gaul; Photo: Mary Harrsch, CC-BY-NC-SA-2.0

In ca. 200 BCE Attalos I, the Hellenistic king whose capital was at Pergamon, responded positively to an Athenian appeal for help against Philip V of Macedonia. Almost certainly in that context, the Athenians agreed that Attalos could put along the south side of the Acropolis a monument marking the Pergamene victories over the Gauls in the later third century. This monument showed a series of great battles, mythological and historical—Gods against Giants, Greeks against Amazons, Greeks against Persians, and Attalos' forces against Gauls. The sculptures were two-thirds life-size, and this has meant that, although the original statues are lost, marble copies of them from Rome have been identified. One of the features of these sculptures, seen here in an image of a dying Gaul, is the willingness to show the wounds of those who have been defeated. But although we are shown blood spurting from the wounds, here again, as in the earlier representation of Sarpedon, the wounds themselves are neat incisions, and blood is all that is to be seen. Nothing of the innards of the body is ever shown.



GRAECO-ROMAN MEDICAL CULTURES

Chiara Thumiger

Cluster of Excellence Roots, CAU University, Kiel

INTRODUCTION

The first documented beginnings of Graeco-Roman medicine are identified traditionally with the dawn of Hippocratic medicine, owing its name to Hippocrates, the fifth-century legendary physician said to have come from the island of Cos, in the south-eastern Aegean. The work and movements of the professional doctors in this context can be located from Asia Minor and the Aegean to mainland Greece, southern Italy and Sicily; later, the elaborations of this medical tradition will flourish in Hellenistic Egypt, and then extend to the borders of the Roman empire in the imperial age, enabling the Syriac and Arabic receptions and translations of the Greek texts which will contribute to preserving them for medieval and early modern readers. The authority of these medical doctrines—even more, their terminological and conceptual backbones—would remain in place through the centuries, despite changing medical trends and scientific models.

It would be naive, of course, to think that medicine was born in the classical era, and in a specific location: medical doctrines, therapeutics, patient observations and interventions on the body existed around the Mediterranean for centuries long before this time, notably in the millennial traditions of Egypt and among the Babylonians (but surely not only there). The first systematised texts of learned Western medicine to reach us, however, are those of the Greeks and their Roman heirs, a body of knowledge that exerted immense influence and which is still visible, in many ways, in the rhetoric, terminology, ethics and scientific frame of Western “official” medicine.

Graeco-Roman medicine did not show great interest in reaching under the skin and into the human body to explore and map its contents from the start. The first surviving detailed anatomical works are those by Aristotle, who worked only on non-human animals; and it is only in the Hellenistic era (4th–2nd centuries BCE), in the exceptional context of Alexandrian, palace-sponsored research, that for a short period of time the dissection of human cadavers (and, if we are to believe controversial evidence, even vivisection of condemned criminals) appears to have been openly allowed. So begins the history of “anatomy” in the tradition of Western medicine in its etymological sense of *ana-tomia*, the “orderly cutting into parts” of the animal body and the careful distinction of components, tissues, substances, to which Galen’s writings on the vivisections he practiced on a vast range of animals, small and big, left to us evidence as wonderful as it is ghastly.

This learning itinerary and these scientific programmes, unfortunately, left behind no pictures of the body “imagined” by these thinkers for us to look at; while writers, poets, and artists, on the other hand, offer us complementary, if indirect evidence of this growing curiosity in what lies under the skin, inviting the eye to turn towards the inside of the human body and reach underneath its surface. The figurative material available to the historian is fundamentally of two types: artistic; and votive in purpose (especially Etruscan and Roman, rather than Greek); both, then, for a public very general and largely unspecified. In the first, artistic evidence, the inside is preserved intact (as Osborne shows, pp. 136–143) and communicates to the outside through modest lesions.

The medical fascination with the inside of the body as preserving powerful mechanisms and vital matters, however, cannot have left artists indifferent, although the conventions of public art were identical with highly stylised, solid and healthy forms; Apollo’s belly (fig. 3) could be read in this sense—and certainly the comical bellies of the grotesque terracottas (fig. 2). The votives aimed at focusing the healing powers of the divinity by displaying the body part (ill, then healed) constitute a legitimate exception; and while the classical Greeks shied away from including inner parts among the depictable objects to be displayed in gratitude, in the Etruscan and Roman workshops polyvisceral plaques of the individual stomach, womb or intestine are relatively common (figg. 4, 5).

1

Marble tombstone of an Athenian physician

Athens, 2nd century CE; © The Trustees of the British Museum; CC BY-NC-SA 4.0

This second century CE Athenian marble tombstone characterises the profession of the deceased, the physician Jason, by depicting a typical “doctor’s visit”. The doctor examines a young patient by palpating his protruding belly. Both touching and probing, and the abdomen as the “soft” centre of life in the body accessible to the hand, are central in the practice of Graeco-roman medicine (and not only there). The belly, often deemed as irrational and “inferior” to brain and heart in philosophical-biological discussions, is the first location in the body to which the healing hand must reach.



Grotesque terracotta figurine

3rd century BCE–3rd century CE (?); © 2023, Benaki Museum, Athens.
Benaki Museum inv. No 12793

This Hellenistic terracotta, part of the Benaki Museum collection in Athens, depicts with hyper-realistic traits an old, and/or “disabled” man with a protruding pot belly, achieving a grotesque effect and signalling a pathology while offering a comical symmetry to the bold head, if larger and rounder. The purpose of such “grotesque figurines”, found in large number around the Mediterranean and usually dated in a wide range (3rd century BCE–3rd century CE) was probably decorative and domestic. In these figurines the belly is often conspicuous as an inflatable part, as space holding content; it typifies old age but also, as in this case, the deformity and pathology of the underlying internal organ.

Terracotta anatomical votive

Athens, 2nd century CE, 3rdC BCE–1stC BCE; © The Trustees of the British Museum, Museum Number 1839,0214.51; CC BY-NC-SA 4.0

This image represents an inner part; some of the features, such as the ribs and wrinkles and the central globe, point to a womb as an “empty sack”, a container ready to receive the embryo; on the other hand, the piece is flat and the coils somehow more involute, offering analogy to the intestines; or could indeed point at any other sack. The potential for different interpretations allows us to make a key point: “pouchiness” and coils appear to be a fundamental modular element in the conceptualisation of inner parts of the body, at least in the Greek-Italic contexts, in poetry as much as in learned medicine (the Greek *koilia* is used for the stomach, the womb, the intestines, the cavities of the torso as a whole, and has a general meaning “hollowness”, “concavity”, “sack”, “pouch”).

Terracotta anatomical votive; spiral coil ending in trefoil

Tivoli/Lazio, 3rdC BCE–1stC BCE; © The Trustees of the British Museum
Museum inv. No 12793; Museum Number 1899,0720.13; CC BY-NC-SA 4.0

This terracotta votive nicely combines the clean volumetric rotundity of the belly with the coiled shape of the imagined innards (intestines? the uterus? the spiral image as an abstract indication of “innerness” and functionality)? As such, this coiled shape is even less interested in the “real” as tangible object and source of description than in a raffiguration of function and form per se, imaginatively fitting the round shape of the lower abdomen that appears to the eye of the observer and is experienced by the living person as s/he touches, feels, covers his or her belly.

Apollo the Python-Slayer or Cleveland Apollo

Hellenistic (?); Courtesy of the Cleveland Museum of Art,
Museum Number 1839.0214.51

The celebrated Cleveland Apollo is one of the most famous works attributed to the fourth-century Attic sculptor Praxiteles. Many later marble copies survive, but this bronze classical piece came to public attention only in 2004 when it was acquired by Cleveland Museum from a German estate, where it had been since before World War II. There has been an ongoing dispute as to whether this is an ancient copy of Praxiteles' work or whether it could be, indeed, the original work. In any case, this exemplary displays a trait the marble copies do not: a pronounced volumetry of the lower abdomen, almost a saggy belly, unexpected in the portrayal of the youthful god. This unusual lower abdomen suggests an interest, unnoticed in other works, in the *koiliai*, the "pouches" or "cavities" of the belly variously described by medical authors as the hollows inside the torso where fluids are gathered, food is received, and embryos grow in females. The sculptor of this piece (or Praxiteles in sculpting the original, if this is not the original but copies this feature of the original) devoted important attention to this intriguing volumetry, and gravity in response to the torsion of the trunk; the influence of contemporary medical and biological discussions plays a plausible role here.





εἰ πάντα τὰ ὄντα καπνός γένοιτο, ῥῖνες ἂν διαγνοῖεν

"If all existing things became smoke, the nose would discern them."

Heraclitus Fragment 7 DK (reported in Aristotle, *On sense and sensible objects* 5, 443a24-25)

GUT SCENT — THE SMELL OF GUTS

Alchemies of Scent Project

Victor Golubev, Sean Coughlin
Institute of Philosophy, Czech Academy of Sciences

INTRODUCTION

Scent was a prominent part of the experience of ritual animal sacrifice in Graeco-Roman antiquity. Literary sources of the period typically describe the experience as pleasant, focusing on the scent of the animal meat roasting on the altar fire. This scent, called *knisa* in Greek and *nidor* in Latin, is one of the primary purposes of the ritual, being not only pleasant in itself but also the offering presented to divine beings (as in Homer):

οἱ δ' ἀπελυμαίνοντο καὶ εἰς ἅλα λύματα βάλλον, ἔρδον δ' Ἀπόλλωνι τελέσσας ἑκατόμβας
ταύρων ἢ δ' αἰγῶν παρὰ θῖν' ἄλδς ἀτρυγέτοιο· κνίση δ' οὐρανὸν ἵκεν ἑλισσομένη περὶ καπνῶ.

They cleansed themselves and threw the dirt into the sea. Then they offered to Apollo a perfect sacrifice of bulls and goats near the shore of the barren sea. And the *knisa* (the scent of fat and meat) reached heaven, whirling around within the smoke. Homer, *Iliad* I 314–317 (tr. Coughlin)

Animal sacrifice, however, would have produced conditions for a far more complex smellscape than the hedonic and performative one emphasised in literary sources. Entrails of freshly slaughtered animals would have released odorant compounds typically characterised today as foul, acrid or otherwise unpleasant (fig. 2). Concentrations of such compounds would vary during the ritual, with some present during the slaughter and butchering of the animals, others during the removal and roasting of the inner organs.

Literary sources rarely discuss scents beyond roasted meat. This may be because they were not part of the focus of the ritual, or precisely because they were unpleasant. Nevertheless, we can use literary, epigraphical and iconographic sources and organic chemistry and biochemistry to reconstruct what compounds would have been present at the different stages of the animal sacrifice. Within these stages, the entrails of the sacrificial victim—organs like the heart, liver, spleen, gallbladder, kidneys and large and small intestines—would have contributed unique chemical compounds to the environment that would be detectable by participants and their noses. While the experience and interpretation of these compounds vary with social, cultural, individual and biological factors, the compounds themselves are stable reference points for understanding how entrails were or may have been experienced during ritual sacrifice.

Black-figured terracotta column-krater

British Museum, London, 1837,0609.38.

© The Trustees of the British Museum, CC BY-NC-SA 4.0

Vessel for mixing wine and water, late 5th century BCE, with men sacrificing a goat to a terminal figure of the god Hermes. The sacrificial victim has been dismembered and a part is being held in the flame on the altar. The entrails resting on the small table would release odorants including putrescine and cadaverine, typically characterised as strong and putrid, as well as ammonia, skatole, indole and other volatile organic compounds.

THE SMELL OF GUTS

Odorants of animal slaughter

In the first stage of animal sacrifice, the animal, often a goat, sheep or bull, but also sometimes swine, is brought to the altar. Its throat is slit and the animal is bled (fig. 2). Some of its blood is poured onto the altar as an offering (as described by Homer):

αὐτὰρ ἐπεὶ ῥ' εὖξαντο καὶ ἔσφαξαν καὶ ἔδειραν, μηρούς τ' ἐξέταμον κατὰ τε κνίσῃ ἐκάλυσαν, δίπτυχα ποιήσαντες, ἐπ' αὐτῶν δ' ὠμοθέτησαν. οὐδ' εἶχον μέθυ λείπει ἐπ' αἰθομένοισ' ἱεροῖσιν, ἀλλ' ὕδατι σπένδοντες ἐπώπτων ἔγκατα πάντα.

Now after they prayed, slaughtered the animals, and skinned them, they cut out the thigh-pieces and covered them with knisa (here the fat and meat themselves), having prepared and placed a double layer of fat and meat onto them. They had no wine to pour over the blazing sacrificial fire, but they made libations with water and roasted in addition all the entrails.

Homer, *Odyssey* XII 359–363 (tr. Coughlin)

When oxygen comes into contact with blood cells, they will start to necrotize (undergo cell death), causing them to release their contents into the environment. Red blood cells are highly sensitive to oxygen and can begin to undergo hemolysis (breakdown) within minutes of coming into contact with it. The blood would smell metallic and slightly sweet, primarily due to iron-containing compounds such as haemoglobin. Haemoglobin, present in red blood cells, is responsible for transporting oxygen and gives blood its distinctive red colour. When blood is exposed to air, the iron in haemoglobin reacts with oxygen to form iron oxide, which can oxidatively interact with lipids (fats) to form volatile aldehydes and ketones, which are the source of the characteristic metallic smell (fig. 4a). In addition to haemoglobin, other compounds present in the blood can contribute to its odour profile, such as urea and other nitrogen-containing compounds, amino acids, and lipids. Volatile compounds are also present in animal blood and these can contribute to its scent. They include indole (musty, floral odour), skatole (faeces-like odour, fig. 4b), and trimethylamine (ammonia or “fishy” odour), which are produced by bacteria in the gut. They also include alcohols, aldehydes and ketones, which are produced as a result of metabolic processes in the body. The scent of blood can also vary depending on other factors, including the animal species, its age, and the kinds of bacteria or other microorganisms in the animal or environment.



2

Red-figured terracotta stamnos

Musée du Louvre, Paris, Cp 10754.

© 2013 RMN-Grand Palais (Musée du Louvre) / Stéphane Maréchal

Vessel for storing liquids, attributed to the Eucharides Painter, early 5th century BCE, with two figures preparing a bull for sacrifice. When slaughtered, iron ions derived from the haemoglobin in the animal's blood would interact with fats and oils to form volatile aldehydes and ketones, like oct-1-en-3-one, typical sources for the "metallic" scent associated with blood.

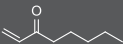
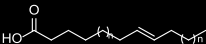

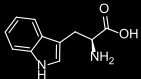

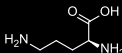
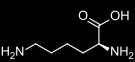

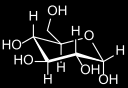
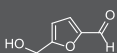
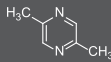



3

Red-figured terracotta bell-krater

Metropolitan Museum of Art,

New York, 41.162.4. Public domain

Vessel for mixing wine and water, attributed to the Nikias Painter, late 5th century BCE, with three youths preparing meat offering, altar stacked with burning wood and smoking with *knisa*. Attendants on either side carry skewers likely holding viscera. Skewered viscera would release, e.g., ptomines or ammonia, characterized as putrid and pungent, while roasting viscera would produce compounds like furfural, HMF, and 2-acetylpyridine, characterized as buttery, nutty or roasted.

Odour-contributing compound		Precursor in the body	
(a) Oct-1-en-3-one		Fatty acids	
(b) Skatole		Tryptophan	
(c) Ammonia	NH ₃	Urea	
(d) Putrescine	H ₂ N(CH ₂) ₄ NH ₂	Ornithine	
(e) Cadaverine	H ₂ N(CH ₂) ₅ NH ₂	Lysine	
(f) Furfural		Glucose	
(g) HMF			
(h) 2,5-Dimethylpyrazin		Glycine	
(i) 2-Acetylpyridine		Alanine	

Compounds in the environment following removal of animal guts that contribute to perception of odours:

(a) Oct-1-en-3-one, a ketone resulting from the interaction of Fe²⁺ ions and degraded lipid, commonly characterised as "metallic" smelling;

(b) 3-Methyl-1H-indole, known as skatole, associated with faecal odour, but is also present in lower concentrations in flowers like jasmine and orange blossom;

(c) Ammonia, derived from urea, associated with a strong, pungent odour;

(d) Butane-1,4-diamine, known as putrescine and

(e) Pentane-1,5-diamine, known as cadaverine, derived from amino acids in the body, are both characterised as putrid;

(f) Fufural and

(g) Hydroxymethylfurfural, produced from thermal degradation of glucose, are characterised by almond-like, buttery, caramel odours;

(h) 2,5-Dimethylpyrazine and

(i) 2-Acetylpyridine, produced from thermal degradation of glycine, are characterised by sweet, nutty and roasted odours.

Red-figured terracotta bell-krater

Musée du Louvre, Paris, G496.

© 2012 RMN-Grand Palais (Musée du Louvre) / Stéphane Maréchalle

Vessel for mixing wine and water, late 5th century BCE, with four figures and altar smoking with *knisa*. The boy on the left is holding skewered *splanchna*, "viscera", and roasting them on the fire. These would produce a complex odour profile including meaty, fatty and smokey odours. A man to the right is holding a bag-like organ over the fire, which may be either a heart or possibly a bladder, in which case its contents would degrade and contribute a scent of ammonia.



Odorants during butchering and removal of entrails

After the blood is removed from the animal, it is either suspended vertically or laid horizontally, then cut along the length of its belly. At this point, its entrails (*entera*, *enkata*) are removed. First the viscera (*splanchna*), likely including the heart, liver, pancreas, and spleen are removed. These are followed by the large intestine (*koilia*) and other organs, providing access to the kidneys (*nephron*). Finally, the small intestine (*skolion*) is removed and discarded or more likely cleaned and used as sausage casing. When the abdomen is opened, the release of bodily fluids and gases would be accompanied by compounds typically characterised as having a strong and unpleasant odour. These include skatole and indole which we have already encountered, but also ammonia (characterised by a strong, pungent odour, often described as acrid, fig. 4c), and so-called "ptomaines," including putrescine (putrid odour, one of the main contributors to the odour of rotten meat, fig. 4d) and cadaverine (another compound responsible for the odour of decaying meat, fig. 4e). Skatole and indole are produced by the bacteria in the intestines during the breakdown of amino acids (fig. 4b). Ammonia is formed from urea in the presence of urease, commonly present in

bacteria (fig. 4c). Putrescine and cadaverine are produced from the breakdown of amino acids by bacteria, particularly in rotting or decaying animal tissue (fig. 4d & e). Due to the presence of bacteria in the intestines, these compounds could also be formed in living animals and be released after dissection. In addition, mercaptans, a group of sulphur-containing compounds with a strong unpleasant smell, can result from the breakdown of animal tissues as well in the process of digestion. The odour may be more intense in warmer and more humid environments, as these conditions can accelerate the decomposition process and increase the release of odour-causing compounds. According to some modern studies, the raw meat of freshly slaughtered beef can contain a large variety of volatiles, often weak and somewhat sweet smelling: limonene (citrus-like), 2-methyl-3-buten-1-ol (floral odour), acetoin (sweet, buttery odour), 6-methyl-3-buten-1-ol (grassy odour), nonanal (fatty soapy odour), acetic acid (vinegar-like odour), γ -butyrolactone (sweet, creamy odour), 1-nonanol (sweet, fatty odour). Acetic acid, butyrolactone and nonanal are present in greatest proportions, however, the exact perception of the smell will depend on personal sensitivity. It should be noted that the conditions of modern studies will not correlate precisely with the historical context of animal sacrifice. In addition to cultural, social and individual differences in the perceivers, variation in animal diet, hygiene and health would likely also result in perceived differences, with faecal odours having been reported in the case of disorders of the liver, and putrid and ammonia-like odours reported in the case of abscess and peritonitis.

Odorants of roasting entrails

Along with some other parts of the animal, the entrails were often perquisites (reserved items) of the priest. In iconographic sources, the priest first roasts what is called the “divine portion” (*hiera moira*) of the animal, usually identified with the *osphus* or tail-bone. After the divine portion is cooked, attendants holding the viscera (*splanchna*) on skewers or spits will place them into the ritual fire (fig. 3). After roasting, the viscera are then eaten. The odour of roasted organs is likely included as part of the *knisa*, the combination of smoke and smokey and meaty scents mentioned in literary sources. However, the chemical component of such a sensory experience would be complex, depending on, among other factors, the type of wood used as fuel, the state of the organs and the species of animal. We can examine in more detail the complex mixture of volatile compounds that would contribute to the unique profile of roasted viscera, including fatty acids, amino acids, sugars, and products of their thermal decomposition. Heat from the fire will cause fatty acids to be formed by the decomposition of fats and oils present in the viscera. Some of the major fatty acids that contribute to the odour of roasted sheep organs include octanoic acid (caprylic acid) and decanoic acid (capric acid). During roasting, amino acids can also be released by means of the denaturation of proteins in the organs, and these can have distinctive odours, like alanine (fruity or flowery odour) and glycine (caramel odour). Sugars as well as these amino acids can undergo further thermal degradation reactions that result in the formation of volatile compounds. Some of the major volatile compounds produced during the thermal degradation of glucose include 5-hydroxymethylfurfural (HMF) and furfural (caramel, buttery odour, fig. 4f & g). Thermal degradation products of glycine include 2,5-dimethylpyrazine (roast, nutty odour) and 2-acetylpyridine (sweet, fatty odour, fig. 4h & i). These compounds will interact with each other to produce a complex scent mixture. Some literary and iconographic sources suggest entrails like intestines or the bladder may have been roasted at a late stage of the process (fig. 5), contributing other compounds we have encountered to the odour profile, including skatole, indole, ptomaines, and ammonia. The fire itself will also contribute to the overall odour by producing smoke and other compounds that interact with the smell of the roasting viscera. These include polycyclic aromatic hydrocarbons, volatile organic compounds, and benzene, which would contribute a smoky odour to roasted entrails.

The scent of guts would have been inescapable during ritual animal sacrifice. The viscera and entrails of animals would have contributed distinctive compounds to the chemical environment in the air around participants. Literary, epigraphic and iconographical sources allow us to reconstruct in more detail the way that environment would change during the ritual, starting from compounds associated with blood, to those released during removal of the entrails, to the degradation products produced when they are cooked. Without modern antibiotics, bacterial processes that contribute to odour-related compounds may have been more common in domesticated animals in the past and scents related to decay could also have progressed more quickly.

Ancient Graeco-Roman literary sources offer few descriptions of how this changing chemical environment was experienced. They focus mostly on the odour of *knisa*, the scent of smoke and roasted meat which was said to be pleasing to both human and divine beings. We can assume, however, that the scent of ancient guts would likewise have been experienced. How participants at these sacrifices would have described such experiences remains unclear.

Acknowledgments

Victor Golubev researched odorant compounds, provided the reconstructed sequence of compounds in the chemical environment, and wrote the body of the text. Sean Coughlin researched the literary and iconographic evidence for ancient Graeco-Roman animal sacrifice, wrote the introduction and conclusion, selected images and edited the final draft. This paper was written as part of the grant project GM21-30494M "Alchemies of Scent" supported by the Czech Science Foundation and coordinated by the Institute of Philosophy of the Czech Academy of Sciences in Prague.

Acree, T. and Arn H. 2004. 'Flavornet and Human Odor Space.' June 25, 2004. <https://www.flavornet.org/flavornet.html>.

Bell, R. 2016. 'The Smell of the Slaughterhouse.' *National Geographic* (blog). February 29, 2016. <https://www.nationalgeographic.com/culture/article/the-smell-of-the-slaughterhouse>.

Bowden, H. 2022. 'A Cognitive Approach to Ancient Greek Animal Sacrifice.' In A. W. Geertz, E. Eidinow, and J. North (eds.) *Cognitive Approaches to Ancient Religious Experience*. Cambridge: Cambridge University Press, 19–43.

Bradley, M. (ed.). 2015. *Smell and the Ancient Senses*. London/New York: Routledge.

Buettner, A. (ed.) 2017. *Springer Handbook of Odor*. Cham: Springer International Publishing.

Carbon, J.-M. 2017. 'Meaty Perks: Epichoric and Topological Trends.' In S. Hitch and I. Rutherford (eds.) *Animal Sacrifice in the Ancient Greek World*. Cambridge: Cambridge University Press, 151–177.

Conte, F., Cincotta, F., Condurso, C., Verzera, A. and Panebianco, A. 2021. 'Odor Emissions from Raw Meat of Freshly Slaughtered Cattle during Inspection.' *Foods* 10 (10), 2411.

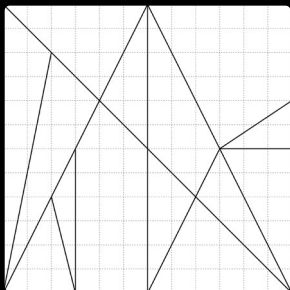
Frère, D., Munzi, P., Pouzadoux, C., and Del Mastro, B. (eds.) 2021. *Manger, boire, se parfumer pour l'éternité : Rituels alimentaires et odorants en Italie et en Gaule du IXe siècle avant au Ier siècle après J.-C.* Naples: Publications du Centre Jean Bérard.

Hitch, S. and Rutherford, I. (eds.) 2017. *Animal Sacrifice in the Ancient Greek World*. Cambridge: Cambridge University Press.

Lilja, S. 1972. *The Treatment of Odours in the Poetry of Antiquity*. Helsinki: Societas Scientiarum Fennica.

Van Straten, F. T. 1995. *Hiera Kalá: Images of Animal Sacrifice in Archaic and Classical Greece*. Leiden/New York: Brill.

Wong, K. H., Aziz, S. A. and Mohamed, S. 2008. 'Sensory Aroma from Maillard Reaction of Individual and Combinations of Amino Acids with Glucose in Acidic Conditions.' *International Journal of Food Science & Technology* 43 (9), 1512–19.



THE ANCIENT STOMACHION, A GRAECO-ROMAN GUTS-GAME

Marco Vespa

The Hebrew University of Jerusalem,
ATLOMY ERC Project

THE CONTEXT

The game, which in the ancient Graeco-Roman world was referred to by the term *Stomachion*, is not included in the encyclopaedic and lexicographical texts that usually convey most of the information about the rules, places and players of ancient games. Neither in the ninth book of Julius Pollux's *Onomasticon* (2nd century CE), nor in the few fragments of the indirect tradition of Suetonius' *On the Games of the Greeks* (1st–2nd century CE), nor in Isidore of Seville's encyclopaedic summa, the *Etymologies* (6th century CE), at the beginning of the Latin Middle Ages, is there any trace of this game.

The earliest evidence of the name of the game is the rediscovery in Istanbul in the late 19th and early 20th centuries of an ancient manuscript containing some geometry texts, a codex most likely compiled and written in the environment of the imperial court in Constantinople in the 10th century CE and rewritten two or three centuries later with some liturgical texts. The palimpsest volume (a manuscript whose later writing overlays the earlier one) contained texts by the Greek mathematician and engineer Archimedes (3rd century BCE), including the first part of a treatise called *Stomachion*, of which unfortunately only a little over two pages of text survive. The game was discussed by Archimedes from a geometric-mathematical perspective in the context of ancient mathematics' emerging interest in combinatorics. Archimedes' treatise probably started from a calculation of the fractions into which a square could be subdivided and of the amplitudes of the angles of the various figures that resulted from the subdivision (fig. 1), and was interested in the calculation of the possible combinations of figures that could recompose the same square in different ways.

It was precisely to the geometrical implications of combinatorics that the Roman poet Lucretius (1st century BCE) referred in his poem *De rerum natura* when he used the reference to the *Stomachion* to draw an analogy between the construction of the world by a finite number of atoms, which can combine in many configurations, and the various combinations, *formae*, of the inner parts of the square, *quadratus*.

THE GAME

The *Stomachion* takes its name literally from the Greek noun *stomachos*, a term from ancient Greek anatomy referring to the oesophagus, the tube of the digestive system through which food passes from the oral cavity into the stomach, or the stomach itself.

The texts available to us describe that the game consisted of fourteen lamellae, possibly made of bones, with various geometric forms, triangles and polygons, from which innumerable shapes and combinatorial arrangements could be made, giving life to various animal or human figures, from elephants and wild boars to gladiators and hunters with their dogs. The skill of the advanced players (*periti*) lay precisely in the speed and confidence with which they could compose and assemble (*iunctura*) the pieces into ever new figures.

Although the ancient texts are fairly unanimous in describing a game very similar to the modern tangram, which became popular in Europe from the 19th century onwards and is based on combining a limited number of tiles to form figures, there is also speculation that the *Stomachion* was actually an ancient form of jigsaw puzzle. According to this interpretation, the fourteen bone lamellae would lie scattered in disorder in front of the player and the aim of the game would be to arrange the lamellae so that they reassemble the figure of a square (fig. 2).

There is uncertainty about the motivation that might attach the game to its name. Based on a disputed reading in the handwritten tradition of the Latin poet Ausonius (4th c. CE), some have even assumed that the name of the game was *Ostomachion*, namely the “bones battle” in the ancient Greek language, and not *Stomachion*. This hypothesis justifies the name on the basis of the bone material of which the tiles were supposedly made, which Ausonius seems to confirm in part by calling them *ossicula*, i.e. “little bones”.

Differently, the traditional interpretation considers that especially for the inexperienced players the great difficulty of the game would have particular physio-psychological consequences, such as a feeling of angry stubbornness due to the frustration of not being able to put the slats together properly. In ancient Graeco-Roman culture, this stressful state of mind was associated with a feeling of sickness of the stomach, a state of altered moods that was also reflected in certain linguistic expressions, where words derived from *stomachus/stomachos* in Latin or in Greek expressed anger, as attested by the Latin verb *stomachor* or the Greek adjective *stomachōdēs*. A final hypothesis on the meaning of the game emerges from the analysis of its name, *Stomachion* as “small stomach” or “miniature stomach”. If we consider the image of a game contained within a frame forming a square, a *loculus*, and made up of internal parts that, once removed, are difficult to reassemble, this could perhaps be a reference to the intricate connection of the various organs that make up the abdominal cavity and form the digestive system, starting with the stomach. After examination *ex situ* (outside their original location) of the organs, as was often the case with medical anatomical dissections, it must have been very complicated to restore the original configuration so that everything would hold together.

The geometric design of the *Stomachion* diagram

The division of the square according to the indications of an Arabic manuscript; description: *Stomachion* of Archimedes, with a 1/12 grid, author: Hagen von Eitzen, copyright: public domain

This image reproduces the Graeco-Roman *Stomachion* square according to the proportions provided by a 17th century manuscript in the collection of the German National Library in Berlin, which conveys the Arabic translation of part of an ancient Greek treatise on geometry attributed to Archimedes, the *Stomachion*. The edition of the texts contained in the manuscript with German translation from Arabic was prepared in 1899 by the German philologist Heinrich Suter.

Kotsanas' wooden reproduction of the *Stomachion*

A modern reproduction of Archimedes' *Stomachion*. Copyright: Kostas Kotsanas – Museum of Ancient Greek Technology (www.kotsanas.com)

The image shows a reproduction of the *Stomachion* game located in the K. Kotsanas Museum of Ancient Greek Technology in Heraklion, Crete. This wooden artefact consists of a square geometric structure divided into fourteen triangular and polygonal tesserae with different sized angles. Engineer Kostas Kotsanas made the faithful reproduction based on information contained in the Arabic manuscript edited by H. Suter which handed down part of Archimedes' treatise called *Stomachion*.

From another manuscript, in which the incipit and a minimal initial part of the treatise in Greek are preserved, it can be deduced that one of the aims of the game was to reassemble the initial square through rotations and re-arrangements of the individual tesserae, which could be removed from their original position.

Heiberg, J. L. 1907. 'Eine neue Archimedeshandschrift', *Hermes*, 42, 235–303.

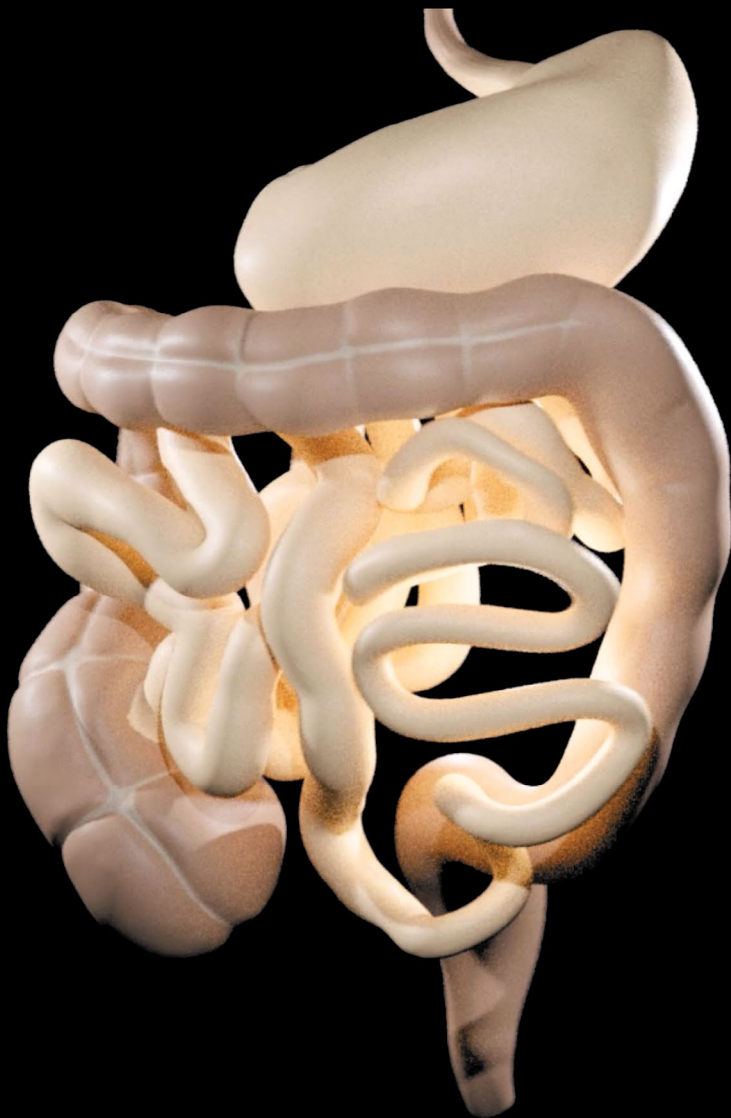
Morelli G. 2009. 'Lo *Stomachion* di Archimede nelle testimonianze antiche', *Bollettino di storia delle scienze matematiche* 29, 181–206.

Moretti, G. 2021. 'Atomi, giochi geometrici e immaginario combinatorio in Lucrezio', in *Lucrezio, Seneca e noi. Studi per Ivano Dionigi*. Bologna: Centro Studi La permanenza del Classico, 147–156.

Netz, R., Acerbi, F. and Wilson, N. G. 2004. 'Towards a Reconstruction of Archimedes' *Stomachion*', *Sciamus* 5, 67–99.

Suter, H. 1899. 'Der *Locus* Archimedeus oder das *Syntemachion* des Archimedes. Zum ersten mal nach zwei arabischen Manuskripten der Koeniglichen Bibliothek in Berlin herausgegeben und übersetzt'. *Abhandlungen zur Geschichte der Mathematik* 9.

Wilson, N. G. 1999. 'Archimedes: The Palimpsest and the Tradition', *Byzantinische Zeitschrift* 92.1, 89–101.



DIGITAL IMAGING AND HISTORY OF MEDICINE

ATLOMY Project

Orly Lewis, Yael Baron, Dmitry Ezrohi, Yotam Giladi, Shay Hermon, Nir Propper, Marco Vespa

ATLOMY is based at the Department of Classics at the Hebrew University of Jerusalem
and funded by the European Research Council, GA 852550.

THE GUTS ACCORDING TO ARISTOTLE: A VISUAL RECONSTRUCTION

Ancient Greek anatomical ideas stand at the basis of modern anatomical knowledge. The writings of Greek physicians and philosophers reveal their perceptions of the internal parts of the body and the empirical evidence which shaped their perceptions. They gained such evidence from observing open bodies of animals in ritual sacrifice and planned dissections. To fully understand these ancient scientists, we must try to step into their shoes and see the body as they describe it. To this end, we must try to bridge the gap between the text and the body and reconstruct from their verbal, textual descriptions the visual image they had in mind of the parts inside the body—including the guts. Project ATLOMY works to bridge this gap. We turn the ancient words back into visual representations of the three-dimensional body as perceived by the ancient authors. Classicists, modern anatomists and experts in 3D design and software development work together to analyze and decipher the ancient anatomical texts and ideas. We use philological analysis as well as hands-on dissections, which recreate the observations performed by the ancients. As part of our goal of creating a complete anatomical human model based on the writings of ancient scientists, we have created a 3D model of the digestive system as perceived by the Greek philosopher Aristotle (4th century BCE). To make these models accessible we have developed a groundbreaking integrative atlas of Graeco-Roman anatomical ideas, terminology, and research. It offers tailored viewing and research tools for researchers, students and the public. Our exhibits reflect on Aristotle methods of investigating the anatomy of the guts and other organs in the 4th century BCE (fig. 1) and then take you through the stages of ATLOMY's work to interpret Aristotle's writings (fig. 2), to create a 3D model of the digestive system as perceived by him (figg. 3, 4), and presenting it on our interactive open-access atlas of Graeco-Roman anatomy (fig. 5). You can use the Atlas to delve deeper into Aristotle's terminology and conception of guts or to explore other body parts and terminology used by Aristotle and other ancient Greek and Roman scientists and practitioners. You might recognize some terms!

For Aristotle, the guts or the intestines were a place of marvelous change, crucial for all living organisms. Somewhere along the intestinal tract, between the stomach above and the colon below, food will make its first step in a long process that Aristotle dubbed “cooking” (*pepsis*). During this process, food will gradually assimilate into the body. First, it will become blood in the heart, then this blood, coursing through a complex system of vessels and tubes, will reach the different body parts and be absorbed into them. Blood, according to Aristotle, is the final form food takes upon itself before turning into a wide variety of tissues—flesh, bone, fat, and others. Instead of blood carrying essentials, like oxygen, to the different tissues, the blood itself is their foodstuff. Aristotle describes how in the intestines, the food makes its first qualitative leap in this long process. The heat of the stomach and intestines forces the liquid mass of food to separate into two substances—a thick vapor that will continue its way to become viscous blood and a heavier mass of waste which will be excreted from the body. In many ways, this process resembles the separation of cooked milk into whey and curd. When engaging with Aristotle's text, it is crucial to be able to trace his description of digestion in space and not only with the mind's eye. Aristotle's inquiries were, for the most part, about embodied organisms whose spatiality and three-dimensionality are lost to us. This model and the project for which it stands are a step towards a better contextualization of Aristotle and the Graeco-Roman culture in general.

1

From observation to text: The guts according to Aristotle

Copyright: ATLOMY (ERC StG GA 852550), Hebrew University of Jerusalem; Bronze retractor, Roman, 1–100 CE. Science Museum, London. Attribution 4.0.; International (CC BY 4.0) <http://www.internetculture.it/>

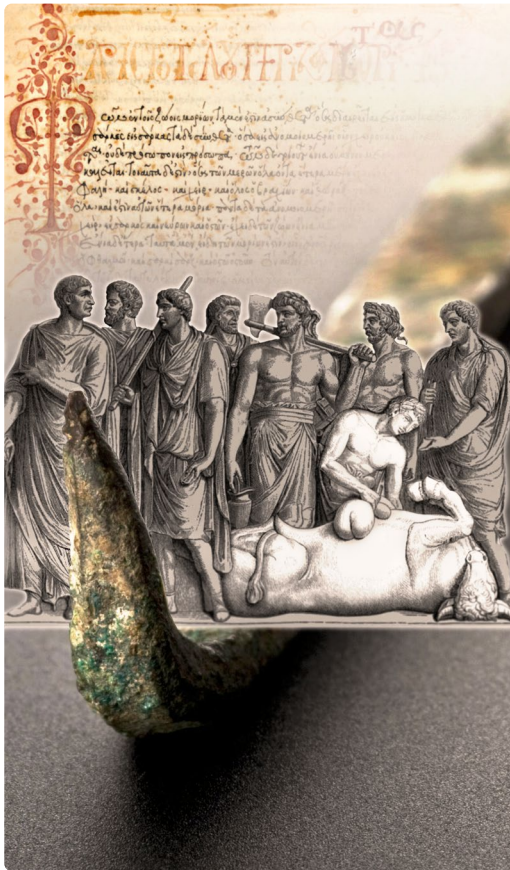
Sacrificial rituals were a common means to observe and learn about internal anatomy in ancient Greece. Aristotle investigated the body also by means of methodical dissections and vivisections of animals, ranging from mollusca and insects to pigs and bulls; and he often refers to pigs and dogs as sources for learning about human anatomy. Archaeological excavations have revealed tools used in such dissections, such as the hook in the foreground of fig. 1. Aristotle described his observations and understanding of internal anatomy in his zoological works, especially the treatise *Inquiries on Animals*, which, like other ancient Greek writings, has reached us in form of manuscripts copied in the Middle Ages; at the top of the exhibit you can see the opening lines from one such manuscript.

2

From text to model: The guts according to Aristotle

Copyright: ATLOMY (ERC StG GA 852550), Hebrew University of Jerusalem

A depiction of the first stages towards creating a 3D model of the human guts as described in Aristotle's treatise *Inquiries on Animals*. The interdisciplinary team undertakes a unique analysis which bridges the gap between the text and

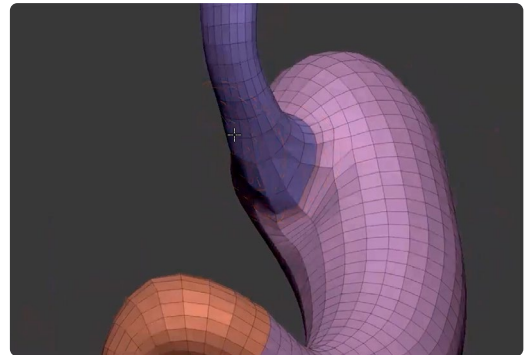


τος· ἡ δὲ κοιλία ἡ τοῦ ἀνθρώπου ὁμοία τῇ κυνείᾳ ἐστίν· οὐ πολλὰ γὰρ τοῦ ἐντέρου μέζων ἀλλ' ἐοικυῖα οἰονεῖ ἐντέρῳ τινὶ· εὐρύς ἐχοντι· εἴτα ἐντέρου ἁπλοῦν εἰληγμένον /στ/ ἐπιεικὺς πλατύν· ἡ δὲ κάτω κοιλία ὁμοία τῇ ὑεῖρ· πλα-

Body Part	Menstr	Qualities	Medus
1	κοιλία	ἡ τοῦ ἀνθρώπου ὁμοία	τῇ κυνείᾳ ἐστίν· οὐ
2	πολλὰ	γὰρ τοῦ ἐντέρου μέζων, ἀλλ'	ἐοικυῖα οἰονεῖ ἐντέρῳ
3	εὐρύς	ἐχοντι· εἴτα ἐντέρου ἁπλοῦν, εἰληγμένον,	
4	ἐπιεικὺς	πλατύν· ἡ δὲ κάτω κοιλία ὁμοία τῇ ὑεῖρ· πλατύν	

View of Modelling instructions - Sub-Items

Sub-Item	Name of Item / Sub-Item	Instructions
1	Oesophagus	stomachos, oesopha... Aristotle does not differentiate between the laryngopharynx a...
2	Membrane bonds	humerodes, desmol... Draw connections of membranous material from the esophag...
3	Stomach	anō kollos, stomach... The basic model for the stomach is canine and not human. Se...
4	Thin intestine	enteron, thin_intest... From the "end" of the stomach, draw a tube like structure, vid...
5	Cecum	katō kollos, cecum, te... For Aristotle, the cecum is a second cavity, symmetrical in size ...
6	Large intestine	to stenōteron kai ell... Based on the layout of the ascending, transverse, descending ...
7	Rectum	to euthu, rectum, text... After the coiled part, draw a straight, wider tube connecting t...



Aristotle's empirical observations informing it. Each section in the image represents a stage in our work. First, we translate and analyze the ancient Greek text from the printed modern edition which is based on the manuscripts. The analysis includes the classification of anatomical words by categories such as body parts, adjectives and more. Digital tagging of the categories facilitates further textual analysis by machine-learning tools. The next step is the analysis of the text together with experts in veterinary and human anatomy and by performing animal dissections to clarify and observe key anatomical structures described in the text. Finally, we compile a table listing the body parts and their names and instructions for creating the 3D model based on our interpretation of Aristotle's description.

3

3D Modelling of the guts according to Aristotle

Copyright: ATLAMY (ERC StG GA 852550), Hebrew University of Jerusalem

The next stage towards a visual reconstruction of Aristotle's conception of guts is creating the 3D model. Based on the table of instructions the modellers use 3D-modelling software to create the model: from an initial 3D illustration of the structures, through geometrical enhancement (to smooth connections, increase resolution and decreasing the file size), to the design of the visual appearance and texture of the parts. The process of creating a visual interpretation of the ideas described in the text forces a more nuanced understanding of the text than one required by an interpretation presented verbally in a book or article. The modellers frequently consult the researchers to clarify anatomical details, resulting in an improved understanding of the ancient texts and revisions of the modelling instructions. Thus, the modelling process both creates the research output and is also an inherent part of the research process.

4

The 3D Model of the digestive system according to Aristotle

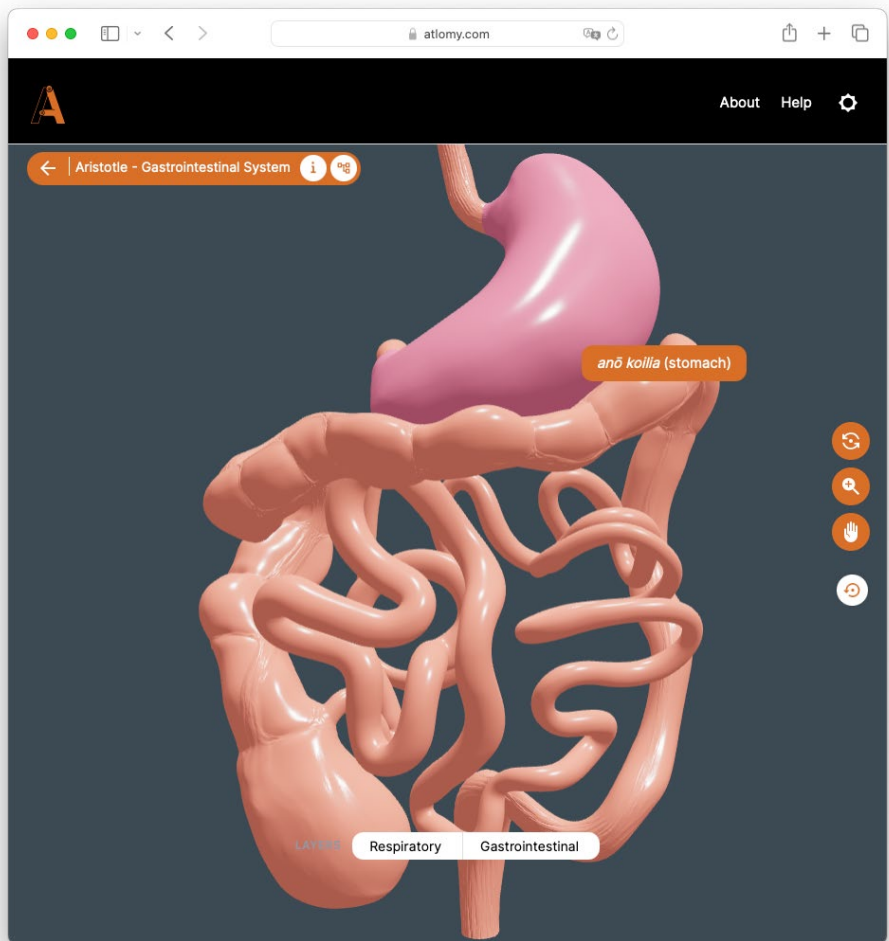
Copyright: ATLAMY (ERC StG GA 852550), Hebrew University of Jerusalem

This 3D model of the stomach and the intestines presents ATLAMY's interpretation of the ancient text. While it might not be evident at first sight, this model differs from contemporary models of the human digestive system. For example, humans do not have an inflated sac at the beginning of the large intestine (bottom left in the model). We attribute such differences to Aristotle's reliance on animal dissections to reconstruct human anatomy, specifically on pigs and dogs in the case of these organs. In order to make this visual reconstruction of Aristotle's ideas intelligible and a valuable research resource, it cannot stand alone. It must be accessible on an interface providing interactive viewing and research tools.

3D Model embedded in the Graeco–Roman Anatomical Atlas

Copyright: ATLOMY (ERC StG GA 852550), Hebrew University of Jerusalem

We have developed an interactive digital Atlas where anyone can view and explore this model of the guts and learn about Aristotle's ideas of the anatomy of the digestive system and about his anatomical terminology. You might recognize some terms! On the atlas you can explore other 3D models of the body that we designed based on anatomical texts by Aristotle and other ancient authors. The interactive interface allows you and others to use your mouse to view it from different angles, or to dig deeper: to view inner layers, to learn about the names of parts and access the lexical and historical discussions about the Greek terms, or to learn more about the anatomical details or about the research and sources informing this model.



The open-access Atlas is available on www.atlomy.com.

Iulianus in aqua et oleo et in una et altera
 lica corpore infans pluri ducat sed per illius
 dicitur ad iniquitatem suam et reus et opus
 multum in sua peccata et in corripit et fieri possit
 manum lateris lingue ad aliquid habet pedibus foris adducit corripit

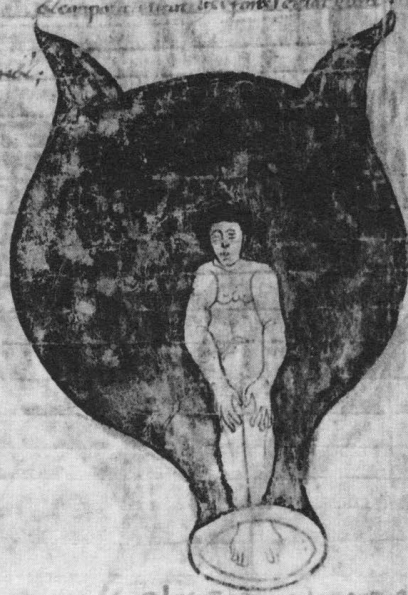


Iulianus in aqua et oleo et in una et altera
 uuluae planca infigit in mitta
 manus sua obsecrat eos iungat et
 ad orificium matris componat
 et sic eos foris adducat

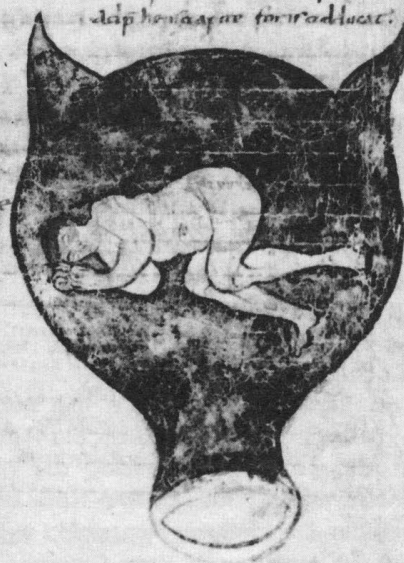


Derit et sic re
 conatus fuerit quid
 facient rectorius
 replendus e. et
 cor rector pedibus
 si ead adducendus e
 foris

Eice tu quid facient. Quale mander
 obsecrat iniquitatem iniquitatem et illa
 et componat in foris adducat



et sic rector
 fuerit quid facient suola duol
 modis per iniquitatem
 et componat in foris adducat



MEDIEVAL EUROPE

Claire Bubb

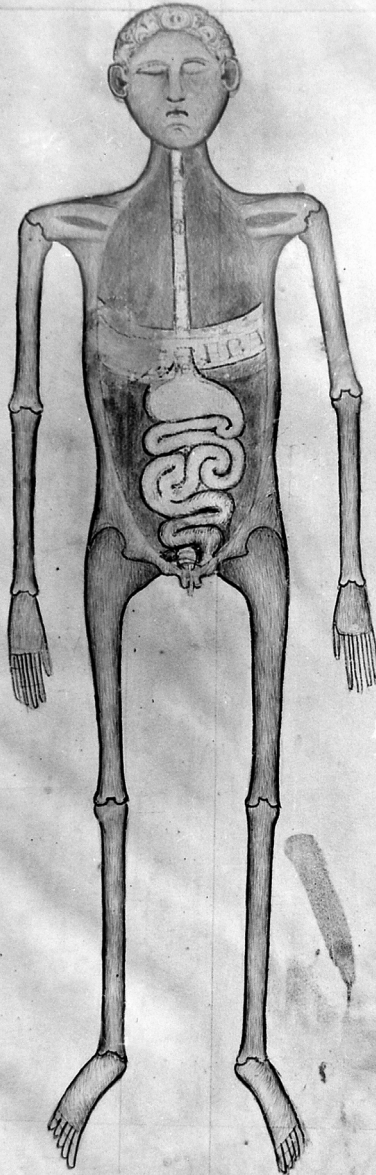
Institute for the Study of the Ancient World,
New York University

INTRODUCTION

The Medieval period in Europe is bracketed on the one side by Late Antiquity and on the other by the early Renaissance. There are no precise dates that mark the transitions between this period and its neighbors—and, indeed, the period itself can be further divided into early, high, and late—but the millennium from roughly 500–1500 CE can fall generally under the heading of Medieval. The geographical boundaries of Medieval Europe are similarly slippery to define: borders, both internal and external, fluctuated often. The core of the region, as treated here, were the lands previously encompassed by the Western Roman Empire. To the southeast, the Byzantine Empire waxed and waned, sometimes claiming a significant presence in the Italian peninsula. To the west, the Muslim caliphates vied for control of medieval Spain with their Christian neighbors. Indeed, the element that most coheres Medieval Europe as a unit is the pervasive dominance of Christianity, which shaped life across religious, civic, and cultural spheres. Medical conceptions of the body in the early medieval West centered on Late Antique packaging and translation of the largely Greek medical wisdom of antiquity into Latin. Starting around the twelfth century, an influx of Latin translations of Arabic and Graeco-Arabic material greatly expanded both the understanding of internal anatomy and the approach to its study.

[illegible]

hec est nona figura
 anochome dēmen
 per quod trāsit ab
 et potus ingēdītes
 stom. s. quia mēn
 non potiar delīgn
 eo q. potus ē s. cā
 nua pulmōis et s.
 pulmōis iō optant
 me hūc figuram p
 se ponē cā oñdendi
 mēn sic continuat
 stomaco. 2^{do}.



Medical texts drove much of Medieval Europe's depiction of the insides of the human body. In the earlier centuries, medical knowledge centered on a comparatively circumscribed canon of texts, which appear to have contained minimal illustration. The illustration that does survive leans towards the conceptual (fig. 1). In the eleventh and twelfth centuries, an influx of texts from the Arabic world—translations of, adaptations from, and additions to ancient Greek texts—enriched European medical thinking. Likely coming in with this wave of material were the illustrations known as the Five/Nine-Figure series (figg. 2,3) which remained popular across the Medieval world, in western Europe and beyond (see Arabic Materials, figg. 3,4). Though integrated with a short anatomical text, these images largely operated as their own didactic unit, rather than as subordinate illustrations. One set of nine, for example, (fig. 3) was sewn together into a stand-alone booklet, the text being confined to the level of captions. Indeed, this independent operation of anatomical images continues to be visible into the 15th century, where illustration (e.g., fig. 5) can represent the only coverage of the subject of anatomy in the document.

By the early fourteenth century, human dissection became a regularized feature of medical education in Bologna, but the practice was not immediately adopted universally. The Italian Guido da Vigevano, personally experienced with the dissection of human cadavers, created his set of anatomical illustrations (fig. 4) to circumvent French belief that human dissection was contrary to religious doctrine. Though there it was seen as a damper, Christianity had its own role to play in the imaginary of the body's recesses: the embalming of saints' bodies for relics and the depiction of their demises equally invited contemplation of the guts (see Birth of Modern Anatomico-Pathology, fig. 1 p.178).

The images collected here are diverse in many respects, but all attest to a desire for detailed understanding of the viscera—unsurprising given the foundational roles medieval medicine assigned to anatomy in medical theory and to diet and digestion in overall health. Further, each grapples in its own way with the conundrum of how to represent a three-dimensional conglomeration on the page: some isolate individual organs or organ systems (figg. 1, 2, 3) others offer multiple, complementary views (figg. 4, 5).

1

Illustrations of the uterus from Muscio's epitome of Soranus' *Gynecology*

Brussels, Bibliothèque Royale MS 3714, fol. 28r; ca. 900 CE, CCO 1.0 Universal

These illustrations of various positions of the fetus in the womb accompany Muscio's Late Antique Latin summary of Soranus' 2nd century Greek work on gynecology. The 9th/10th century manuscript pictured here contains the earliest surviving images to accompany this text. Though anatomical illustration is known to have been used in classical antiquity, none survives. It is therefore difficult to know when precisely these images originated, but they are generally considered to be descendants of 6th—or even 2nd—century originals. The depiction of the womb shows a hybridity of theoretical and observational approaches to anatomy. The uterus takes the form of a cupping vessel or pot—an established analogical way of understanding its form and function—but also

includes a pair of “horns”, offering an artistic (mis-) interpretation of the text’s dissection-based awareness of the anatomy of the organ, including the sinuses (“horns”/*cornua*) that (pronouncedly, in some animals) lead to the ovaries.

2

Anatomical figures

Munich, Bayerische Staatsbibliothek, Clm 13002, fol. 2v; 1165 CE

Photo: Bayerische Staatsbibliothek München; CC BY-NC-SA 4.0

These figures offer the earliest example of the so-called Five-Figure Series (*Fünfbilderserie*), which appears in medical manuscripts from across the medieval world, with Latin, Provençal, Arabic, and Persian versions surviving. The series, which likely originated in Late Antiquity, displays a remarkably coherent set of characteristics. The figures are depicted as squatting, and each is rendered “see-through” to display a different bodily system: the veins, arteries, bones, muscles, and nerves, respectively. The two figures pictured here represent the veins (left) and the arteries (right). Each includes a somewhat floral liver on the left and a tear-drop spleen on the right; the vein man also includes the complete digestive tract and its appendages. While the digestive tract here is schematic, other versions offer more abstract interpretations, like the perfectly coiled bowel (reminiscent of a garden hose) in a 13th century Latin version at the Bodleian.

3

Organs of the abdomen

Cambridge, Gonville and Caius College, MS 190/223, fol. 5r; 12th cent. CE; Photo:

By Permission of the Master and Fellows of Gonville and Caius College, Cambridge

While the five figures representing the five bodily systems are the core of the Five-Figure Series, several iterations include nine figures rather than five, adding on depictions of the male reproductive tract, abdominal organs, female reproductive tract, and brain and ocular organs (whence the newer moniker, Nine-Figure Series). This 12th century image—from the earliest surviving set of nine—shows the abdominal organs removed from the bodily cavity and laid out in a non-sequential pattern. The liver (the tulip shaped organ in dark brown) appears twice, juxtaposed with both the stomach (center) and the gall bladder (upper right) as a way of tackling its three-dimensionality. The cross section of the stomach (top left) includes pockets of each of the four humors, mainstays of digestive theory. These choices reveal a detailed conception of discrete organs and their individual roles in the complex and theoretical physiology of digestion.

Guido da Vigevano's *Anathomia*, Figure 9

Guido da Vigevano, *Anathomia*, 1345 CC BY-NC-SA 4.0

Although human dissection began to be systematically practiced in Italy in the early 14th century, it was not immediately embraced across Europe. This prompted Guido da Vigevano to produce a series of seventeen illustrations included in his *Book of Notable Matters* commissioned for King Philip VII of France. Guido explains that his purpose is to “plainly and openly demonstrate the anatomy of the human body through illustrations” (trans. Wallis), which he envisions as useful because of the both transient and controversial nature of human dissection. The images progressively unpeel layers of the body, offering views of different groupings of organs. In the image previous to this one, both the abdominal and thoracic cavities are opened, revealing the digestive organs below and the heart and lungs above, separated by the diaphragm. Here, in the ninth image, the heart and lungs have been stripped away, revealing the previously obscured esophagus and its connection to the stomach.

Illustration accompanying *De Arte Physicali et de Chirurgia*, attributed to John Arderne

Stockholm, Kungliga Biblioteket X.118, fol. 6r; ca. 1430

While the frontal approach to anatomical illustration exhibited in the Five/Nine-Figure Series and Guido da Vigevano's work is most dominant, an alternative, sagittal approach emerged in the medieval period and survives in a few examples. Seemingly pioneered by the French surgeon Henri de Mondeville (ca. 1260–1320), these images “unzip” the body from skull to genitals to reveal the contents within. In order to confront the fact that some organs obstruct the view of others, the approach is applied to both the front of the body (through the nose and navel) and the rear (along the spine). The engaging version pictured here—from an early 15th century manuscript of a text that contains no relevant anatomical section—offers fairly abstract and imaginative depictions of the organs and their positions. The cadaver obligingly opens his skin “coat”, the edges of which drip with blood, offering a delightfully dissonant image of cheerful gore.

in mea...
 No omi passione
 vnde exilient et
 tepa fittua. Et deuen
 one offe va corde ceptu
 in vno det ai pulue
 maguetur. Si adda
 fua boagimo plne
 valibit

Cont' fupritatem
 vna form
 and e lumbria trefies
 piffat ai vno albo e pop
 alambiat e pallabie e pof
 miffat e miffat e miffat
 miffat fignu fua audip
 e miffat miffat. Et si caufa
 fua admiffat fua pofa

Omn' aya amiffat tunc
 aya cauend' est a baluo e
 a sole e a lufue it miffat
 gregate e a chunore. e
 a miffa pefleone
 pnyant' est. ead
 vent' laxant'
 e sic cettine
 cettinat

Veni ut ai ca
 lida. deoq' ab
 fittu e miffa
 m af e fupponat
 te m ai fignu. fiat
 deoq' ai vno albo
 te miffat miffat miffat
 fittu miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

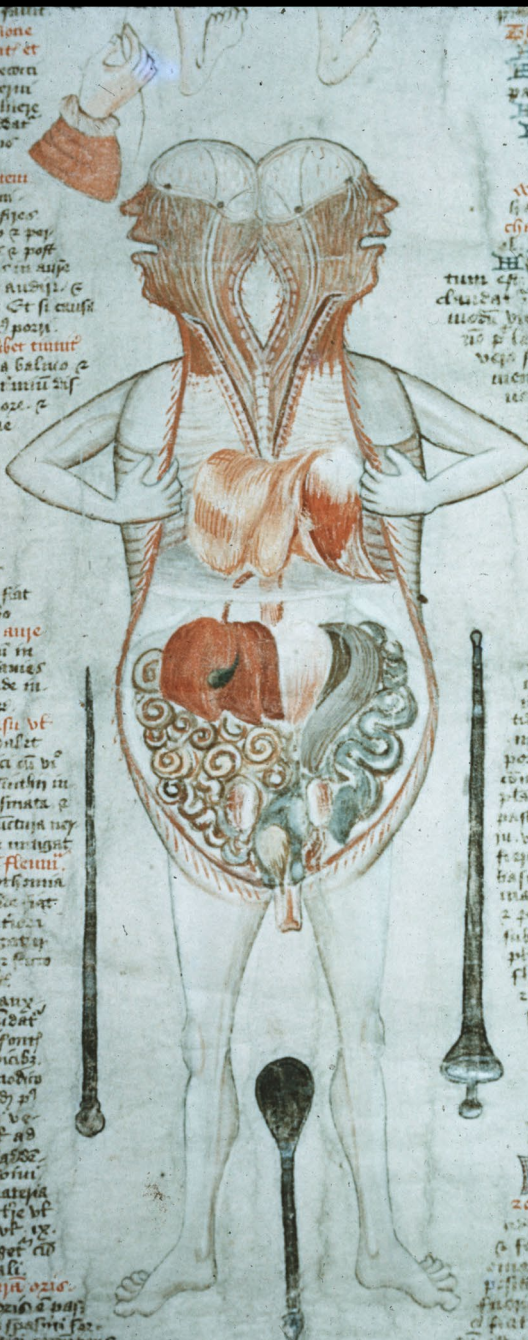
Et colore calu vt
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Quare ffo dethuma
 de miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Et idm. Et any
 tunc capore e fudat
 e piffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Cont' totu ayo
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Cont' totu ayo
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat



Ethel
 Cont' miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Wapia
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Ranhael
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Qont' flux
 um emozoy
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Et colore calu vt
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Quare ffo dethuma
 de miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Et idm. Et any
 tunc capore e fudat
 e piffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Cont' totu ayo
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Cont' totu ayo
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat

Cont' totu ayo
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat
 miffat miffat miffat miffat



BIRTH OF MODERN ANATOMO- PATHOLOGY

Monique Kornell

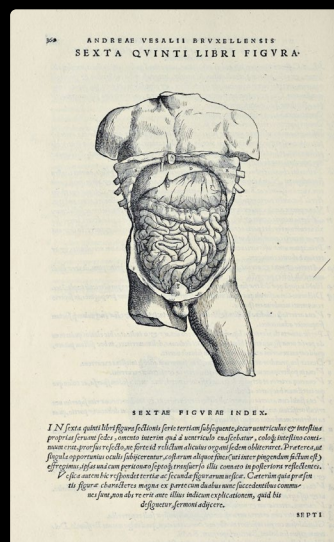
Gideon Manning

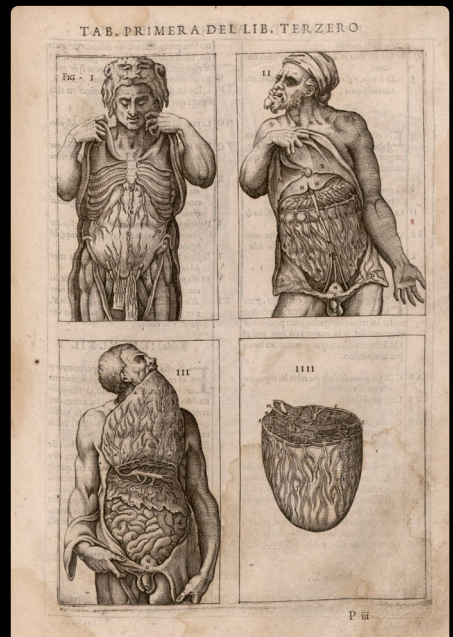
Program in the History of Medicine,
Cedars-Sinai Medical Center, Los Angeles

INTRODUCTION

Europe is both a continent and a nominal collection of city states and countries linked by onetime empires, religion, warfare, and a diverse culture that nevertheless allowed for the interpenetration of languages and ideas. During the European Renaissance, Enlightenment, and early nineteenth century, the major locations of medical study remained universities and colleges. Though the leading schools were initially in Italy, attracting students from the rest of Europe, over time Northern Europe, including the Netherlands, England, Scotland and France would establish their own prominent medical schools and traditions.

During the European Renaissance, the rediscovery of ancient texts on medicine and the publication and distribution of new editions, made possible by the introduction of the printing press, ushered in a new age of anatomy. With it came a new demand for the dissection of the human body for teaching and investigation. Initially, this was to demonstrate the writings of ancient authors and then to challenge their findings, which were based on comparative rather than human anatomy. The practice of autopsy, the dissection of the body to determine the cause of death, was also a source of anatomical knowledge.





Along with a new interest in human dissection, there were revolutionary developments in anatomical illustration. Prior to the Renaissance, the structure of the body was described primarily in words. What medical imagery there was in the medieval manuscript tradition tended towards diagrammatic representation. In illustrated anatomy books, Vesalius's *De humanis corporis fabrica* (1543) being a notable and influential example, there is a discernable move toward a naturalistic representation of the body, and a new emphasis on the power of images to explain the interior of the human form. Different printing techniques also affected the evolution of anatomical illustration, such as copper plate engraving, which allowed for finer detail, and the adoption of color printing.

GUTS AND THE BIRTH OF ANATOMO-PATHOLOGY

Ranging from the fifteenth to the nineteenth centuries, these images of the viscera were produced for a wide range of purposes: for religious contemplation and for social commentary, as explanatory illustrations of anatomy and of pathology, and as records of anatomical instruction. While reciting a prayer for the safety of their "body and soul", the owner of a fifteenth-century decorated prayer book could contemplate the equanimity with which St Erasmus endured the removal of his intestines (fig. 1), a sign of the power of his faith in God. The great length of the intestines is indicated as they are wound around a windlass above the saint, and in fig. 4, another scene of disembowelment. In this period in Europe, human dissection was a standard element of medical education, with lectures delivered in front of the open body (figg. 3, 4), usually that of an executed criminal. The intestines and stomach were typically the first parts to be removed, as these were the soonest to putrefy. In dissections, knowledge of the body was gained by sight and by touch and, often, by the reading of anatomy texts, like that seen open in the background of John Banister's late sixteenth-century lecture on the viscera (fig. 3). The painting commemorates the lecture on the viscera given to the Company of Barbers Surgeons in London and was once part of a manuscript with depictions of anatomy and of surgical instruments.

The woodcut from Vesalius's *De fabrica* (fig. 2) is one in a sequence in which the abdomen is gradually dissected on the page. All the parts are identified in an explanatory text, keyed to the lettering, and the image is also referenced in the main text. Three centuries later, the use of colour printing is used to its full advantage in Cruveilhier's *Anatomie pathologique* (fig. 5) to capture the ravages of cancer in pathological images of the stomach which serve as illustrations linked to case histories, including specific clinical signs and patient's symptoms.

The Martyrdom of St Erasmus

about 1430–1440, by Master of Sir John Fastolf (French, active before about 1420 – about 1450). Tempera colors, gold leaf, and ink, Leaf: 12.1 × 9.2 cm (4 3/4 × 3 5/8 in.) The J. Paul Getty Museum, Los Angeles, Ms. 5 (84.ML.723), fol. 38v.

This scene of the martyrdom of the Christian saint, St. Erasmus of Formia, Bishop of Campania, (d. 303) appears in a small, decorated book of hours, meant to be consulted for private prayer. In punishment for the practice and the promotion of his Christian faith the emperor, Maximian Hercules (286–305) ordered that Erasmus's abdomen be cut open and his intestines wound around a windlass. St. Erasmus, who wears a bishop's mitre on his haloed head, is bound at his arms and legs. Three men crank the windlass that pull his intestines from a gash in his belly. The blue-robed bearded man who wears a crown and holds aloft a sword is the Emperor overseeing the carrying out of his command. St. Erasmus is traditionally held to be the patron saint of sailors and, appropriately, of abdominal pain. (Monique Kornell)

Abdominal Dissection

woodcut after Jan Steven van Calcar (North Netherlandish, ca. 1515 – ca. 1546). From Andreas Vesalius, *De humani corporis fabrica libri septem* (Basel: J. Oporinus, 1543), bk. 5, p. 360 [460], fig. 6, Getty Research Institute, Los Angeles, 84-B27611

Ribs have been broken and the skin peeled back to display the liver, stomach, and intestines in this woodcut illustration. These are encased not in a living body but one of stone, as indicated by the smooth breaks of the headless torso. Composed in Padua by the Flemish anatomist Andreas Vesalius (1514–1564) and published in Basel in 1543, *De humani corporis fabrica libri septem* set a new standard for anatomical illustration in both the quality, size, and number of its woodcuts. This torso is at once a stylish presentation and an uncanny one, as if layers of living flesh could be found within a sculpture of stone and the secrets to what was considered the ideal form of the human body as rendered in antique sculpture could be revealed. Collected and greatly admired, antique torsi also offered more pleasant connotations than quartering and disemboweling, a form of capital punishment in the period. They further marked Vesalius, who refers throughout his writings to ancient authors such as Galen, as one imbued with the classical world. (Monique Kornell)

John Banister Delivering an Anatomical Lecture on the Viscera

1581, painting, 33.8 × 43.2 cm. Courtesy of University of Glasgow, Archives & Special Collections, MS Hunter 364 (V.1.1), frontispiece

The English surgeon and physician John Banister (1532/3–1599?) lectures on the viscera, placing his hand on the open abdomen of a cadaver while indicating the related area on an articulated skeleton. Labels have been added to the body, identifying the liver, stomach, and intestines. Behind Banister is a copy of Realdo Colombo's *De re anatomica*, first published in 1559, open to the chapter on the intestines – the part of the cadaver on which Banister's ringed hand rests. Banister and his assistants wear white oversleeves to protect their clothing. Scattered on the tablecloth on which the cadaver rests are surgical instruments used in the dissection, with more held or passed between the assistants. The coats of arms are those of the Banister family and of the Company of Barbers Surgeons, in the hall of which the lecture took place in 1581 when Banister was 48. (Monique Kornell)

The Reward of Cruelty

(The Four Stages of Cruelty), etching and engraving by William Hogarth (English, 1697–1764), February 1, 1751, plate: 15 1/4 × 12 5/8 in. (38.8 × 32 cm); sheet: 15 3/4 × 13 1/16 in. (40 × 33.2 cm), Metropolitan Museum, New York, Gift of Sarah Lazarus, 1891, no. 91.1.139

This scene, incorporating traditional elements of the anatomical theatre made famous by the frontispiece of Andreas Vesalius's *De humani corporis fabrica libri septem* (1543), is the fourth and final stage of cruelty in Hogarth's life of the fictional murderer Tom Nero, whose body lies on the table being dissected, the hangman's noose still around his neck. Disemboweled by the anatomist's knife, Nero's intestines are being pulled out by a kneeling assistant while another assistant gouges out his eye. The message of Hogarth's moralizing scene is that cruelty's "reward" is dissection and public mutilation after death. The pained expression Hogarth has given Nero's corpse serves to reinforce the message of punishment. (Gideon Manning)

Diseases of the Stomach (cancer)

lithograph printed by Benard and Frey after Antoine Touissant de Chazal (French, 1793–1854). From Jean Cruveilhier, *Anatomie pathologique du corps humain* (Paris: J. B. Baillière, 1829–1842), vol. 2, part 27, pl. 1, Huntington Library, Art Museum and Gardens, San Marino, California, RB 632011

By the nineteenth century, publishing technology allowed for the introduction of highly detailed colored images. Cruveilhier's two-volume *Anatomie pathologique* (1829–35), which initially appeared in short installments, was, at the time, the most comprehensive color-illustrated treatise of the diseases of the human body accounting for both diseased organs and body parts. In a chapter dedicated to diseases of the stomach, these illustrations depicting a type of stomach cancer show changes to the gastric muscle and mucosa. By placing Figure 1 and Figure 2 together on the page, Cruveilhier was able to make comparisons between the organs in his accompanying text. Relying on color—e.g., red and white in the muscular tunic of the stomach in Figure 1—Cruveilhier also indicated differences between healthy and diseased organs, like those in the illustrations, which he associated with particular patients and their histories. (Gideon Manning)

Abdominal Dissections and an Omentum

engraving by Nicolas Beatrizet (French, 1507 or 1515 – ca.1565), after Gaspar Becerra (Spanish, ca.1520 – ca.1570). From Juan Valverde de Amusco, *Historia de la composicion del cuerpo humano* (Rome: Antonio Salamanca and Antonio Lafrerij, 1556), bk. 3, pl. 1, National Library of Medicine, Bethesda, 2294023R

Both subjects of dissection and demonstrators of their own anatomy, these impossibly alive figures are from a mid-sixteenth-century anatomy book published in Rome by the Spanish anatomist, Juan Valverde de Amusco (ca. 1525–ca.1588), who studied with Realdo Colombo (ca.1515–1559) in Italy. At the lower left, we are given a view of the intestines, the omentum, and the portal vein by a figure who is gripping the upper part of his omentum with his teeth, his hands meanwhile being occupied with holding resected flaps of his body. On the right is another view of the omentum. Many of the illustrations in Valverde's book derive from Andreas Vesalius's *De humani corporis fabrica* (1543). In that book, a series of headless torsi evoking fragmented antique sculpture are used to display the anatomy of the abdomen (fig. 2). In Valverde's book, some have been changed to living figures, with limbs and heads restored to them, so that they can actively display their internal anatomy to the viewer, a style of presentation that was popular in the 16th and 17th century in European anatomy atlases. (Monique Kornell)



LIGHTPAINTING ART: DER KREISLAUF DES LEBENS

Silja Korn

Artist, photographer, Berlin

Silja Korn was born in Berlin in 1966. She is the first blind, state-certified educator in Germany. She is artistically active, paints, takes photographs, is passionate about theatre and has collaborated to the creation of audio descriptions for museums and films, as well as TV-, dance and theatre shows. She is involved in social issues. She breaks down barriers participating in workshops about art and other topics. At the age of 12, Silja became completely blind following a serious traffic accident. Since 2005, she has been dealing with the topic of "blind photography". In 2016, she began to develop the technique of light painting. Exhibitions: *Im In- und Ausland / At home and abroad.* (siljakorn.de/vita)

BLIND AND TAKING PICTURES?

Blind and taking pictures? That sounds unimaginable at first. Isn't the process of taking photographs rather visual? Silja Korn shows that it is possible. To create her light-painting photos, it takes visions, images in the inner eye/head, a sophisticated technique, experience and teamwork. In completely darkened rooms, she uses a wide variety of light sources during long exposures to work out the details of an image that she wants to expose with the camera. In the process, she is supported by a sighted assistant who helps her to align the camera and verbally describes and analyses, in cooperation with her, what can be seen on the camera's display that she cannot perceive visually.

Silja Korn arranges and creates the set herself and acts according to her own ideas. Taking charge of the direction and the motif she wants to express, selecting, aligning, lighting it as she imagines it: in this way, Silja Korn developed an individual visual language. This ranges from black-and-white and colour photographs to unusual portraits, abstract forms with multi-coloured light sources and light-painted arrangements. Photography is very helpful to her in transporting the inner images, thoughts and visions in her head to the outside world and in combining the outside and the inside into one picture. As a blind photographer, she doesn't only focus on the finished photo she wants to create. It is also crucial to let the process of creating the images that are in her head emerge in the photos, to develop them further, to promote open encounters and exchange with other people and to build bridges; her purpose is to manifest the topic of "blind and photography" in public. The colours and the aura of the photos urges viewers to allow expression to their own perceptions and moods, as well as those of others. Silja Korn lives by the motto: "'That's not possible' doesn't exist for me!"

Der Platz im Universum

The Place in the Universe

The light-painting photo is in landscape format with a black background. In the centre of the picture, the discreetly illuminated head and neck of a young woman, surrounded by pastel-like glowing spheres, can be seen dimly. The hair-style merges with the background. To the left and right of the reddish-brown illuminated head are about 20 irregularly arranged, yellow and orange, round, luminous spheres in various shades, connected by a cable, illuminated in the colour of the spheres. They form a wide, abstract, angular U. The head is in the base line of the U. Above the head, a dark green, shoulder-width triangle of coarse fabric with black and white light reflections, tapering upwards, is draped in a folded, layer-like manner, extending to the upper edge of the picture.

Das Tor zur Seele

The gate to the soul

In the centre of the light painting photo with a darkened background in landscape format is a roundish, narrow, fraying spot, which is in a shadowy, grey-blue, diffuse, round arch cut off at the top. The light spot is almost luminous white in the upper area. Towards the top and bottom it becomes increasingly grey with a rough surface. A pale, mist-like stripe stretches to the upper edge of the picture.

Kopf mit Torso Im Licht verborgen

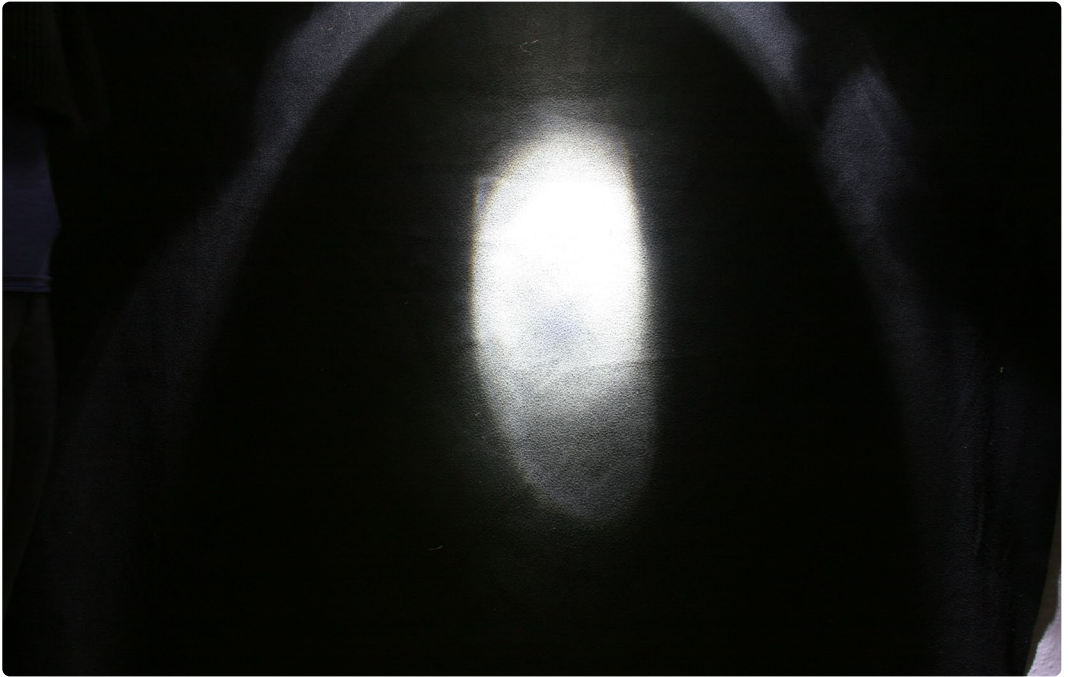
Head with torso hidden in the light

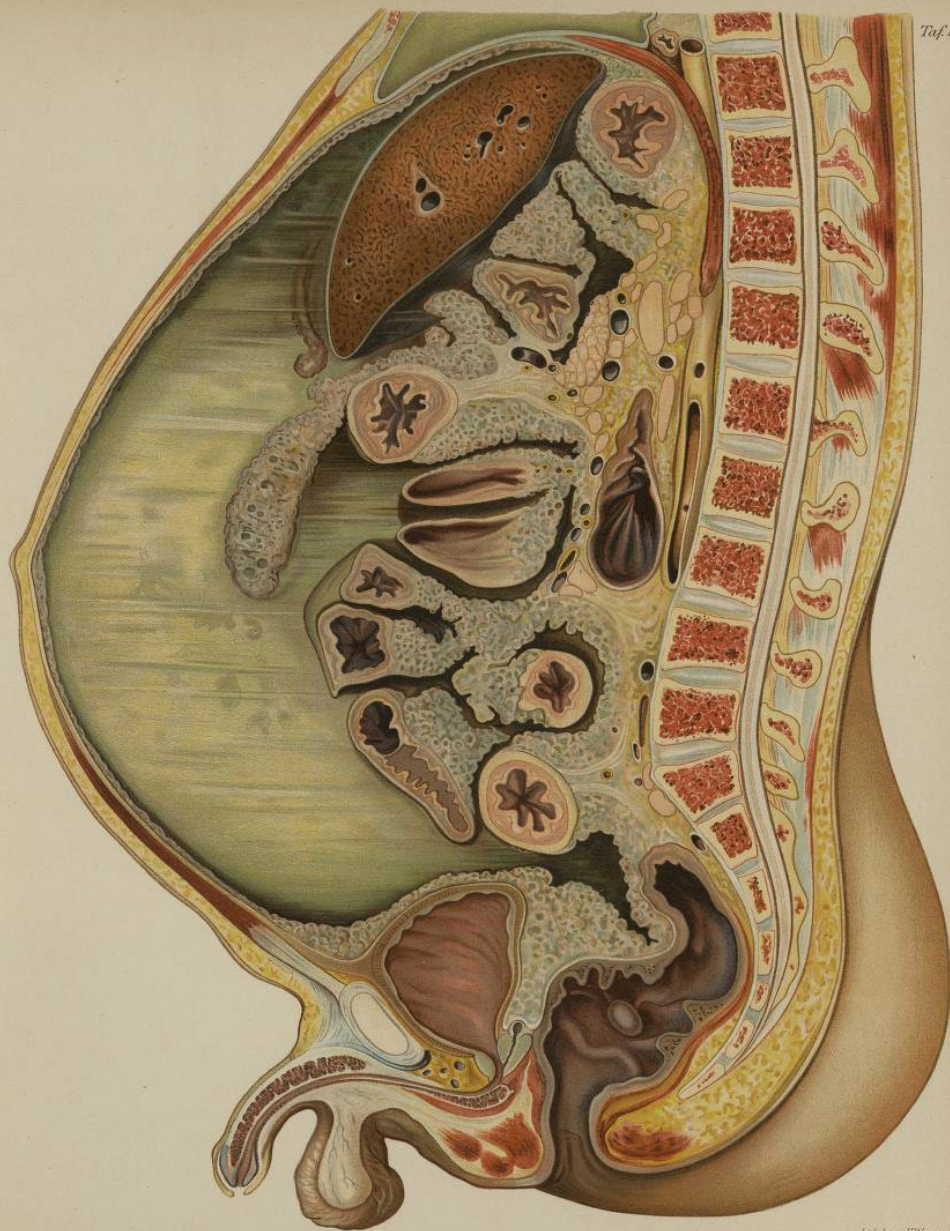
The light painting photo in landscape format is black. In the centre of the picture, the head and torso of a human being are depicted with red tones flowing around them. The misty, red marbled, striped-looking border has bright, thin lines. On the left side, it slopes downwards at waist height.

Von Lebensadern umgeben, von Energie umgeben

Surrounded by life veins, surrounded by energy

This is my windpipe. That's how I imagine it and that's how energetic it feels inside me. Because without it, it would be impossible to receive air to breathe through my body, to let it flood through and flow; it is surrounded by thin, powerful red, randomly curved lines. The many veins pulsate, the blood that has been enriched with oxygen, tirelessly, ceaselessly, over and over again through the many veins until day x brings everything to a standstill. This is the cycle of life!





Dr. E. Leachmann, gem.

Lith. Anton. K. Neuberger, Jena.

Carcinoma colloides peritonel.

Nat. Gr.

Verlag von Gustav Fischer in Jena.

CONTEMPORARY IMAGING TECHNIQUES FOR MEDICAL PURPOSES

Heiner Fangerau

Department for the History, Philosophy and Ethics of Medicine,
Heinrich-Heine University Duesseldorf, Medical Faculty, Centre Health & Society

CULTURAL REGION AND CHRONOLOGY

The images presented here were produced around 1900. The context is that of Western Medicine, which was transformed during the 19th century into a science oriented towards modern chemistry, physics, and mathematics rather than towards history and philosophy. In the hierarchy of the senses, seeing has occupied a special position in Western modernity at least since the Enlightenment (1) (2). Seeing something suggested truth and knowledge. What was in the dark, by contrast, was invisible, indistinct, and the subject of speculation. In the context of the establishment of a scientifically and technically oriented medicine, efforts were made to eliminate subjective elements and to elevate the object of inquiry to the status of an object that could be scientifically observed and documented. For example, images that made the previously invisible visible, or that clarified the visible, were now used to elevate facts to the status of an object of scientific justification. The aim was thus to create images that were as objective as possible, ideally using technical means to eliminate the fallibility and inadequacy of the human senses.

In medical diagnostics, pictorial documentation caused problems. The conservation of images appeared to be necessary for monitoring the course of a disease, for teaching purposes, and for the development of diagnostic theory. When it came to signs that could be perceived visually, however, linguistic description did no justice to what was visible, and drawings offered only limited diagnostic certainty, being at most a substitute for direct inspection.

Developing technologies of producing images independent of subjective senses or skills accordingly became an objective of medical imaging. Examples include endoscopy and the use of X-ray technology as diagnostic procedures. The production of images from the interior of a living patient's body was particularly difficult, and at the same time spectacular. Here elaborate techniques had to be developed to make hidden organs and structures, such as the guts, both visible and diagnostically meaningful. What could be seen had to be made accessible to scientific discourse. To this end, countless manuals and textbooks, intended to serve as reference works for the "normal pathological", were published in the late 19th and 20th centuries. But the teaching of conceptions of normality, notions of pathology, and learning to read visualizations brought with them a central problem, by contradicting the demand for an objective, unaltered immediacy of diagnostic signs. A susceptibility to deception and subjective influences was a problem for technically produced images from the interior of the human body. For diagnostic imaging, this resulted in a tense ambivalence: interior body parts were directly accessible to the sense of sight, but at the same time, what was seen was bound to indirect procedures of technical reproduction. The simultaneous immediacy and mediated nature of images from within the body became the subject of ongoing contemporary discussion, and resulted in attempts to develop technologies producing self-evident images (1).

1) Dommann, M. 1999. 'Das Röntgen-Sehen muss im Schweisse der Beobachtung gelernt werden.' *Zur Semiotik von Schattenbildern. Traverse, Zeitschrift für Geschichte. Wissenschaft, die Bilder schafft* 6, 114–130

2) Martin M. and Fangerau H. 2012. 'Durchsichtbarkeitsregime: Zur Semiotik radiographischer Bilder in der urologischen Diagnostik'. *Der Urologe* 51, 1450–1458

1

Carcinoma colloides peritonei

From: Emil Ponfick: *Topographischer Atlas der Medizinisch-Chirurgischen Diagnostik* / Topographic atlas of medico-surgical diagnosis, G. Fischer. Jena 1900–1905; Artist: Dr. Emil Löschmann, Breslau

The attempts of the German pathologist Emil Ponfick, who in 1901 attempted to reduce the gap between drawing and original object, show how objectives and implementation should be brought together in order to make the images appear self-evident: Ponfick tried to produce a topographical atlas of medical-surgical diagnostics. The image is taken from this atlas and shows a "Median Vertical Section Through the Abdominal and Pelvic Viscera of A Boy, Aged 17 Years, Who Died of Colloid Carcinoma of the Peritoneum and the Flexura Iliaca". In this atlas he wanted to give an overview of pathological changes not only of

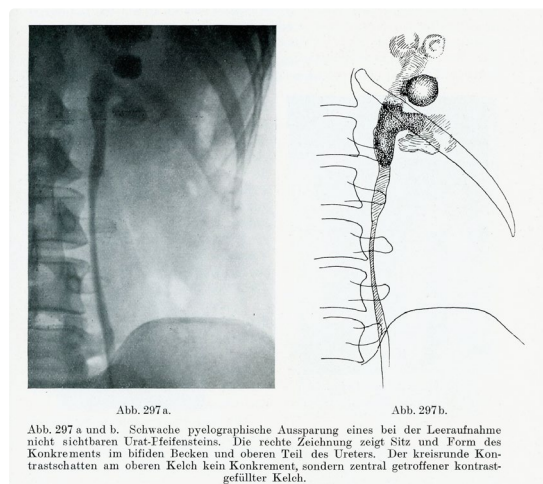
one organ but of an entire body region on panels “at a glance”. Ponfick strived for clarity and images “true to nature” (Ponfick 1901: 1ff.). To achieve this goal, he froze the bodies of deceased patients, cut them into frontal and horizontal sections and covered the cut surface with a frosted glass pane. The contours of the preparation were traced through the pane, transferred to tracing paper and coloured with watercolours on drawing paper. He worked together with an artist, but pointed out that he supervised the artistic work and simultaneously made an image of the preparation on a blackboard. So Ponfick assumed that a specific medical knowledge was needed to correctly structure the drawing process. In other words, concepts of the connection between pathology and diagnosis should be depicted in the images conforming to theory. In this way, he clearly expresses a dependence of the images on theory, although he considered the same images to be true to nature and thus diagnostically self-evident. Yet, the ultimate proof of the self-evidence of the images was in his eyes that he had contributed to their production and that the images were consequently authentic.

2

Pyeolographische Darstellung eines Konkrements im Ureter

Leopold Casper und Edwin Picard (1930) Lehrbuch der urologischen Diagnostik. Thieme, Leipzig, S. 397

Right after the discovery of X-rays, in the late 19th century, innumerable attempts were made to make this novel technique useful for medicine. While the radiological detection of bones quickly became a routine procedure, it was necessary to first develop specific procedures for the radiographic visualization of soft tissue organs and cavities. The problem was that only structures that absorbed X-rays were visible on the negative film. Rays simply passed through soft tissues. The film remained black. The testing of various means used to generate contrast (e.g. iodine) proved to be risky, which is why their use was initially controversial (3) (4).





44.



45.



46.



47.



48.

Blasengeschwülste, Fig. 44–46: Ansichten eines Papilloms, Fig. 47–48: Ansichten eines Tumors (Kneise 1908: Tafel IX)

Kneise, Otto (1908): Handatlas der Cystoskopie; Gebauer–Schwetschke: Halle a. Saale

Attempts to access the interior of the body via orifices had already been made since antiquity, with particular attention being paid to the oral, genital, urinary and excretory organs. Phillip Bozzini (1773–1809) was also active in this field, seeking, as he put it, to “illuminate the inner cavities of the living animal body”. In 1806, he was able to present his “Lichtleiter”, in which the light from a candle was reflected into the interior of the urinary bladder via a mirror (3). Thus the basic idea for the cystoscope (literally “bladder viewer”) was developed. The urologist Maximilian Nitze (1848–1906) took up this idea at the end of the 19th century and presented his cystoscope in 1879, which allowed direct illumination and examination of human and animal body cavities by means of electric light (4).

However, there was now the problem of visual fixation. The examination was painful and patients could hardly be expected to wait until an artist had drawn what they had seen. At that time, a photograph had the disadvantage that, first, it only allowed black-and-white images and, second, it also could not be taken in a matter of seconds. But was the black-and-white image really a disadvantage? Wasn't the black-and-white image clearer in its simplicity, and thus more evident? Wasn't the subjective coloring of the illustrators distorting? This sparked off a debate in which the urologist Otto Kneise defended the colored hand-painted pictures. He praised an *Atlas of Cystoscopy* published by him in 1908 as a collection of “good pictures, corresponding to the natural conditions also in their light and color effects”. Then again, he spoke of the difficulty of “reproducing cystoscopic images in color” (5).

In particular, he pointed out that colors appear quite different in artificial light than in sunlight, that the different light intensities or shadowing in cystoscopy have considerable influence on color perception. The central problem was creating images “true to nature” and evidential value. It was disputed whether colorfulness or photographic objectivity was better suited to achieve evidential effects. The advantages of colorfulness were relativized by doubts about rendering it “true to nature” through the subjectivity of the artistic process. In contrast to this stood the “objectivity” of photography, which in turn was afflicted with the shortcoming of colorlessness. In fact, the latter, the shortcoming of colorlessness, obviously weighed as a more serious disadvantage, because almost all contemporary textbooks and atlases on cystoscopy opted for the colored variant (6).

3) Reuter, M. 2006. 'Phillip Bozzini (1773–1809). Der endoskopische Idealist'. *Der Urologe* 45, 1084–1091.

4) Herr, H. W. 2006. 'Max Nitze, the Cystoscope and Urology'. *The Journal of Urology* 176, 1313–1316.

5) Kneise, O. 1908. *Handatlas der Cystoskopie*. Halle a. Saale: Gebauer–Schwetschke.

6) Martin, M. and Fangerau, H. 2021. *Evidenzen der Bilder. Visualisierungsstrategien in der medizinischen Diagnostik um 1900*. Stuttgart: Steiner.



CONTEMPORARY GUTS

Brooke Holmes

Classics Department, Princeton University

GUTS IN CONTEMPORARY ART

The boundaries of contemporary art are under constant contestation. The questions that continue to unsettle what is inside and what is outside the time of the contemporary and the parameters of art are both highly abstract and deeply material. They bear on the ways that the universalizing discourses and knowledge practices of European modernity have worked with the extractive and disciplinary systems of colonialism, imperialism, and racial capitalism to generate global systems of power and the homogenization of culture. What registers as contemporary art is powerfully shaped by transnational market forces working in tandem with the cultural institutions that confer aesthetic value. These networks of power are also imbricated in patterns of migration under the pressures of war, climate change, and economic inequities. Such entanglements generate a pervasive, generative porosity between traditions while running the constant risk of reproducing the value hierarchies that distort the distribution of planetary resources and fuel unsustainable economies. They make contemporary art a site of extraordinarily complex and unpredictably radical creativity in twenty-first-century global culture.

Within the history of art over the past half century, the body has repeatedly emerged as a field of aesthetic possibilities, particularly for practitioners engaged with feminism, critical Black theory, queer theory, psychoanalysis, new materialism, animal studies, postcolonial and decolonial theory, and disability studies. These theoretical traditions have critically challenged the abjection and objectification of the body within the globally hegemonic philosophical, scientific, and art traditions associated with a cosmo-anthropology of Nature traced back to ancient Greece. In so doing, they have activated the potentialities of embodiment and bodies anew. The guts are metonymic of the body at its most abject, associated with digestion and excretion as well as the matter of the mother and the blurred boundaries of subjectivity within reproduction. In the early twenty-first century, biotechnological developments and the awareness of ecological precarity have also led to an efflorescence of collaborations between artists, activists, scientists, and theorists. These collaborations are remaking the gut as a laboratory of creative hybridizing and cosmological experimentation.

The artists whose work is gathered here approach the gut from many angles: as a model of symbiotic collaboration; a site of unraveling; a challenge to hierarchies of form; a fold in the history of the sexed and raced body to be flattened and reworked; a landscape of processes through which human beings metabolize their world; vessel and loop. In the gut's ancient communities are coiled new possibilities of living differently in our bodies, together, on a rapidly transforming planet.

The privileging of vision within modern European systems of knowledge has been an object of transdisciplinary critique over the past fifty years. This critique has interrogated, in particular, how modern visual cultures and museums have cultivated the disembodied gaze of hegemonic subjects while positioning others as its objects. These artworks adopt a critical perspective on visibility as a mode of knowing, sensing, and being in a body, while exploring other aesthetic modes. They amplify the representational tropes associated with modern practices of ocular consumption (as in Wangechi Mutu's collaging of medical textbooks, fashion magazines, and pornography in the series *Histology of the Different Classes of Uterine Tumors* or Mary Reid Kelley's subversive anatomization of the female corpse and evisceration of the cinematic gaze in the video-work *This is Offal*). They multiply perspectives through the multi-dimensional possibilities of sculpture and installation (as in Martha Friedman's sculptural group in "Castoffs" or Anicka Yi's "macrobiotic" installation *Le Pain Symbiotique*). They activate a range of sensory experiences through which vision becomes syn-aesthetic (as in Isabel Lewis' live artwork and research site *Scalable Skeletal Escalator*). They stand as witnesses (as in Rose B. Simpson's *Vital Organ: Gut*).

At the same time, as with the collective labor that takes place in the gut, these works break down habits of seeing and knowing as part of a process of reimagining an aesthetics that draws on the manifold potentialities of various bodies as they unfold in new webs of relation. They hold in common an interest in assemblage, gathering materials (dough, fur, rubber, scent, grout) from unlikely places and putting them into unlikely partnerships. These practices of bricolage challenge the classical holism of the Aristotelian body, whose parts read as organs harnessed to the normative realization of a given form of life—above all, "the human." They ask what else "the human" might be.

The artists included here collaborate with scientists, mechanics, dancers, and other practitioners to think anew about synergistic imagination and interspecies kinship inside and outside conventionally bounded bodies. In so doing, they realize the agency aligned with the artist as both expansively multiple and singularly intentional. Here, the gut is not a metaphor or image of anything. Rather, its metabolic processes are brought forward as co-creators of the work, not in isolation from culture but in visceral relation to layers of lived history. These processes are refracted through materials moving at their own speeds: earth shaped and glazed, dried and fired; compost; silicone rubber snaking around steel.

The hum of matter thus feeds the cosmological energies of these multiform aesthetic projects. It invites us to reimagine the encounter with the artwork as a stimulus to inhabiting our innards otherwise, transforming our practices of consumption, and attending with all our senses to the world around us.

Martha Friedman, *29 Untitled* (2018)

Concrete, silicone rubber, and steel; Photo credit: John Berens. Courtesy of the artist

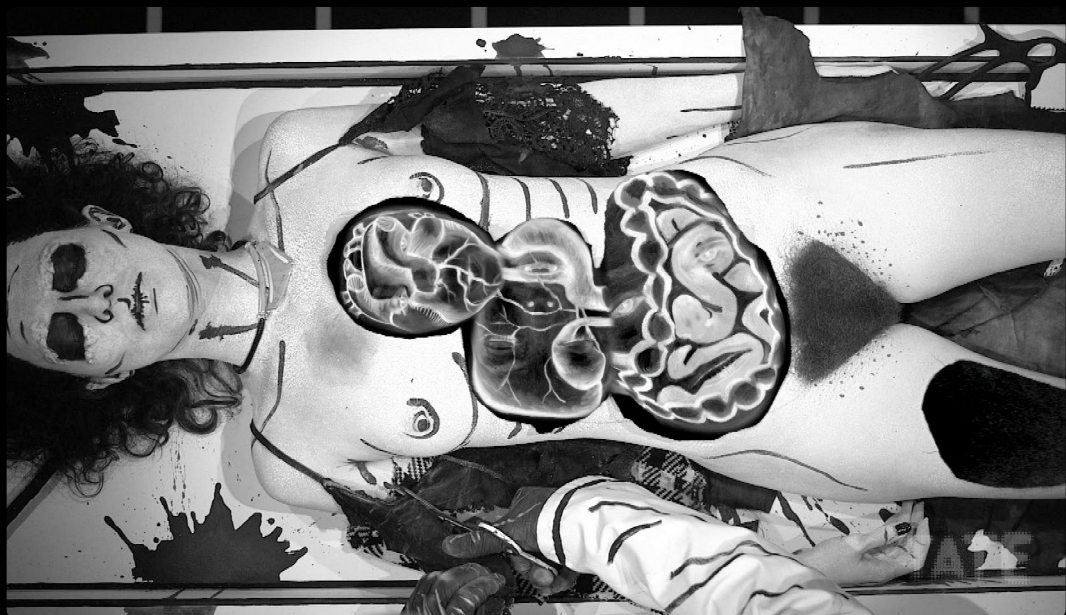
The work of Martha Friedman registers her ongoing experiments with materials—especially silicone rubber, concrete, and glass—capable of radical phase change under controlled conditions. She puts these material transformations into feedback loops with the capacities of the human body to endure or change. Her practice muddies the gendering of sculpture, often in collaboration with the dancer and choreographer Silas Riener. The series of twenty-nine untitled sculptures that were exhibited together in the show “Castoffs” intervenes in the marble-heavy tradition of classical art as it has been defined through a series of receptions of the articulated male form in fifth- and fourth-century BCE Greek sculpture. Friedman incorporates the flotsam of earlier work—solid rubber tubing that recalls viscera and mats like tissue samples, all in colors associated with the four humors; large metal spikes—into fragments of a virtuosic whole cast in concrete. Made from alginate molds taken through an arduous process with Riener, the fragments are sometimes rough-edged, pocked crusts, sometimes smooth and solid. They evoke the body as both shell and core. Staged on high pedestals ordered into a grid, the varied assemblages suggest a disciplined dis/re-embowelment, where matter is both released from form and threaded back through it. The “castoffs” refer to Friedman’s recycling of material in her studio as well as the constant trafficking of changeable material through the gut as metabolic processes sustain the body in time.

Mary Reid Kelley with Patrick Kelley, *This is Offal* (2015)

Live performance streamed via internet, 8 min., Tate Modern, November 19, 2015

Photo credit: Patrick Kelley. Courtesy of the artists

Mary Reid Kelley works at the boundary between performance, painting, and poetry. She crafts vivid, layered videos in collaboration with her partner Patrick Kelley that tack through folds of history and myth, ancient and modern, with a sharply graphic, black-and-white aesthetic, a raucously feminist sensibility, and a penchant for the poetics of the absurd that plumbs the logic of sense. In “This is Offal,” Kelley performs as a body of proliferating parts, dramatically dislocated from the unified Aristotelian organism. The scene, in dialogue with Thomas Hood’s 1844 poem “The Bridge of Sighs,” is an autopsy of a woman who has died by suicide. The procedure is ostensibly being conducted by a white-coated pathologist. Yet as his gloved hands at the edge of the frame snip away clothing, we come face-to-face with a noisy body. Various parts (foot, leg, heart, liver, gut, head), uncannily animated and voiced by Kelley, speak in rhyming couplets to accuse one another, in turn, of causing the death. Their brilliant wordplay mocks the coherence of the whole with an overabundance of logic produced by accelerating fragmentation, while Kelley’s persistent presence as the dead woman counters ludic abandon with tragic finality. The guts interrupt a debate between the head and the liver to declare: “I’ve never





had the rank of leader/I've always been the bottom-feeder." But having "seen the light," they speak the existential claim of the work's title: "I stink, therefore I am! Cast off all/Vanity, 'cause This is Offal!"

3

Isabel Lewis, *Scalable Skeletal Escalator* (2020)

Live art work, initially realized at Kunsthalle Zürich, September 24–November 8, 2020 in collaboration with Dirk Bell/Mo Stern, Lara Dâmaso, The Field (Mirjam Jamuna Zweifel, Pierre Piton, Lucia Gugerli and Declan Whitaker, in cooperation with Tanzhaus Zürich), LABOUR (Colin Hacklander and Farahnaz Hatam), Matthew Lutz-Kinoy, Rafat Pierzyński, Mathias Ringgenberg, Sissel Tolaas, Juliette Uzor, Marcelo Alcaide and Yolanda Zobel; Photo credit: Andrea Ebener and Annik Wetter. Courtesy of the artists

Isabel Lewis's practice spans dance, live art, and a multi-faceted research project that explores the potentialities of bodies in relation. Her work disrupts the philosophical traditions of idealism and materialism through a range of social choreographies and embodied techniques. It is often generated through a complex practice of collaboration that she designed in 2008 called Communal EPIC (Experience in Performing Instantly Created) Fiction, with the intention of locating individual agency within relational structures of making, play, and performance. *Scalable Skeletal Escalator* was initially realized together with dancers, sound artists, painters, thinkers, and scent researchers over three floors of the Kunsthalle Zürich—with a community compost station in the basement—as an experimental form of the holobiant. In working with the idea of the holobiant, Lewis is drawing on the evolutionary biologist Lynn Margulis's work on symbiotic structures such as coral reefs or the human gut. The immersive work engages the visitors' full sensorium as they move through the space. They encounter dancers who are at once responding to a fluid choreographic score, authoring their own movements, and adapting to shifting conditions in a play of intimacy and distance. The scalability of the title undoes the hierarchies of form that have structured the longue-durée cosmo-anthropology of Nature in terms of race, gender, and species. Instead, drawing on contemporary research on gut microbiota in conjunction with the varied ecologies of human and non-human life, Lewis probes the capacities of aesthetic form to cultivate a motile awareness of the different scales and configurations of living-together.

4

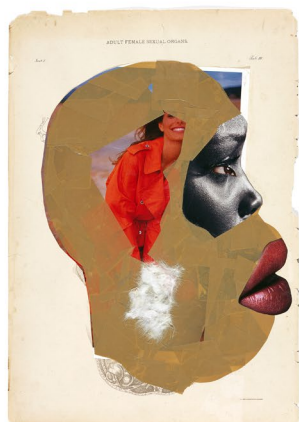
Rose B. Simpson, *Vital Organ: Gut* (2022)

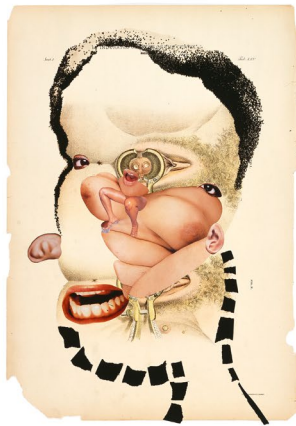
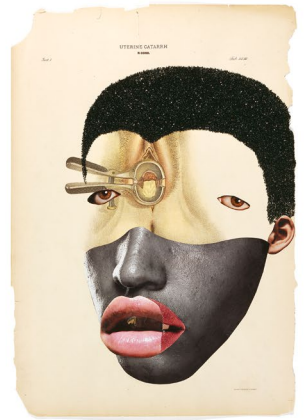
Clay, twine, grout, glaze. Photo credit: Dan Bradica; Jessica Silverman, San Francisco; Jack Shainman Gallery, New York. Courtesy of the artist

Rose B. Simpson works across media: steel, leather, beads, linen, car parts, jute string, volcanic stone. Over the past decade, she has repeatedly turned to ceramic sculpture in order to disclose the capacities of the body to bear witness, harness attention, make new bodies, resist sedimented structures of settler violence, and articulate pathways to mytho-scifi futures. Simpson's

experiments in clay rework a material molded by generations of her family in northern New Mexico, where she grew up on the Santa Clara Pueblo and still lives. In *Vital Organ: Gut*, traces of touch complicate the whole of the glazed, earthen surface. The curved, androgynous form is marked by black and gray lines, symbols, and rows of dots and dense markings, evoking both vessel and votive. On its head sits a rounded, hollow, angled rectangular form, topped by a spout-like opening. The form suggests both the externalization and the avatar of the gut: a vital part lifted out of the cavernous interior but also a show of tension between holding and void. Balanced aloft and bared to the world, the gut seems to shed its fleshy vulnerability. But incorporated into the work's particular abstraction—Simpson has referred the cross and x'ed symbols to, respectively, the cardinal points and protective force without systematically glossing her languages—it locates vitality within Simpson's negotiation of opacity as a strategy of cultural survival and her pursuit of artmaking as a radical opening of the self.







Wangechi Mutu, *Histology of the Different Classes of Uterine Tumors*, 2004–2005

Series of twelve collages on found printed medical illustrations, including printed paper, glitter, ink, adhesive tape and fur. © Wangechi Mutu. Courtesy of the artist

Wangechi Mutu works expansively across sculpture, film, collage, performance, drawing, and painting. In dialogue with Afrofuturism, feminism, critical anthropology and evolutionary biology, surrealism, and local and translocal African cosmologies, her open-ended practice recruits the found materials of history and culture, organic elements, and a capacious reservoir of myth and ideology. She creates unpredictable hybrids that model new ways of living in temporalities fusing past, present, and future. Each of the twelve works that constitute *Histology of the Different Classes of Uterine Tumors* deploys the material strategies of collage to scramble representations of the Black female body at the juncture of modern medicine, fashion, and pornography. Mutu intensifies the spectacular visuality of objectification to the point where it begins to consume itself. Building from old medical texts that taxonomize pathologies of the female reproductive system, she distresses the smooth surfaces that cloak the violence of dissection. Cut-outs of eyes, human (and non-human) mouths, and legs-turned-noses are spliced into the anatomical illustration's demure curves, together with tufts of fur and glittery black hair. These new folds interrogate the foundational logic of the collage's base layer. Lusciously rendered lips, pierced tongues, and open, blood-spattered mouths subvert hysterical anxieties about racialized female sexuality. Anatomized to the extreme and integrated into a new syntax, they meet head-on, and undo, biopolitical tropes of appetite that conflate mouth and vulva, hunger and desire, womb and gut.

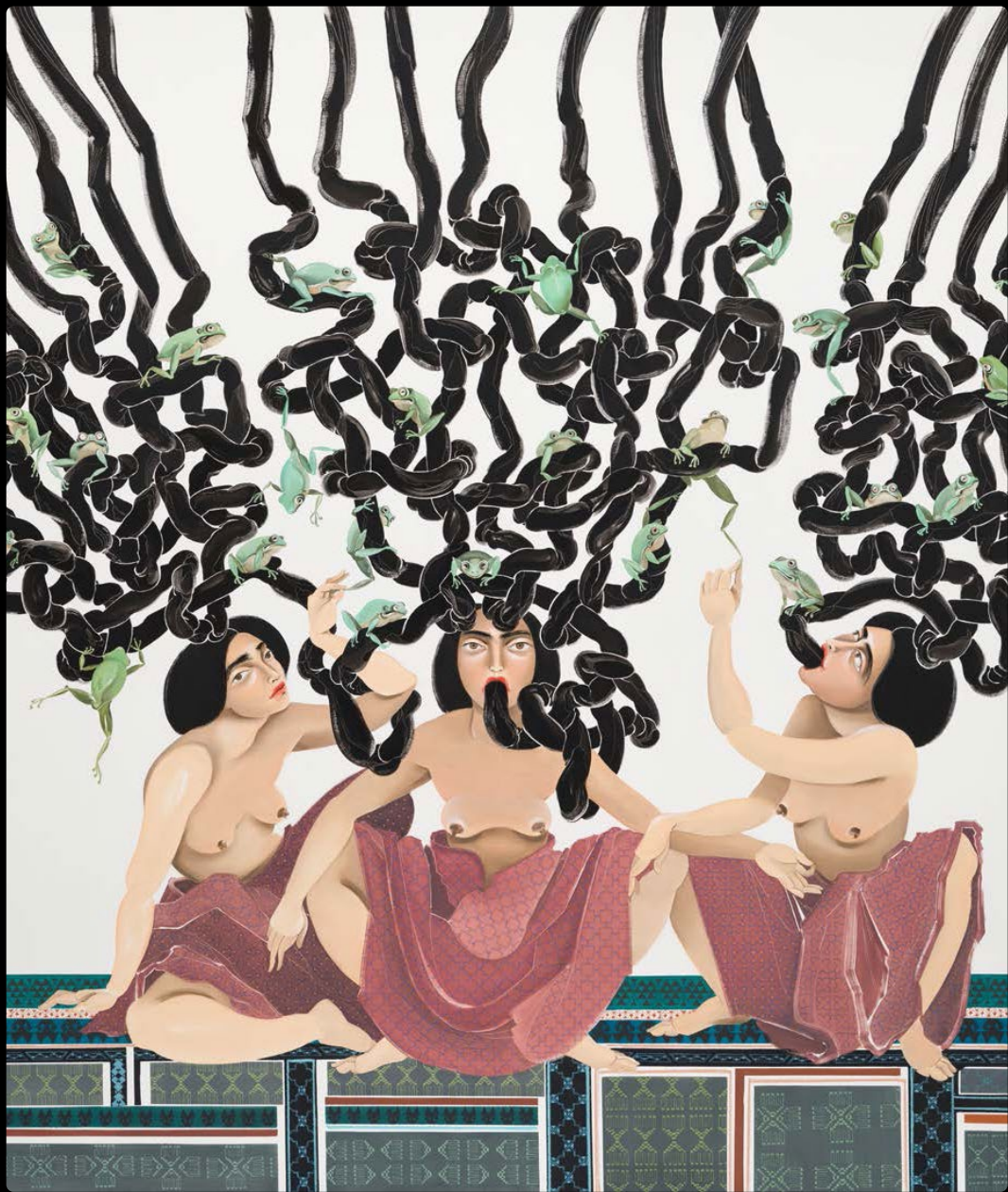
Anicka Yi, *Le Pain Symbiotique* (2014)

PVC dome, projector, single channel video, glycerin soap, resin, dough, pigmented powder, plastic, Mylar, beads, tempera paint, cellophane, 320 × 430 × 630 cm. Installation view, Taipei Biennial, 2014. © 2023 Anicka Yi, courtesy of 47 Canal, New York, and the Taipei Fine Arts Museum, Taipei; licensed by VG Bild-Kunst, Bonn

The practice of Anicka Yi enacts sculptural collaborations between human and non-human agents. It elides the boundary between the organism and the machine, querying the nature of “natural” intelligence. Yi has developed a complex, at once “techno-sensual” (her own term) and highly conceptual, aesthetics of symbiosis that cross-contaminates critical vitalism and post-humanism, feminist art practices, the biological sciences, and anti-capitalist and anti-nationalist activism. Embedded in research practices that move in undisciplined yet rigorous ways between art and science, *Le Pain Symbiotique* interrogates what it means to re-present the microbiome of the gut and plays with the analogically entwined scales of microcosm and macrocosm. The work invites visitors to circumnavigate a large, transparent PVC cellular structure carpeted in a bright ochre dough. Through the room's sheer membrane, they

can watch bacterial activity projected onto gently lit glycerin and resin sculpture-screens. Incubating microbial yeast, mold, and bacteria, the hermetically sealed room suggests a biosphere that we have been locked out of. *Le Pain Symbiotique* emerged out of Yi's yearslong thinking about metabolism, the cluster of chemical processes that transform ingested matter into life-sustaining energy through the collective labor of the gut's microbial community. Appropriating the aesthetics of the laboratory, where forms of life are subjected to experimentation and hybridization by human agency, the work stages performances of micro-organismic metamorphoses that hauntingly evoke those occurring beneath the visitor's own skin.





GUT FEELINGS

Hayv Kahraman

Los Angeles

Hayv Kahraman is a Kurdish–Iraqi painter whose work primarily deals with the body politics of migrant consciousness. Oftentimes blended with her personal history as a refugee to Europe and ultimately to the United States, she creates a unique visual language that reflects her nomadic background and challenges various notions of hegemonic control.

All images © Hayv Kahraman;
Courtesy of the artist and Pilar Corrias, London.

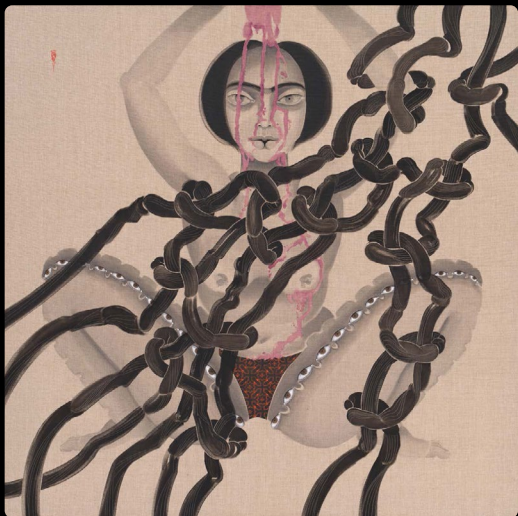
HAYV KAHRAMAN: GUT FEELINGS

The works reproduced here are part of Hayv Kahraman's solo exhibition *Gut Feelings, The Mosaic Rooms*, London (2022). The body of work on display built upon the artist's scientific research into psychotherapeutic neurological models of "neurosculpting"—the potential to rewrite neural pathways. Kahraman radically reclaims the gut—our so-called 'second brain'—as an alternative epistemological engine through which to develop, digest and share new ways of thinking, seeing and relating to disenfranchised peoples.

Emphasising the impact of socio-cultural forces on our somatic states, Kahraman's artworks centre the digestive organs as the nexus between pain and psychological transfiguration. Female bodies are held in suspension across the canvases, weightless yet shackled by webs of jet-black guts, which they unravel to only then tangle again, knit then unknot, do, undo, learn and unlearn. By their dignified, intent expressions, this is a reality they are accustomed to—re-routing trauma is a task that must be seen to daily.

Kahraman confronts the familiar condition of feeling "stuck", suggesting that the only way to free oneself from this state is not to struggle against it but to accept and work through it. Several works have been painted with the lilac dye from *torshi*—a staple Middle Eastern dish of fermented vegetables said to improve the balance of good and bad bacteria in the gut, and in turn boost brain health. Other works have been painted or drawn on handmade flax fabric, a diaphanous material produced via microbial activity in the soil before it is spun and "refined" into linen.

Using bacteria as an allegory for "othered", vulnerable bodies, Kahraman employs materials that break down and rebuild structures and create sources of nourishment to bodies in need.



Hayv Kahraman
Torshi and eyes, 2022
 Oil and torshi on linen
 127 × 127 cm, 50 × 50 in
 (KAHR 2022006)

Hayv Kahraman
NeuroBust no.5, 2022
 Oil on linen
 88.9 × 88.9 cm, 35 × 35 in
 (KAHR 2022004)





The Gut / Der Darm
public sculpture, Schillerplatz, Chemnitz
(part of the project Gegenwart | Presences),
photographed by the artists

THE GUT / DER DARM

Anetta Mona Chişa

Lucia Tkáčová

All images © Anetta Mona Chişa & Lucia Tkáčová
Courtesy of the artists

INTRODUCTION

The Gut is the organ that renders Marx's body in the city that holds the largest sculpture of Marx's head in the world – Karl-Marx-Monument. The actual head is over 7.1 meters tall, and in total the bust weighs 40 tons and stands over 13 meters high. The Gut represents Karl Marx's large intestine and is made in a size proportional to Marx's head (The Gut / Der Darm. Public sculpture, Schillerplatz, Chemnitz)

DER DARM VON KARL MARX

Ontologically, the head is quite small compared to the gut. The gut is the last part of the gastrointestinal tract and is home to the biggest number of living entities in our body. This makes it the most prominent ecological symbiosis of human and nonhuman parts of the biosphere. It is the place of an intrinsic solidarity, which makes The Gut, in fact, a monument to the microbiome. Marx's microbiome surely had a great impact on his ideas (and, by extension, on how our world is today) and it certainly deserves a monument, just as much as his head does. A new reading of the Karl Marx monument asks us to collectively throw ourselves into restoring the missing organ(ism)s in order to envisage a new (social, political, ecological, and metaphysical) body. Let's activate the vagus nerve and connect The Head with The Gut. The Head is the visual facade of a sharp-edged hyper-rationality. It is erect, vertical, and aspiring. The Gut makes the anarchic swarming more evident. It does not need a pedestal. It performs itself horizontally, lying on the ground. It is accessible, encompassing, and inclusive. Once we connect Marx's Gut to Marx's huge, chimerical body-city, Marx's Head becomes porous. It transcends the past. It breathes in the present and breathes out the future. The Head makes sense of its body, discerning its pulse, tuning to other presences and coupling with The Gut. The Gut makes sense of The Head, feeding it with essence while thinking, 'If your mind were only slightly more permeable, I'd drown you in meaning.' The "gut instinct" wants to access the brain more often, but the brain resists—a manifestation of the class antagonism and political tension in effect, one may say.



DRAWING BREATH >< GUT FEELINGS

An Experimental Anatomical Art Lab for
Contemporary Dance

Nina Sellars

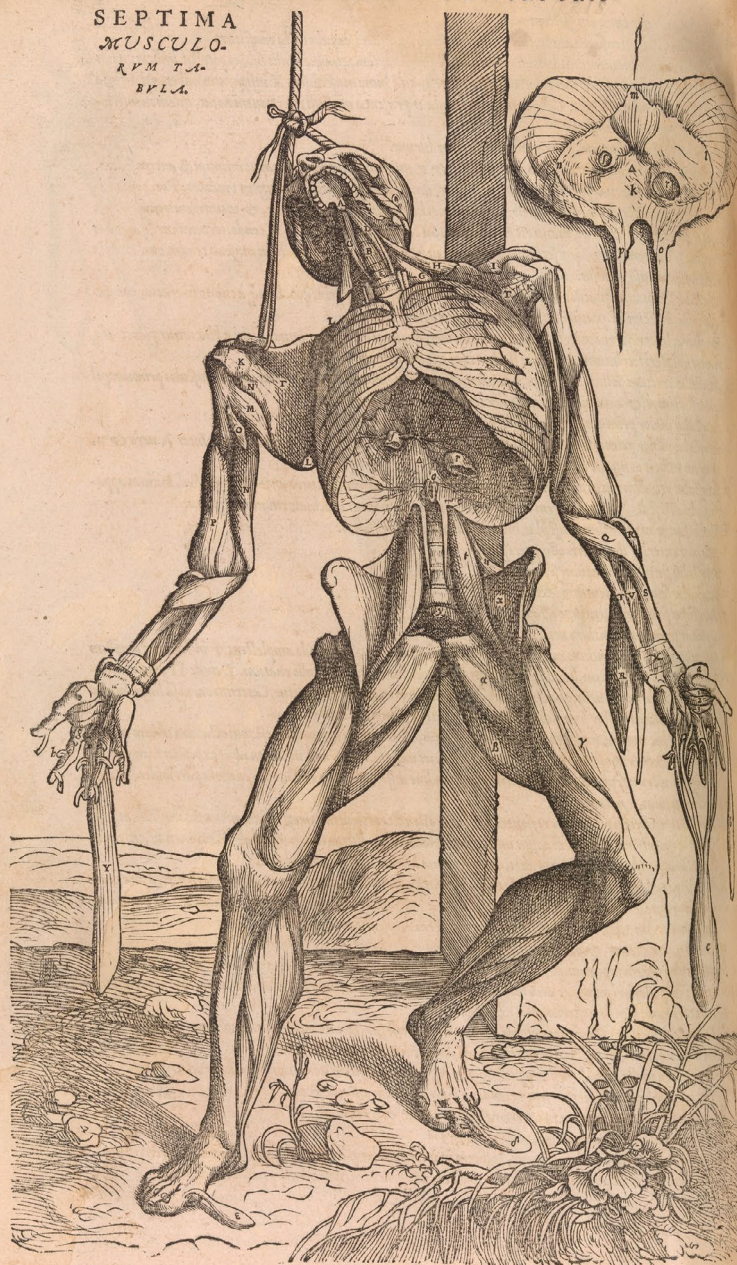
Faculty of Fine Arts and Music,
University of Melbourne

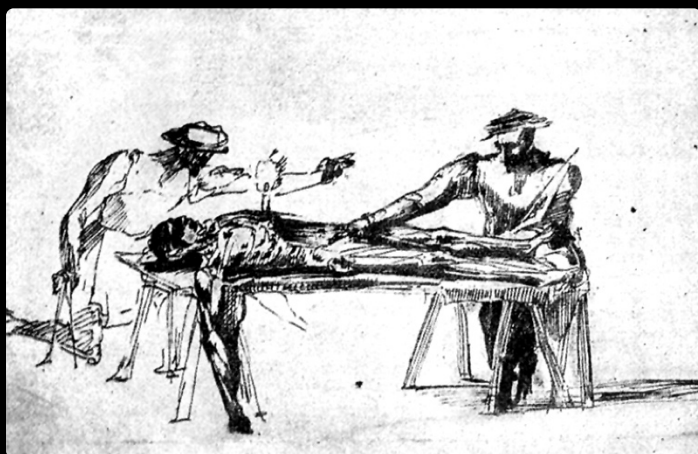
INTRODUCTION

The images contained in this section form part of a collection being presented for a new studio-lab initiative titled *Drawing Breath >< Gut Feelings*, which has been created for the postgraduate course subject *Dance Science & Somatics*, located at the Faculty of Fine Arts and Music, University of Melbourne, Australia. The studio-lab focuses on the discipline of anatomy and its visual archives—delving into the histories of the body as an object of anatomical discourse. *Drawing Breath >< Gut Feelings* “explores how this knowledge could catalyse new species of feeling, sensing, and enacting corporeality” within the practice of contemporary dance. (1) One of the aims of the *Dance Science & Somatics* subject is “to bring body knowledge to the foreground within an interdisciplinary context”. (2) To support this design, the studio-lab initiative not only looks to reveal perceptions of anatomy but also bring awareness to the underlying assumptions and biases that surround the various ways of seeing and experiencing anatomy within different disciplines. With this intent, *Drawing Breath >< Gut Feelings* engages the dance students in a studio-lab practice of experimental perceptual drawing, accompanied by a close reading of visual archival material—including historical anatomy atlases held within the University of Melbourne’s Rare Books Collection.

SEPTIMA

MUSCULO.

RPM T.A.
BVL.A.



At its etymological origins in ancient Greek, the word anatomy literally means to *cut*. A vital process, the *cut* of anatomy can be broadly defined as a twofold act: the physical action of cutting the body asunder, and the visual cut of image-making which carves out a particular representation of the body. By exploring the visual archives of anatomy, insight can be gained into how certain ways of seeing are formed (from a contingent coalescing of practices, materials, and ideas) and performed (sustained as enactments of visual knowledge, which can be also viewed as iterations that are open to change, i.e., offering us the possibility of seeing, and doing, otherwise). (3) Inviting the students to be open to experimentation, visual artist and curator—Dr Nina Sellars—together with choreographer and dancer—Professor Carol Brown (Head of Dance at the Faculty of Fine Arts and Music)—approach the anatomy archives from their separate spheres of body knowledge. Their intention is to begin with the guts—considered in relation to the history of anatomy and contemporary dance. In particular, the techniques and influence of Brown’s mentor, Aotearoa (New Zealand) dancer and choreographer, the late Shona Dunlop–MacTavish MBE, 1920–2019, and her teacher, Viennese dancer and choreographer, Gertrud Bodenwieser, 1890–1959 are important presences. *Drawing Breath >> Gut Feelings* also incorporates Sellars’ knowledge from her previous work as an anatomy museum curator, body dissector and anatomical illustrator, in addition to her contemporary biological and new media arts practice. (4) Moreover, the drawing exercises integrate aspects of Sellars’ sensory experience of having been blind as a teenager and the transitional phases of “almost seeing” and “seeing differently”.

1) Carol Brown, email dialogue between Nina Sellars and Carol Brown, Naarm (Melbourne) Australia, 27/11/2022; unpublished.

2) University of Melbourne, *Dance Science & Somatics*, graduate course, <https://handbook.unimelb.edu.au/2023/subjects/dnce90018> (accessed January 24, 2023).

3) Sellars, N. 2021. ‘Robert Hooke’s Micrographia: A historical guide to navigating contemporary images,’ in H. Star Rogers, M. K. Halpern, D. Hannah, and K. de Ridder–Vignone (eds.) *Routledge Handbook of Art, Science and Technology Studies*. London: Routledge, 142.

4) Sellars, N. 2020. ‘Fat matters: fluid interventions in anatomy,’ in N. Köhle and S. Kuriyama (eds.) *Fluid Matter (s): Flow and Transformation in the History of the Body*. Asian Studies Monograph Series 14. Canberra: ANU Press. (accessed March 24, 2023).

The performance of an anatomy dissection and the living anatomies of contemporary dancers both appear to follow the same directive—to begin by “opening” the abdomen—i.e., one gut is being incisively penetrated, the other appears spatially extended. Historically, in the practice of anatomy the abdominal cavity is the beginning entry point of a dissection. For a contemporary dancer, the guts designate their somatic centre and represent the core of their movement and mass. This notion takes on a particular relevance in regard to the dance techniques of Dunlop–MacTavish and Bodenwieser—in which they call for dancers to “reach beyond yourself”, enabled by a strong capacity for core mobility and a “freeing up of the pelvis” (fig. 1). (1)

In the *Drawing Breath >< Gut Feelings* studio–lab the choreographic elements of space, body, movement and time, are explored through the performance of anatomy. Essentially, the study of anatomy is the art of visually locating organs in space—this relates both to the physical exploration of the corporeal body and also its pictorial representation in images (fig. 2). The aim is for the students to contemplate the ways in which anatomical knowledge can be enacted and conveyed and to reimagine it through artistic intervention.

Selected images are used to emphasise the importance of considering the processes, environments and protagonists that are involved in each individual act of studied anatomical observation, (figg. 3,4). The intention is to bring the students’ awareness to the possible insights that can be gained when we give thoughtful attention “to seeing ourselves see”—that is, to question our perceptions (fig. 5). This idea connects to the first half of the studio–lab title, which relates not only to the medium of drawing but also the act of drawing breath.

The idiom, to draw breath, indicates both a movement and a stillness. To take a breath, and to pause. To direct our attention away from the external world and reflect inwards. A transition from exteroceptive to interoceptive body awareness. To locate in this moment of stillness, a perspective—to ask why, and by what means, do we arrive at our particular understandings of the anatomical body? Diaphragmatic breath in dance is a powerful mover of the guts and is engaged here also as a metaphor for a body that is in the process of sensing itself into being—with a focus on the dancers sensing differently, and of knowing anatomy otherwise, beyond the parameters of a single discipline. Yet, most importantly, they are encouraged to follow their gut feelings.

1) Brown, C. 2017. 'Entangled histories, part 1: Releasing the Archive,' *Journal of Dance & Somatic Practices* 9, 1, 65; Kampe, T. 2017. 'Entangled histories, part 2: Releasing the de-generate body,' *Journal of Dance & Somatic Practices* 9, 1, 81.

Dancer Shona Dunlop performing the role of Cain in *Cain and Abel*, Sydney, Australia, 1940

Choreographer: Gertrud Bodenwieser; Composer: Marcel Lorber;
Medium: gelatin silver photograph; Photographer: Margaret Michaelis;
Hocken Collections, Uare Taoka o Hākena, University of Otago

Shona Dunlop was born in Ōtepoti, Aotearoa (Dunedin, New Zealand), and studied with choreographer and dancer Gertrud Bodenwieser in Vienna, Austria. She became a member of her all-woman dance troupe, *Tanzgruppe Bodenwieser*, which toured Europe, Japan and Columbia—before Bodenwieser immigrated to Australia in 1939 and founded the *Bodenwieser Ballet* in Warrane (Sydney) with Dunlop as principal dancer.

The dynamic expressive movements of Bodenwieser's dance style exemplify her desire to identify modalities that could strengthen and liberate women's bodies. Her choreographic work placed an emphasis on the dancers' spiralling engagement with space. This dance practice requires a freeing up of the pelvis and spine and calls for the dancer to reach beyond their centre. To a large extent, these manoeuvres are supported by the efficient activation of the psoas muscles and diaphragm which in turn induce the sympathetic movement of the internal organs. Fig. 2, the woodcut from Andreas Vesalius' *De humani corporis fabrica* (1555) illustrates both the psoas muscle and diaphragm. These interconnected structures are also somatically experienced by dancers as receptacles of feeling and emotion in the body.

Experimentation and self-discovery were important components of Bodenwieser's methodology, as too the ethical imperative to engage with the contemporary socio-political issues of the era which she frequently explored through allegory—as seen here in the documentation photograph of Dunlop in her performance of *Cain and Abel*.

Andreas Vesalius (anatomist) and Jan van Calcar (artist), studio of Titian. The Seventh Plate of Muscles

Illustration from the second edition of the anatomy text *De humani corporis fabrica* (On the Fabric of the Human Body), 1555, p. 230; Medium: woodblock print made by unknown block cutter. Collection: Metropolitan Museum of Art, New York, Gift of Dr. Alfred E. Cohn, in honor of William M. Ivins Jr., 1953, Accession Number: 53.682

The illustration depicts a cadaver with its abdominal wall muscles removed and guts eviscerated, leaving the two long fusiform muscles of psoas major exposed. Located either side of the spine, the muscles descend from the level of the twelfth thoracic vertebra, continuing down through the pelvis, to insert into the femurs. The bilateral muscles of psoas major connect the upper body to the lower body and influence both the dynamics of the pelvic region and also the body's respiratory function through shared ligamental attachments to the diaphragm. The domed muscle of respiration, which separates the thoracic cavity from the abdominal cavity, has been removed from the cadaver and appears suspended in the illustration—top right.

Significantly, the cavities and recesses of the body can be thought of as being as integral to the study of anatomy as the organs. As observed by literary theorist Jonathan Sawday in his writings on the Renaissance culture of dissection, 'the study of anatomy was the study of the organization of space.' (1) In regard to imaging, the technique of linear perspective not only embodies this concept it also provides a method to visually disseminate this view. The quality that proved so vital to the illustration of anatomy was not the optical technology's ability to show objects three-dimensionally, but rather its capacity to depict objects as existing together in continuous relative space. *De humani corporis fabrica*, originally published in 1543, is often referred to as the first modern book of anatomy and the first anatomical atlas to use perspectival illustrations.

1) Sawday, J. 1995. *The Body Emblazoned: Dissection and the Human Body in Renaissance Culture*. London: Routledge, 86.

3

Anatomical Dissection (1495–approximately 1543)

Two men studying a corpse by the light of a candle stuck in its chest. Etching after a drawing attributed to Polidoro Caldara (Polidoro da Caravaggio). Wellcome Collection. Attribution 4.0 International (CC BY 4.0)

In the Renaissance era, the tempo and sequence of a dissection were dictated by the decomposition rate of the individual structures of the cadaver. Traditionally, the dissectors began by opening the abdomen—to isolate the viscera. The image illustrates a dissection that is illuminated by a single candle, inserted into the cadaver's rib cage. Candles provide a light of proximity, that is, their luminance does not extend far into the darkness. Moreover, the quality of candlelight appears erratic: it creates flickering shadows, distorts our perception of forms, and they generate heat. All of which is inimical to the viewing and preservation of a rapidly decaying body. Yet both dissectors are shown holding instruments of measurement, which suggests there was an expectation of precision.

Relating this image to fig. 2, the illustration from *De Humani Corporis Fabrica*, historical records reference Andreas Vesalius working by candlelight also—however, his dissections were often public affairs with hundreds of people in attendance. A sixteenth-century medical student, Baldassar Helser, recounted in his class notes the mise en scène of one of Vesalius' candle-lit dissections: 'A table on which the subject was laid, was conveniently and well installed with four steps of benches in a circle, so that nearly 200 persons could see the anatomy.... At last, D. Andreas Vesalius arrived, and many candles were lighted so we all should see.' (1)

1) Baldassar Heseler, *Andreas Vesalius' First Public Anatomy at Bologna, 1540: An Eyewitness Report* by Baldassar Heseler, ed and trans. by Ruben Eriksson. 1959. Uppsala and Stockholm: Alqvist and Wiksells, 85.

John Sloan, A self-portrait of the artist holding a cup of barium and undergoing an upper gastrointestinal fluoroscopic study under the care of two radiologists, 1926

Medium: etching and aquatint. Collection: National Library of Medicine

Anatomy is a science predominantly based on visual observation. Therefore, the anatomical body's existence is seemingly reliant on modes of visual communication—which are constantly, and rapidly, evolving. However, with each new technology used in our seemingly relentless visual interrogation of the body we are not only seeing more of the body, but we are also seeing it differently. Indeed, the anatomical body is as much defined by the methods used to behold it as it is defined by the structures that it claims to reveal.

In the radiography room, which is an anatomy theatre of sorts, the relations and positions of the traditional protagonists are altered. The observed body is no longer necessarily a dead body, but is alive and conscious.

A comparison can be made here with fig. 3, the Renaissance dissection lit by candlelight—as one light source illuminates the body, while the other penetrates the body. Essentially, the quality of a light source defines a perceptible limit to both the observer's action and understanding of anatomy by determining what they see and by instigating how they see it. In the theatres of anatomy, light can be thought of as both an environment and agent.

This raises questions not only about the ways in which the quality of a light source influences our phenomenological engagement with the anatomical body but also how we see ourselves after being exposed to our anatomical interiors. In the twenty-first century, there can be a sense of transparency about the physical body, which can feel open, isolated, and lacking a boundary.

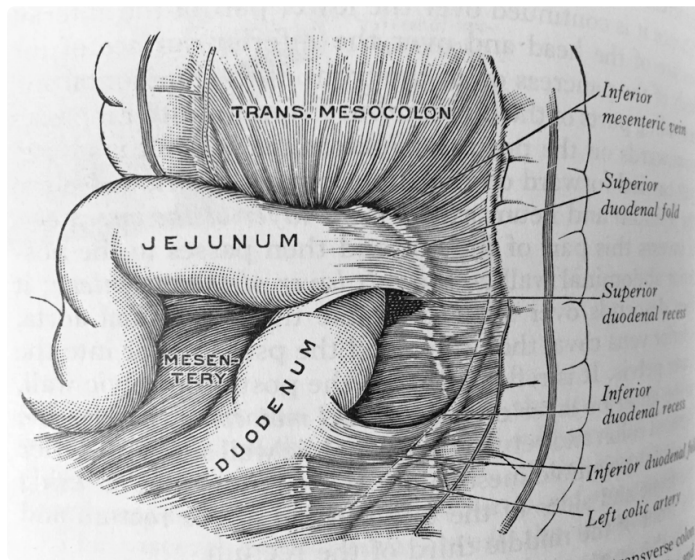
Henry Gray (anatomist) and Henry Vandyke Carter (artist), Fig. 1005, Superior and inferior duodenal fossæ

Gray's Anatomy Descriptive and Applied. A New American Edition (1913), p. 1265.

Private collection: Nina Sellars; Photographer: Nina Sellars

Giving thoughtful attention to the physical qualities of the classical anatomical atlases brings our awareness not only to their content and history but also to the choreographic elements, of space, body, movement and time, which evolve through our careful handling and reading of these editions. Moreover, delicate incidentals that may appear in the print can be enhanced through acts of mediation. For example, a close-up of an illustration can transpose it into a magnified specimen—as seen in this photographed page from *Gray's Anatomy*. Here, the words 'recess' and 'fold' are not only tethered visually to the anatomical illustration of intestines but also seem to label the book's internal architecture, that is, its guts. As the page recedes into the spine of the book's binding, a fossa is created. The shallow depth of field in the photograph intensifies the effect, by allowing the words to drift out of focus.

In comparison to analogue books, the digital media employed in contemporary anatomy archives reconfigure our choreography of engagement with visuals. Significantly, the methods that are used to create and view images in the twenty-first century seem to complicate prior notions of reality—for example, augmented reality, mixed reality, and virtual reality. To a large extent, we no longer look at images, but rather, we interact with images in multiple dimensions and in multisensory ways. Increasingly, it would appear that any contemporary definition of the word “image” will need to question where the image appears, how it appears, and how it relates to (our general understanding of) reality, that is, is the viewer assimilated into the view of the image, or more interestingly, is the image behaving as an object.



BIOGRAPHIES

Atlomy Project

Orly Lewis, Yael Baron, Dmitry Ezrohi, Yotam Giladi, Shay Hermon, Nir Propper — Hebrew University of Jerusalem (funded by the European Research Committee, GA 852550) — ATLOMY is a multidisciplinary study of the history of anatomy, funded by an ERC starting grant and headed by Dr Orly Lewis. Our team has classicists, historians, modern anatomists, digital artists and software experts. We are working together to analyse and decipher Graeco-Roman anatomical knowledge and to present it by means of the 21st century. The creators of our exhibit are students and researchers from classics (Ezrohi, Lewis, Propper, Vespa), our lead 3D modeller (Yotam Giladi), our product manager (Shay Hermon) and coordinator (Yael Baron). → [162](#)

Jason Birch

Jason Birch (DPhil, Oxon) is a senior research fellow for the 'Light on Hatha Yoga' project (SOAS, London and Marburg University). He is also co-director of the Yogacintāmaṇi project at the University of Massachusetts Boston and a visiting researcher on the Suśrūta Project at the University of Alberta. He is well known for his important paper on the meaning of haṭha in early Haṭhayoga, which has reshaped our understanding of the origins of this term by locating it within Buddhist literature. → [100](#)

Claire Bubb

New York University — Claire Bubb is Assistant Professor of Classical Literature and Science at the Institute for the Study of the Ancient World at NYU. Her research focuses on Graeco-Roman medicine, natural philosophy, and social history. Her publications range from a book on *Dissection in Classical Antiquity* (Cambridge, 2022) to articles on blood flow, dietetics, and beyond. Her current project—on theories of digestion and blood creation in the Graeco-Roman world—has her deeply involved with guts. → [168](#)

Che-chia Chang

Institute of Modern History, Academia Sinica — Che-chia Chang is an Associate Research Fellow at Institute of Modern History, Academia Sinica, Taiwan. His research interests cover various topics on the cultural exchanges of medicine between East Asia and Europe. In 2008 he won the "Zhu Kezhen Award" from the ISHEASTM with his paper on the Qing Empire's strategic embargo on rhubarb. His current major project is about *Manchu anatomy*, with which the Kangxi Emperor studied Western medicine. → [56](#)

Anetta Mona Chiša & Lucia Tkáčová

Anetta Mona Chiša and Lucia Tkáčová have been working together since 2000. At the heart of their collaboration lies their quest to find a means of reconciling the political and poetical agency of art. In their work, they use various tactics shifting between several media (video, performance, sculpture, text, photography). They live and work in Prague and Athens. Their works have been exhibited widely in numerous institutions across the world, from Art in General New York, n.b.k. Berlin, MoCA Miami, MuMoK Vienna, MNAC Bucharest, Kunsthalles Bratislava, Bunkier Sztuki Cracow, The Power Plant Toronto, Schirn Kunsthalle Frankfurt, Sprengel Museum Hannover, Kunsthau Graz, to Taipei Biennale, Moscow Biennale and the Romanian pavilion at the 54th Venice Biennale among others. → [210](#)

Sean Coughlin

Institute of Philosophy of the Czech Academy of Sciences. — Sean Coughlin is a Junior Star Research Fellow at the Institute of Philosophy and an Associate Scientist at the Institute of Organic Chemistry and Biochemistry, Czech Academy of Sciences. He publishes in history of philosophy, science, and their connections with medicine, literature, art, and culture. He currently leads the Alchemies of Scent project, a 5-year multidisciplinary venture funded by the Czech Science Foundation using modern chemistry studying perfumery and alchemy in ancient Egypt and Greece. → [150](#)

Thomas Cousins

Thomas Cousins is Associate Professor in the Social Anthropology of Africa at Oxford University. He has a particular interest in health, labour, and kinship, especially nutrition and pharmaceuticals and their attendant forms of value and life, including topics such as global health surveillance, welfare, communications technologies, and zoonosis. His book, titled *The Work of Repair: Capacity after Colonialism in the Timber Plantations of South Africa* (2023), is a fine-grained exploration of the relationships between laborers in the timber plantations of KwaZulu-Natal, and the historical decompositions and reinventions of the milieu of those livelihoods and lives. → [10](#)

Charlotte Damm

Department of Archaeology, History, Religious Studies and Theology at The Arctic University of Norway — Professor of archaeology, specialising in prehistoric hunter-fisher-gatherers. Although her main research area is northernmost Europe, she has also worked in Greenland and southern Africa. Thematically her interests cover multicultural interaction, identity-studies and demography, rituals, cosmology and alternative ontologies. She identifies with anthropological archaeology, in as much as she hopes to contribute towards diminishing the gap between these two and other related disciplines, to achieve a broader multifaceted understanding of global diversity, past and present. → [114](#)

Jane Draycott

University of Glasgow — Jane Draycott is Lecturer in Ancient History at the University of Glasgow. She investigates science, technology, and medicine in the ancient world. Her publications include *Prosthetics and Assistive Technology in Ancient Greece and Rome* (2023), *Roman Domestic Medical Practice in Central Italy from the Middle Republic to the Early Empire* (2019), and *Approaches to Healing in Roman Egypt* (2012). Her research has been funded by the Royal Society of Edinburgh, the Wellcome Trust, and the Arts and Humanities Research Council. → [132](#)

Heiner Fangerau

Department of the History, Philosophy and Ethics of Medicine; Heinrich-Heine University Düsseldorf — Heiner Fangerau (Prof. Dr. med., Dr. h.c., ML) is a medical historian and ethicist. He is Director of the Department of History, Philosophy and Ethics of Medicine at the Heinrich Heine University in Düsseldorf. Previously, he held chairs in this field in Ulm (2008–2014) and Cologne (2014–2015). His research focuses on the history of medical diagnostics (including imaging), the history and ethics of psychiatry and neurology, child and adolescent psychiatry, and historical network analysis. → [188](#)

James Flowers

PhD, Johns Hopkins University School of Medicine; Brain Pool Program Fellow, National Research Foundation (Korea). Climate-Body Institute, Kyung Hee University, Seoul. — Historian of medicine, working on the history of medicine in East Asia, focusing on Korea. He has published work on Eastern medicine in colonial period Korea, medicine in Qing China, the history of Chinese medicine in Australia, the history of science in Qing China, and the practice of Chinese medicine and Korean medicine in the twenty-first century. He is preparing a book manuscript on the history of Eastern medicine in Japan-ruled Korea, 1910–1945, arguing for the significant role of Korea in the survival and flourishing of traditional East Asian medicine as a whole. → [53](#)

Victor Golubev

Institute of Philosophy of the Czech Academy of Sciences. Institute of Chemistry — Victor Golubev is a PhD researcher at the Institute of Chemistry and Biochemistry and the Institute of Philosophy of the Czech Academy of Sciences, contributing to the chemical research at the Alchemies of Scent project led by Sean Coughlin. His research interests lay in the area of chemistry and life sciences, and their applications in multidisciplinary studies, including their intersection with historical and other humanity sciences. → [150](#)

Marta E. Hanson

Independent Scholar, Affiliate of Department III "Artifacts, Action, Knowledge" at the Max Planck Institute for the History of Science — Marta Hanson publishes on the history of medicine in China, public health in East Asia, and early modern Sino-European medical exchanges. She wrote *Speaking of Epidemics in Chinese Medicine: Disease and the Geographic Imagination in Late Imperial China* (Routledge, 2011) and is working on *Grasping Heaven and Earth: The Mind in Hand in Chinese Medicine*. She collaborates with Gianna Pomata on the first translation of Chinese medical texts into Latin (*Specimen Medicinæ Sinicæ*, 1682). → [74](#)

Christophe Helmke

University of Copenhagen — Christophe Helmke is Associate professor of American Indian Languages and Cultures at the Institute of Cross-cultural and Regional Studies, University of Copenhagen, Denmark. Besides Maya archaeology and epigraphy, other research interests include the Pre-Columbian use of caves, Mesoamerican writing systems as well as rock art and comparative Amerindian mythology. → [20](#)

Brooke Holmes

Princeton — Brooke Holmes is the Susan Dod Brown Professor of Classics at Princeton University, where she also directs the Gauss Seminars in Criticism. She is the author of *The Symptom and the Subject: The Emergence of the Physical Body in Ancient Greece and Gender: Antiquity and its Legacy* and a co-editor of six volumes. She has regularly collaborated with artists and curators on discourse programs, publications, and exhibitions, most notably *Liquid Antiquity* (2017). → [194](#)

Hayv Kahraman

Hayv Kahraman is an Iraqi-American-Swedish artist. She was born in Baghdad, Iraq in 1981 to Kurdish parents; she fled to Sweden with family during the Gulf War, studied in Florence, and is now based in Los Angeles. She is primarily a painter; her work deals with the body politics of migrant consciousness. Oftentimes blended with her personal history as a refugee to Europe and ultimately to the United States, she creates a unique visual language that reflects her nomadic background and challenges various notions of hegemonic control. → [206](#)

Natalie Köhle

The University of Sydney — Natalie is a lecturer in History and Philosophy of Science at Sydney University. She researches the history of Chinese and Eurasian medicine. She works on two book projects: one on the history of Donkey Hide Gelatin, and one on the global history of Chinese phlegm. Her recent publications include "The Many Colors of Excrement" (2023) and *Fluid Matters: Flow and Transformation in the History of the Body* (2020). → [44](#)

Silja Korn

Silja Korn was born in Berlin in 1966. She is the first blind, state-certified educator in Germany. She is artistically active, paints, takes photographs, is passionate about theatre and has collaborated to the creation of audio descriptions for museums and films, as well as TV-, dance and theatre shows. She is involved in social issues. She breaks down barriers participating in workshops about art and other topics. At the age of 12, Silja became completely blind following a serious traffic accident. Since 2005, she has been dealing with the topic of "blind photography". In 2016, she began to develop the technique of light painting. Exhibitions: *Im In- und Ausland / At home and abroad*. (siljakorn.de/vita). → [184](#)

Monique Kornell

Visiting Associate Professor, Program in the History of Medicine, Cedars-Sinai Medical Center, Los Angeles — Monique Kornell is an art historian concerned with the evolution of the anatomical print and the bibliography of the history of medicine, specializing in anatomical book illustration and anatomy books for artists from the sixteenth to the eighteenth century. She recently curated the exhibition at the Getty Research Institute in Los Angeles: *Flesh and Bones: The Art of Anatomy* (2022). → [176](#)

Shigehisa Kuriyama

Harvard University — Shigehisa Kuriyama is Reischauer Institute Professor of Cultural History at Harvard University. His research interests center on the comparative history of medicine and the body in East Asia and in Europe. His publications include *The expressiveness of the body and the divergence of Greek and Chinese medicine* (1999), "The forgotten fear of excrement" (2008), "Money as a humour" (2013), and "The geography of ginseng and the strange alchemy of needs" (2017). → [66](#)

Vivienne Lo

UCL History — Vivienne Lo is a professor of Chinese History at UCL, London University. Her core research concerns the social and cultural origins of acupuncture, therapeutic exercise, and the boundaries of food and medicine. She translates and analyses manuscript material from Early and Medieval China and publishes on the transmission of scientific knowledge along the so-called Silk Roads. She has a long-term interest in the visual cultures of medicine and healthcare. → [36](#)

Gideon Manning

Gideon Manning is Associate Professor of the History of Medicine and Humanities at the Cedars-Sinai Medical Center in Los Angeles where he directs the Cedars-Sinai Program in the History of Medicine. Broadly interested in the interaction between medicine, science, and philosophy, Gideon has recently edited, with Anne Marie Roos, *Collected Wisdom of the Early Modern Scholar*, and has articles forthcoming on the history of surgery, the good death, and Galen's early modern reception. → [176](#)

Angelika C. Messner

Professor of Chinese Studies & Director of the China Centre at Kiel University. — Born and educated in Italy, she studied Medicine, Sinology, History of Medicine and Anthropology in Innsbruck, Vienna, Beijing and Freiburg. She has initiated and organized the Villa Vigoni Research Conferences on the "Emotion Knowledge in Chinese Past contexts", served as PI of the MOST-DFG Joint Research Project "Materialities of Medical Culture In/Between Europe and East Asia 醫藥文化的物質頂：介於歐洲與東亞之間", and of the Chinese Fund of Social Science Project "Kulturen und deren Philosophien im Ost-West-Vergleich 东西文化及其哲学." She is PI of the BMBF (Federal Ministry of Education and Research) supported project ChIKoN (Chinacompetency in Northern countries). She is an associate member of the Cluster of Excellence ROOTS at Kiel University, and acts as the President of IASTAM. She is elected member of the European Academy of Science and Arts (EASA). → [34](#)

Rune Nyord

Emory University — Rune Nyord is Associate Professor of Ancient Egyptian Art and Archaeology at Emory University. His research focuses on conceptions and experiences of representation, ontology, and personhood in ancient Egypt, especially as evidenced in Middle Kingdom (early 2nd millennium BCE) funerary culture. He is the author of the monographs *Breathing Flesh: Conceptions of the Body in the Ancient Egyptian Coffin Texts* (Copenhagen 2009) and *Seeing Perfection: Ancient Egyptian Images beyond Representation* (Cambridge 2020). → [6](#)

Ulla Odgaard is currently an independent researcher and censor at Copenhagen and Aarhus University — Since her PhD her research has focused on Arctic and northern archaeology, with a background in archaeology and history of religion. She has a special interest in circumpolar hunting societies, dwellings and hearths—both pyrotechnology and connected ideology, hunting rights and strategies, ethics and rituals. Her research is based on many seasons of fieldwork in Greenland, both surveys and excavations but also studies among contemporary Greenlandic hunters. She has also gained experience from excavations in Norway, Israel and Northern Japan. → [120](#)

Robin Osborne University of Cambridge — Robin Osborne is Professor of Ancient History at the University of Cambridge and a Fellow of the British Academy and of King's College Cambridge. His interest in the body led to *The History Written on the Classical Greek Body* (2011), and his most recent monographs are *The Transformation of Athens: Painted Pottery and the Creation of Classical Greece* (2018) and *The Oxford History of the Archaic Greek World: Volume II, Athens and Attica* (2023). → [136](#)

rodo pfister Research Institute for the History of Afroeurasian Life Sciences (RIHAELS), Basel, Switzerland — rodo pfister lives as a climbing plant and city hermit in Basel, and studies expressions of human consciousness. The body maps of Master Yan Luo open their eyes for a second glimpse on the community of the inner observationists in medieval China. → [60](#)

Maddalena Rumor Case Western Reserve University — Maddalena Rumor is Assistant Professor at Case Western Reserve University. Her primary research focuses on the social and intellectual history of medicine and pharmacology in antiquity, and specifically in the Ancient Near East. Funded by the American Council of Learned Societies, and the National Endowment for the Humanities, her monograph *Perplexing remedies: 'Dreckapotheke' in Ancient Mesopotamian Medicine and the Graeco-Roman World* is forthcoming in De Gruyter's *Science, Medicine and Technology in Ancient Cultures* series → [126](#)

Katharina Sabernig University of Applied Arts Vienna — After studying medicine and cultural anthropology, Katharina Sabernig focussed on Asian medical history and anatomical illustrations. Inspired by the diversity of anatomical artworks, she began knitting anatomical objects in 2015 and asked fundamental questions about ethics, materiality and the perception of anatomy in order to find new answers. In her current project "Knitted Body Materiality" (doi: 10.55776/AR705), the creations are not only exhibited, but also presented through photography, video animation and performative anatomical theatre. → [82](#)

Ignacio Sánchez University of Castilla-La Mancha — Ignacio Sánchez is Distinguished Researcher at the Escuela de Traductores de Toledo (University of Castilla-La Mancha). His main research interests are medieval Islamic intellectual and cultural history, literature, and history of medicine and science. He has published on a variety of topics including the edition and translation of the Ikhwān al-Ṣafā's *Epistle 4: On Geography* (with J. Montgomery) and Ibn Abī Uṣaybi'ah's *The Best Accounts of the Classes of Physicians* (with E. Savage-Smith et al.). → [108](#)

Nina Sellars University of Melbourne — Nina Sellars is a visual artist, scholar, and curator. Her research focuses on the contemporary and historical influence of anatomy on our understanding of the body and the ways in which perception and attention define the construction of anatomical knowledge. Recent authored publications—*Fat Matters: Fluid Interventions in Anatomy* (2020) and *Robert Hooke's Micrographia: a historical guide to navigating contemporary images* (2021). Recent exhibition—*The Brain on Art*, San Diego Brain Observatory (2023). → [212](#)

Brigitte Sonne Retired — Brigitte Sonne was born in 1936; she acquired her Ph.D. in Sociology of Religion at the University of Copenhagen in 1973. Brigitte held various scholarships before becoming professor at the Institute of Eskimology (today the Greenlandic and Arctic Studies, Department of Cross-Cultural and Regional Studies) at the University of Copenhagen, where she taught from 1986 to 2006. She is the author of *World Views of the Greenlanders. An Inuit Arctic Perspective*. University of Alaska Press (2017); her *Grønlandske Verdensbilleder i et Inuit-Arktisk Perspektiv* is currently in preparation. → [120](#)

Chiara Thumiger Cluster of Excellence Roots, CAU University, Kiel — Chiara Thumiger is a historian of medicine and ancient literatures and cultures. Her work focuses on ancient Greek and Roman material, as well as history of psychiatry, body history, and critical comparative approaches. She is the author of *A History of the Mind and Mental Health in Classical Greek Medical Thought* (Cambridge University Press, 2017) and *Phrenitis and the Pathology of the Mind in Western Medical Thought: Fifth Century BCE to Twentieth Century CE* (Cambridge University Press, 2024). → [144](#)

Tawni Tidwell University of Wisconsin-Madison — As a biocultural anthropologist and Tibetan medical physician, Tawni Tidwell currently serves as Research Assistant Professor at Center for Healthy Minds. Her research facilitates bridges across the Euroamerican scientific and Tibetan medical traditions for illness contexts, particularly gastrointestinal, chronic inflammatory, and cancer conditions, along with their attendant epistemologies and ontologies of embodiment and health ecology. She is Principal Investigator of the Examining Individual Differences in Contemplative Practice Response (ExamID-Biome) Project and Science Lead for the Tukdam Study. → [82](#)

Marco Vespa The Hebrew University of Jerusalem — Marco Vespa is a post-doc research fellow in classics at the Hebrew University of Jerusalem. He is currently working on medical-anatomical knowledge in the Aristotelian biological corpus, with particular attention to the *Historia animalium*, as part of the ERC Atlomy project. He has recently published a monograph on the cultural representation of the monkey in ancient Greek and Graeco-Roman textual traditions (Geloion mimēma. *Studi sulla rappresentazione della scimmia nei testi greci e greco-romani*, Brepols 2021). → [158](#)

Yi-Li Wu University of Michigan, Ann Arbor (USA) — Yi-Li Wu is an Associate Professor in the Department of Women's and Gender Studies and the Department of History at the University of Michigan. Her research on the history of Chinese medicine focuses on the multiple intersections of society, culture, and the body, with special emphasis on the late imperial period (16th to 19th centuries). She is the author of *Reproducing Women: Medicine, Metaphor, and Childbirth in late Imperial China* (University of California Press, 2010) and of articles on medical illustration, forensic medicine, the treatment of wounds, and Chinese views of Western anatomical science. She is currently completing a manuscript on the history of traumatology in China. → [94](#)