



An important survey of the history of machine-body analogies through intellectual history

Maria Gerolemou and George Kazantzidis (eds.): *Body and machine in classical antiquity*. Cambridge: Cambridge University Press, 2023, 331 pp, \$110 HB

Douglas R. Campbell¹

Accepted: 29 October 2023

© The Author(s), under exclusive licence to Springer Nature B.V. 2023

The editors have put together an interesting and important collection of twelve essays that trace the development of explanations of the human body that appeal to machines and other technological artefacts. Although the focus of the book is ancient authors, with the oldest being Homer and Pindar, the last essay reaches into the eighteenth century, at which point there are no longer mere analogies between human bodies and machines but a conception of the human body as something mechanized. The essays are put together in such a way that emphasizes the early-modern conception as the terminus of the ancient mode of inquiry.

There is such a large diversity of topics and authors covered here that different readers will likely find different aspects of the book most appealing. For myself, I found the essays on ancient biology most rewarding: three of the twelve essays concern Hippocratic texts, and there are also essays on Galen and Aristotle. I have only one complaint with the collection—the omission of Plato in general and the *Timaeus* in particular. None of Plato’s texts, or even his name, appear in the index. A few of the essays allude to Plato briefly in footnotes. This is regrettable because the *Timaeus* is filled with the sorts of appeals to machines that the collection is built around, such as the fish-trap, waterwheel, and irrigation system, which are mentioned in the discussions of replenishment, respiration, and circulation, respectively. I shall briefly preview each of the essays.

The collection begins with Deborah Steiner’s “More Than a Thing: Figuring Hybridity in Archaic Pottery,” which engages with the earliest authors in the collection of essays, namely, Homer and Pindar. Concerning the work of the former, she is mostly interested in Hephaestus’ self-moving tripods and animated bellows; concerning the work of the latter, most of her discussion revolves around

✉ Douglas R. Campbell
campbelldr@alma.edu

¹ Department of Philosophy, Alma College, Alma, MI, USA

Pelops and the Delphic temple of Apollo. Her essay is helpfully accompanied by a variety of colored pictures, depicting, among other things, the Eleusis amphora by the Polyphemus Painter.

Jane Draycott's "Automata, Cyborgs, and Hybrids: Bodies and Machines in Antiquity" examines ancient attitudes towards disabilities. The most interesting part of this essay, to my mind, was the survey of ancient assistant technologies that were employed to help disabled people improve their quality of life. There is also a fascinating look at how ancient medical texts viewed such disabilities and technologies, such as in the Hippocratic *Joints*, and at literary depictions of automata that were invented as assistants to the disabled, e.g., Hephaestus' automata.

Isabel A. Ruffell's "Not Yet the Android: The Limits of Wonder in Ancient Automata" considers the extent to which ancient Greeks and Romans built machines in the images of humans. Large parts of this essay are focused on non-human machines, such as Archytas' dove and Demetrius of Phaleron's giant snail. The essay also deals with accounts of machines built in the images of gods, such as Athena. Ruffell concludes that ancient machines were modelled after humans only to a limited extent and that the ancients were not terribly interested in producing mechanized versions of the human body.

Maria Gerolemou's "Technical Physicians and Medical Machines in the Hippocratic Corpus" explores some of the machines that appear in the Hippocratic corpus. Specifically, she discusses the Hippocratic board, ladder, and bench. To my mind, the most interesting part of the essay was the examination of the prejudices *against* those physicians who used these machines: they were seen as charlatans who did not focus enough on curing the patient and instead cared more about their own reputation.

Jean De Groot's "The Empirical Art and Science in Hippocrates' *On Joints*" considers not only the use of implements in Hippocratic context but also the theoretical understanding that accompanies the use of these tools. There is a large discussion of the verbs and nouns that are used in *On Joints* and of what they reveal to us about how the Hippocratic authors thought about the tools they were using.

Colin Webster's "Hippocrates' *Diseases 4* and the Technological Body" explores the way that the Hippocratic texts — especially *Diseases 4*, *On the Nature of the Child*, and *Generation* — talk about technologies and their uses. There is, of course, the practical use of technologies to achieve some aim, but there are also analogies with technologies to help illustrate the functions of some organs in the body. I especially valued the discussion of the motions of moistures within the body, and their attraction to moistures of similar kinds.

Giouli Korobli's "Aristotle on the Lung and the Bellows-Lung Analogy" deals with Aristotle's *De Juventute et Senectute, Vita et Morte, de Respiratione*'s important discussion of the lungs. This essay contains a very helpful survey of the archeological evidence of forge bellows, which features prominently in Aristotle's discussion of the lungs as he attempts to refute Empedocles' proposal that the lungs function similarly to a clepsydra. Korobli has a fascinating argument that resolves an apparent downside to Aristotle's analogy between the lungs and forge bellows: the lungs cool the heart, but forge bellows heat a fire and keep it alive.

Robert Mayhew's "The Ill Effect of South Winds on the Joints in the Human Body: Theophrastus, *De ventis* 56 and Pseudo-Aristotle, *Problemata* I.24" makes sense of the effects that the south winds have on the human body by comparing these effects to the way that various technologies are affected by similar processes. For instance, solidification and dissolution, which are processes that our bodies undergo, can be better understood by attending to the way that beds and tables undergo these processes too. Accordingly, Mayhew argues that the human body and technologies are subject to a shared set of principles.

George Kazantzidis' "The Beauty That Lies Within: Anatomy, Mechanics, and *Thauma* in Hellenistic Medicine" considers the way that ancient attitudes towards the human body changed between the time of the early Hippocratic authors and the time of Erasistratus and Herophilus in Hellenistic Egypt, especially attitudes towards the interior of the body. The interior of the human body had been invisible for much of the classical period and beforehand — and much of Kazantzidis' essay revolves around Aristotle's remark that it was disgusting to behold the things that make up our body. Aristotle had suggested a remedy to this problem: coming to appreciate the purposes of each organ in the body. Kazantzidis presents a fascinating look at how much this attitude dominated ancient anatomists through Herophilus and Erasistratus. The most interesting part of his essay was the discussion of the late Hippocratic cardiological text, *On the Heart*, and the way that its author shared Aristotle's appreciation of the marvels of the interior of the human body.

Matteo Valleriani's "The Mechanics of the Heart in Antiquity" focuses on intellectual developments in Alexandria at the start of the Hellenistic period. Valleriani does a great job clarifying the interdisciplinary conversations that were happening at the time. The essay presents to the reader the mechanics of the heart chiefly as Erasistratus understood them. The new research that was being conducted on the interior anatomy and physiology of the human body was taking place hand-in-hand with new research in mechanics. Valleriani discusses how confidently we should believe that Ctesibius' hydraulic hand pump was part of the background in which Erasistratus modelled his understanding of the heart.

Orly Lewis' "The Mechanics of Galen's Theory of Nutrition" adds to our conception of Galen's view of digestion. It is generally accepted that Galen explains digestion by means of some natural faculties that our organs have, such as attraction and expulsion. Lewis adds to this view that, alongside these natural faculties, there are material structures, such as fibers in our stomach, that contribute to digestion, too. The motions of the organs can be understood mechanically. I will also add that Lewis' essay is paired with many helpful colored diagrams that make her reconstruction of Galen's anatomy and physiology much easier to follow.

Marquis Berrey's "Iatromechanism and Antiquarianism in Morgagni's Studies on Celsus, 1720–1761" explores the early-modern reception of ancient biological views. Specifically, the essay considers the reception of Celsus' *De medicina* by Giovanni Battista Morgagni (1682–1771). The essay wraps up the whole volume by introducing the early-modern period. In a short conclusion to the whole volume, the editors claim that the modern idea of the body as a kind of machine can be traced back to antiquity, and this final essay helps make the case for that understanding of the history of ideas.

Overall, this edited collection substantiates the claim that the editors make regarding the trajectory of ancient conceptions of the body. The volume also succeeds at furnishing scholars with interesting and important essays, in many cases on topics that are under-researched. As mentioned above, my only complaint is that there are serious omissions, such as the complete omission of Plato and his *Timaeus*.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.