non-scientific beliefs. And in return, philosophers have largely ignored these anthropological efforts. What Lloyd and Vilaça offer us here is a glimpse into what a truly joint practice of philosophy and anthropology would look like.

In characterizing this endeavour, they choose the term 'metalogue', inspired by Gregory Bateson: 'tentative, exploratory' (p. 9), fundamentally open-ended discussions, never reaching a full conclusion. More than anything else, though, the book is highly reminiscent of Ludwig Wittgenstein. Thematic resonances with the discussion of aspect perception in Part II of the *Philosophical Investigations* (1953) are certainly abundant. Most importantly, the convergence resides in the way empirical details slowly unfold in a fragmentary manner, progressively revealing complications in how human practices and language fit together, tensions and paradoxes quietly ebbing and flowing. And indeed, the book's most successful moments come when it effectively dissolves received philosophical problems – when, for instance, the authors come to the realization that, in a world in which perspectives come first and are ever-shifting, it would make no sense to frontally question a shaman's visions.

What this experiment shows us is that a successful collaboration between anthropology and philosophy cannot be understood through a simplistic opposition between empirical data and theoretical framework. Instead, it is a mutual opening that is warranted, in which anthropology reshapes philosophical problems and philosophy reshapes anthropological description, anthropology being approached philosophically and (the history of) philosophy being approached anthropologically. In this regard, the authors' final declaration that their agendas are different – Vilaça being interested in preserving difference, while Lloyd wishes to find commonalities – feels like a slight regression from the text's previous developments.

Nonetheless, following these labyrinthic metalogues could very well guide historians of science in their own methodological reflections, inspiring them to consider the role anthropology could play in their own research. Moreover, the brevity and conversational format of *Of Jaguars and Butterflies* would make it a formidable tool for the classroom, providing students with a stimulating access point into the intersection of philosophy and anthropology.

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Paulo Galluzzi, *The Italian Renaissance of Machines*

Cambridge, MA: Harvard University Press, 2020. Pp. 296. ISBN 978-0-674-98439-4. £37.95 (hardcover).

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This volume is based on the Berenson Lectures on the Italian Renaissance delivered in 2014 by Paolo Galluzzi at Villa I Tatti, the Harvard University Center for Italian Renaissance Studies. Individual chapters draw on, synthesize and expand on Galluzzi's previous publications in Italian dealing with Renaissance engineers, Leonardo da Vinci, and period depictions and conceptions of machines. The volume's three chapters probe

period representations and conceptualizations of machines and the rising social prestige of the artisan engineers who designed and depicted them.

The Sienese artist–engineer Mariano di Jacopo (1382–*c.*1453), known more commonly as Taccola, is the subject of Chapter 1, which comprises roughly half the volume. A practising artist–engineer who served the Sienese government in senior administrative positions, Taccola authored two manuscript Latin treatises, *De ingeneis* and *De machinis*, whose approximately 580 pages of text and images are generally seen as marking a shift away from medieval depictions of machines towards more modern conventions.

Galluzzi argues that Taccola's manuscripts were intended for potential patrons, not personal use, and that he deliberately employed symbolism to render his innovative ideas inaccessible. While Taccola envisioned machines as labor-saving devices of tangible benefit, the real-world applicability of the designs in his manuscripts varied. Whereas many of these images, particularly those related to water control, fishing and milling, were likely inspired by local industry and the Sienese landscape, Galluzzi describes Taccola's images of fortification devices and military strategies as 'creative' depictions intended for amusement. According to Galluzzi, Taccola employed the Latin term *ingenium* ('clever device', 'natural capacity') to refer to both the machine itself and the mental process through which it had been developed, and he argues that Taccola came to regard drawing and sketching as more effective than the written word for describing machines. An examination of surviving marginalia and manuscripts composed by the Sienese artist–engineer Francesco di Giorgio (1432–1501) leads Galluzzi to conclude that Taccola's work inaugurated a Sienese tradition of depicting architectural and machine designs, which influenced later artist–engineers including Leonardo da Vinci (1452–1519) and the Sienese metallurgist Vannoccio Biringuccio (1480–1539).

In Chapter 2, Galluzzi considers the graphic conventions and conceptual approach of Leonardo da Vinci. Whereas Leonardo initially relied on the paradigm of 'one machine–one drawing' employed by Taccola, he developed new approaches by the mid-1490s. These graphic conventions included the techniques of perspective, shadowing, exploded views and geometric diagrams; Leonardo also came to employ letters and numbers to closely integrate text and images. These new image-making techniques were undergirded both by Leonardo's conception of *elementi macchinali* as a foundational analysis of the general principles of mechanics and by his conviction that drawing represented the ideal realm for investigating processes and causation. By the late fifteenth century, Leonardo applied this approach to the Archimedean tradition and the medieval science of weights, which he sought to reform through consideration of material imperfections and friction. Galluzzi argues that Leonardo's consideration of the optical phenomena of burning mirrors (the reflection of solar rays in concave mirrors) reveals his conception that experimentation and geometrical analysis could speak to questions of natural philosophy.

Chapter 3 describes the evolution of these graphic techniques and conceptions in the sixteenth and seventeenth centuries. Galluzzi considers, first, collaborations between humanist scholars and artist–engineers to restore the text and images of Vitruvius' *De architectura* (first century BCE). Whereas early editions focused on providing realistic images of the machines described by Vitruvius, later editions aimed to explain the mathematical and mechanical principles governing their operations. Galluzzi then juxtaposes two divergent approaches to machines and the mechanical arts pursued in the sixteenth and seventeenth centuries. On the one hand, the genre of the theatre of machines emphasized connections between the artist–engineer and the natural magician; it was grounded in the ancient idea that art, through deceit, can force nature to perform actions outside its ordinary course. The developing science of mechanics, which Galluzzi explores through the published and unpublished writings of Guidobaldo dal Monte (1545–1607) and Galileo Galilei (1564–1642), in contrast, affirmed the limits that nature placed on

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machines. In a move that rejected Leonardo da Vinci's approach and challenged seventeenth-century practising engineers, it sought to analyse idealized bodies abstracted from matter and friction.

Galluzzi frames his contribution as an attempt to broaden conceptions of the Renaissance to encompass 'machines' as well as 'arts and letters'. Historians of science will likely find more compelling his engagement with and intervention in debates on early modern artisanal knowledge and science and visual culture as exemplified in the scholarship of, among others, Pamela Long, Pamela Smith, Christoph Lüthy, Melissa Lo and Alexander Marr. His analysis of Taccola, for example, addresses the concept of 'secret' knowledge, the intended use and audience of early modern texts describing artisanal practice, and the role of the visual in communicating scientific knowledge. Similarly, his analysis of the Vitruvian revival enriches previous scholarship on artisan–learned collaborations described by Pamela Long and others by offering a nuanced examination of the specific skills that artisans and humanists brought to their shared project of restoring Vitruvius' work. In its careful attention to the relationship between text and images of machines, moreover, Galluzzi's volume contributes to a growing body of scholarship on the production and reception of early modern technical images, including, for instance, Wolfgang Lefèvre's edited volume *Picturing Machines* (2004), Marie-Claude Déprez-Masson's *Technique, mot et image* (2006) and Nicholas Jardine and Isla Fay's *Observing the World through Images* (2013).

As befits his subject matter, Galluzzi develops his analysis in dialogue with more than a hundred full-color images. The argument and the layout of the volume closely integrate text and image in ways that resonate with the methods he ascribes to his historical actors. The case studies it considers, moreover, have been the subject of extensive and long-standing scholarly inquiry. Galluzzi's careful attention to established traditions of scholarship serves not only to position his argument with respect to previous claims but also to introduce readers to vibrant and long-standing debates in the field.

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Ian Hesketh (ed.), *Imagining the Darwinian Revolution*

Pittsburgh: University of Pittsburgh Press, 2022. Pp. 352. ISBN 978-0-822-94708-0. $55.00 (hardcover).

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'The Darwinian Revolution', Adrian Desmond noted in the opening sentence of *The Politics of Evolution*, ' – it is an evocative metaphor.' From the beginning, Darwin and his followers proclaimed the 'revolutionary' character of their work. The Darwinian Revolution quickly became a battle cry in the so-called 'warfare between science and religion', in which a naturalistic science of biology would sweep away the antiquated views of theologians, philosophers and idle speculators. Based on a conference held at the University of Brisbane in 2019, this readable and well-produced gathering of twelve essays aims to understand the different meanings that this key organizing framework has had, from the Victorians to the present day. *Imagining the Darwinian Revolution* is a model of coherence and skilful organization, with especially helpful framing discussions by the editor.