

INTRODUCTION

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THIS VOLUME FOCUSES ON medical and philosophical debates about human and animal cognition in the early modern age. At first sight, early modern dualism seems to imply the dismissal of most of the earlier medical and philosophical research perspectives on human cognition. If thought and cognition need to be viewed as properties characterizing those substances that are not part of the physical world, as the Cartesians assert, then it is necessary to establish a radical dichotomy between the mind and the body and between humans and animals; the view that considers mental functions as depending on and, possibly, developing from physical functions, seems to set out from the wrong premise.

However, a closer glance reveals that this perspective on the modern age is somehow distorted. It is clear that the moderns never ceased to approach cognition—the brain and its functions—from both a medical and a philosophical perspective. They never lost interest in the anatomical structures and the physiological conditions underlying the rise, differentiation, and articulation of human and animal forms of cognition. On the contrary, they expanded the earlier practice of comparative anatomy and physiology to give it a new experimental and scientific basis, and they deepened their investigations of the human brain and the nervous system. Doing so, they drew on traditions from both antiquity and the Renaissance more than

any other branch of science. Their field of inquiry had been largely established by Aristotle, whose zoological and psychological works attest to his intention to create a comprehensive “scientific” discourse on the soul as the informing principle of animal life. Aristotle structured this discourse in several different ways: in *De anima*, as a purely theoretical investigation into the nature and the properties of the soul; in the *Parva naturalia*, as an account of the affections and activities common to the soul and body (perception, sleep and wakefulness, dreams, memory, life and death, respiration, etc.) based on the complex interplay of theoretical principles and empirical observations; in the *Historia animalium*, as a descriptive account of the bodily and behavioral features of different animal species; and in *De partibus animalium*, as a systematic functional account of the structures of animal species. All of these works continue to be read in the modern age; and the Aristotelian soul or principle of animation and its functions remain a continuous object of meditation, even among the most fervent Cartesians.

The aim of this book is to provide fresh insights into these developments, and into the theories of human and animal cognition in early modern western Europe, from the sixteenth to the eighteenth century. Against a prevailing tendency in current scholarship, the book looks at medical and philosophical theories as expressions and interacting factors of a coherent, although complex and multifaceted, research agenda. In our view, the interplay between medicine and philosophy throughout early modern Europe is so constant, strong, and fertile that it seems impossible to fully grasp the intellectual content and the conceptual structure of a theory or a work by considering it as “merely” philosophical or “merely” medical without looking at how “medical” materials may have been embedded or echoed in “philosophical” speculations and vice versa.

In the past few years this larger approach has informed a number of works focusing, respectively, on (1) the interplay and dialogue between philosophy and medicine,¹ (2) the rise and constitution of a form of knowledge defined by some scholars as early modern “anthropology” or “philosophical anthropology,” where philosophical, medical, theological, ethical, and juridical issues are deeply intertwined;² (3) the early modern (re)thinking of “nature,” and more specifically of “human nature” as a conceptual space shaped by the tension between the universal and the particular;³ (4) early modern attempts to set, but also to cross, the boundaries between the categories of “human,” “animal,” and “artificial.”⁴

Most of the available studies, however, still attest to a tradition treating

medicine, philosophy, and science as quite distinct and distant forms of knowledge; they view history of medicine, history of philosophy, and history of science as separate research fields having different objects and adopting different methods of investigation. The underestimation of the interplay between early modern medical and philosophical discourse on human and animal cognition proves to be evident when one considers, for example, some of the most significant pieces of scholarship published in the past few years on Aristotelian psychology. The otherwise excellent book by Sascha Salatowsky on the early modern commentary tradition on Aristotle's *De anima* as well as Dennis Des Chene's study on the late Aristotelians' conceptions of the soul do not tackle momentous issues such as those concerning, respectively, the influence exerted by Galen's "materialistic" psychology on early modern Aristotelians, many of whom had received a medical education and/or even held chairs of medicine, and the fact that psychology gradually turned into an "anatomy of the soul" based on and in some cases even incorporated into an anatomy of the brain.⁵

It is therefore not surprising that such works fail to fully acknowledge that medical studies were thoroughly integrated within natural philosophy in antiquity and the early modern age.⁶ In fact, this wide philosophical and medical perspective is what shaped modern views on the soul, on moral psychology, on first philosophy, ethics, and theory of knowledge. In order to challenge those disciplinary approaches and reconstruct the debate between natural philosophy and medicine in the early modern age it therefore seems necessary to cross the boundaries between disciplines and make different perspectives interact. This is one aim of our book: to bring together contributors from various disciplinary backgrounds and areas of expertise (history of modern philosophy, epistemology, ancient philosophy, history of medicine, history and philosophy of biology, history of the classical tradition), who all share an interest in intellectual history and whose research is very much concerned with processes of formation, aggregation, and transformation of ideas as well as patterns of thought.

A second aim of the book is to overcome a tendency toward an "atomization" of the early modern age that has resulted from a need for specialization and that postulates a sharp distinction between Renaissance studies, studies on the age of the Scientific Revolution, and eighteenth-century studies. It considers a time frame that somehow escapes current patterns of periodization and suggests the existence of a *fil rouge* extending from the Renaissance to the eighteenth century and of a continuous and creative reception of Scholasticism up to the Enlightenment, which despite its

obvious dismissal of its hylomorphic premises, remains deeply embedded within the older tradition.

The earlier, more atomistic view has, of course, helped to bring out the discontinuities in the history of early modern philosophical and scientific thought, but in many cases it has also overshadowed the continuities, leading to overlooking the *longue durée* processes of assimilation, adaptation, and hybridization of ancient traditions as a constitutive aspect of early modern investigations into human nature. While the arrangement of the chapters in three parts follows both a chronological and a thematic criterion, such *longue durée* processes are emphasized throughout the book. This form of presentation may clarify in what sense *new* approaches to the human and animal nature (meaning approaches that *were*, or *were proclaimed*, or *aimed to be new*) arose from the dialogue with, and the rethinking of, traditional forms of knowledge.

The first part, “Sixteenth-Century Aristotelian Anthropology between Zoology, Psychology, and Embryology,” contains contributions focusing on sixteenth-century zoological, psychological, and embryological discourses on man. The second part, “Humans, Animals, and the Rise of Comparative Anatomy,” explores the impact of comparative anatomy on philosophical and medical conceptions of body and soul as well as on ideas on the human position within the *scala naturae*. The third part, “Eighteenth-Century Inquiries into the Nature of Sensibility,” analyzes the rise to prominence of sensibility in the medical and philosophical Enlightenment.

All chapters share a common epistemological approach to the general subject; approaching cognition in manifold philosophical, theological, and medical dimensions, they adopt a historically wide viewpoint allowing appreciation of the presence of ancient traditions and patterns of argumentation in the modern philosophical and medical discourse. For these reasons, this book is addressed to a broad audience of scholars working in the fields of history of science, history of medicine, history of (early) modern philosophy, history of the classical tradition, history of ideas and intellectual history, and above all to scholars who are interested in bridging the gaps between each of these disciplines and connecting them with each other.

In the latter half of the sixteenth century and in the early seventeenth century, the epistemological and methodological paradigm of comparative anatomy became central to emerging medical and philosophical discourses

on perception and thought. In many ways, this process was connected to renewed interest in and new approaches to the Aristotelian discourse on the soul and ensouled bodies. As many scholars have noted,⁷ early modern Aristotelianism is not indicative of a conservative culture or a culture in decline, as one might be inclined to think. It became one of the most sophisticated and accomplished expressions of the principles of the humanistic turn. Early modern Aristotelianism both prompted a reconsideration of the theoretical and methodological assumptions of medieval scholasticism and fostered a new and more independent, yet also more respectful, approach to the ancient “authorities.” This is the period when scholars returned to the original texts, reading them in the original Greek—in some cases for the first time in the Western tradition—and applying rigorous and sophisticated philological criteria to the task of editing, translating, and commenting on them. The rediscovery of the ancient texts not only led to a new understanding and, in some cases, the actual (re)discovery of ancient ideas, but also made it possible to raise issues and elaborate new ideas that could be presented not only as *interpretations* of ancient authorities, but also as original developments created in dialogue with and in emulation of the ancients. This is especially true of Aristotelian milieus in Italy and Protestant northern Europe, since it was here that the study of natural philosophy was most intimately connected to medical and anatomical interests and concerns.

This Aristotelian Renaissance and the close interaction of natural philosophy and medicine—that is, the Aristotelian and the Galenic traditions—that this Renaissance prompted serve as the background for the contributions to part I of this volume. The chapters in this section investigate some of the most representative figures and key issues of the sixteenth-century debate on the nature of human and animal cognition and the differences between them. The authors aim to show how different conceptions of the relationship between humans and animals developed depending on the specific questions and aims of the “research program” in which they emerged. While the Aristotelian “zoological project” considers man within a broader investigation of the animal world, Aristotelian psychology—especially the account of the nature, origin, and properties of the human intellect in the third book of Aristotle’s *De Anima*—approaches the difference between man and animal from a much more “anthropocentric” view, explicitly tackling the issue of what makes man unique in the living world. Of course these two approaches should not be viewed as mutually exclusive. On the contrary, they are complementary, not only in

Aristotle—as one may easily see, for example, in his *De generatione animalium*—but also in the works of many sixteenth-century Aristotelians.

In the opening chapter of this book, Simone De Angelis argues that the genesis and configuration of early modern “anthropology,” that is, the “science of man” as it was known from the eighteenth century onward, can be traced as far back as the sixteenth and early seventeenth centuries as the product of two kinds of relationships: first, within the framework of Aristotelianism, the relationship between zoological and psychological discourses; and second, within a wider framework intersecting with yet going far beyond Aristotelianism, the relationship between natural philosophy, theology, medicine, and natural law theory.

The tension and interplay between the accounts of human and animal cognition in Aristotle’s zoological and psychological works are the subject of investigation in chapter 2, which focuses on the reception of the third book of *De anima* and Aristotle’s zoological works within the Paduan milieu. Three major points are raised here: (1) both Pomponazzi and Nifo tend to grant animals a variety of mental faculties; although they are connected to the sensitive soul, they are nevertheless characterized as forms of “sensitive thinking”; (2) early sixteenth-century Paduan Aristotelianism very clearly tends to emphasize the aspects of Aristotle’s natural philosophy and psychology that suggest his acceptance of a gradualist concept of the scale of beings; and (3) the great contemporary interest in animal cognition as a general theoretical issue goes beyond even the scope of Aristotle’s own investigations.

The position of man within the scale of beings and the particular nature and faculties of the human soul was of course a matter of concern not only in secular Aristotelianism, but also, and quite understandably, in confessional Jesuit Aristotelianism. In chapter 3 Christoph Sander recounts how elements of Aristotelian psychology were adopted by the Christian Church to rationalize the Christian doctrine of the immortality of the soul as early as the beginning of the fourteenth century. He further shows how the contrast between ecclesiastical and secular streams of Aristotelianism prompted the dogmatic declaration made at the Fifth Lateran Council (1513) that the immortality of the human soul could be maintained on philosophical—more specifically, on Aristotelian—grounds. Against this background, Sander explores how some qualifying patterns of the Aristotelian idea of man were transformed into a Christian anthropology, how the vegetative and sensitive faculties of man were related to his immortal intellectual soul, and where man stood with respect to plants, animals, and angels.

These debates also concerned the Protestant tradition. Chapter 4 gives an illuminating analysis of how medical, anatomical, and secular knowledge, on the one hand, and theological knowledge, on the other, intersected in Protestant anthropology. Davide Cellamare reconstructs a central debate between Casmann and Vallesius over animal and human souls. First, he shows that Casmann, in arguing that human beings were radically different from other animals, sought to respond to Vallesius, who, by rethinking the nature of the term “reason,” had admitted that brutes may have a share in the soul’s highest cognitive faculties. Cellamare then proceeds to show that the divergence between the forms of rationality that Casmann and Vallesius assign to brutes may result from the different anatomical sources used by both authors. Cellamare shows that Casmann’s claim that the souls of brutes and men were fundamentally different depends extensively on Christological elements inherent in the type of anthropology depicted by his *Psychologia*.

With chapter 5, we move to the domain of the embryological discourse and take up one of most controversial issues of Aristotelian embryology, namely, Aristotle’s account of the intellect as “coming from outside” rather than emerging from the generative process, as the vegetative and sensitive parts of the soul are said to do. Hiro Hirai shows that this doctrine—which is extremely problematic and controversial per se, since we do not know what Aristotle actually meant—was not considered as self-evident by Renaissance medical writers. Although they discuss the emergence of life and the origin of souls in animal and human generation within an overarching Aristotelian theoretical framework, they do not hesitate to formulate theories that adapt, develop, and in some cases even substantially depart from what we find in Aristotle’s *De generatione animalium*, often under the influence of medical ideas from the Galenic tradition. This process of rethinking a key issue of Aristotelian embryological discourse materializes in different ways: Jean Fernel advocates the celestial origin of the soul by drawing on the Renaissance Platonism in vogue at the time, rejecting the naturalistic or physicalist interpretation of Galen’s conception of the soul; Jacob Schegk adheres to Aristotle’s axiom that “intellect comes from above” by making the Creator the immediate origin of human souls and establishing his theory of the everyday creation of human souls by God; Daniel Sennert advocates the theory of the creation of the first soul of each species and the subsequent “multiplication” (not creation or production) of souls, clearly rejecting Aristotle’s axiom.

The last chapter in this section shifts the focus from Aristotelian

natural philosophy to medicine. In chapter 6, Marie Gaille gives an in-depth account of the theoretical and epistemological scope of Paré's approach to the human body and, more generally, to human nature. On the one hand, she shows to what extent and on what premises Paré rejects what he calls the "philosophical" approach to the human body and puts forward a medical method of investigation of man; on the other hand, she explores how this shift from philosophy to medicine affected the understanding of the relationship between man and the other animals.

According to conventional wisdom, the scientific revolution is characterized by the "mechanization" of the world picture and by the emergence of new doctrines that challenged ancient methods, principles, and psychology. While this description may suit physics and the inanimate world, it is less true of the living world: here, a variety of ancient traditions and explanatory paradigms—humoral, chemical, and biomechanical—subsisted, competed, and served as the basis for new scientific adventures. Comparative anatomy had ancient roots in Aristotle and Galen, but it took a fresh angle in the early modern period in the works of Malpighi, Claude Perrault, Willis, and others. These comparative anatomists take a broad view, ranging from animals to human beings, and employ an analogical method to shed light on the human organism. Such a bottom-up approach to human beings, beginning with animals and creatures that rank lower on the "scale of beings" and emphasizing homologies between them, was potentially humiliating for man; and yet, undoubtedly, animal bodies had certain practical and epistemic advantages over human bodies. Not only were they more accessible to anatomists, but they also presented analogous features in greater variety and in simpler form. Animal bodies set the structure of organs and functions and their interrelationships right before the eyes, revealing "mechanisms" that would have remained hidden if one's attention was limited to the human organism.⁸ These new comparative practices are the focus of several chapters in part II of this book.

Nico Bertoloni Meli shows that the Italian physician and university professor Giovanni Battista Morgagni's reliance on ancient comparative methods and experimental practices enabled him to draw analogies between the natural and diseased state of the animal and the human brain. While contemporaries such as Giovanni Alfonso Borelli frequently criticized the ancients, especially Galen, Morgagni considered that modern scholars' prejudices against the ancient "have often carried them too far beyond proper bounds." What separated Morgagni from the ancients and

gave him new insight into the location of brain functions was a broad survey of a great number of individual cases and a new visual emphasis, evident in vivid verbal descriptions, rather than the use of novel microscopic techniques.

Justin E. H. Smith's chapter investigates comparisons between humans and a particular animal species, birds. He questions the typical opposition between birds and humans in terms of song or music versus speech and language. In a broad historical survey ranging from Aristotle and Lucretius to Kant, Smith shows that philosophical ornithological inquiries "reached a peak of intensity in early modern Europe," leading to new physiological research in the works of Pierre B lon, Leibniz, and Athanasius Kircher. Smith further shows that, just like the debate on apes inspired by Edward Tyson's *Orang-outan, sive Homo sylvestris, or the Anatomy of a Pygmy Compared with that of a Monkey* (1699), the debate on birds is characterized by the paradoxical tendency to "anchor linguistic capacity in a certain physiological conformation" while decoupling the two. The desire to preserve human superiority also sometimes emerges in early modern research in the form of reluctance to consider birds as speakers: while humans may be said to imitate avian music, the notion that humans may imitate an avian "language of nature" is more problematic. Instead, early modern philosophers tend to believe that birds "counterfeit" and "parrot" human speech.

These comparative debates on the human/animal divide were inspired by a variety of philosophical traditions. Charles Wolfe explores the Epicurean tradition in France and beyond. He shows how materialism, with its emphasis on the animation of matter, tended to blur boundaries and reduce the anthropological distinction between humans and animals to a gradual difference of more or less human. Authors such as Bayle, Lamy, La Mettrie, Diderot, and Collins took a growing interest in primates, dogs, foxes, sheep, and beavers and their respective forms of cognition and volition. One could consider these attempts to base humanity on material structures as humiliating to man or, on the contrary, as creating the conditions for a true humanism that dispenses with the illusory idea of humanity as an *imperium in imperio*. As La Mettrie put it, "That the mind possesses such a corporeal structure need not be feared as a blow to our self-esteem."

A major challenge for these comparative studies was the brain and the particular nature of the human brain, as indicative of a human soul and superiority over the animal. As Claire Crignon discusses in chapter 10, on Thomas Willis, the new comparative practices of seventeenth-century

anatomy gave rise to novel doctrines of the soul. In this context, Willis's views on the use and limits of comparative anatomy are far from incoherent; in fact, they herald the arrival of a new psychology. Willis neither attempts to simply anchor humanity in particular anatomical structures of the brain nor considers the anthropological difference between man and animals to be invisible and undetectable by "the hands and the tools of the anatomist." Instead, he proposes a new doctrine of man as a "two souled" and "amphibious animal," possessing a middle nature and belonging to an order between angels and brutes, communicating "with brutes by the corporeal soul" and with angels "by the intelligent, immaterial and immortal soul." While Willis considers the rational soul to be the faculty that can carry "man not only beyond the brutes, but . . . above his natural State," he nonetheless emphasizes its dependence on what he calls the "corporeal" and "sensitive" soul, which appears before the anatomist's eye.

The features that one may hold to characterize the human being in particular include physiological particularities (such as the brain, the hand, the upright posture), and cognitive faculties (reason, understanding) that are often connected to human language. In chapter II, Gianni Paganini focuses on a different faculty or phenomenon traditionally ascribed to humans, sociability, and explores its possible application to animals. He shows that early modern attempts to theorize animal politics typically drew on either the Epicurean or the Aristotelian paradigm. While Gassendi favored the Epicurean, Hobbes preferred the Aristotelian paradigm, even though he included Epicurean elements. In Gassendi's reinterpretation of Epicurean political philosophy in the *Ratae Sententiae*, a contract as a social phenomenon is available only to man, because he alone is capable of logos. Hobbes, on the contrary, grants animals a kind of diminished politics by replacing the Epicurean binary opposition between humans and beasts with a graded scale according to the biological continuity of all living beings. In his view, animals are capable of expressing "consent" but are nonetheless incapable of true "union." Such a union can be achieved only by an "artificial" social contract.

Whereas Aristotelianism viewed sensibility as a faculty common to animals and humans, the Enlightenment tended to transform sensibility into a properly human faculty at the foundation of reason or even, to some extent, displacing reason. The chapters in part III measure the distance between modern and ancient theories and investigate the reasons for the terminological shift from "sensation" to "sensitivity," *sensibilité*, *Gefühl*, and

Empfindsamkeit. They also explore the background of the growing interest in a human type of sensibility over the course of the eighteenth century.

Strikingly, all the authors in this section underline the medical and physiological context from which these new notions emerged before spreading to the fields of philosophy, ethics, and politics. They all hint at the major influence of Albrecht von Haller, who in his *De partibus corporis humani sentientibus et irritabilibus* (1752–1753) drew a novel distinction between sensibility and irritability. Although Haller conducted experiments on animals, he was led to assert in the preface of his treatise that his findings supported a “new division of the parts of the *human* body.” In his view, the faculties of sensibility and irritability could be isolated and located in particular bodily organs: sensibility, the faculty causing obvious signs of pain and pleasure, is immanent in the nerves, while irritability, the faculty of contraction, is a property of muscles. In the latter half of the eighteenth century, these new insights and their philosophical implications were debated throughout Europe.⁹

In chapter 12, François Duchesneau examines the epistemic and methodological content of Haller’s claims in greater detail: Haller’s project was to determine the physiological properties and inherent forces (*vires insitae*) of distinct types of fibers as elements of the animal and the human body. As Duchesneau explains, Haller relies here on the analogy of human and animal sensibility and the idea that the “operations [of an animal soul] are no different from our own as long as we limit ourselves to what may be termed empirical references.” Haller applies distinct empirical criteria to determine these physiological properties: motile effects in the case of irritability and broader psychological and behavioral effects in the case of sensibility. In contrast to irritability, sensibility can be viewed as expansive and as developing into higher functions as part of a larger, integrative network. These claims generated lively debate among physicians and philosophers such as Whytt, Unzer, Blumenbach, Diderot, Bichat, and Barthez, and they shaped forms of vitalism in later physiology.

The way in which Haller’s investigations into the physiology of sensation and sensibility entered the philosophical debate—especially in France—and decisively contributed to the integration of medicine and philosophy within a materialistic and vitalistic anthropology is one of the main points raised by Stephen Gaukroger in chapter 13. He argues that the rise to prominence of *sensibilité* in eighteenth-century French philosophy can be traced back to the integration of anthropology into medicine and to earlier debates between members of the medical faculty of Montpellier. In

contrast to contemporary biomechanics, the *médecins-philosophes* at Montpellier already endorsed a nonreductive view of organisms inspired by Haller, and they believed that medicine was also concerned with individuals' general well-being. In Gaukroger's view, the French debate led by Condillac and the *idéologues* can be viewed as a program to naturalize human beings that builds on this medical and anthropological program. It is characterized by general consensus that questions of sensibility—including moral sensibility—"fell under the purview of medicine" and were susceptible to comprehensive medicalization.

In the context of the French debate among the ideologues, in chapter 14 Tobias Cheung focuses on Cabanis's *Rapports du physique et du moral de l'homme* from 1802. He shows how *Rapports* can be read as the outline of a "science of man" that revised the views of Locke and Condillac and shed new light "on the animality of humans." Following Bourdeu, Cabanis rejected Haller's dualism of nervous sensibility and muscular irritability; he instead considered sensibility to be the more fundamental property, which subsumed irritability as a possible form of expression or consequence. In Cabanis's view, sensibility was the source of a great variety of perceived and unperceived impressions and sentiments and of "reaction centers" such as the brain or the stomach: these interacted with one another according to stimulus-reaction schemes to maintain the inner order of living systems. Locke's and Condillac's error was to neglect these interactions and the interplay of different organs. Cabanis attempts to remedy these shortcomings and to connect Condillac's statue to the complex processual framework of the production of sentiments in living beings. He retraces the evolution of these reaction centers from early fetal stages to birth and proposes a new classification.

Finally, early modern medical and physiological debates not only had an impact on French philosophy, but also shaped German philosophy. Although German philosophers such as Herder, Sulzer, Platner, and Kant unanimously rejected certain materialist conclusions drawn by their French counterparts and, in contrast, still gave the notion of the "soul" a central position in the emerging disciplines of empirical psychology and anthropology, they nonetheless participated in the same critical move toward demolishing traditional metaphysics, now qualified as "speculative."¹⁰

The example of Ernst Platner, discussed in Stefanie Buchenau's chapter on self-feeling and the organ of the soul, is a case in point. Platner, a professor of physiology and philosophy in Leipzig, published a number of medical texts early in his career prior to his *Anthropology for Doctors and*

Philosophers in 1772. As Buchenau explains, his anthropological turn attests to the profound influence of Haller's new physiology. Platner acknowledges that Haller's physiological insights relate to both the body and the soul and necessitate that the soul be anchored in sensibility: he proposes to adjust Wolffian psychology in this physiological and anthropological sense. This anthropology, however, threatens man's intermediate status between God and beasts in the chain of beings.

While sometimes preserving an Aristotelian terminology, the Enlightenment breaks with the Aristotelian *scala naturae* and with deeper philosophical premises. The semantic shifts indicate the considerable distance separating the eighteenth century from Ancient and from Renaissance Aristotelianism. At the same time, they show the flexibility of Aristotelian philosophy that makes it a central and anthropologically fruitful reference for so many centuries.