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Dissertation Summary

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WILLIAM HARVEY, SOUL SEARCHER: TELEOLOGY AND PHILOSOPHICAL ANATOMY

The goal of this dissertation is to understand what I term the *philosophical anatomy* of William Harvey (1578-1657), the physician and philosopher who discovered the circulation of the blood in his (1628) *De motu cordis*. I argue that teleology, modeled on the philosophies of Galen and especially Aristotle, is central to understanding this kind of anatomy. More specifically, Harvey's philosophical anatomy revolves around the relationship between body to soul, in which soul is understood as the set of goal-oriented capacities that characterize living animal bodies. By tracing these ideas from Aristotle to Galen and to certain Renaissance philosophers and physicians, I argue that these philosophers and anatomists eventually came to believe that soul and body could not be investigated separately. Thus the study of soul became intertwined with the study of body, and thus with empirical methods such as dissection. Harvey, following in this tradition, thinks that soul must be understood in light of animal dissection and observation.

Importantly, I hope to incorporate into this account of Harvey a number of his works which have not received due attention, including his *Prelectiones anatomie universalis* (1616-1627) and his *De generatione animalium* (1651). In the first chapter, after discussing the history of these works of Harvey's, I locate Harvey in the Renaissance by arguing that he must be understood as an eclectic, post-Humanist philosopher of the sort that characterizes late Renaissance Aristotelianism. Thus Harvey's philosophical training and allegiance are given to the Ancients, chief among them Aristotle, though Galen figures prominently as well. This philosophy, however, is not one of allegiance to the *doctrines* of the Ancients, but rather to their *philosophical methodology*. Harvey must be understood not as attempting to believe what Aristotle believed, or as finding new arguments for Aristotle's positions, but rather as trying to resuscitate Aristotle's way of doing natural philosophy.

Teleology is central to its subject matter and methods for investigating soul and body in this anatomical tradition. There are two sorts of teleology that characterize its subject matter: first, there is the teleology of being, which characterizes the teleology of the parts of the body; and second, there is the teleology of becoming, which characterizes the generation of the parts of the body. The first sort of teleology understands the parts of the body as the instruments of soul, and thus each part is explained by way of reference to its soul-function, what Harvey calls the 'actions,' 'uses' and 'utilities' of a part. Further, the structure and material make up of the part is understood by means of hypothetical necessity: given that the part must complete such and so function, it is necessary that it be structured in such and so a way and made of such and so materials. Having introduced Harvey's intellectual context in the first chapter, in the second chapter I describe this teleological system in Harvey's work, focusing especially on his lecture notes, the *Prelectiones* (1616-1627), but incorporating into this picture his work in the *De motu cordis* as well. I argue that the subject matter of anatomy is this teleological union of soul to body.

The second sort of teleology aims at understanding how the parts come to be through organic generation. In the third chapter I argue that Harvey follows Aristotle in understanding generation as proceeding by epigenesis (part by part, over time), and understanding epigenesis as the progressive actualization of soul, which I explain by building off the conception of soul discussed in the previous chapter. Here soul is understood as the final and formal cause of the body, and Harvey here relies upon an Aristotelian conception of final and efficient causality to explain generation. That is, he argues that the final cause of future offspring, the soul of that creature, guides the

efficient cause of its development in the embryo. I argue, furthermore, that Harvey embeds this conception of generation within a larger cosmological framework, one common to early modern Europeans, wherein God is responsible for the Design of natural things, including, importantly, the way in which they are generated.

Finally, in the fourth chapter, I turn to characterize Harvey's methods. I start by articulating how Harvey conceives of anatomy not as a body of pre-existing knowledge, but rather as an active ability, a skill, with a particular goal of coming to understand the body in its union with the soul by means of the actions and uses of its parts. Thus teleology is key to understanding Harvey's methods, as well as his subject matter. I then trace the history of the definition of anatomy, starting from Galen, and argue that there had long been a traditional division between the experiential-artistic side of anatomy and the rational-scientific side. The former is conceived of as the skill of hand and eye by which one cuts up the body, the latter as the knowledge of the causes of the parts of the body, and it was this latter that was thought most noble for much of the history of anatomy. Starting during the Renaissance, however, one sees a new emphasis on the experiential side of anatomy, and an increasing stress on the actual practice of dissection. I argue that in Harvey, following in the footsteps of his Paduan teacher Fabricius ab Aquapendente, we see an attempt to unify the experiential and rational aspects of anatomy such that what experience can teach the anatomist what the causes of the body are, most importantly the final cause. I then turn to look in detail at Harvey's methods in particular, describing how, following Aristotle, he divides his practice into two parts, the historical part, focused on observing the body, and a causal part, focused on discovering the causes of those things discovered in the historical part. I argue that Harvey's method here should be understood as a process of definition, wherein by repeated experiences, the anatomist forms concepts about the parts of the body. Then, with the help of reason and what Harvey calls the rule of Socrates, the anatomist can proceed by means of similarity relations between these concepts to form universal definitions of the parts of the body. These definitions are just the subject matter discussed in the previous chapters, that is, they are statements of the essence and form of the parts of the body, understood as the teleological union of body and soul. Finally, I incorporate into this conception of method how experience and experiments fit in, in particular how, for Harvey, experiments are tests of specific propositions that concern those definitions.

I end with a historiographical discussion given the results of the previous chapters. I argue that this work shows that there have been two consistent problems in much of the work done on Harvey. The first is that historians have been preoccupied, perhaps with good reason, with Harvey's accomplishment in the *De motu cordis*. But this has led them to understand that work as emblematic of Harvey's thought, attempting to shoe-horn his other writings in that mold. In other words, what historians have been doing is trying to fit Harvey's philosophy and practice into their conception of the *De motu cordis*, when really what they should be doing is trying to fit *De motu cordis* into Harvey's larger conception of philosophical anatomy. I argue that the results of the current dissertation give a different, and more accurate, picture of Harvey's philosophy. The second problem is that historians have often run together the image of Harvey that can be gleaned from his work with that which can be gleaned from the work of his contemporaries and those who come after him. Harvey's voice, then, is often lost among those his friends, enemies, and those whom he influenced. I argue that this is a mistake, and that we cannot run these two pictures of Harvey together.

CHAPTER OUTLINE

1.0 INTRODUCTION: HARVEY AND RENAISSANCE HUMANISM

I start with a general discussion of some historiographical issues, and I discuss the history and philosophy of science as the history of the philosophy of science. I then move on to discuss Harvey's works, in particular the circumstances and history of those understudied works: his lecture notes the *Prelectiones*, and his notes on the movement of animals, the *De motu locali animalium*. Second, I argue that, to understand Harvey's philosophy, we must understand Harvey in the context of Renaissance post-humanist philosophy. That is, Harvey values the wisdom of the Ancients over and above that of his contemporaries, not necessarily in terms of substantive agreement with their specific doctrines (though he does so in many cases), but rather in his conception of their overall project and method in natural philosophy. Andrew Cunningham has usefully characterized as least part of this idea as the 'Aristotle Project,' which Harvey learned from his teacher at Padua, Fabricius ab Aquapendente. I then very briefly discuss the actual Latin editions of the works of the Ancients that Harvey consulted.

1.1. HISTORIOGRAPHY

1.2. SOME BACKGROUND ON HARVEY'S TREATISES

1.2.1. The *Prelectiones anatomie universalis*

1.2.2. The *De motu locali animalium*

1.3. HARVEY'S ECCLECTIC POST-HUMANISM

1.4. SOME BACKGROUND ON THE LATIN EDITIONS OF HARVEY'S SOURCES

2.0. THE BEING OF BODY AND SOUL: THE SUBJECT MATTER OF ANATOMY

In this chapter, I discuss what I argue is the subject matter of Harvey's anatomies, the hylomorphic union of body and soul, specifically that part that has to do with the functions of living creatures, which I call, following Katherine Park, the 'organic soul.' I characterize it here as an investigation into the relations of 'being for the sake of' in living animal bodies, where the central goal is to explain the parts of animal bodies by means of these final causes and the efficient causes which carry them out. I trace Harvey's philosophical lineage here from Aristotle, to Galen, and through various Renaissance physicians and philosophers, concentrating especially on his teacher Fabricius. I then turn to characterizing Harvey's own approach, concentrating especially upon his conception as is revealed in his most explicit work on anatomy, the *Prelectiones anatomie universalis*, as well as other works such as the *De motu locali animalium*. I then discuss in detail how Harvey conceives of the parts of the body as organized by the soul, and how he understands their material natures as being necessitated hypothetically by those soul functions. I then discuss Harvey's terminology, which, following the Ancients as well as his more contemporary colleagues, revolves around the categories of action (*actio*), use (*usus*), and utility (*utilitas*). I then argue how Harvey's work in the *De motu cordis* fits into this conception of the soul, anatomy and parts

2.1. BODY AND SOUL: THE SUBJECT MATTER OF ANATOMY

2.1.1 Body and Soul in Aristotle

2.1.2 Body and Soul in Galen

2.1.3 Body and Soul in in the Renaissance

2.1.4 Body and Soul in in Harvey

2.2 ORGANIZING THE BODY AND THE MEANING OF A 'PART OF THE BODY'

2.3. ACTION, USE, UTILITY: TELEOLOGICAL TERMINOLOGY

2.4. THE TELEOLOGY OF THE DE MOTU CORDIS

3.0. THE COMING TO BE OF BODY AND SOUL: THE SUBJECT MATTER OF *DE GENERATIONE*

In this chapter, I discuss the subject matter of Harvey's work on generation, which I characterize as the 'coming to be' of the body soul as described in Chapter 2. By articulating certain problems left over from the *De motu cordis*, namely, those concerning the final cause of the circulation, I argue that part of the motivation for Harvey's work on generation comes from these problems. We can thus trace in Harvey's work on generation certain strands of thought such that a study into the origin of the parts and activities of living animals might reveal the 'for the sake of which' those parts and activities act, that is, will reveal their causes, their uses and actions. After characterizing in general Harvey's conception of generation, I discuss in detail Harvey's explanation of the process of generation, which relies fundamentally on a strong conception of final causality, over and above the sorts of explanations discussed in the previous chapter. I argue that Harvey's account of generation by epigenesis (part by part, over time) must be understood as the progressive actualization of soul. In particular, we shall find that Harvey's account of generation necessitates that the efficient causes of development be guided, in a sense, by the final cause of generation, which we shall see is the account or plan (*ratio*) inherent in those causes.

3.1. PROBLEMS FROM DE MOTU CORDIS

3.2. THE PROBLEM OF GENERATION

3.2.1. Form and Epigenesis

3.3. FORM AND SOUL

3.3.1. Form, Soul, Essence

3.3.2. Elaborating Harvey's Account of Epigenesis

3.3.3. Contagion, Concepts, Form and Final Cause

3.3.4. God and Nature

4.0. SOUL SEARCHING: HARVEY'S EMPIRICAL METHODS

In this chapter I describe how Harvey's methods are supposed to produce knowledge of the subject matter described in the previous chapters. Harvey conceives of anatomy not as a body of pre-existing knowledge, but rather as an active ability, a skill, through which one comes to understand the body in its union with the soul by means of the actions and uses of its parts. I then trace the history of the definition of anatomy, starting from Galen, and argue that there had long been a traditional division between the experiential-artistic side of anatomy and the rational-scientific side. The former is conceived of as the skill of hand and eye by which one cuts up the body, the latter as the knowledge of the causes of the parts of the body, and it was this latter that was thought most noble for much of the history of anatomy. Starting during the Renaissance, however, we see a new emphasis on the experiential side of anatomy, and an increasing stress on the actual practice of dissection. I argue that in Harvey, following in the footsteps of his Paduan teacher Fabricius ab Aquapendente, we see an attempt to unify the experiential and rational aspects of anatomy such that what experience can teach the anatomist what the causes of the body are. I then turn to look in detail at Harvey's methods in particular, describing how, following Aristotle, he divides his practice into two parts, the historical part, focused on observing the body, and a causal part, focused on discovering the causes of those things discovered in the historical part. I argue that Harvey's method here should be understood as a process of definition, wherein by repeated experiences, the anatomist forms concepts about the parts of the body. Then, with the help of reason and what Harvey calls the rule of Socrates, the anatomist can proceed by means of similarity relations

between these concepts to form universal definitions of the parts of the body. Finally, I discuss how experiments for Harvey are tests of specific propositions that concern those definitions.

4.1. A TALE OF TWO ANATOMIES

4.1.1. Anatomy as Facultas

4.1.2. The Double Aspect Definition of Anatomy

4.1.3. Defining Anatomy Again

4.2. FACULTAS: HARVEY'S ANATOMICAL METHOD

4.2.1. Experientia

4.2.2. *Historia Anatomica*

4.2.3. Definitions and Concepts

4.2.4. The Rule of Socrates

4.2.5. Harvey on Conception

4.2.6. Natural Criteria

4.2.7. Experimenta

4.2.8. Harvey's Tests

4.3. OBSERVATIONAL KNOWLEDGE?

5.0. CONCLUSION: HARVEY AND HISTORIOGRAPHY

I argue that there have been two consistent problems in much of the work done on Harvey. The first is that historians have been preoccupied, perhaps with good reason, with Harvey's accomplishment in the *De motu cordis*. But this has led them to understand that work as emblematic of Harvey's thought, attempting to shoe-horn his other writings in that mold. In other words, what historians have been doing is trying to fit Harvey's philosophy and practice into their conception of the *De motu cordis*, when really what they should be doing is trying to fit *De motu cordis* into Harvey's larger philosophical and experimental system. I argue that the results of the current dissertation give a different, and more accurate, picture of Harvey's philosophy. The second problem is that historians have often run together the image of Harvey that can be gleaned from his work with that which can be gleaned from the work of his contemporaries and those who come after him. Harvey's voice, then, is often lost among those his friends, enemies, and those whom he influenced. I argue that this is a mistake, and that we cannot run these two pictures of Harvey together. I end with a discussion of history and philosophy of science as the history of philosophy of science given the results of this dissertation.

5.1. HISTORIOGRAPHICAL PROBLEMS

5.1.1. Beyond the *De motu cordis*

5.1.2. Let the man speak!

5.2. HISTORY OF PHILOSOPHY OF SCIENCE