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State of the Art: Current work on William Harvey[1]

1. Context and Central Ideas

William Harvey is known to most historians of philosophy of science as the discoverer of the circuit of the blood, announced in his (1628) *De motu cordis*. He is not often thought of as a philosopher of science. (However it must be noted that aspects of Harvey's method did appeal to a number of mid-twentieth century philosophers of science, best illustrated by I.B. Cohen's (1981) *Studies of William Harvey*.[2]) But consider this: Aubrey, the great (if flawed) biographer of many early modern philosophers and scientists, wrote that, "All his profession would allowe him to be an excellent anatomist, but I never heard of any that admired his therapeutic way."[3] If Harvey's anatomical investigations did not benefit his therapy—which is, incidentally, how he made his living—then what purpose did they serve? As indicated by the title of Roger French's (1994) *William Harvey's Natural Philosophy,* Harvey's goal seems to have been the acquisition of natural philosophical knowledge. The task for historians of philosophy of science is to characterize Harvey's conception of natural philosophical knowledge, and understand the scientific practices he employed to achieve it. Despite the title of French's book, this aspect of Harvey's thought remains underexplored. Gweneth Whitteridge, the modern translator and editor of much of Harvey's corpus (and to whose extreme diligence and hard work we owe much) is paradigmatic of much of 20th century Harvey scholarship, writing in 1971 that, "…Harvey falls into the category of the great scientist who is not conscious of any philosophical method underlying his actions…."[4] Fortunately, Harvey's philosophical method is now being explored in new and interesting ways by a small number of scholars, both senior and junior. What I hope to stress here in this short essay are ways in which Harvey is especially interesting to historians of philosophy of science.

As both an Aristotelian and an experimentalist whose discovery would shake the foundations of early modern science, Harvey provides historians of philosophy of science with a unique place to investigate important changes taking place in natural philosophy during this period. His work provides an opportunity for insight into a variety of important topics, including the role of teleology in explanations of nature, the method and justification of induction, and the role of experimentation and experience in natural philosophy.[5]

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[1] I thank Peter Distelzweig for his extremely useful comments.
[2] Cohen, I.B. (1981), Studies on William Harvey, New York: Arno Press. See also Lennox, James (2006), "William Harvey's Experiments and Conceptual Innovation," *Medicina & Storia*, 12, 5-27.
[3] Aubrey, John (1898), *Brief Lives Vol. I,* Ed. Andrew Clark, Oxford: Clarendon Press, 302.
[4] Whitteridge, Gweneth 1971, *William Harvey and the Circulation of the Blood*, London: Hazell Watson and Viney Ltd., xi.
[5] For which see: Dear, Peter (2006), "The Meanings of Experience," In: *The Cambridge History of Science, vol.3, Early Modern Science,* Eds. Katherine Park and Lorraine Daston, Cambridge: Cambridge University 106-131.

To understand Harvey, one must begin with his education. Harvey attended Cambridge before attending the prestigious medical school at Padua, the home of a long line of anatomists including Vesalius and Columbus. There Harvey received important training in natural philosophy and anatomy under the tutelage of Fabricius ab Aquapendente, becoming part of what Andrew Cunningham (1985) has called 'the Aristotle Project,' which he understands as a, "…deliberate and self-conscious attempt to model new anatomical research on …Aristotle's own practice."[6] While Cunningham is right in identifying Aristotle and his methods as central to Harvey's self-conception as a philosopher, one must be careful in understanding this sort of Aristotelianism. For Harvey was no Schoolman, nor even a true follower of his teacher Fabricius. Rather Harvey epitomizes Charles Schmitt's characterization of Renaissance Aristotelians, eclectic in two ways: first, they accepted new developments, especially those from the empirical sciences, most importantly in Harvey's case those from anatomy.[7] Second, they drew material from non-Aristotelian sources, most importantly in Harvey's case from Galen. It is in Galen that the methods of Aristotle are deployed in the anatomical context, logic and natural philosophy now explicitly combined with dissection, and this influence, though often difficult to detect in some of Harvey's work, is essential for understanding Harvey's natural philosophy and its relation **to** his anatomical practice. From this eclectic point of view, Harvey can be understood in a way that avoids the unfortunate schizophrenic interpretation of earlier historians such as Walter Pagel, where there are many 'different' Harvey's: the cool man of science, Harvey the Aristotelian, Harvey the critic of Aristotle, and so on.[8]

Central to Harvey's eclectic Aristotelian-Galenic position are a number of key concepts that tie his philosophy together, of which I shall flag just two of especial interest to me. First there is teleology—*causa finali, actio, usus, utilitas,* terms used to describe different aspects of functions and motions of the living body (e.g., the action of stomach is to churn food, and its use to prepare the food into chyle to be converted into blood). This concept and these terms are central to Harvey's conception of both the subject matter of anatomy and its goal, and while Harvey is following in a long tradition of using these terms, his use is peculiar and particular to his own conception of anatomy and natural philosophy. As for the former, Harvey understands anatomy as an investigation into the union of soul to body, following a long line of philosophers starting with the Aristotle and Galen and continuing right up through the Renaissance. Soul in this tradition was conceived as the set of goal-oriented capacities that form an animal's life: the powers of nutrition, perception, movement, and so on. The body is thus conceived of as the instrument of soul, accomplishing its goals, a conception which he depends upon crucially especially in his *De generatione animalium* to explain the complex process of epigenesis (the formation of the embryo part by part, over time).[9] The living body is then understood through a set of teleological relations, and for which Harvey uses the specialized medical terminology of action, use, and usefulness mentioned above. As Harvey writes, "…the end of an Anatomy is to know or be acquainted with the parts and to know them through their causes and [to know] in

[6] Cunningham, Andrew (1985), "Fabricius and the 'Aristotle project' in anatomical teaching and research at Padua," In: *The Medical Renaissance of the Sixteenth Century*, Eds. A. Wear, R.K. French, and I.M. Lonie, Cambridge: Cambridge University Press.
[7] Schmitt, Charles (1983), *Aristotle and the Renaissance*, Cambridge: Harvard University Press, 92.
[8] For which, see: Pagel, Walter (1967), *William Harvey's Biological Ideas*, New York: S. Karger: 229.
[9] See especially the treatise appended to the end of the *De generatione,* the *De conceptione.*

every animal the 'for the sake of which' and [to know] the reason why…."[10] Teleology is thus central to understanding what Harvey considers anatomical knowledge.

The second concept of key importance ties together this teleological conception of anatomical knowledge with the method used to gain it, which must be through experience—*experientia, experimenta*, terms related to, but not identical to, our own *experience* and *experiment.* Harvey insisted on the primacy of observation and testing facts for oneself, stemming from the Aristotelian and Galenic insistence on repeated anatomical experience. One of the ways this fact shapes Harvey's philosophy is that the goal of his research is to find those teleological relations mentioned above: action, use and utility. The only way to determine these, according to Harvey, is through anatomical experience, which for Harvey is tantamount to repeated observations of similar structures across all animals, thus fulfilling his conception of anatomical knowledge mentioned above. This method—an inheritance and elaboration of the thought of Harvey's ancient forbearers, and which he names the *regula Socratis*—is a key part of Harvey's methodology, deeply tied to his natural philosophical commitments.[11]

Harvey's social network is an interesting factor for historians of philosophy of science to consider. Social networks are, however, very complicated things to reconstruct, and here I limit myself to some brief remarks to whet the appetite, as it were. Harvey, while a Royalist himself and a seemingly staunch political and religious conservative, was good friends with some who had quite different ideas, including Thomas Hobbes and Robert Fludd. Harvey's network also included two kings, the elite of the Royal College of Physicians, as well as a vast number of patients, mostly well to do, about whom we know very little. The most interesting facet of Harvey's social network, to my mind at least, is his connection to and influence upon the founders of the Royal Society. This connection has been admirably traced out in Robert Frank's (1980), *Harvey and the Oxford Physiologists*, a classic text in the history and philosophy of science that has been somewhat neglected. Indeed, I can do no better to explain Harvey's social network than to recommend Frank's book! Frank elaborates in great detail the social connections, scientific influences, collaborations, and friendships among a group he calls the 'Oxford Physiologists', whose scientific activities were centered around Harvey and his research during the civil war, while Harvey was attending the King, whose was stranded in Oxford. Harvey is, furthermore, one of the few mentioned by Descartes (almost) directly, and his influence on early modern experimentalists and the new philosophers is quite well known. Finally, one must also recognize the connections Harvey had with the physicians of his day, ranging from those he studied with, such as Fabricius, to those he read, such as Fernel and Laurentius, to those he debated with over the circulation of the blood, such as Riolan and many others.

As one might gather from his far-flung and eclectic network of friends and enemies, Harvey's philosophy is in many ways a reflection of the changing scientific culture of the time, and is a unique articulation of Renaissance Aristotelianism and Galenism, combined with what we usually associate with the methods of much later early modern experimentalists. One might equally well call him a transitional figure. As such, historians of philosophy and of science can

[10] Harvey, William (1616-1626 [1964]), *Prelectiones anatomie universalis,* Ed. Gweneth Whitteridge, London: Royal College of Physicians, 22, my translation.
[11] The phrase 'rule of Socrates' is, so far as I know, found only in Harvey, and is used only twice in his *Prelectiones.*

learn a great deal about this shift in natural philosophy through Harvey's work, as well as his predecessors and those he influenced. In the following sections, I hope to provide some relevant information in the hopes of furthering the study of William Harvey as a philosopher, indeed, a philosopher of science.

2. Central Primary Sources

Harvey did not publish much. His most famous works are the (1628) *Exercitatones de motu cordis et sanguinis in animalibus* and his replies to his rival Jean Riolan, the (1649) *Exercitationes Duae de circulatione sanguinis.* In these works, Harvey carefully lays out his arguments for the circulation of the blood, and his responses to criticisms. Although for reasons of space I will not delve into the extensive historiography on these works, there are a number of outstanding problems, such as the resolving the schizophrenic view of Harvey mentioned above, evaluating the status of teleology in the *De motu,* as well as determining the best way to understand Harvey's so called 'quantitative argument' (see Bylebyl 1977). These problems, and indeed Harvey's discovery of the circuit of the blood, can be resolved and illuminated through the analysis of Harvey's other, understudied texts.

The only other work published in his lifetime was the (1652) *Exercitationes de generatione animalibus.* This massive tome is a detailed investigation into animal reproduction, and though it contains a huge amount of empirical work that was treasured for years to come, it did not make nearly the impact of his *De motu cordis,* at least partially because it was, in many ways, an old fashioned sort of work, with its constant references to Aristotle, it's unfashionable teleology, and it's rather standard solutions to the problem of generation (or, perhaps better, non-solutions!). This is evidenced most clearly by a 1674 edition of Harvey's *De generatione* published in Amsterdam by a Dutch physician named Justus Schrader: he excised all the philosophical parts and left only the empirical parts, thus demonstrating that while Harvey's observations were cherished for many years following his death, his more philosophical speculations were ignored and considered, at best, old fashioned.[12] However, as historians we should ignore the judgment of Harvey's later peers, for the *Prefatio* of this work contains what is perhaps Harvey's most explicit and interesting methodological remarks, and which again turn out to demonstrate clearly Harvey's respect for Aristotle and other ancients in combination with experimental exuberance. The work is also an interesting contrast to other works on generation, especially its lack of images and it's almost commentary like discussion of the works of Aristotle and Fabricius. Historians have not treated this work much better than Harvey's contemporaries, content mostly to ignore it in favor of Harvey's cardiac treatises, and it remains a ripe area of inquiry for historians of philosophy of science.

Besides this work, there are number of other works which exist only in manuscript form, many of which have not received due attention. There are, first of all, his (1616-1627) *Prelectiones anatomie universalis,* his lecture notes for the Lumleian Lectures. Starting in roughly 1582, these lectures allowed the Royal College of Physicians to appoint one of their fellows to give a public

[12] See: Pomata, Gianna 2005, "*Praxis Historialis*: The Uses of *Historia* in Early Modern Medicine," In: *Historia: Empiricism and Erudition in Early Modern Europe*. Eds: Gianna Pomata and Nancy G. Siraisi. Cambridge: MIT Press,121-122.

anatomy, and for which Harvey was appointed from 1616-1627.[13] Harvey's notes in the *Prelectiones* are thus an important resource for understanding his early thoughts on the heart (see whit). They also include a good deal of material which relates his conception of the subject matter and proper method of anatomy (underexplored). Second, there is a set of notes, comparable to the Prelectiones on the muscles, the *De musculis,* written around the same time as the lectures. Finally there are working notes for a treatise on the nature and causes of animal motion, written by 1627, called the *De motu locali animalium.* In fact, this is the name of only one section of the work, but it was misleadingly treated by Gweneth Whitteridge, the editor of much of Harvey's unpublished materials, as the title of the whole set of notes; as pointed out to me by Peter Distelzweig, Harvey refers to these notes in the *De motu cordis* Ex.17 as '*De motius organis animalium, & de musculorum fabrica*.' These works are available in translation, again by Whitteridge, and the Latin texts can also be readily found through either Whitteridge's works or in many library holdings.

3. Current and Future Scholarship

The number of historical and philosophical interpretations of Harvey is truly enormous—indeed, as Harvey's good friend Thomas Hobbes remarks in the *Epistle Dedicatory* to the *De corpore,* Harvey is the only one that he knew to have his new doctrine established while he was still alive, having over come the ill will first directed at the circulation of the blood.[14] Thus, as Frank shows in his work on the Oxford Physiologists, Harvey's name and discovery were quickly drafted to the cause of promoting the new science, regardless of Harvey's own opinions on the manner (for he was a staunch opponent of the new corpuscularian and atomistic philosophies until the end of his life. It is unsurprising that early, Sartonian historiography on Harvey tends to echo the assessment of Harvey as an innovator, the revolutionary discover of the circulation, and as the founder of modern experimental medicine. And while historiography has gotten more sophisticated, there has been, until recently, an almost exclusive emphasis on Harvey's work on the heart, to the general detriment of Harvey studies. Take the *Prelectiones* for instance: much of the historical work done on this manuscript has been aimed at understanding Harvey's early cardiac doctrines, and thus has ignored a great deal of interesting methodological and philosophical concepts discussed in detail by Harvey in the course of his notes.

Because I cannot hope to do any real justice to the historiography here, I shall identify a certain number of trends in the study of Harvey, before moving on to highlight the work of some younger scholars reinvigorating Harvey scholarship.

There are three main trends in the existing Harvey literature: Harvey the Revolutionary; Harvey the Aristotelian; and Harvey the Anatomist. The first is exemplified by the earliest works on Harvey produced at the end of the nineteenth century, in which Harvey is seen as not just an experimentalist *par excellence*, but as a mechanist—something quickly undermined by later historians, most notably through the studies of Walter Pagel. (Of course, there is a sense of 'mechanism' by which Harvey counts as a mechanist—but then so too would Aristotle count as a

[13] (1582) "Lumleian Lecture, letter re: Seal by Elizabeth to Lord Lumley," Royal College of Physicians Library: 1022/21.
[14] Hobbes, Thomas (1990), *Elementa Philosophiae Tome I, De Corpore*, 'Epître Dédicatoire,' Paris: Vrin, 4.

mechanist.[15]) Overall, I set aside this literature as it is of more interest for what it says about the historians who wrote it than about Harvey himself. However, there is still an important element of this trend that remains even in current historiography (and thus can be found in the trends discussed below), and that is the idea that Harvey is somehow *different,* somehow *more modern* than his contemporary physicians, and thus some aspect of his practice and philosophy must be revolutionary. For instance, Roger French in his book on Harvey's natural philosophy (see below) argues that Harvey is revolutionary because of his rejection of the need to provide the final cause—what French calls Harvey's 'principle of limited explanation.' This is a grave mistake, I believe, not only because there is no evidence for such a principle in Harvey's writings, but, even if there was such a principle, its only instance is in the *De motu cordis*—and thus again we see that the focus on Harvey's discovery has distorted our image of his natural philosophy. Before claiming something unique and revolutionary in Harvey, we should first concentrate on analyzing the full range of his works.

The second trend considers Harvey as an Aristotelian, and while Walter Pagel (for which, see the bibliography in the following section) was the first to sketch out this idea in great detail, this is still a topic that deserves much great attention: what, in fact, does it mean for Harvey to be an Aristotelian? For Pagel it involved an unhealthy obsession with circles, and I argued above that Harvey is an eclectic Aristotelian as described by Schmitt—but this only tells us that Harvey's sources and doctrines are bound to be a hodgepodge of ancient and modern, innovation and anachronism—there is still a great deal of work to be done here, especially for those versed in Aristotelian philosophy of science. To my mind, the best work on Harvey as an Aristotelian are a (1984) article by Charles Schmitt "William Harvey and Renaissance Aristotelianism: A Consideration of the Praefatio to *De Generatione Animalium* (1651)," and James Lennox's (2006) piece, "The Comparative Study of Animal Development: William Harvey's Aristotelianism," (see the bibliography in the following section). These two pieces demonstrate that, to understand Harvey as an Aristotelian, an intimate knowledge of Aristotle's doctrines, especially those found in his works on animals, is an absolute requirement.

The third trend considers Harvey not as an Aristotelian (or at least, not primarily as one), but as a Galenic anatomist, trained in the ways of dissection by the physicians. This work usefully corrects the overemphasis on Harvey's Aristotelianism, and is best illustrated by Andrew Wear's (1983) "William Harvey and 'the Way of the Anatomists'" (again, see the bibliography below). Wear identifies a core component of what he calls Harvey's "sensory epistemology" as stemming from the tradition of the anatomists, which focuses on *autopsia*—seeing for oneself, as well as upon experimental dissection and observation. Wear's work is the foundation of Roger French's (1994) *William Harvey's Natural Philosophy* (see below), which takes this conception of Harvey's epistemology as foundational to his account. And while there is a great deal to be gained from the study of Wear's and French's learned texts, their work founders in its analysis of Harvey's epistemology by not paying enough attention to the Ancient sources and to Harvey's specific doctrines—again, the tendency to focus on Harvey's work on the heart obscures the fact that Harvey's 'sensory epistemology' has much more in common with Galen and Aristotle than with Boyle or Locke.

[15] Kosman, Ayreh (2004), "Mechanisms in Ancient Philosophy of Science," *Perspectives on Science*, 12(3), 244-261.

What is interesting about these two trends is that, while neither side denies the validity of the other side's approach (at least most of the time), there is precious little by way of trying to integrate the perspectives—that is, as I see it, to understand Harvey the Eclectic, to analyze the complex way in which the various traditions out of which he emerged and into which he entered were assimilated, rejected, and ultimately united in various ways by Harvey (perhaps consistently, perhaps not: it is up to the community of Harvey scholars to resolve the issue of systematicity). There is thus a need for nuanced analyses of Harvey's work, especially on his philosophy of science and how it relates to his Galenic and Aristotelian sources. Further areas of investigation involve trying to understand his conception of experiment and its role in warranting his findings, as well as looking into the connections between Harvey's epistemology and those of other experimentalists, as well as contemporary Galenic physicians and Aristotelian philosophers. Indeed, simply by moving beyond Harvey's work on the heart, HOPOS scholars will find a great deal of interesting material in desperate need of philosophical analysis and historical contextualization.

The new work by younger scholars I shall now highlight attempts to understand Harvey in all his complexity, eclecticism and all. Karin Ekholm has done some excellent work on Harvey's theory of generation (2008; 2010). Ekholm recognizes Harvey's classical inheritance, but her work demonstrates the complicated ways in which Harvey was involved in the various intellectual currents of his time, such as on questions of the proper modes of explaining generation: for instance, should generation be explained by soul or by matter alone? Through detailed comparison to Harvey's colleague Nathaniel Highmore and his teacher Fabricius, Ekholm paints an interesting (and eclectic) picture of Harvey.

Alan Salter, has done an incredible job in identifying the huge range of sources used by Harvey in justifying his experimental methodology, as well as in the course of making his arguments (2010a; 2010b). Salter, with a detailed study of the literary culture, allusions and conventions of writing philosophy contemporary to Harvey, analyzes the rhetorical style Harvey created and used in order to make his discoveries comprehensible and convincing—what he calls Harvey's 'intimate converse with nature.' Further, in work with Charles Wolfe, Salter (2009) has analyzed Harvey's empiricism in comparison with standard views of empiricism, especially that of Locke.

Finally I want to highlight the working group on Early Modern Medicine, Philosophy and the Scientific Revolution I have formed here at the University of Pittsburgh with James Lennox and Peter Distelzweig. This group has focused on (1) understanding Harvey's amalgamation of Aristotelian and Galenic doctrines, with a special focus on teleology and the role it plays in structuring Harvey's anatomical practice, and (2) understanding Harvey's complex relationship with Fabricius. We welcome collaborators, and if you have interest please get in touch!

It is thus a quite exciting time to be working on Harvey!

4. Annotated Bibliography

The literature on Harvey is vast. Here I give only a few highlights, including some relevant early modern works contemporary to Harvey that will be of special interest to historians of philosophy

of science. As for contemporary works, my list is a very partial selection of works, based upon those that have been of substantial and direct use to me in my own work, and thus many classics are left off the list. For the interested scholar, the bibliographies of French's and Fuch's volumes are a convenient source of additional references.

Early Modern Bibliography

Aristotle (1552), *Aristotelis libri omnes…cum Averrois Cordubensis variis in eosdem commentariis*, Venice. – *This is the edition of Aristotle Harvey is known to have cited in many (if perhaps not all) of his works*.

Bauhin, Caspar (1605), *Theatrum anatomicum*, Frankfurt. – *This work was an important resource and textbook for almost all early sixteenth century physicians, and Harvey used it as the base for much of the anatomical descriptions of his* Prelectiones.

Fabricius ab Aquapendente (1621), *De formation ovi, et Pulli*, Patavii. – *Harvey's teacher at Padua's own work on generation, which comes in for heavy commentary and criticism in Harvey's own* De generatione animalium.

Galen (1549) *Galeni Peragameni…opera quae nos extant omnia*, Basle. – *The edition of Galen that Harvey used.*

Contemporary Bibliography

Bono, James (1990), "Reform and the Languages of Renaissance Theoretical Medicine: Harvey versus Fernel," *Journal of the History of Biology*, 23(3). – *An excellent comparison of some theoretical terminology and metaphysical doctrines of Harvey's with that of the great French physician Jean Fernel.*

Bylebyl, Jerome (1977), "Nutrition, Quantification and Circulation," *Bulletin of the History of Medicine*, 51 369-85. – *A classic analysis of the so called 'quantificatory' argument of the* De motu.

Cunningham, Andrew (1985), "Fabricius and the 'Aristotle project' in anatomical teaching and research at Padua," In: *The Medical Renaissance of the Sixteenth Century*, Eds. A. Wear, R.K. French, and I.M. Lonie, Cambridge: Cambridge University Press. – *In this article Cunningham argues that Fabricius' project is one not of adherence to the substance of Aristotle's doctrines, but rather is an attempt to reintroduce the methods of Aristotle into natural philosophy.*

Ekholm, Karin (2008), "Harvey's and Highmore's Accounts of Chick Generation," *Early Science and Medicine* 13, 6, 568–614. – *An interesting comparison of two colleagues with quite differing metaphysics on the question of animal generation.*

Ekholm, Karin (2010), "Fabricius's and Harvey's Representations of Animal Generation," *Annals of Science* 67, 3, 329–52. – *An astute and much needed response to Harvey's*

dismissal of and lack of use of images, especially in contrast to Fabricius.

Frank, Robert (1980). *Harvey and the Oxford Physiologists*. University of California Press: Berkeley. – *An excellent work that describes Harvey's influence on some of the most important experimentalists of the late seventeenth century.*

French, Roger (1994), *William Harvey's Natural Philosophy,* Cambridge: Cambridge University Press. – *A work of incredible erudition that is especially helpful in understanding the immediate reception and impact of Harvey's work, especially amongst the physicians.*

Fuchs, Thomas (2001), *The Mechanization of the Heart: Harvey and Descartes*. Trans. Majorie Grene. Rochester: University of Rochester Press. — *A very interesting study of Harvey's work on the heart in comparison with Descartes', although based upon somewhat debatable philosophical presuppositions.*

Keynes, Sir Geoffrey (1966), *The Life of William Harvey*. Oxford University Press: Oxford. – *The best and most complete biography of Harvey.*

Lennox, James (2006), "The Comparative Study of Animal Development: William Harvey's Aristotelianism," Chapter 1, In: *The Problem of Animal Generation in Modern Philosoph*y, Ed. Justin E.H. Smith, Cambridge: Cambridge University Press. — *The best and most comprehensive assessment of the structure and philosophical methodology of Harvey's* De generatione animalium.

Pagel, Walter (1967), *William Harvey's Biological Ideas,* New York: S. Karger
Pagel, Walter (1976). *New Light on William Harvey*. Basel: New York. – *These two works by the founder of modern Harvey studies are required reading, and should be the starting place of anyone interested in Harvey. Although they lack any deep analysis, they do an excellent job of situating and contextualizing Harvey's work.*

Salter, Alan and Charles Wolfe (2009), "Empiricism contra Experiment: Harvey, Locke and the Revisionist View of Experimental Philosophy," *Bulletin de la SHESVIE*, 16, 2. – *An interesting comparison of the views of Harvey and Locke in the hopes of resituating discussions of the meaning of early modern empiricism.*

Salter, Alan (2010a), "Early Modern Empiricism and the Discourse of the Senses," In: *The Body as Object and Instrument of Knowledge: Embodied Empiricism in Early Modern Science*, Eds. Charles Wolfe and Ofer Gal, Studies in History and Philosophy of Science, Dordrecht: Springer. – *An analysis of Harvey's eclectic literary practices in constructing his sensory based methodology*

Salter, Alan (2010b), "Intimate converse with nature: body and touch in Harvey's way of inquiry," In: *Word and Self Estranged in English Texts, 1550–1660*, Eds. Phillipa Kelly and L.E. Semler, Farnham: Ashgate. – *A deep literary and terminological analysis of Harvey's use of metaphors, images, and other means of justifying his sensory based approach to natural philosophy.*

Schmitt, Charles B. (1984), "William Harvey and Renaissance Aristotelianism: A Consideration of the Praefatio to *De Generatione Animalium* (1651)." In: *Humanismus und Medizin.* Eds. Rudolf Schmitz, Gundolf Keil, Weinheim*:* Acta Humaniora, 117-138. – *An excellent analysis of the Aristotelianism found in Harvey's* Praefatio*.*

Wear, Andrew (1983), "William Harvey and 'the Way of the Anatomists'," *History of Science* xxi, 223-249. – *Here Wear argues that the Galenic tradition—the way of the Anatomists—provides an important balance to Aristotle in understanding Harvey's work.*

5. Archive Holdings

The most significant holdings of Harvey related materials are at the British Library, London. Below is a listing of the main holdings, though I do not claim completeness.

Abstract of his circulation of the blood 17th cent. Sloane. 1484 ff. 8-17 b
Abstracts of his 'De generatione animalium' circ. 1700. Lat. and Engl. Add. 42118 ff. 30-31
Account of the circulation of the blood derived directly from, by T. Copeland circ. 1655. Sloane. 719 ff. 40-49
Certificate of the removal of his remains to the Harvey chapel in Hempstead church 1883. Add. 39768
Certificate on a Privy Seal to 1604 (?). Add. 36767 f. 49
De animalium generatione 17th cent. Excerpts. Sloane. 2880 ff. 19-35
De motu cordis 17th cent. Sloane. 2781 f. 91 b
De musculis, de motu: Sloane. 486
De musculis, motu locali, etc. 1627. Hologr. Sloane. 486
Letter 1643. Add. 18980 f. 125
Letter from Highmore: Add. 29586 f.21
Letter of Dr. H. Power against his being the discoverer of the circulation of the blood 1655. Sloane. 1326 f. 9
On the heart 17th cent. Sloane. 236 ff. 62-77
Oratio Harveiana, a C. Tearne [1656-1680]. Two copies. Sloane. 1865 ff. 103-109; Sloane. 1903
Marginal notes of Harvey in Theodore Goulston's 1640 edition of *Opuscula varia*," C.61.h.9
Oratio Harveiana, ab E. Greaves 1661. Sloane. 302
Prælectiones anatomiæ 1616. Hologr. Sloane. 230 A
Prescription for the eyes 1643. Add. 36308 f. 85
Prescriptions 1647. Sloane. 520 ff. 12, 18 b
Prescriptions for L. Troute 1653-1656. Sloane. 206 A ff. 138, 139
Professor of Anatomy. Article on, by J. Kennedy 1851. Add. 23193 f.8
Professor of Anatomy. Autograph 1641. Lat. Add. 23105 f. 38
Professor of Anatomy. Letter to, from Dr. Highmore 1653. Add. 29586 f. 21
Rated as a taxpayer in the Old Bailey Quarter, London temp. Jas. I. Sloane. 395, B f. 1
Verses by Sir W. Petty rel. to Dr W. Harvey circa 1649 Lat Partly autogr. Add. 72891 f. 9
Witness at Padua, as " Consiliarius Magnificæ Nationis Anglæ," to the grant of M.D. to T. Heron, 19 March, 1602. Lat. Sloane. 3450 f. 6

There are some interesting materials house in the archives of the Royal College of Physicians, London. Again this list is incomplete as the records of these archives are somewhat haphazard.

Lumleian Lecture, letter re: Seal by Elizabeth to Lord Lumley. 1022/21 SR.Lumleian Lectures, Indinture tripartite between Lord Lumley Dr. Caldwal and President of College re: surgery lecture. 1022/22.
Hempstead Church, Documents related to Harvey's remains and burial. 1024/251-256.
Harvey, William, Transcripts of Chancery suit Harvey V Sir William Smith. 1024/284-291; cf. SR Bay 16 Shelf C
Harveian Orations, Dr Christopher Terne 1662/3(?) 1024/405-406 SR 506.
Harveian Oration, Dr. Charles Scarburgh, 1662. 1024/407 SR.
Extracts from Merton college re: Harvey as Warden (1644-1645). 1024/432-433.

Finally, in the Pybus Collection, at the University of Newcastle upon Tyne, there are annotations from Harvey's own copy of his *De generatione animalium,* some of which can be found in Whitteridge, Gwenneth (1981), *Disputations Touching on the Generation of Animals,* Blackwell Scientific Publications.