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"A Diet for Barbarians": Introducing Renaissance Medicine to Tudor England

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Should one wish to choose any one region in which to examine in detail the introduction of Renaissance medicine and what it stood for, the example of Tudor England would surely be high on the list of preferred subjects. Its medicine and that medicine's practitioners are, when it began in 1485, obscure—few, save for the Welsh or hunters after the exotic, now remember Lewis of Caerleon, royal physician, mathematician, astrologer, and spy—yet it ends in 1603 with one of the most famous names in medical history, William Harvey, newly returned from Padua and failing, at least for the moment, to gain entry into the London College of Physicians.[1] Within little more than a century, England and its physicians had moved from northern darkness almost to center stage in European medicine. From letters, private papers, and publications—to say nothing of their grave monuments—one can gain an insight into the hopes and aspirations of those who, directly or indirectly, brought about this change and can see clearly what they themselves thought most important in the development of their medicine. Even if what they have to say touches rarely on natural philosophy in the narrow sense, as opposed to investigations of the wider world, at the very least it serves as a reminder that natural philosophy was but one key to unlock the secrets of nature.

It is important to stress, at the very outset, the low state of English learned medicine in the later Middle Ages, even as compared with its continental neighbors, let alone with Italy. In 1500 the two universities of Oxford and Cambridge between them produced at most five or six M.D.'s a decade, with Oxford somewhat more prolific than Cambridge.[2] A few foreign practitioners might come to England, usually in the train of prelates and princes. Henry VII employed a German, Jacobus Fries; a Frenchman, Jean Veyrier of Nîmes; and, most famous of them all, Giambattista Boerio of Genoa.[3] The timorous Ferdinando de Molina in 1490 was moved to make his will because "I am now in way to depart for to go to Oxford."[4] That town in 1500 saw the prosecution of an Italian, Dionisio of Nola, for practicing surgery without a license, and the town of Coventry was briefly home to a Greek,

Nicholas Rayes.[5] But the contribution of these visitors to English medicine was minimal; few stayed for long, or had eminent pupils. Nor was there much movement of physicians from England to Italy—the Hundred Years' War with France and the English civil wars saw to that. Between Thomas the Englishman in 1401 and William Hadcliffe at Padua in 1446, no Englishman went to Italy to study medicine, and between John Free in 1460 and John Chamber in 1503 I count a mere eleven medical travelers to Italy.[6] When they returned, it was far more often to political or ecclesiastical preferment, as Walter Lacey enjoyed, than to day-to-day medical practice.[7]

The great age of English medieval medicine—with John of Gaddesden, John of Arderne, and Mertonian natural philosophers like Simon Bredon, whose works were copied and circulated on the Continent—had long since departed, and the writings of English medical men were unknown abroad, even if they had been worth reading.[8] Roger Marchall's *Lanterne of fisicians* and the *loci communes* of John Argentine are poor things indeed.[9] They show how firmly fixed English medicine of the 1460s and 1470s was in the medicine of the 1300s, if not the 1200s. Signs of an acquaintance with such luminaries as Taddeo Alderotti are few; and although in the 1480s one can trace the gradual arrival of contemporary practical medical texts by Cermisone and Bartolomeo Montagnana, their apparent impact was small.[10] Institutionally, the situation was no better. England lacked any organization for the control or improvement of medicine in general—a result of its political fragmentation as much as of the weakness of its doctors. Its hospitals were numerous but usually tiny, and frequently tottering on the edge of bankruptcy;[11] there were no civic physicians or municipally paid healers; and such public health regulations as there were were poorly enforced.

The gradual establishment and consolidation of the Tudor dynasty, under Henry VII and still more under his son and successor Henry VIII, was the prerequisite for any wider medical developments, for, as David Starkey has argued, it was in the forms of politics and statecraft that Renaissance ideas came first to be felt.[12] England became more stable, more firmly governed, and wealthier, and both monarchs began to adopt openly fashions taken from France and Italy. In medicine, the new trend can been seen in the request by Henry VII around 1500 for a copy of the statutes of the hospital of S. Maria Nuova in Florence to serve as a basis for his new hospital of the Savoy in London.[13] Begun in 1508, though not completed for almost a decade, the Savoy hospital was a tangible, indeed monumental, sign of the new medical renaissance, even if the result was more English than Italian.

It is tempting to see in Henry's request the first evidence for the influence of a scholar, physician, and humanist—Thomas Linacre, newly returned

home from Italy. Born in 1460 and educated at Oxford, where from 1484 he was a fellow of All Souls, Linacre was to play a decisive role in the development of English medicine, even after his death in 1528.[14] His career is highly unusual: not least because he spent eleven years or more continuously in Italy, first with Politian and Chalcondylas in Florence, then for three years in Rome, and finally for five or six years in Venice and Padua, where he took a medical degree in 1496. How much Greek Linacre knew when he left England has been vigorously disputed, but all are agreed that it was his period in Italy that turned him into one of the finest Greek scholars of his day, specializing above all in scientific and medical translation. The 1490s, the years of his Italian sojourn, were a crucial decade in the transformation of medicine and science. The clarion call from Leoniceno and his fellow hellenists in northern Italy for the replacement of traditional Latin authors by their Greek sources was loud and rousing. Linacre, a friend of Aldus, was one of those who responded by translating texts from the Greek into a more classical Latin, beginning in 1499 with a translation of Proclus, *De sphaera.* His first publications on medicine, however, did not appear for almost twenty years: Galen's *De sanitate tuenda* in 1517; the *Methodus medendi* in 1519; *De temperamentis* in 1521; *De facultatibus naturalibus* in 1523; *De usu pulsuum* in 1524; *De symptomatum differentiis* in 1524; and, posthumously, a fragment from Paul of Aegina, *De diebus criticis,* in 1528. In quantity, and even more in quality, this was a considerable achievement. Basing himself largely on his own Greek manuscripts, Linacre turned into elegant and accurate Latin the most important of Galen's works on practical medicine.

But it was as a pedagogue, not a physician, that Linacre reappears at the English court in 1500, charged with the education of the young prince Arthur, and it was not until nearly ten years later, in 1509, that he was appointed a royal physician. A friend of Colet, Erasmus, and their circle, he was actively engaged in education—he wrote three grammar books for schools—and he numbered Thomas More among those to whom he taught Greek. It was this combination of Erasmian humanism (to use a shorthand term), Greek, and medicine that was to have an enormous impact on English medicine, for one would not go far wrong in describing the practice of learned medicine in England down to the end of the sixteenth century as being in the Linacre tradition.[15]

It was an influence not only mediated through Linacre's own personality, impressive though that was, and through his friendship with other humanists such as More and, later, Juan Luis Vives. It was also expressed in more permanent ways. Linacre was a very wealthy man, amassing, out of the income provided by various canonries and rectories, a considerable fortune in

books, land, and cash. At his death, he founded a lectureship in physic at St. John's College, Cambridge, and two at Oxford. St. John's appointed their first lecturer in 1525, but it was not until 1559 that the first such lecturer was admitted at Oxford. Linacre's will makes it clear what was to be taught: the new Galen, using, for the most part, Linacre's translations, with a strong bias toward practical therapy. They were specifically enjoined to deal with "literal" questions—that is to say, explication; and they were to avoid those that "Galen callyth logical," that is, more disputatious debates about natural philosophy, in part simply to save time and make it possible to cover Linacre's syllabus within two and a half to three years.[16] It was a bias later followed by Henry VIII when he in turn came to establish the new Regius Professorships of Physic at the two universities in the early 1540s. Along with the other new professorships of Hebrew, Greek, divinity, and civil law, medicine was now to participate fully in the new humanism, the learning that took texts from antiquity as the basis of sound theory and practice.[17] The impact on their respective universities of the Linacre lecturers has been well studied by Gillian Lewis and, even if one takes a less sanguine view of their achievements than she does, two things are clear: some of the holders of the post were men of distinction, even if not as well qualified in medicine as we might expect; and their books and publications display that prejudice in favor of the classics called for by their founder.[18]

Second, and even more significant, it was at the urging of Linacre, and of other Italian graduates in medicine around the court, that in 1518 the London College of Physicians was set up to govern medical practice in London and its immediate environs.[19] This was, in effect, the first time that such a governing institution had been created in London—an attempt a century earlier had failed within two years—and, at least in theory, it mandated for the first time a graduate qualification for the practice of physic in London. Its model was that of an Italian college, like that of Padua or Venice: a body of elite physicians charged with laying down and enforcing standards of practice within the locality.[20] This is not the place to recount in detail the vicissitudes of the College or to explain the difficulties faced in imposing the authority of a small committee—with never more than twenty-five members in all until the end of the century—over a burgeoning metropolis.[21] It is enough here to emphasize two points. First, like the College of Physicians at Lyons, the London physicians saw their role as superior even to that of the universities, and their standards as far outstripping even those of a Paduan M.D. And, second, the College's aim was to impose a Galenic medicine on all English medical practitioners. Exactly what was initially implied by this is unclear, since the earliest statutes have not come down to us, but Sir George

Clark has argued convincingly that the ferocious examination in the works of Galen with a little Hippocrates, as approved in 1563, must have gone back at least to 1541, if not earlier.[22] Institutionally, then, the London College of Physicians maintained, for at least a century, the preferences and prejudices of Thomas Linacre, if not of Galen of Pergamum.

It is only too easy to deride the London College for its ambitions, its outdated learning, its bookishness, and its elitism. Seen from the perspective of the 1590s, or even the 1570s, the efforts of successive councils and presidents, most notably John Caius, to impose the classical writ of the College on all throughout England who might wish to practice medicine appear ludicrously overoptimistic, and its leading spokesmen antiquarian bigots. But, as is becoming clear, in 1518 when the College was founded, and indeed into the 1550s, the new Greek-based medicine was seen as the utmost in modernity. By purifying the medicine of the Middle Ages of ignorant accretions, by using new and better translations of Galen, one could avoid many errors in practice—the program advocated by Leoniceno in Ferrara and eagerly taken up by other northern Italian Hellenists—and win new knowledge from texts whose longevity of itself guaranteed their value.[23]

Nor, until the introduction of Paracelsian medicines and ideas in the 1560s, was there any clear alternative to humoral medicine save empiricism. Even if there might be disagreement on details, the general principles of classical medicine were never challenged. Besides, Linacre's own translations, notably of Galen's *Method of Healing,* had rescued major practical Galenic texts from medieval neglect; and as the next generation of scholars was to show, they offered many apparently new ideas on therapy.[24]

It was a program that fitted perfectly with the new ideals of the utility of scholarship put forward by Erasmus, Colet, and their friends: the purification and improvement of learning by a return *ad fontes,* to the mainly Greek springs of their various disciplines. The young men of the 1520s who were to carry out this program—Thomas Lupset, Edward Wotton, and, above all, John Clement—were given royal support, financial as well as moral; they were provided with posts at the new humanist foundations in Oxford; they communicated regularly with Thomas More and his London circle; and they shared in the reforming interests characteristic of Erasmus, in theology as well as in medicine.[25] In their writings, in their libraries, and in their letters, we may glimpse their priorities—and their dislikes. The older Aristotle of the Oxford schools is replaced by Plato; the medieval scholastics by the church fathers, notably Chrysostom; logical analysis by exegesis and emendation.

This new English learning can claim, as its most enduring monument in medicine, the Aldine *editio princeps* of Galen, published in Venice in 1525.

It was seen through the press by three Englishmen, including John Clement, and by one Saxon, Georg Agricola, later to be more famous for his mineralogy than for his medicine. In the next decade, the editors of the Basel edition of Galen in 1538 gratefully acknowledged the valuable help they had received from notes sent from Britain. One can trace this tradition of medical textual scholarship in Greek through John Caius at Cambridge, and George Edrych at Oxford, down to Theodore Goulston at Oxford and London at the beginning of the seventeenth century.[26] In the quality of their Greek learning, these men compare favorably with their Continental counterparts, and, what is often forgotten, their publications often had a directly didactic purpose. Caius' editions and translations of Galenic anatomy were intended for practical use, and Edrych's commentary on Paul of Aegina's surgery was dedicated "pro iuuenum studiis ad praxim medicam."

In essence, what is being done in England amounts to little more than the continuation of the program and methods first announced by Leoniceno: the acquisition, collation, translation, and elucidation of Greek medical and scientific books and manuscripts in order to reach a better understanding of the principles on which medicine had for centuries been based. It was a program supported at the highest level by king and by court. When in the 1540s there arrived in England a Portuguese *converso,* Manuel Brudus, a member of a family that had long treated members of the Spanish nobility, he enjoyed the powerful patronage of the king's steward, Sir William Sidney, and leading English courtiers like Sir John Baker and Sir Thomas Audley. In return he dedicated to them his book *On Diet in Fever according to Hippocratic Principles,* in which he explained that the English diet of good red meat and beer was medically necessary for those who live in cold northern climates.[27] His little book is a neat exposition of modern humanist medicine, well suited to an audience already familiar with its main principles and able to appreciate the practical benefits of the new learning.

Those who were responsible for its propagation in England were also, like Leoniceno, eager explorers of the whole natural world. John Clement and George Owen were keen botanists, an interest they shared with William Turner despite their religious differences.[28] Many of the early members of the London College of Physicians were singled out for praise by William Bullen for their interest in botany or zoology, and even a diplomatic bag might contain seeds and specimens from abroad intended for a leading London physician.[29] One can detect a slight shift in emphasis over the generations. Clement, Owen, and Edward Wotton are rather more bookish than their successors: Wotton's treatise *De differentiis animalium,* printed after a long delay in Paris in 1552, contents itself largely with identification and with or-

ganization of material assembled out of classical texts. Conrad Gesner, to whom Wotton presented a copy, passed a harsh but not unjust verdict upon it: "he took a good deal from Athenaeus, but he did not take everything, nor was he as careful as I am myself."[30]

It is in the next generation, with those who came to maturity in the 1540s, such as John Caius and William Turner, that practical experience of the plants and animals themselves comes to the fore. True, their work, whether like Turner on plants, or like Caius on birds and animals (his book on *English Dogs* is still well worth reading today), is largely descriptive: concentrating on the identification and naming of the natural world, and taking Aristotle and Dioscorides as the starting points.[31] But both men impart a sense of the importance of observation and practical understanding of plants and animals. They examined them out of an Aristotelian enthusiasm for the natural world—even for such unlikely subjects as tinkers' curs, which, "with marueilous paceience beare bigge budgettes fraught with Tinckers tooles, and metall meete to mend kettels, porrige pottes, skellets, and chafers, and other such like trumpery requisite for their occupacion and loytering trade, easing him of a great burthen which otherwise he himself should carry upon his shoulders."[32] One has only to read Turner on the plants of the Rhineland, or Caius on the humble puffin or the greyhound, to be convinced that their energy and enthusiasm did not stop at the printed page or at their library door.[33] Gillian Lewis has drawn attention to a booming interest in botany and in botanical books from the 1540s onward in Oxford, and she has suggested that many Oxonians may have carried this passion for plants and herbs with them after their university days, even into the wilder reaches of North Wales.[34] All this signifies the transition from the world of Leoniceno to that of Conrad Gesner, a friend of both Caius and Turner and, like them, a practical man as well as a bibliophile. It marks, one might say, a return to Aristotle—not to Aristotle the logician but to Aristotle the naturalist—and one might indeed think of it as a contribution to natural philosophy, in the widest sense.

The same generation, and in particular John Caius, can also be credited with the introduction of the new anatomy from Italy into England. It was once thought that David Edwards, who taught medicine and Greek at Corpus Christi College, Oxford, around 1524, and who later migrated to Cambridge, had learned his anatomy at Padua around 1525.[35] Unfortunately, the Englishman abroad who was called Odoardus was Edward Wotton; although Edwards certainly did at least once dissect a corpse—whether in Oxford or in Cambridge is not clear—his learning appears to have been largely homegrown. This is not to say that some of it, as displayed in his *In anatomen introductio luculenta et brevis,* printed in London in 1532, does not derive from

reading an Italian exemplar, in this case Alessandro Benedetti, or that it is not also a testimony to the introduction of the new Greek technical terms into medicine.[36] But there is no evidence that Edwards knew the newly published and newly translated texts of Galen that, for effectively the first time, revealed the anatomical discoveries of that ancient physician and the central place that they held in his thought and writings.

The same could not be said of John Caius, that doughty defender of the status quo, who, like his mentor Galen, was passionate in his advocacy of dissection.[37] He lectured on anatomy himself, and his statutes for his refounded Cambridge college demanded at least one annual anatomy for its medical students. He collated manuscripts of Galen's *Anatomical Procedures,* which he edited with a commentary, and he also edited and translated into Latin *On Bones*. According to his autobiography, it was his work on anatomy that he prized most highly, not least because he had shown up the follies of Vesalius in translating Galen without a full mastery of Greek and, still more, in proclaiming that Galen had never dissected a corpse—which, of course, depends entirely on what one means by dissection.[38] That there was a market for the new anatomy in England is also clear from the success of Thomas Geminus in his plagiarisms of the *De humani corporis fabrica* of Vesalius, as well as from the number of copies of the *Fabrica* circulating in Oxford and Cambridge within a year or two of its publication.[39] Richard Caldwell, sometime fellow of Brasenose College, Oxford, was one of those most involved in 1570 in setting up the Lumleian Lectures in surgery at the London College of Physicians, and he himself produced a translation, via an earlier Latin version, of the *Tables of Surgerie* of Jean Tagault.[40] Another anatomical publicist, John Banester, author of the highly derivative *History of Man, Sucked from the Sap of the Most Approved Anatomists* (published 1578), had a license from Oxford to practice medicine and left his tiny ivory-and-boxwood manikin, which he presumably used in his anatomical demonstrations, to Cambridge.[41] As we know from Peter Jones's work on the books of Thomas Lorkyn, the long-lived Regius Professor of Physic, anatomical study was pursued enthusiastically in Cambridge; the very latest of discoveries were eagerly debated well into the 1580s, if not beyond.[42] William Harvey, a scholar and later fellow of Caius College, also reports on seeing at least one dissection carried out while he was there before he left for Italy.[43] One can draw a similar picture of the introduction of the new anatomy into London, and of the propagation of the new humanist medicine by leading members of the London College. They were joined in this by the learned surgeons forming the elite of the Company of Barber Surgeons, who took their knowledge of Galen and of ancient surgery at secondhand, via the French of Tagault or Vidius.[44]

In short, if one looks at English medicine around 1580, one cannot fail to be impressed by the vigor, if not always by the quality, of the work being done and by the great changes that had taken place since Linacre returned from Italy. There was now little to distinguish what was taking place in the English universities from that of, say, Montpellier, though not perhaps Bologna or Padua; and while the members of the London College were untiring (and unsuccessful) in their attempts to control the swarms of irregular practitioners who flocked to the ever-expanding and ever-wealthier capital, the same problems afflicted most of the medical colleges of northern Europe.[45]

What part in all this was played by natural philosophy? The answer is, sadly, almost none. Aristotle still formed part of the staple of the arts course in both Oxford and Cambridge, and in 1560 a Swiss student, Johann Ulmer, reported back very favorably on the medical teaching at Oxford in which the eight books of Aristotle's *Physics* were read daily.[46] How much of them the weary student could master at 6 A.M., when the lectures were held, or whether he was any better equipped to cope with an hour of Galen *On the Affected Parts* immediately afterward, is a matter to be left to the imagination. But compared with what is going on in northern Italy or at Wittenberg, there appears to have been little interaction between natural philosophy and medicine in England.[47]

There is, however, one possible exception to this. John Caius in 1544 published at Basel a treatise, *De methodo medendi,* which he republished with a few slight changes at Louvain in 1556.[48] Its opening pages, in traditional fashion, consider the precise meaning to be given to the three types of method outlined by Galen at the beginning of the *Ars medica* (*Ars parva*). Caius is brusque in his definition of method; it is a way and rationale for teaching and learning, based on the nature of the thing to be investigated, and his preferred advice is that one should follow Galen and Plato in breaking down a larger topic into more manageable parts and proceeding from there.[49] Caius is aware of the vigorous debate on this begun by Leoniceno—given his Italian connections, it would have been very surprising if he were not—but it is difficult to determine just what influence this debate had on him, for several reasons.[50]

First, his treatise is about a specific method, that of healing. Once Caius has explained his general understanding of what a method is, the rest of the first book is taken up entirely with recommendations for medical practice, which Caius divides up into the conservation, preservation, and rectification of the body's health. Book 2 is entirely concerned with the treatment of diseases. In all this one needs both method, which deals with universal

principles, and practice, which deals with individual instances; these are the two legs of medicine.[51] In other words, although the preface might suggest engagement with wider questions of natural philosophy, the bulk of this treatise pays no attention to them.

Second, Caius merely takes over the conclusions of Leoniceno that Galen's recommendations in the *Ars medica* were aimed at teaching, and that discussions on the epistemological value of Galen's three methods of approach can be subordinated to a focus on their utility in promoting a specific method of healing.[52]

Third, it is above all Galen who provides the information and model for Caius. Aristotle is mentioned only in passing, and with apparently less regard than Plato, whose methodology Galen had appreciated highly.[53]

Finally, and perhaps most crucial for my purposes, the arguments and indeed most of the wording of this book are not Caius' own. They are taken over directly from the lectures that the greatest Galenist of the sixteenth century, Giovanni Battista da Monte, had just given in Padua, on Galen's *Method of Healing for Glaucon*.[54] Caius' justification for this at the end of his life, that he was bringing to wider notice in a more elegant form the most significant conclusions for medical practice of the greatest physician and teacher of the day, rings as hollow today as it did then; and Caius' long list of predecessors, including Galen, who have taken over large chunks of others' writings and ideas in their own publications succeeds only in cloaking plagiarism with pedantry.[55] As we can see from the other published versions of da Monte's lectures, Caius, despite his protestations, was merely his master's voice.[56] Thus, even if we allow that this tract shows an awareness of wider debates in natural philosophy, it is hard to credit it all, or even mostly, to John Caius.

If we exclude this hybrid production, there is very little evidence for any of the English medical writers being influenced directly by any of the wider debates in natural philosophy taking place in Italy. Their hero was Galen, the anatomist, the therapist, and, one should not forget, the logician. The second possibility of a strong influence on medicine from natural philosophy comes with the work of William Harvey, and in particular with his *Exercitationes anatomicae de motu cordis et sanguinis in animalibus* of 1628. This has been recently emphasized by Roger French in his argument for the crucial role of Harvey and his discovery of the circulation of the blood in the transition from the medieval world of Aristotelian natural philosophy to the world of the eighteenth century.[57]

In one sense, French is saying nothing new. Thirty years previously Walter Pagel had argued strongly that Harvey's thought world was still that

of the Aristotelian universe, with its Aristotelian causes and its ideas on the perfection of circular motion; and he had connected some of Harvey's own arguments with those being put forward in Italy by Aristotelians such as Cremonini and Cesalpino.[58] Nor is there any dispute that Harvey owed much to that great Aristotelian anatomist Fabricius ab Aquapendente, his teacher at Padua.[59] Thus natural philosophy, in an Aristotelian sense, clearly does have a part to play in Harvey's work—but what that part was, as French unwittingly demonstrates, and when it began to exercise its influence are far from easy to determine.

French takes the strong line that Harvey was influenced considerably throughout his life by the natural philosophy of Aristotle as expressed in his *Physics* and its related books about the natural world. It was something that he had learned as a student in Cambridge, and it was only confirmed for him in Padua, where he was exposed, perhaps for the first time, to Aristotle's writings on animals, which had not formed part of the traditional syllabus of natural philosophy. Harvey's Aristotelianism found its expression in his language of discovery and in the careful proofs he offered for it in a manner reminiscent of a university disputation in philosophy or medicine. And, of course, French is right to point out that whether one accepted or rejected Harvey's discovery frequently depended far more on one's preexisting attitude toward a wider natural philosophy than on any single or specific argument put forward by Harvey.[60]

But once one begins to look for detailed evidence of influence from natural philosophy, French's arguments either collapse at crucial points or rely more on faith than on documentation. What lectures Harvey heard on Aristotle in Cambridge are unknown; they will have included lectures on the *Organon, Physics,* and *De anima,* but how the lecturers interpreted these texts or what subsidiary guides were used, two crucial questions, cannot be answered with any degree of certainty.[61] It may, however, be relevant to note that at least in the opinion of Charles Schmitt, who knew Renaissance Aristotelianisms better than most, Harvey's use of Aristotle was very different from that of the English tradition represented by John Case.[62] The intellectual career of Gabriel Harvey, a decade or so before his more famous namesake, would appear to show that Ramism was being rejected in favor of a stricter but much more elementary Aristotelianism, such as was later visible in the summaries of Bartholomaeus Keckermann, widely read in Cambridge in the 1610s.[63]

Whatever Harvey read of Aristotle in Cambridge or in Padua, overt acknowledgment of Aristotelian physics is rare in *De motu cordis,* although, as Gweneth Whitteridge has shown, the proofs that form the second half of the

book correspond exactly to the rules laid down by Aristotle.[64] Besides, if Andrew Wear's argument is correct, Harvey was following "the way of the anatomists," which was neither that of the philosophers nor that of the physicians, and which depended heavily on the precedent and the injunctions laid down by Galen.[65] Indeed, Galen is far more prominent in Harvey than is Aristotle, and one could with some force argue for a continuation in Harvey of the tradition of Galenism represented (in their different ways) by Fabricius and by John Caius. The quantitative argument about the sizes of the veins and arteries coming to and from the heart and the consequent meditation on the amount of fluid they might contain have Galenic precedents familiar to Harvey.[66] Harvey's consideration of the purpose of the elegantly and artistically contrived structure of the heart, its fibers and the veins, would have gladdened the heart of any Galenist brought up on *The Usefulness of Parts*. At least one of his experiments with ligatures was anticipated by Galen, and one might compare Harvey's careful use of logic to establish the truth of his observations with Galen's recommendations for his ideal anatomist.[67] Although chronologically much later, the notes that Harvey made around 1644 in the margin of one of his copies of Galen are of considerable significance for understanding how his mind worked. The texts Harvey was then reading were only peripherally concerned with practical medicine, but he underlined every single word that had any connection with logic and proof—"plausibility," "judgment," "demonstration," "accurate," and so on—all of which bespeaks an unusual interest in precision of argument.[68]

Even for Harvey, then, a certain skepticism is required in assessing the part played in his discoveries by natural philosophy, whether in the narrow sense of Aristotelian physics or in a larger one that goes on to encompass all aspects of science. From one perspective, Harvey unites an English intellectual tradition of medical Galenism and of studying the natural world of plants and animals with a more sophisticated anatomical tradition deriving from Italy and, through Fabricius, concentrating on comparative anatomy and physiology. In this, Harvey is not untypical of the leading figures in English medicine in the sixteenth century, which, in its passage from obscurity to a blaze of success, depended little if at all on natural philosophy, except as it was mediated by and through Galen. Instead, its main focus was practical rather than theoretical: it aimed at medical rather than intellectual benefits. It was not at all insular, for one can point to English scholars on the Continent, and to an increasing number of foreigners coming to England and even elsewhere in Britain. In the sophistication and precision of what was done, particularly to edit and interpret Galen, English medicine performed at a level that at least equaled the best that Italy could provide.

It was a tradition that began by emphasizing the advantages of Greek and of Greek medicine, and, as represented by the hierarchy of the London College, it gained institutional permanence. It was a tradition that encouraged observation and description of the natural world of plants and animals, and, certainly from the 1540s if not earlier, the importance of dissection as the foundation of medicine. It was supported at the very outset by the monarch and the court; as such, it was merely one of the ways in which England was transformed in the first half of the sixteenth century into a Renaissance monarchy. Although by 1580 orthodox Galenists were often finding their attempts to prosecute or force out Paracelsian practitioners frustrated by wealthy and eminent patrons, this was not the case earlier in the century. Besides, even in 1600, Galenists continued in control of the two universities and of the London College.

This pattern was not repeated in every other European country; France, Spain, Germany or Denmark developed in different ways and with different emphases—some political, some religious, others intellectual or more strictly medical. The clash between Aristotelian natural philosophers and Galenist physicians familiar to us from accounts of life at Bologna or Padua does not appear to have occurred in England, where Paracelsianism and Protestantism were more vigorous opponents.[69] But how to identify these differences—and, still more, how to explain them—is not at all easy. At least in some places, medicine as an academic discipline might remain relatively immune from the blandishments of natural philosophy. But whether that immunity was due to the authority of Galen, to the attitudes imparted by the new medical humanism, or to the cussedness and traditionalism of many of its English practitioners must remain an open question.

NOTES

1. Pearl Kibre, "Lewis of Caerleon, Doctor of Medicine, Astronomer and Mathematician," *Isis* 43 (1952): 100–108; Sir Geoffrey Keynes, *The Life of William Harvey* (Oxford: Clarendon, 1978), p. 39.

2. F. M. Getz, "The Faculty of Medicine before 1500," in *The History of the University of Oxford,* ed. Jeremy I. Catto and Ralph Evans, vol. 2, *Late Medieval Oxford* (Oxford: Clarendon, 1992), pp. 373–405; Damian R. Leader, *A History of the University of Cambridge, vol. 1, The University to 1546* (Cambridge: Cambridge University Press, 1988), pp. 202–210.

3. The data on most individual physicians are conveniently found in Charles H. Talbot and E. A. Hammond, *Medical Practitioners in Medieval England* (London: Wellcome Historical Medical Library, 1965), hereafter cited as TH. On Fries, see TH, pp. 96–98; Veyrier, TH, p. 192; Boerio, TH, pp. 117–119. For good overviews of medieval English

medicine, see Carole Rawcliffe, *Medicine and Society in Later Medieval England* (Stroud: Alan Sutton, 1995); Faye Getz, *Medicine in the English Middle Ages* (Princeton: Princeton University Press, 1998).

4. TH, p. 47.

5. TH, pp. 36, 228–229.

6. On Thomas, see G. B. Parks, *English Travellers in Italy* (Stanford: Stanford University Press, 1955), p. 636; Hadcliffe, TH, pp. 398–399; Free, TH, p. 147; Chamber, TH, p. 131–132. Others abroad include John Argentine, TH, pp. 114–115; Henry Bagot, TH, p. 75; William Buckingham, TH, p. 386; John Clerke, TH, pp. 133–134; Thomas Denman, TH, pp. 339–340; Donat of Ireland, Parks, p. 625 (possibly to be identified with Denys of Ireland; ibid., p. 627); Walter Lacey, TH, p. 369; Thomas Linacre, TH, pp. 348–350; John Oxney, Parks, p. 634; John Racour, TH, p. 177.

7. One would like to know more of the medical career of Robert Sherborn, later bishop of Chichester; see TH, pp. 300–302.

8. Getz, "Faculty of Medicine before 1500," pp. 389–393. Whether the elder John Caius, "doctor in medicinis" by 1495, obtained his degree in Italy is unclear; see Damian R. Leader, "Caius Auberinus: Cambridge's First Professor," in *A Distinct Voice: Medieval Studies in Honor of Leonard E. Boyle, O.P.,* ed. Jacqueline Brown and William P. Stoneman (Notre Dame, Ind.: Notre Dame University Press, 1997), pp. 322–327.

9. See TH, pp. 314–315 (Marshall), with L. E. Voigts, "A Doctor and His Books: The Manuscripts of Roger Marchall (d. 1477)," in *New Science out of Old Books: Studies in Manuscripts and Early Printed Books in Honour of A. I. Doyle,* ed. R. Beadle and A. J. Piper (Aldershot: Scholar Press, 1995), pp. 249–314; Oxford, Bodleian Library, Ashmole MS 1437 (Argentine). See also Damian Riehl Leader, "John Argentein and Learning in Medieval Cambridge," *Humanistica Lovaniensia* 33 (1984): 71–85.

10. Argentine in his commonplace book mentions a "Pilula Taddei"; copies of Montagnana (d. 1467) were owned by John Racour (TH, p. 177) and by William Goldwyn (d. 1482; TH, p. 396), who also had a work by Cermisone (d. 1441).

11. See Nicholas Orme and Margaret Webster, *The English Hospital, 1070–1570* (New Haven: Yale University Press, 1995).

12. David R. Starkey, "England," in *The Renaissance in National Context,* ed. Roy Porter and Mikulás Teich (Cambridge: Cambridge University Press, 1992), pp. 146–163.

13. Katharine Park and John Henderson, "The First Hospital among Christians," *Medical History* 35 (1991): 164–188.

14. Basic documentation, and much else, is in Francis Maddison, Margaret Pelling, and Charles Webster, eds., *Essays on the Life and Work of Thomas Linacre, c. 1460–1524* (Oxford: Clarendon, 1977), on which this paragraph largely depends.

15. V. Nutton, "John Caius and the Linacre Tradition," *Medical History* 23 (1979): 373–391; Jonathan Woolfson, *Padua and the Tudors: English Students in Italy, 1485–1603* (Cambridge: James Clarke & Co., 1998), pp. 73–102.

16. John M. Fletcher, "Linacre's Lands and Lectureships," and R. Gillian Lewis, "The Linacre Lectureships Subsequent to Their Foundation"; both in Maddison, Pelling, and Webster, *Thomas Linacre,* pp. 107–197, 223–264.

17. F. Logan, "The Origins of the So-called Regius Professorships," in *Renaissance and Renewal in Christian History,* ed. Derek Baker, Studies in Church History 14 (Oxford: Published for the Ecclesiastical History Society by B. Blackwell, 1977), pp. 272–277.

18. Lewis, "Linacre Lectureships."

19. Charles Webster, "Thomas Linacre and the Foundation of the College of Physicians," in Maddison, Pelling, and Webster, *Thomas Linacre,* pp. 198–222.

20. Sir George Clark, *A History of the Royal College of Physicians* (Oxford: Clarendon Press for the Royal College of Physicians, 1964): 64–66; Gweneth Whitteridge, "Some Italian Precursors of the Royal College of Physicians," *Journal of the Royal College of Physicians* 72 (1977): 67–80.

21. On the fortunes of the College, see Clark, *History;* Margaret Pelling and Charles Webster, "Medical Practitioners" in *Health, Medicine, and Mortality in the Sixteenth Century,* ed. Charles Webster (Cambridge: Cambridge University Press, 1979), pp. 165–235; Harold J. Cook, *The Decline of the Old Medical Regime in Stuart London* (Ithaca, N.Y.: Cornell University Press, 1986).

22. Clark, *History,* pp. 88–105.

23. For this perspective, see Daniela Mugnai Carrara, *La Biblioteca di Nicolò Leoniceno. Tra Aristotle e Galeno: Cultura e libri di un medico umanistico,* Accademia Toscana di Scienze e Lettere "La Colombaria" 18 (Florence: Olschki, 1991); Lawrence I. Conrad, Michael Neve, Vivian Nutton, Roy Porter, and Andrew Wear, *The Western Medical Tradition, 800 BC to AD 1800* (Cambridge: Cambridge University Press, 1995), pp. 250–264; V. Nutton, "The Rise of Medical Humanism: Ferrara, 1464–1555," *Renaissance Studies* 11 (1997): 3–19.

24. Jerome J. Bylebyl, "Teaching *Methodus Medendi* in the Renaissance," in *Galen's Method of Healing,* ed. Fridolf Kudlien and Richard J. Durling (Leiden: Brill, 1991), pp. 157–189.

25. Maria Dowling, *Humanism in the Age of Henry VIII* (London: Croom Helm, 1986); Vivian Nutton, *John Caius and the Manuscripts of Galen* ([Cambridge]: Cambridge Philological Society, 1987), pp. 38–49, 58–61.

26. For Caius, see Nutton, *John Caius;* for Edrych, Gillian Lewis, "The Faculty of Medicine," in *The History of the University of Oxford,* ed. James K. McConica, vol. 3, *The Collegiate University* (Oxford: Clarendon, 1986), pp. 238, 242; for Goulston, Daniel Béguin, "L'Edition Goulston et les prétendus manuscrits perdus de Galien," *Revue d'Histoire des Textes* 19 (1989): 341–349; Vivian Nutton, "The Galenic Codices of Theodore Goulston," *Revue d'Histoire des Textes* 22 (1992): 259–268.

27. M. Brudus Lusitanus, *Liber de Ratione Victus in singulis Febribus secundum Hippocratem ad Anglos* (Venice: heirs of P. Ravanus, 1544); a second edition was published at Venice in

1559. The much-traveled Brudus ended his life as one of the doctors of the sultan of Turkey.

28. William Turner, *De re herbaria* (London, 1538), sig. A 1v; idem, *A new herbal* (London: S. Mierdman, 1551), sig. A iiv; Charles E. Raven, *English Naturalists from Neckham to Ray* ([Cambridge]: Cambridge University Press, 1947), p. 69. For Clement, note also his "three fair herberes and a great cage for birds" in his garden in Bucklersbury; see A. W. Reed, "John Clement and His Books," *The Library,* ser. 4, 6 (1925–1926): 333.

29. William Bullein, *A Dialogue between Soarness and Charity, The Bulwarke of Defence against all Sicknesse* (London: John Kingston, 1562), pp. 4–5; on the diplomatic bag, see J. Gairdner, *Letters and Papers of the Reign of Henry VIII,* vol. 13.2 (London: Stationery Office, 1891), p. 16 n. 45.

30. Vivian Nutton, "Conrad Gesner and the English Naturalists," *Medical History* 29 (1985): 930–97.

31. Whitney R. D. Jones, *William Turner: Tudor Naturalist, Physician, and Divine* (London: Routledge, 1988); for John Caius as a naturalist, the best account still remains that of Raven, *English Naturalists.*

32. John Caius, *A Treatise of English Dogges,* in *The Works of John Caius,* ed. Edwin S. Roberts (Cambridge: Cambridge University Press, 1912), p. 27.

33. For the story of Caius' pet puffin, see Conrad Gesner, *Historia animalium, I–IV* (Zurich: C. Froschover, 1551–1558), 3:768. Caius' further comment is written in the margin of his own copy of Gesner, Gonville and Caius College, Cambridge, classmark L. 19.4, and repeated with slight verbal changes in his *De rariorum animalium atque stirpium historia libellus* (London: W. Seres, 1570), fols. 21v–22r.

34. Lewis, "The Faculty of Medicine," pp. 247–249.

35. The suggestion of Edwards's Paduan studies goes back to Alfred B. Emden, *A Biographical Register of the University of Oxford, A.D. 1501–1540* (Oxford: Clarendon, 1974), p. 185, and has been followed by most recent scholars, including Lewis, "The Faculty of Medicine," p. 255. For a disproof, see Nutton, *John Caius,* p. 74.

36. Edwards's book is reprinted, with introduction and translation by Charles D. O'Malley and Kenneth F. Russell, as *David Edwardes, Introduction to Anatomy, 1532* (London: Oxford University Press, 1961). They do not note the immense debt to Alessandro Benedetti, *Historia corporis humani sive Anatomice* (Venice: B. Guerraldus, 1502, and often reprinted); see now Alessandro Benedetti, *Historia corporis humani sive Anatomice,* ed. and Italian trans. Giovanna Ferrari (Florence: Giunti Gruppo Editoriale, 1998).

37. To the old biography of Caius by John Venn in his *Works,* ed. Roberts, add Clark, *History,* pp. 106–124; Christopher Brooke, *A History of Gonville and Caius College* (Woodbridge: Boydell Press, 1985), pp. 55–88; and Nutton, *John Caius.*

38. John Caius, *De libris suis* (London: W. Seres, 1570), reprinted in *Works,* ed. Roberts, pp. 75–83.

39. I know of at least six copies in circulation before 1550.

40. Francis W. Steer, "Lord Lumley's Benefaction to the College of Physicians," *Medical History* 2 (1958): 298–305.

41. *Pace* Lewis, "The Faculty of Medicine," p. 246, the manikin is to be found in the Cambridge University Archives.

42. Peter Murray Jones, "Thomas Lorkyn's Dissections 1564\5 and 1566\7," *Transactions of the Cambridge Bibliographical Society* 9 (1988): 109–229; idem, "Reading Medicine in Tudor England," in *The History of Medical Education in Britain,* ed. Vivian Nutton and Roy Porter (Amsterdam: Rodopi, 1995), pp. 153–183.

43. Keynes, *Life of Harvey,* p. 17.

44. Vivian Nutton, "Humanist Surgery," in *The Medical Renaissance of the Sixteenth Century,* ed. Andrew Wear, Roger K. French, and Ian M. Lonie (Cambridge: Cambridge University Press, 1985), esp. pp. 96–99; Margaret Pelling, "Appearance and Reality: Barber-Surgeons, the Body, and Disease," in *London, 1500–1700: The Making of the Metropolis,* ed. A. Lee Beier and Roger Finlay (London: Routledge, 1986), pp. 82–112. For some speculative interpretation of this boom in anatomy, see Jonathan Sawday, *The Body Emblazoned: Dissection and the Human Body in Renaissance Culture* (London: Routledge, 1995).

45. Margaret Pelling, *The Strength of the Opposition: The College of Physicians and Unlicensed Medical Practitioners in Early Modern London* (London: Macmillan, 1999).

46. Lewis, "The faculty of Medicine," p. 231.

47. On Italy, see Charles B. Schmitt, "Aristotle among the Physicians," in Wear, French, and Lonie, *Medical Renaissance,* pp. 1–15. For Wittenberg, see Vivian Nutton, "Wittenberg Anatomy," in *Medicine and the Reformation,* ed. Ole Peter Grell and Andrew Cunningham (London: Routledge, 1993), pp. 11–32; Sachiko Kusukawa, *The Transformation of Natural Philosophy: The Case of Philip Melanchthon* (Cambridge: Cambridge University Press, 1995).

48. John Caius, *De methodo medendi libri duo ex Cl. Galeni Pergameni et Jo. Baptistae Montani sententia* (Basel: H. Froben and N. Episcopius, 1544); reprinted in John Caius, *Opera aliquot et versiones* (Louvain: A. M. Bergagne, 1556). The latter is reprinted in *Works,* ed. Roberts, pp. 1–56, and this is the edition cited hereafter.

49. Ibid., pp. 7–14.

50. Daniela Mugnai Carrara, "Una polemica umanistico-scolastica circa l'interpretazione delle tre dottrine ordinate di Galeno," *Annali dell'Istituto e Museo di Storia della Scienza di Firenze* 8 (1983): pp. 31–57.

51. Caius uses this (traditional) metaphor at length at *De methodo medendi,* p. 56.

52. For this debate, see, as well as Mugnai Carrara, "Una polemica," Neal W. Gilbert, *Renaissance Concepts of Method* (New York: Columbia University Press, 1960); Andrew Wear, "Galen in the Renaissance," in *Galen: Problems and Prospects,* ed. Vivian Nutton (London: Wellcome Institute for the History of Medicine, 1981), pp. 238–245; and Bylebyl, "Teaching *Methodus Medendi.*"

53. Contrast Caius' single reference to Aristotle, in passing, at *De methodo medendi,* p. 9, with the fulsome praise of Plato on pp. 7–12.

54. Although Caius hints at this in his title, he makes no reference to da Monte in his text; and the casual reader would be easily misled into thinking that da Monte, like Galen, provided merely a starting point for Caius' own cogitations. The similar production by Crato (see note 56 below) is both more honest and more independent of da Monte's words.

55. Caius, *De libris suis,* pp. 73–75.

56. Caius' wording can be compared with that in Walenty Lublin's edition of da Monte's *In libros Galeni De arte curandi ad Glauconem explanationes* (Venice: B. Constantinus, 1554) and in the (much freer) version put out by Johann Crato von Crafftheim (with da Monte's approval), *Methodus therapeutica ex sententia Galeni et Joannis Baptistae Montani* (Basel: J. Oporinus, 1555); the three are printed consecutively in Johannes Baptista Montanus, *Opuscula* (Basel: P. Perna, 1558). For da Monte's reaction to Caius' publication, see his *In primi libri Canonis Avicennae primam fen commentaria* (Venice: V. Valgrisi, B. Constantinus, 1557), p. 8.

57. Roger French, *William Harvey's Natural Philosophy* (Cambridge: Cambridge University Press, 1994).

58. Walter Pagel, *William Harvey's Biological Ideas* (Basel: Karger, 1967).

59. On Fabricius ab Aquapendente, see Andrew Cunningham, "Fabricius and the 'Aristotle Project' in Anatomical Teaching and Research at Padua," in Wear, French, and Lonie, *Medical Renaissance,* pp. 195–222.

60. See especially French, *Harvey's Natural Philosophy,* pp. 51–70.

61. Prof. M. Feingold in discussion that followed this paper suggested that while the Aristotelian texts remained in the curriculum, they were studied as part of language training, and that by 1600 little trace, if any, remained of the advanced Aristotelianism common in Italy and Germany. If he is correct, Harvey's "natural philosophy" is far more likely to have derived from Italy than from Cambridge.

62. Charles B. Schmitt, "William Harvey and Renaissance Aristotelianism," chap. 6 of *Reappraisals in Renaissance Thought* (London: Variorum, 1989).

63. Virginia F. Stern, *Gabriel Harvey: His Life, Marginalia, and Library* (Oxford: Clarendon; New York: Oxford University Press, 1979), pp. 21–22, 70. Cf. W. T. Costello, *The Scholastic Curriculum at Early Seventeenth-Century Cambridge* (Cambridge, Mass.: Harvard University Press, 1958).

64. See William Harvey, *An Anatomical Disputation Concerning the Movement of the Heart and Blood in Living Creatures,* trans. Gweneth Whitteridge (Oxford: Blackwell Scientific Publications, 1976).

65. Andrew Wear, "William Harvey and the Way of the Anatomists," *History of Science* 21 (1983): 223–249; see also his introduction to William Harvey, *The Circulation of the Blood and Other Writings* (London: Dent, 1990).

66. Owsei Temkin, *The Double Face of Janus* (Baltimore: Johns Hopkins University Press, 1977), pp. 162–166.

67. Charles R. S. Harris, *The Heart and the Vascular System in Ancient Greek Medicine* (Oxford: Clarendon, 1973), pp. 381–383.

68. Vivian Nutton, "Harvey, Goulston, and Galen," chap. 14 of *From Democedes to Harvey* (London: Variorum, 1988).

69. Some good examples of conflict are found in Schmitt, *Reappraisals in Renaissance Thought*. The clash between Aristotle and Galen (and the new learning) is famously exemplified in the debate between Corti and Vesalius, summarized in Charles D. O'Malley, *Andreas Vesalius of Brussels* (Berkeley: University of California Press, 1964), pp. 98–100.

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9

From the Laboratory to the Library: Alchemy According to Guglielmo Fabri

Chiara Crisciani

In the history of Latin alchemy, much remains to be learned about the period from John of Rupescissa to Paracelsus. In particular, fifteenth-century alchemical texts, which include both examples of alchemical research and assessments of alchemy, have been among the least studied by historians. Yet these are precisely the texts that may be expected to illuminate the process whereby the three major shifts in emphasis that characterized alchemy between the end of the Middle Ages and the early modern period were disseminated and received. These changes were the relative discredit into which transmutatory alchemy had fallen, the increasing importance of therapeutic doctrines and goals in the alchemy of the elixir and fifth essence, and the emergence in alchemical literature of linked alchemical and religious themes that do not always refer to work in the laboratory.

These three developments were interrelated in various complex ways that have yet to be fully clarified. They evidently evolved from trends already present in medieval alchemy; but they also belong to a general restructuring both of the scientific disciplines of alchemy and medicine and of forms of knowledge—empirical, rational, prophetic, and magical. The work of Guglielmo Fabri that is the subject of the present paper provides one noteworthy example of a fifteenth-century alchemical text in which continuity and innovation go hand in hand and in which previously developed topics are reworked and transformed. Fabri seems to be at a crossroads between the trends and problems of late medieval alchemy and their development in the early modern period. He provides us with a useful vantage point for evaluating continuity and innovation, the utilization of traditional sources and concepts, and the introduction of new themes and approaches destined to undergo further development in the future.

I

The *Liber de lapide philosophorum et de auro potabili,* which as far as I know is unedited, seems to have been written about 1449 and certainly before the