Poetical Allusions to the Circulation of Blood up to the end of the Seventeenth Century

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SUMMARY

The history of medicine has conventionally been studied by research into prose medical texts, which provide an index of the depth of the professional knowledge available to the contemporary physician, but examination of poetry gives a measure of the diffusion of this knowledge into the laity. William Harvey's monumental discovery of the circulation of the blood in 1628 is now acknowledged as a revolutionary milestone in the history of medicine. It was met however with initial rejection by the majority of his colleagues, and it was not until over twenty years later that Harvey and his discoveries start to be mentioned in poetry. It is interesting to note that the eventual acclaim for his work might well have been based on its correspondence with the rain cycle! In the second half of the century, medical poets start to pay tribute to Harvey's contribution, and a number of his colleagues wrote eulogies to him and his work.

RÉSUMÉ

La récherche sur l'histoire de la médecine a tradionnellement été l'étude de la littérature médicale. Celle-ci nous montre l'étendue des connaissances à la disposition des médecins d'une époque. D'autre part, l'analyse de la poésie nous permet d'évaluer à quel point ces connaissances étaient connues des profanes.

La découverte capitale, par William Harvey, de la circulation sanguine en 1628 est maintenant reconnue comme un événement déterminant de l'histoire de la médecine.

À l'époque cependant, cette théorie a été l'objet d'un rejet de la part de la majorité de ses collègues, et ce n'est que plus de vingts ans plus tard que mention est faite de Harvey et de ses découvertes dans la poésie.

Il est intéressant de noter que la reconnaissance ultime de ses travaux a peut être été due à leur correspondance avec le cycle de la pluie!

Dans la seconde moitié du XVIIè siècle, des médecins poètes ont commence à rendre hommage à Harvey, et nombres de ses collègues ont écrit son panégyrique.

The doctrine of correspondences was a recurrent feature of Renaissance philosophy. It had been a means by which mediaeval man had sought some key to the unity of man, the Universe, and the Earth. Concepts of physiology were based on these fanciful analogies with Nature rather than scientific deduction and human dissection, and ideas about blood flow were derived originally from Empedocles' ancient correspondence with the ocean tides, which postulated an ebbing and flowing of blood in the veins in a shuttlewise manner. Galen had modified and improved this simplistic idea and based it on a similarity with the rain-cycle. This was another easily understood correspondence, suggested by Aristotle, who had made an analogy between the blood being soaked up by the peripheral tissues in the same way that the rain which falls on the Earth is soaked up by the fields. It was hardly surprising that the doctrine of Correspondences was readily seized upon by contemporary poets, since it was in itself so essentially poetical.

Harvey himself not only compares the circulation of the blood to the circular motion of the planets but also to the 'circular' motion of rain, *Which motion* we may call circular, after that same manner that Aristotle sayes that the rain and air do imitate the motion of the superior bodies. For the earth being wet, evaporates by the heat of the Sun, and the vapours being rais'd aloft are condens'd and descend in show'rs and wet the ground.¹

This cyclical movement from sea to clouds to rain to rivers to sea was perhaps an instance in the 17th Century mind of God's providential ordering of the universe so that nothing is wasted. Sylvester in 1605 alludes to it clearly in *Divine Works:*

The purest humour in the Sea, the Sun Exhales in the Air, which there resolved, anon Returns to water; and descends again By sundry ways unto his mother Main.¹

The physician/poet Henry Vaughan refers to this raincycle in a translation from Latin of Boethius (A.D. 470/475-524). Vaughan translates:

As blood let out forsakes the heart And perisheth; but what returns With fresh and brighter spirit burns?

Martin (1957) suggests that probablyVaughan is thinking here of Harvey's work on the circulation.¹¹ It is more likely that he is considering the rain-cycle, which Boethius would also have known about. These few lines, in fact, are a very good rebuttal of the Empedoclean ebb-and-flow: after forsaking the heart, the blood does not trickle back - it perisheth. This is surely a suggestion that it is soaking into the tissues. It might be usefully added here that Plato and Anaxagoras had taught that all rivers and springs flowed from a vast cavern in the centre of the earth, and to it they proceeded. The book of *Ecclesiastes* refers to it somewhat obliquely: *All the rivers run into the* sea; yet the sea is not full; unto the place from whence the rivers come, thither shall they return again. 5

Sir John Davies' poem *Nosce te Ipsum* (1599) tells very clearly of the circulation of surface water on the earth:

And as the moisture which the thirsty earth Sucks from the sea, to fill her emptie veins... Yet nature so her many streams doth lead and carry... Till she her selfe unto the Ocean marry Within whose watry bosome first she lay:⁶

Richard Crashaw (1612-1649) is doubtless referring to Plato's great cavern in *Sospetto d'Herode*,

Below the Botome of the great Abysse, There where one Centre reconciles all things, The world's profound Heart pants.⁷

He is placing the world's deep *Heart* in an analogous situation to the human heart and alludes very clearly to the pumping (panting) action in a circulatory metaphor.

Thomas Traherne (1637 - 1674) was another metaphysical poet who followed science closely and he almost certainly intended a double meaning and an allusion to the rain-cycle in a poem that he actually called *The Circulation.* His correspondences and abridgements find circulations everywhere.

All Things to Circulation owe Themselvs; by which alone They do exist ... The Thirsty Earth drinks in the Rain, ... Which run like Rivers from, into the Main, And all it doth Receiv returns again?

To complicate the matter further, Plato had suggested that elements changed from one into another in a circular manner. He had called this process "transmutation", and both Milton and Sandys have alluded to it in their poetry. In addition to the possible misunderstanding caused by this, the analogy of the raincycle to the alchemical process of distillation was also fairly inevitable. In fact, distillation bears more of a resemblance to the Aristotelian rain-cycle than to any circular movement, because it basically involves much more of an ascent and descent of liquids and vapours than any type of circular orbiting.

Perhaps predictably, furious debate and rebuttal followed the publication of de *Motu Cordis* in 1628, and this continued to rage for some twenty years. A biographer of William Harvey writes, after his book of the *Circulation of the Blood came out, he fell mightily in practice, and that, 'twas beleeved by the vulgar that he was crack-brained, and all the physitians were against his opinion.⁹ It would appear from this and other biographies that during this period, an embarrassed silence prevailed.The President and Fellows of the Royal College of Physicians*

seem to have initially considered his discovery as an odd eccentricity in a worthy fellow and an excellent friend, one to be listened to and politely humoured, but not discussed.¹⁰

Harvey refused to enter into any argument or debate about his discovery, and remained quietly confident until 1649 when he eloquently answered (and demolished) some fairly strong criticisms of the French anatomist, Jean Riolan. The twenty-one years of silence is very interesting. It is highly significant that John Donne, perhaps the most forceful and influential English lyrical poet of the century, did not mention Harvey's discoveries. Poynter cites numerous facts, which strongly suggest that Donne had met Harvey and even attended Harvey's Lumleian lectures." Donne was certainly interested in medicine and made a great number of medical allusions in his works (more than to any other science¹²) He also had a definite obsession with circles. He considered God to be the perfect circle and thought of the circle as a symbol of God. He even preached a sermon on the subject: 0 Eternal and most gracious God, he wrote, who, considered in thy selfe, art a Circle, first and last, and altogether.³ Why then did he not seize on the Circulation of the Blood (as other metaphysical poets who succeeded Donne did so)?This silence is significant evidence of the coolness of the reception of Harvey's ideas in the years immediately following 1628.

The first two poems to mention William Harvey by name are mentioned for the sake of completeness: indeed the first is in Latin and written in 1624. It was by Sir Peter Bowne (1575-1624) praising Harvey's dexterity both in his learned lecturing and in his wonderful skill at dissection. It is thought that this eulogy arose from the author's attending Harvey's celebrated Lumleian lectures, which began in April 1616.⁴

The second poem is in English and alludes to Harvey's argumentativeness, as well as his keenness for dissection:

What ho! Doctor harule, yt are ranked among perui", Are you still dissecting?¹⁵

This comes from an anonymous Cambridge medical student, and compared to the references to other doctors in the same manuscript is complimentary: most of the verses are an obscene libel on the Fellows of the College of the time.

The first poetic reference to Harvey's discoveries after 1628 is from William Cartwright in 1638.

New, not as th' year, to run the same Course o'r Which it hath run before, Lest in the Man himself there be a Round, As in his Humor's found, And that return seem to make good Circling of Actions, as ofBloud;¹⁶ Although this poem does not mention Harvey by name, there is evidence to show that the poet (who was a cleric) had social links with him. 17

The first poetical reference to the circulation theory, which quotes Harvey by name, is in 1651^{18} by Sir John Berkenhead (1616-1679), and interestingly is entitled *In Memory of Mr William Cartwright* (who was the author of the verse quoted above).

For as immortall HARVEY'S searching Brain Found the Red Spirit's Circle in each Veyn,... And proves its Circulation through all Arts. All-over Wit, ne'r runs a-ground, but rides In ever-flowing never-ebbing Tides.¹⁹

In 1653, Martin Lluelyn wrote the dedicatory poem to William Harvey's other important anatomical book, *Exercitationes de Generatione Animalium.*²⁰ Harvey is addressed,

With Drake and Candish^b hence thy Bays is curld Fam'd Circulator of the Lesser World.²¹

This compares Harvey's discovery to the contemporary achievements of the great circumnavigators of the World. Lluelyn pays tribute to Harvey's rejection of long-accepted yet unproven dogma and his reliance purely on scientific deduction from Nature,

Great Light of Art, Who to the long-dim World dost sight impart... This rescue thence, that <u>Science</u> is not <u>Creed</u> Who for their Age alone do Writers trust, From <u>Books</u> to <u>Nature</u> thy <u>Appeale</u> is made Thy <u>Copies</u> by their <u>Archetype</u> are swayd.²²

He also describes Harvey's previous battle with adverse critics:

From <u>Forreign Coasts</u>, and to the conflict come, Some they bold <u>Challeng</u>ers, thy <u>Seconds</u> some But when Experience¹¹ vanquish't their <u>defence</u> And Prejudice was captive led by <u>Sense</u>: The Ingenuous laid down Arms, and fled to you As their <u>Instructor</u>, and their <u>Victor</u> too.²²

This Seconds alludes to James Primerose, who was admitted to the Royal College of Physicians when William Harvey was an examiner. This was the year prior to Primerose's virulent but groundless attack on de *Motu Cordis*, in his book, *Exercitationes et Animadversiones in librum Guiliemi Harvaei de Motu Cordis et Circulatione Sanguinis*,⁶ (1630).^{2#1} The *Forreign Coasts* is a reference mainly to Jean Riolan in Paris,²⁵ Aemylius Parisianus in Venice,²⁶ and Caspar Hofmann in AltdorP (Germany), all of who joined in the onslaught and were highly critical of Harvey's work. The last couplet above refers to Hofmann who later graciously and magnanimously recanted publicly and acknowledged Harvey's great contribution.²⁸

Also in 1653, in the English translation of de *Motu Cordis,* appeared a very short dedicatory verse,

Long <u>Aristotle</u>, long may <u>Galen</u> live Whose great renown all ages shall survive And long live <u>Harvey</u>, they the Arts did find Which this brave Englishman has now refm'd.^e

In 1654, Thomas Washbourne, the canon of Gloucester, wrote a poem entitled *The Circulation* in which we are left in no doubt that Harvey's theory and evidently his methods had become well known outside purely medical circles. Washbourne's poem starts,

Our famous <u>Harvey</u> hath made good The circulation of the blood, And what was paradox we know To be a demonstration now.²⁹

He goes on to mention the correspondence of the rain-cycle (as well as other natural cyclical events):

Thus we see almost every thing

Circling about as in a ring..... Rivers which borrow from the main Their streams, do pay them back again.³⁰

In the following year (1656), the sceptic poet/physician John Collop included a eulogy to William Harvey in his iconoclastic Poes/s *Rediviva*. In this poem, Collop compares Harvey to a latter day Hercules:

Beyond a <u>Hercules</u> labours thou dost go. Seav'n headed <u>Hydra.</u>* error multiply'd, Thou need'st no Club, thy knife can soon divide: <u>Augean</u> filths^g no work when vy'd with thee, Do'st cleanse the Jakes of all antiquitie, All truths before thine, did like heat-drops^h fall, Vanish'd so soon, scarce seen, or known at all.³¹

In 1663, Abraham Cowley (1618 - 1667), regarded in his day as the foremost English poet... pays graceful tribute ... to the great achievements of William Harvey.³¹ Like Collop, he too was a Royalist and was arrested by the Roundheads during the Civil War for carrying messages from Queen Henrietta in Paris back to the King. Indeed it is said that he was only granted his medical qualification by the government as a 'blind' in his activities in the Royalist cause and did his medical studies whilst arrested and released on £1000 bail.³³ Whether or not this is true, he was certainly a Doctor of Physick (M.D. Oxon 1657).

The Ode to Harvey is one of three eulogies which Cowley wrote; the other two were dedicated to Thomas

Hobbes, the noted philosopher and the physician, Sir Charles Scarborough. These three men were also staunch Royalists. William Harvey had been Charles Is physician; Hobbes had spent 1641-52 in Paris where he had been personal tutor to Charles II. Scarborough had been ousted from his fellowship at Caius College, Cambridge by the parliamentarians in 1641 - the same year they had also plundered Harvey's large collection of anatomical specimens in the College Museum. (It was such Roundhead vandalism as this, which prompted Cowley to pen the phrase a barb'rous War's unlearned Rage.) After Scarborough's ejection from Cambridge, he sought refuge in Oxford, where he was evidently keen to take up arms for the Cavaliers.William Harvey dissuaded him from such a violent course of action, saying, Prithee, leave off thy gunning and stay here; I will bring thee into practice.³⁴ Scarborough accepted this advice and in 1656, he succeeded Harvey as Lumleian lecturer at the Royal College of Physicians of London.

His Ode Upon Dr Harvey is almost an apotheosis, in which he alludes to the classical story of Daphne and Apollo, in which Apollo (Harvey) pursues Daphne (Coy Nature), but on the point of his conquest of her, she prays to Zeus for help and she is metamorphised into a laurel tree. The classical story ends here with Daphne's virginity intact. In Cowley's Ode, however, this does not halt Harvey, our Apollo. He went after her, first into the tree and then into the bloodstream!

Into the Bark, and root he after her did goe:... Harvey pursues, and keeps her still in sight. But as the Deer long hunted takes a Pood, She leap't at last into the winding streams of blood.

She then finds her way to the heart thinking herself to be safe. The way Harvey 'rapes' Nature is very reminiscent of the archaic style and allegory of the earlier poet, Edmund Spenser.

Till at the heart she stay'd ... Harvey was with her there, And held this slippery Proteus' in a chain, Till all her mighty Mysteries she descry'd, Which from his wit the attempt before to hide Was the first thing that Nature did in vain³⁵

Cowley points out

Thus *Harvey sought for Truth in Truth's own Book*³⁶ and goes on to say how Harvey has benefited medicine, which was itself in dire need of therapy:

Great Doctor! Th' Art of Curing's cur'd by thee,... Purg'd of old errors by thy care New dieted, put forth to clearer air, It now will strong and healthful prove, It selfe before Lethargick lay and could not move.³⁷ Sir Geoffrey Keynes, in his definitive biography of William Harvey, proposed that Cowley's book on Experimental Philosophy owed much to Harvey's influence: the title page has an insistence on experiment, and Cowley proposed the building of a college for Harveian style research with a surgeon and many animals for experimentation.

Also in 1663, the poet John Dryden (1631 - 1700) (who was Poet Laureate in 1668) mentions William Harvey and the Circulation.

The <u>Circling</u> streams, once thought but pools, of blood (Whether Life's fewel, or the Bodie's food) From dark Oblivion, Harvey's name shall save.^{3*}

Dryden, like Cowley and Harvey was also an ardent Royalist, and in this poem-letter, which is dedicated *particularly* to Charleton's works on Stonehenge, Dryden uses the metaphor of the monolithic stone circle as an ageless symbol of the Divine Right of Kings, stretching back to time immemorial. This is perhaps an appropriate moment to point out that not all intellectual and scientific physicians were Royalists. Thomas Sydenham, the'English Hippocrates', was a Parliamentarian Captain of Horse!

In 1679, the philosophical poet, Henry More published a poem in Latin³⁹ called simply *Circulatio Sanguinis.'* Despite the date of publication, it has been suggested that this poem was probably written a few years earlier. There is a possibility that More had met up with Harvey between 1651 and 1653.⁴⁰ More's poetic tribute was in Latin, but it was eventually translated and published in English and is a joy to read.⁴¹ It is a wonderful example of how serious medical tracts were presented *to an amazed world* not only in a poem but in the style of Latin verse usually used in classical Latin epic poetry. A few years later, another clergyman, Bishop Robert Grove also described the tying off of the aorta and vena cava in Latin verse (*Carmen* de *sanguinis circuitu, a Guiliemo Harvaeo, primum invento.* Londini, 1685).⁴²

Neither Thomas More nor Robert Grove were scientists. Indeed they were both vicars. Their clear acceptance and obvious understanding of Harvey's radical new theory indicates two important points. First it shows that the gulf between religion and science had not yet formed.

Indeed More's life-long interest in contemporary science was partly motivated by a desire to draw on it for the existence of spirit and of God.⁴³ Secondly, together with Dryden's lines of 1633, they indicate that a knowledge and understanding of Harvey's work has now reached the non-medical public.

For the sake of completeness, it should be mentioned that in 1650 (seven years before William Harvey's death!) a Dutch poem was written *On the Death of Harvey* by van Assendelft. This was included in the Dutch translation of *de Motu Cordis* published that year.⁴⁴ This verse shows that although physicians in Continental Europe might have been mistaken about his death, (concerning which there had been rumours), by this time they had developed admiration for the important work of this great man.

It has been suggested that Harvey's work did not only affect contemporary scientific thought. In Sawday's study of the impact of Renaissance medical progress on contemporary literature, he has suggested that after the acceptance of de Motu Cordis, the language of English poetry changes. Harvey's discoveries, symbolic of the advances of science itself would seem to have been assimilated into the common vocabulary of scientist and poet alike.*5 Could it be that the scientists' attempts to embrace a clearer style of English to describe their anatomical discoveries without recourse to allegory, has weakened the former significance of the correspondences which had hitherto been so important not only to poetry, but to the whole Elizabethan concept of the World?

Notes

- a *The term 'perui'* (i.e. parvis) alludes to the group of argumentative lawyers who met on the *parvis* or small terrace in front of St. Paul's.
- b *Candish* here refers to *Cavendish:* Francis Drake (1580) and Thomas Cavendish (1588) were the second and third circumnavigators of the World.
- c The word, *Experience* was also used to mean *Experiment* at this time.
- d (Latin) A Dissertation and Depreciatory References to the Book by William Harvey about the Movement of the Heart and the Circulation of the Blood.
- e This English translation is in HARVEY, William. The anatomical exercises of DrWilliam Harvey concerning the motion of the heart and blood, 1653, London. The original Latin poem (1648) is thus:

Vivat Aristotoles, vivat Galenus et ingens. Hippocrates, quorum fama perennis erit. Vivat et Harveius, turn sanctas nempe tulerunte Illi artes, quas nunc anglus hie ecce colit.

- f *Hydra* is the mythical nine-headed serpent of the Lernean Marsh, killed as Hercules second labour. It was often used as a symbol for misjudgment since when one head was cut off, two more grew in the place!
- g The Augean Filths alludes to another (the fifth) labour set by Hera for Hercules. The Augean stables had

held 3,000 oxen and had not been cleansed for thirty years. When Hercules was tasked to cleanse the filthy stables, he diverted two rivers, (the Alpheus and Peneus) and so cleansed them in one day. Brewer's Phrase & Fable says: *To cleanse the Augean stables has come to mean To clear away an accumulated mass of corruption, moral, religious, physical or legal.* (BREWER, E. Cobham. *Dictionary of Phrase and Fable,* 1870, rev.ed. Cassell, London, 1981, p.74.)

- h The *heat-drops* are the slight shower foretelling a hot day.
- i Proteus was Neptune's herdsman, who was impossible to catch: "he would elude anyone ... by changing his shape, for he had the power of changing it in an instant into any form he chose"
- j (Latin) The Circulation of the Blood.

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Biography

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EmbaumeursImédecins de l'Egypte ancienne

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RÉSUMÉ

Les prêtres-embaumeurs qui réalisaient quotidiennement la momification soignaient le corps en lui apportant une certaine immortalité. Auraient-ils pu exercer également la profession de médecin ?

SUMMARY

On a daily basis, priest embalmers carefully carried out mummification of bodies to give them a certain immortality. Could they also have practised the profession of medicine?

Confrontés quotidiennement au traitement des corps, les prêtres-embaumeurs ont acquis des connaissances et une expérience opératoire irremplaçable grâce à la vision directe de l'anatomie interne. De nos jours, il semble difficile de mettre en évidence un lien entre ces professionnels de la mort et les médecins. Pourtant, les deux professions ont une fonction commune : la guérison du corps, car les substances qui servent au traitement post-mortem sont de véritables préparations à l'égal des remèdes utilisés pour le corps malade. Les embaumeurs connaissaient parfaitement les vertus thérapeutiques de nombreux produits à usage médical. Réciproquement le papyrus Edwin Smith (1), traité de chirurgie, cite, dans son vocabulaire, le pansement ssd comme étant utilisé à la fois par des embaumeurs (2) et par des médecins. Réalisaient-ils de véritables "autopsies" médico-légales comme le suggère le Dr. F. Jonckheere (3) ?

Embaumeur et médecin ?

Dès l'Ancien Empire, on trouve de rares attestations de dignitaires qui associent à la fonction médicale, la connaissance des mystères liés à la pratique de l'embaumement. Ainsi Neankhré (4), dans les inscriptions de sa tombe à Giza, est dit "médecin du palais" (5) et "supérieur des mystères" (6). Ces deux titres accolés peuvent permettre de croire que ce practicien excerçait les deux professions au sein du Palais royal. A l'époque ptolémaïque, les embaumeurs augmentent leurs activités. Le métier semble désormais accessible aux femmes puisque Tanetaoua (7), femmemédecin, avait la charge de momifier les corps féminins. Les exemples n'abondent pas dans la littérature, aussi est-il permis de se demander s'il était souhaitable pour un médecin, soucieux de préserver sa respectabilité, de préciser même dans l'au-delà sa fonction d'embaumeur? Un exemple de parenté entre un médecin et un embaumeur nous est donné sur la stèle 1086, conservée au Musée de l'Ermitage. Dédiée à Minemsehet, elle porte la mention de son grand-père Nebneb qui était embaumeur ainsi que le nom de son père, Sahi, qui était

"Chef des médecins" (8). La confusion s'installe dans les esprits lorsque Hérodote (9) désigne par "taricheute", les fabricants de momies et les "saleurs" c'est-à-dire ceux qui interviennent dans la conservation du poisson. En outre, des exemples bilingues attestent que le terme "médecin" traduit le grec "taricheute" (10). Le papyrus Oxy. III, 75 (II), relatant "un rapport d'accident avec ordre d'examiner le cadavre", montre que le taricheute pouvait exercer des activités spécifiques réservées aujourd'hui au médecin-légiste. O. Nanetti (12) en publiant vingt rapports de médecine légale a révélé que les médecins/embaumeurs délivraient des attestations de décès, des rapports de visite médicale et de soins, ainsi que des témoignages écrits lors de procès. Ils pouvaient également rédiger des certificats de maladie à un employé. Ce statut officiel d'expert légal est acquis dans l'Egypte impériale (13). Les professions pourraient se confondre. Définir les strictes cadres d'exercice de chacun paraît bien délicat.

L'abord physique du corps n'est pas du tout le même pour ces deux techniciens. A l'époque pharaonique, le savoir médical égyptien, aussi réputé soit-il sur le plan international, semble figé dans des textes se transmettant de génération en génération, de dynastie en dynastie, sans aucune remise en cause, ni évolution de leur différent contenu. Diodore de Sicile (14) affirme que, dans les traitements prescrits à leurs patients, les praticiens ne peuvent s'écarter, sous peine de mort, des règles établies à une époque reculée par de nombreux médecins renommmés. En outre, les médecins de l'époque pharaonique limitent le plus souvent leurs appréciations cliniques aux seules cavités naturelles du corps (15). De même, l'identification d'instruments médicaux pour ces périodes restent encore à faire. En revanche, l'approche et la pratique quotidienne des embaumeurs sur le cadavre et dans ses structures les plus intimes, tant humaine qu'animale, ont pu parfaitement leurs permettre d'accumuler un savoir tiré d'observations anatomiques. Ainsi de nouveaux noms d'organes apparaissent dans le Rituel de l'embaumement de l'Apis. On relève l'emploi de termes spécifiques