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Chapter 5

Extending the Renaissance Mind: 'Look what thy memory cannot contain'

Miranda Anderson

In *Mindware* the philosopher Andy Clark presents a hypothesis of how scholars construct academic works and theories:

> The brain supported some rereading of old texts, materials, and notes. While rereading these, it responded by generating a few fragmentary ideas and criticisms. These ideas and criticisms were then stored as more marks on paper, in margins, on computer discs, etc. The brain then played a role in reorganizing these data on clean sheets, adding new on-line reactions and ideas. The cycle of reading, responding, and external reorganization is repeated, again and again. Finally, there is a product. A story, argument or theory. But this intellectual product owes a lot to those repeated loops out into the environment. Credit belongs to the embodied, embedded agent in the world.[1]

The particular intellectual product Clark proposes here is a cognitive system that consists of brain, body and world: the extended mind hypothesis (EM). EM's proposal is that rather than being confined to neural circuitry, coalitions of biological and non-biological resources can constitute cognitive processes. Clark presents the means by which such a hypothesis develops, in order to demonstrate the use by the brain of the tools of pen, paper and computer to externalise its thoughts in a stable form that allows for further reflection, and so hopefully clearer and higher level thoughts on the original murky and mundane ones. The suggestion is that rather than a disembodied or brain-bound intellect pouring its preformed ideas onto the page, the tools used participate in the development of secondary thoughts. The extent to which tools become a part of the process of cognition is reflected in the fact that tools which are used repeatedly become transparent in use.[2] Provided nothing goes wrong, as you write you do not normally think of the pen or the keyboard as separate objects, as your flow or stutter of thoughts appear on the page or screen, any more than you think of the neural synapses firing in your brain, or the hands that you are using to control the pen, or type the letters. Furthermore, the words used are themselves another form of 'mind tool', since language itself is a fundamental part of the human cognitive repertoire that enables the initial concretisation, as well as the development, of an idea.

The possibility of diverse resources acting as part of the cognitive system is highlighted in Andy Clark and David Chalmers's seminal paper, 'The Extended Mind'. In what has become a much-cited thought experiment, Clark and Chalmers suggest the hypothetical comparison of Inga, who uses her biological memory, with the memory-impaired Otto, who uses his notebook, in order to perform the same task of recalling how to find MOMA (Metropolitan Museum of Modern Art). Clark and Chalmers argue that the role the retrieved information plays in guiding their behaviour has 'sufficient functional similarity' to warrant treating both Inga's memory and Otto's notebook as constitutive of their respective dispositional beliefs that they know how to find MOMA. The potential functional similarity of the resources leads to Clark and Chalmers suggesting the following rule of thumb:

> If, as we confront some task, a part of the world functions as a process which, were it done in the head, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world is (so we claim) part of the cognitive process.[3]

While external and internal resources may share functional parity, the external resources can also be radically unlike the internal ones, as Clark describes the brain 'must learn to interface with the external media in ways that maximally exploit their particular capacities'; they can be 'alien but complementary'.[4] So while a computer does not store or compute information in the same way as the brain, it can for that very reason be useful in supplementing neural capacities. Through their differences, as well as similarities, various forms of representational and computational resources can supplement biological limitations. This proposal expands on a theory called 'distributed cognition', which was developed by the cognitive anthropologist Ed Hutchins; and the term is sometimes used interchangeably with 'extended mind'. In his study of ship navigation, *Cognition in the Wild*, Hutchins made a case for cognitive systems as distributed both through equipment that incorporates aspects of necessary expertise and through other social agents, as the navigation team operate collectively as a computational system.[5] Clark first encountered such ideas in a particular passage by Rumelhart and his co-authors in their 1986 paper, and Hutchins also credits this passage with influencing his theory.[6] Rumelhart and his co-authors describe the tendency of the brain to rely on external resources to overcome its limitations. They provide the example of our typical use of a pen and paper as tools to complete difficult mathematical sums: we divide the task into simple pattern completing sections easily perceivable and manageable by our brain and store the accumulation of data on paper so that, as they describe, 'the external environment becomes a key extension to our mind'.[7]

This essay will explore how this understanding of the mind as non-trivially extended both resonates with and invites a reappraisal of existing literary and cultural studies and is evident in Renaissance notions of the mind.

Renaissance Textuality and Memory

Intimate technological relations have always been an essential aspect of our humanity. Clark describes that:

> We see some of the cognitive 'fossil trail' of the cyborg trait in the historical procession of potent cognitive technologies that begins with speech and counting, morphs first into written text and numerals, then into early printing… They constitute… a cascade of 'mindware upgrades': cognitive upheavals in which the effective architecture of the human mind is altered and transformed.[8]

One pathway on this trail is the history of the book, an area of research that has long been considering the effect on culture and cognition of the technological changes from orality to literacy and from manuscripts to printing. One of the most seminal examples of the literature on these transitions is Michael T. Clanchy's *From Memory to Written Record*. Much like those philosophers who conceive of language as a 'mind tool', Clanchy comments that 'literacy in itself is primarily a technology… penetrating and structuring the intellect itself'.[9] Following Clanchy, Walter Ong unreservedly argues for the need to reappraise the effects of writing on humans:

> Many of the features we have taken for granted in thought and expression in literature, philosophy and science, and even in oral discourse among literates, are not directly native to human existence as such but have come into being because of the resources which the technology of writing makes available to human consciousness.[10]

Books make perceptions of language more material and increasing textuality results in the development of new forms of cognition.[11]

Recent interest in the materiality of texts has led to work on related topics such as marginalia. William Sherman's *Used Books* makes evident the cognitive work being done by the common Renaissance practices of readers' annotation and alteration of the books with, for example, the mental connotation of 'to mark' developing out of the physical practice (2008, 3). Readers' alteration of books when they were bound or rebound, with the addition of blank pages for personalized indexes and tables, the rearranging of sections, and even the recombination of sections with other texts, Sherman argues, demonstrate that readers were 'active and appropriative' participants, who challenged 'the integrity of the entire printed book'.[12] Like Sherman, Ann Blair and Daniel Rosenberg describe how glossing, personal additions to indexes, abbreviations and symbols, notetaking and literal cut and pasting were used to organise and personalise the ever increasing information available.[13]

A familiar reason for such active reading practices lies in another aspect of this cognitive fossil trail: early modern information overload. Modern academics' wonder and anxiety about the proliferation of publications in our 'information age' is paralleled by early modern scholars' reaction to the growing number of books available due to print technology. Offloading information via representational and organizational modes enables readers to deal with the increasing cognitive loads. These advances progressively serve to extend the amount of information which minds can remember through offloading it in increasingly structured external systems, which then increases the further advances possible; therefore it is a spiralling developmental process that occurs.

Commonplace-books, consisting of series of quotes ordered by readers under headings, were in effect an extension of this active type of reading practice. Ann Moss describes how the multiplicity within the popular commonplace-books was viewed in terms of a greater unity and extendibility, as the commonplace-book reflects a belief in making a single body from many strands.[14] Thus commonplace-books operated as an external cognitive resource for storing, evaluating and generating information, and this example of Renaissance fragmentation did not necessarily involve psychoanalytical or postmodern notions of lack and rupture, but could be understood as a means of organising a vast array of wide-ranging and counterbalanced units of information in a productive open ended system.

Many influential Renaissance books such as Montaigne's *Essays* compile authorities' quotes under headings, interfusing and developing these along with their own views, and continuing to revise and add material even after publication, as an ongoing generative process. Ben Jonson's *Timber; Or Discoveries*, also essentially a commonplace-book, expresses views through selective borrowing; Jonson describes it as 'made upon men and matter: as they have flowed out of his daily readings; or had their reflux to his peculiar notion of the times'.[15] Such books act as a means to develop complex reflective structures through appropriating the tangible structures of textual matter. Commonplace-books also stand in for memory, suggesting an easy fluidity between biological and textual forms, and between one individual's memory and another's. Justus Lipsius' *Politica* describes history as memory in print and as 'the soule and life of memory…For in her, as in a glasse, thou mayest, adorne and frame thy life by the vertues of other men'.[16] He then goes on to describe history as superior to individual experience since she safely 'extendeth her bounds further'.[17] The textual was understood as itself memory, with the narratives of the lives of others a means to supplement individual memory and experience; the textual is a means to augment moral bearing, and may be a more reliable guide for dispositional beliefs than one's own experience.

The study of memory has also long been concerned with the effects of technology on culture, subjects and cognition. Francis Yates's *The Art of Memory* is still the standard reference book in this area, although more recently John Sutton and Evelyn Tribble have been exploring the relations between concepts of memory in the Renaissance and current theories of distributed cognition, particularly with reference to acting and worshipping practices.[18] Yates

describes the shaping of knowledge through the memory arts, whereby by attaching a sequence of information to a sequence of architectural features or places, one could then recall the information by again visualizing these features.[19] The memory arts were viewed as supplementing the leakiness of the biological memory. Ong, in his review of Yates, emphasises that since the memory spaces are conceived as something the individual is inside of, or looking into, 'the space and its contents are felt in one way or another as an extension of oneself'.[20] Thus, while concerns about memory remain the same (in terms of its limitedness and uncontrollable nature) the means of dealing with these vary in relation to the resources available.

As the computer became the mind model of 1950s classical cognitive science, so the printed book, as the new technology of the Renaissance was used to figure and to comprehend the memory's or the mind's functions. The 'House of Alma' section in Spenser's *Faerie Queene* represents the body as a castle and the head as a turret with three chief rooms that house the faculties of imagination, judgement and memory. The old and feeble Eumnestes (good memory) requires the aid of a young assistant Anamnestes (reminder) as they labour ceaselessly in their ramshackle library in which:

> …all was hangd about with rolles,
> And old records from auncient times deriu'd,
> Some made in books, some in long parchment scrolles,
> That were all worme-eaten, and full of canker holes.[21]

Rhodes and Sawday suggest that the perpetual activity of the librarians in the dilapidated library, where records are 'lost' or 'laid amiss', is an image of the imperfect human mind that was spawned through the new print technology;[22] although it is perhaps worth adding that in this case it is rather an image of one faculty of the human mind, the memory, since there are in addition the rooms of the imagination, and judgement as well as other 'diverse roomes and diverse stages' in the turret which acts as 'the mind model'.[23] Memory's need for supplementation is also evident in Thomas Tomkis's play *Lingua*, in which Anamnestes complains that his master Memory is every hour calling for him because he has 'growne so old and forgetfull'.[24] Even more troublingly, as Montaigne observes, you do not necessarily get to choose what remains and what slips away:

> For memory sets before us not what we choose, but what it pleases. Indeed there is nothing that imprints a thing so vividly on our memory as the desire to forget it: a good way to give our mind something to guard and to impress it on her, is to solicit her to lose it.[25]

From these extracts, Renaissance insight into the quasi-independent functioning of aspects of one's own mind is apparent, along with a realisation of the memory's flawed nature.

In describing *The Faerie Queene*, Spenser expounds that the 'generall end' 'of all the booke is to fashion a gentleman or noble person', which again evokes Renaissance belief in the power of a book to fundamentally shape a person.[26] Greenblatt has persuasively argued that the use by Protestants of the Bible, which led to the shifting of authority from the church to the book, also carried over to belief in secular texts' ability to carry out 'a coup in the very heart of the individual'.[27] Greenblatt conceives of such fashioning relations as involving 'identity as achieved at the intersection of an absolute authority and a demonic Other'.[28] Anxiety about texts bypassing the safeguard of transmission via a guiding authority is certainly evident from religious, political and literary censorship. This ambivalence about texts can also be allied to a continuing ambivalence about speech. In the Christian schema Jesus and the Bible as the living

and written word of God, and man as God's image, is juxtaposed by the Tower of Babel and the Fall. The supposed flaws of technologies were seen, when taken back to the root, as a result of flawed human nature. Yet as reflected in Spenser's intents, the nature of language was also celebrated for its ability to augment human nature.

In Francis Bacon's account, language is a necessary mind tool that supplements biological cognitive processes. He argues that the limitedness and uncertainty of human knowledge is not just attributable to the senses, but generally to the intellectual powers' weakness.[29] Bacon states that he explains this to stir us up to seek help, giving the physical parallel that 'no man, be he never so cunning or practised, can make a straight line or perfect circle by steadinesse of hand, which may bee easily done by helpe of a Ruler or Compasse'.[30] Like the body, the intellect requires tools and assistance: 'Neither the bare hand nor the unaided intellect has much power; the work is done by tools and assistance, and the intellect needs them as much as the hand'.[31] One such tool are words, which he argues enable us to recover knowledge, while writing enables the retaining of knowledge.[32] In his book on rhetoric, Thomas Wilson describes God's gift of speech after the Fall as restoring man's humanity, and bringing civilization, social fellowship and technological skills (1553).[33] George Puttenham explains that although language is not quite as natural as sensory acts, the arts relieve the natural as does the spectacle the eye; they are a prosthetic to the understanding (1589).[34] Tomkis's play *Lingua* theatricalises Clark's proposal that language is akin to the human race having learned a new perceptual modality, since the central conceit of the play is speech demanding recognition as one of the five, or rather six, senses.[35] A mixture of views is voiced then, with language described as enabling human redemption, as constituting human nature, and as a cognitive prosthetic.

Ben Johnson describes language as that which allows the mind to be mediated:

> Language most shows a man: speak that I may see thee. It springs out of the most retired, and inmost parts of us, and is the image of the parent of it, the mind. No glass renders a man's form, or likeness, so true as his speech.[36]

Implied here is both the view that language makes the mind visible by acting as a transparent glass through which the mind can be seen, *and* the idea that language provides an image of the mind in the same way as one's image is replicated in biological offspring. This implies a stronger resemblance than we might recognise today since, as Helkiah Crooke describes, a child is an extension of his parent:

> For so euery *indiuiduum* extending it selfe as it were, in the procreation of another like vnto it selfe, growth young againe and becommeth after a sort eternall. The father liueth in the sonne, and dyeth not as long as his expresse and liuing Image stands vpon the earth.[37]

This also implies a strong relation between concepts of physical and mental means of extending oneself. There is a close relationship in Renaissance thinking between physical and mental conception, and the production of biological or cognitive offspring. For instance, in *Troilus and Cressida* Ulysses appeals to Nestor: 'I have a young/ Conception in my brain; be you my time/ To bring it to some shape'.[38] The idea of bringing the conception 'to some shape' echoes Renaissance language used to describe the transition of the foetus from a mass of matter to form.[39] It also suggests a notion of intersubjective cognitive intercourse as operative in producing thoughts. A later example in the play presents the quasi-independent status and potential unruliness of the cognitive offspring: 'My thoughts were like unbridled children, grown/ Too headstrong for their mother'.[40] That the mind may be impregnated like a mother's

womb was physiologically naturalized by accounts reporting the similarity between the material protecting the womb and the brain. In Bartholomew Traheron's translation of Joannes de Vigo's medical dictionary the 'Pericranium' is defined as 'lyke the skynne wherwith a chylde is wrapped, in the moothers woumbe'.[41] Yet, the conceit could also work the other way: *England's Merry Jester,* a popular jest book, describes the tale of a woman who has failed to conceive. At first unable to say the reason out of modesty she attempts to write it down, but it is observed she is unable to do so because there is 'no Ink in her Pen', to which she responds they have found out the reason without her needing to write it; hence, the cause is her impotent husband figured by the inkless pen.[42] Thus, the figuring of brain as womb, and of producing thoughts or writing as cognitively equivalent to producing a child, infiltrated diverse spheres' modes of understanding these activities.

A related conceit was employed in reference to texts. In his dedicatory epistle to *Devotions* Donne describes a two-way production: 'In this last Birth, I my selfe am borne a Father: This Child of mine, this Booke, comes into the world, from mee, and with mee'.[43] Thus, the mind through being produced on the written page produces the subject which in turn produces the book. Montaigne more explicitly describes this two-way movement, back and forth, between the construction of the book by him and his own construction by the book:

> In modelling this figure upon myself, I have had to fashion and compose myself so often to bring myself out that the model itself has to some extent grown firm and taken shape…I have no more made my book than my book has made me – a book consubstantial with its author…[44]

This concept included not only the fashioning of the subject or the mind through interaction with one's own text; a text was also valued for its potential ability to generate mental offspring in others. Ficino expresses the textual and collaborative nature of cognition, with his description of his own work as a 'mind':

> …by means of mind, we shall ourselves have the power of creating mind…I may perhaps have created, in a night's work, a mind of this kind, by means of mind; and this mind I would now introduce among you in order that you yourselves…may at some time bring forth an offspring…[45]

Mind produces mind in succession; whilst this may appear more a case of the reproducing rather the extended mind, again it needs to be considered in the light of Renaissance views of reproduction as an extension of the individual. The reciprocal flows between individual and social, and between textual and biological cognitive resources are a cause variously of anxiety about and celebration of the fertile and multiply realizable nature of mind and self.

'Sonnet 77'

This final section considers how these parallels between current and Renaissance notions of the extended mind and subject can inform a reading of Shakespeare's 'Sonnet 77'. 'Sonnet 77' lies within the 'young man' sequence of the sonnets, which explores the benefits and downfalls of textual and biological forms of reproduction, with the latter earlier figured as a glass ('Sonnet 3', line 9: 'Thou art thy mother's glass'), another newly improved technology.[46] In this sequence the shortcomings of both biological and textual forms are repeatedly juxtaposed from oscillating perspectives, with proffered solutions later overturned or undermined, and interwoven with concerns about mortality and endurance, and memory and forgetting. The central argument is that a textual representation lacks embodied form, whereas a biological one since living is therefore transient and lacks the endurance of the textual. Joel Fineman's reading

of the sonnets stresses the anxiety involved in a psychological or textual displacement of the subject, and characterises language as perceived as 'something corruptingly linguistic'.[47] Yet a consideration of Renaissance views of the formative and augmentary capacity of language enables a reading of the sonnets that allows other factors to emerge, such as the celebratory aspect of human's capacity to reproduce through biological *and* linguistic couplings.

'Sonnet 77' uses the word 'glass' both to indicate an offspring and to refer to an actual mirror, while the use of a book is described as a means to supplement the biological mind:

> Thy glass will show thee how thy beauties wear,
> Thy dial how thy precious minutes waste,
> The vacant leaves thy mind's imprint will bear,
> And of this book this learning mayst thou taste:
> The wrinkles which thy glass will truly show
> Of mouthed graves will give thee memory;
> Thou by thy dial's shady stealth mayst know
> Time's thievish progress to eternity;
> Look what thy memory cannot contain,
> Commit to these waste blanks, and thou shalt find
> Those children nursed, delivered from thy brain,
> To take a new acquaintance of thy mind.
> These offices so oft as thou wilt look,
> Shall profit thee, and much enrich thy book.[48]

The poem offers a comparison of three objects through whose use the young man may learn about himself physically, temporally and intellectually. These tools provide various means whereby he may increase his knowledge about himself and the world, by making that which would otherwise be invisible visible: his face, time passing, and his thoughts. The opening couplet allots a line each to the glass and to the dial respectively and these are both personified and use a positive active verb, 'show', while the young man's 'beauty' and 'minutes' will only 'wear' and 'waste', with the ambiguity of 'wear' (spelt 'were' in the original) projecting him into a hypothetical future (1609).[49] Contrastively in the following couplet allotted to the book, in line 3 an active verb expressing a passive activity, 'will bear', is used of which the 'vacant leaves' are the subject, and then in line 4 an active verb depicts the young man as the subject who will 'taste' the objectified 'learning'. So a contrast is set up between the passive position the young man occupies in relation to the revelations made known to him by the glass and dial, and the active procreative position he may occupy in relation to the revelations of the book.

The transience of time is conveyed through a circular dynamic which moves the reader backwards and forwards both spatially over the surface of the sonnet and temporally over the vector of human life. Lines 3 and 4 set up the following eight lines as a list of the learning which will arise from his externalisation of his mind onto the book. In this list a couplet is allotted both to the dial (5-6) and the glass (7-8) and then a quartet to the book itself (9-12). This self-reflectiveness is continued by the closing couplet which cites the offices of the previous list, the learning which he will take from the 'book' in line 4, as in turn enriching the 'book' of line 14. By making lines 5-12 dependent on the use of the book in lines 3-4, the suggestion is that this process is also necessary in order for the young man to truly perceive that which his glass and dial have to teach him. The literal glass will teach him the local reality of the diminishment of his beauty and the 'mouthed graves' of his wrinkles will prophetically remind him of his mortality. On another level, the dial will teach him the global reality of time's 'thievish progress to eternity'. His particular transience is set up against universal everlastingness, whilst yet being revealed as part of the same movement of time. The 'vacant

leaves' and 'waste blanks' are set against the ominous 'mouthed graves' and inevitable 'minutes waste' as open spaces which may be used as fertile preservers of the past and as a means of not only understanding but acting against transience and mortality. This depiction of the book draws on Renaissance notions of the impregnable mind: the written words' deliverance through their metaphorical embodiment, so that he may come to know them anew, as produced by him and yet still requiring reacquaintance, then turns the movement inward again, bringing the process spiralling into a new conception.

This idea resembles the examples from Montaigne, Donne and Ficino which led into this discussion. The mind through being objectified for itself on the written page will 'profit' the subject which will in turn again 'enrich' the book; demonstrating that book-using can extend the mind's capacity to build thoughts upon thoughts, which will in turn improve the book, and so on in spiralling developmental cycles. That the mind or subject may be encapsulated by a textual distillation, and further that this distillation of the mind will in turn teach the mind that created it, creates a circularity and reciprocity between created and creation which places their duality in question. To replay the opening quote from Clark, 'this intellectual product owes a lot to those repeated loops out into the environment'.[50]

The dial and the book also function as metaphorical glasses, as like the literal glass they are represented as allowing the young man access to an extended reflexivity. I use the term 'extended reflexivity' to describe the way in which objects, environments, and other people, can contribute to and participate in self-knowledge.[51] The significance of an object or another person enabling such a form of self-knowledge is underlined by the fact that it is the rational soul which performs this function in Renaissance definitions. As John Donne describes it: 'The difference between the Reason of man, and the Instinct of the beast is this, That the beast does but know, but the man knows that he knows' [sic].[52] So there is an understanding that what marks out the human mind is its ability to reflect on itself, with this reflective cognitive capacity instead generated here most expansively by the book.

On a first reading the exchange of memory for book emphasises their parity, as in Clark and Chalmers's description of Otto and Inga: the words are stored in the notebook as they would otherwise be stored in the memory, and mental conceits are extended to figure the productive capacity of the text. There is a collapsing of the differences between the recorded memories and biological cognition, as the textual records will appear to grow. One way of interpreting this would be to say that as we change, so do the meaning of words open to us in correspondence to our own development, although in fact the same words appear on the page; in the same way, my interpretation of Shakespeare's words have changed through subsequent re-readings, and hopefully on reading this it may have influenced your own. Indeed, while I predominantly refer to the addressee as the young man, it is worth noting that a reader seems to be directly addressed through its use of 'thy' or thou', and consequently to feel personally implicated in the losses threatened and the gains proffered; both a general and a particular reader are gestured towards. There is a further complication here in that the whole sonnet could work as a self-address. The self-reliance and discovery through the written word that the poet is presenting to the young man could equally be spoken to himself, who exhibits a yearning for self-understanding through the written text of the sonnets and who in 'Sonnet 62' already occupies the hypothetical future gestured towards, seeing already reflected in his glass the wearing of his beauty.[53]

However, at issue in 'Sonnet 77' is its complementary durability, in contrast to the limited and leaky biological mind: 'Look what thy memory cannot contain'. This is a sentiment we find envisaged by Montaigne in reference to his own book: 'It may know a good many things that I no longer know and hold from me what I have not retained and what, just like a stranger, I should have to borrow from it if I came to need it'.[54] There is a further suggestion of an equivalency *and* a contrast being made by Montaigne between cognitive processes stored in

the biological memory or a book in his comment that: 'For lack of a natural memory I make one of paper, and as some new symptom occurs in my disease, I write it down'.[55] Awareness of the leakiness and mutability of memory led to the perceived need of cognitive supplementation by non-biological resources, such as a book. As Clark describes: 'Ours are (by nature) unusually plastic and opportunistic brains whose biological proper functioning has always involved the recruitment and exploitation of nonbiological props and scaffolds'.[56]

Shakespeare's description of memory is based in humoral models of human psychophysiology, with the notion of neurological fluidity evident in works such as Crooke's *Mikrokosmographia*, or Traheron's translation of Joannes de Vigo's medical glossary (1543) in which under the entry for 'the brain' the descriptions involve many terms suggestive of fluidity or potential leakiness: 'bored through with holes', 'condute pypes', 'tunnelled', 'nette', 'lattesse wyse', and 'perced lyke a strayner'.[57] The humoral brain, akin at least in its mutability to the brain described by contemporary neuroscience, was likewise perceived as poised, and in need of, the co-opting of complementary external resources. Thus, the brain as a finite and leaky container is contrasted with the textual representation as a durable supplement, which recalls the two mediums' dissimilarity, that is, their complementarity rather than parity. So here emphasis is placed on the value of the notebook, precisely because it offers an alternative to biological mnemonic processes. In addition, since the glass need not only refer to a literal mirror, but also to biological descendants, equivalence and contrast can also be surmised between biological and textual offspring. Notably, in line 3 the use of 'will bear' echoes its earlier use in the sonnet sequence to refer to a biological offspring: 'His tender heir might bear his memory' (1.4). Since the glass in 'Sonnet 77' only reveals the young man's decay, the superiority of a textual heir is implied here, which echoes Montaigne's preference for textual to biological offspring.

This evidence both of a collapsing of differences, and of the placing of emphasis on it, suggests awareness both of the fluctuating nature of these boundaries and of the complementarity, as well as parity, of the roles that external cognitive resources could play. The reassurance offered by 'Sonnet 77' in the form of the book as an extension of the young man has underlying it a wider anxiety about the stability of memory forms, and so of subjectivity. A forgetting, that like mortality ends only in silent 'mouthed graves', haunts this sonnet, and the sonnet sequence. Sonnet 126, the final sonnet of the young man sequence, ends forebodingly with a couplet of gaping parentheses:

( )
( ) [58]

Yet, vitally juxtaposed with the sense of mortality, loss and forgetting is the generative capacities that this enables. The reader or listener's anticipation is left grasping because of and despite this structural and auditory absence. These are also 'waste blanks', which leave a vaginal or womb-like procreative space for readers' and listeners' imaginations, who in attempting to fill it fertilely wonder at the array of meanings which this space affords. There is a celebration of the book as a living image, with corporeal processes used to understand cognitive and technological processes of reproduction. The mutability of the textual and the biological forms indicate the potential space for creative reproduction through the very possibility of 'a new acquaintance' with the forgotten. Such fertile parallels between current hypotheses of extended mind and Renaissance (and specifically Shakespearean) texts invite complex and rich literary readings and inspire a re-evaluation of what constitutes historically situated and literary figurations of cognition and subjectivity.

[1] Andy Clark, *Mindware* (Oxford: Oxford University Press, 2001), 142. This paper was originally presented at the Balzan Project Symposium in Durham and the First International Cognitive Humanities Conference in Bangor in 2012. The author wishes to warmly thank the Leverhulme Trust who awarded her an Early Career Fellowship (2011-2013) and which thereby enabled the research that led to this paper; the author also wishes to warmly thank the AHRC for funding a further fellowship on the History of Distributed Cognition Project, during which time the essay was edited.
[2] Andy Clark, *Natural-Born Cyborgs* (Oxford: Oxford University Press, 2003), 48.
[3] Andy Clark and David Chalmers, 'The Extended Mind.' *Analysis* 58.1 (1998), 8.
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