

Seasonal Variations in the Flow of Milton's Poetic Vein: Neurophysiological Considerations

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Abstract

The vagaries of poetic inspiration have often been regarded as ineffably mysterious, and have provoked conjectures since antiquity. Instead of invoking the muses, we today are more apt to consider neurophysiological factors. The case of the great English poet John Milton, whose poetic inspiration seemed to follow a marked seasonal pattern, is considered here, and evidence is presented to show changes in this pattern over his lifetime. In contrast to a vernal efflorescence in youth the poetical efforts of more advanced age (leading to his masterpiece *Paradise Lost*) showed an autumnal and winter pattern. By way of explanation, possible hormonal influences on brain functions are discussed.

Keywords: Milton, poetic inspiration, seasonal patterns.

1. Introduction

John Milton, the author of *Paradise Lost*, is undeniably one of the greatest poets in the English language, and still generally regarded as holding the next place after Shakespeare. According to testimony dating from his lifetime, his poetic vein is said to have flowed easily only during certain times of the year. On the face of it, this statement is remarkable, and would seem to have important implications, biological or psychological, as to the nature of creativity, or at least of poetic creativity. Moreover, it is well attested, supported implicitly by various passages of his poems and a number of anecdotes as given by his first biographers.

Though there is agreement on the main point, the testimony is inconsistent as to just when Milton may have found it easiest to write. There have also been questions about whether the same pattern held throughout his life or whether that established in youth might not have reversed in later years, as he aged and became blind.

2. Background on Seasonal Fluctuations

2.1 Autumnal to Vernal Equinoctial

At first blush, the most reliable testimony in the matter would seem to have been that provided by Edward Phillips (1630-ca. 1696), Milton's nephew by his sister Anne Milton Phillips. Phillips had once been his uncle's pupil, and he was also the source of the earliest biography of the poet (Phillips, 1957). Phillips recounts some of the circumstances in which Milton, in his blindness, composed the immortal *Paradise Lost*:

The height of his noble fancy and invention began now to be seriously and mainly employed in a subject worthy of such a Muse, viz. a heroic poem, entitled *Paradise Lost*.... This subject was first designed a tragedy, and in the fourth book of the poem there are ... verses, which several years before the poem was begun, were shown to me and some others, as designed for the very beginning of the said tragedy. The verses are these:--

O thou that with surpassing glory crown'd!
 Look'st from thy sole dominion, like the god
 Of this new world; at whose sight all the stars
 Hide their diminish'd heads; to thee I call,
 But with no friendly voice; and add thy name,
 O Sun! to tell thee how I hate thy beams
 That bring to my remembrance, from what state
 I fell, how glorious once above thy sphere;
 Till pride and worse ambition threw me down,
 Warring in Heaven, against Heaven's glorious King.

It thus appears that Phillips had at least an occasional perusal of the poem and was able to note its progress from the very beginning. During subsequent visits he was shown, he says, "parcels of ten, twenty, or thirty verses at a time, which being written in whatever hand came next, might be in need of correction." (Because of his blindness, Milton composed the verses in his head in the early morning hours; he was then "milked"—his term—by amanuenses, usually his daughters, who transcribed as he recited.) What Phillips says next seems to record a very vivid and specific recollection:

Having as the summer came on, not having been showed any [verses] for a considerable while, and, desiring the reason thereof, was answered: That his vein never happily flowed but from the autumnal equinoctial to the vernal, and that whatever he attempted [otherwise] was never to his satisfaction, though he courted his fancy never so much, so that in all the years he was about this poem, he may be said to have spent but half his time therein.

Nothing could seem to be more definite. Moreover, Phillips cannot have been guilty of mere careless error of transcription, as he repeated this same observation to the antiquarian John Aubrey, who records in one of his *Brief Lives*:

From Mr. E. Philips [sic]:--All the time of writing his *Paradise Lost*, his vein began at the autumnal equinoctial, and ceased at the vernal, or thereabouts (I believe about May), and this was 4 or 5 years of his doing it (Aubrey, 1669).

To these testimonies may also be added the report of the third and last Mrs. Milton, who concurred: her husband composed best in the winter (Darbishire, 1932).

2.2 Springtime

Edward Phillips, John Aubrey (who got his information from Phillips and confirmed his testimony, ruling out an error of transcription) and the third Mrs. Milton, all of whom would seem to have been in a good position to know, concur that Milton composed most easily in the winter. Nevertheless, John Toland (1670-1722), another early biographer of Milton, found their contention counterintuitive. Though Toland did not actually know Milton personally, he claimed to have had it from a “more judicious [but unnamed] friend” of Milton that the poet composed well only in the spring and the autumn (Phillips, 1957). In support of this remark, Toland offered a reference to one of Milton’s youthful *Elegies*, in which Milton declares that the advance of spring brings about the increase of his poetical force, “*redeunt in carmina vires.*”

Toland’s evidence did not impress Samuel Johnson, who in his own life of Milton remarked, with his usual sagacity: “Phillips could hardly mistake time so well marked.” Nevertheless, he refuses to dismiss Toland’s position out of hand. Instead he suggests that the seemingly contradictory testimony might well be reconciled if “Milton [found] different times of the year favourable to different parts of life.” (Johnson, 1975). Johnson does not pursue the matter further, presumably from skepticism that seasonal effects on poetic composition in any combination could possibly be real or anything more than the product of autosuggestion. With his strong sense of human responsibility and free will, he dismisses such ideas as mere “fumes of the imagination”:

The author that thinks himself weatherbound will find, with a little help from hellebore, that he is only idle or exhausted. But while this notion has possession of the head, it produces the inability which it supposes. Our powers owe much of their energy to our hopes; *possunt quia posse videntur*. When success seems attainable, diligence is enforced; but when it is admitted that the faculties are suppressed by a cross-wind, or a cloudy sky, the day is given up without resistance; for who can contend with the course of nature? (Johnson, 1975).

2.3 Evidence for Springtime Poetic Fecundity

Recent research into the biological factors underlying mood swings, motivation, and creative efforts makes it harder for us to contend that the processes of creativity are entirely—or at all times—under the control of conscious will and effort. This seems to be particularly the case with certain types of creative enterprise, and most exquisitely, perhaps, poetry, which has long been seen to be particularly vagrant and variable.

In antiquity, poetic inspiration was regarded as one of the forms of divine madness, and experienced as something coming from *outside* the self (as a visitation or a gift of the gods or the muses). Plato says in the *Ion*: “The epic poets, all the good ones, have their excellence, not from art, but are inspired, possessed, and thus they utter all these admirable poems.” E. R. Dodds traces this idea all the way back to Homer and Hesiod. In the *Odyssey* it is a gift of the Muse who, having taken from the rhapsode Demodocus his eyesight (outward vision), gives him something better, the gift of song, “because she loved him.” According to Dodd, “if we consider the occasions on which the Iliad-poet himself appeals to the Muses for help, we shall see that ... he always asks the Muses what he is to say By their grace poet and seer alike enjoyed a knowledge denied to other men.” (Dodds, 1951) In similar fashion the romantic poet Shelley, in *A Defense of Poetry*, says: “A man cannot say, ‘I will compose poetry.’ The greatest poet even cannot say it; for the mind in creation is as a fading coal, which some

invisible influence, like an inconstant wind, awakens to transitory brightness... and the conscious portions of our natures are unprophetic either of its approach or its departure.” The aged Thomas Hardy told Robert Graves that “he could once sit down and write novels to a time-table, but that poetry always came by accident, which perhaps was why he prized it more highly.”(Graves, 1957)

When Milton was a young man, he seems to have had marvelous fluency for poetic composition, with the ability to versify (not only in English but in Latin and Italian in which his effusions are even more numerous) almost “to a timetable.” There are a number of passages which suggest a particular facility in the spring. In his early Elegy V, *In adventum veris* (On the Coming of Spring), written at about age 20, Milton tells us that with the warmth of spring his powers of composition return and rise even as does the sap in the trees. As he says (in translation):

Earth, with her strength renewed, is donning her brief youth and the frost-free soil is putting forth its green sweetness. Am I deluded? Or are my powers of song returning?... My breast is aflame with the excitement of its mysterious impulse and I am driven on by the madness and the divine sounds within me. What mighty song is my soul pouring from its full throat? What is to be the offspring of this madness and this sacred ecstasy?(Hughes, 1957, p. 37)

The rising of Milton’s powers like that of the sap in the trees—the description of his breast being aflame with excitement—of being seized by mysterious impulses—his mention of the word madness—and the reference to his song pouring forth from a full throat and of “offspring”—all suggest the return of a strongly vernal-coupled excitement and drive (obviously such imagery as the sap rising in the trees is also sexual in nature). Many of Shakespeare’s lyrics also suggest that the spring-time is also a ding-a-ding ding time, and it is reasonable to think that the writing of poetry associated with love and courtship—which contains the majority of sonnets and lyrics—is abetted in the spring when “a young man’s fancy lightly turns to thoughts of love.”(Tennyson, 1842)

Among other early Miltonic poems that suggest the genial influences of vernal inspiration are:

Song: on a May morning.

...Hail bounteous May that dost inspire
Mirth and youth and warm desire!
Woods and Groves are of thy dressing,
Hill and Dale doth boast thy blessing.
Thus we salute thee with our early Song,
And welcome thee, and wish thee long.

O Nightingale!

O Nightingale, that on yon bloomy Spray
Warbl’st at eve, when all the Woods are still,
Thou with fresh hope the Lover’s heart doest fill,
While the jolly hours lead on propitious May
Thy liquid notes that close the eye of Day,
First heard before the shallow Cuckoo’s bill,
Portend success in love.....

Admittedly, one of Milton’s only failed attempts to capture an inspiration occurred in the early spring: this is “The Passion,” written in March 1630 in conscious emulation of the success of his well-known “Nativity Ode,” written the previous Christmas. Milton breaks off

abruptly after only eight stanzas, adding the note: “This Subject the Author finding to be above the years he had, when he wrote it, and nothing satisfied with what was begun, left it unfinished.” But this exception may be accounted for by the uncongenial nature of the subject-matter and his strained and self-consciously ambitious attempt to emulate his previous success. With this exception, it would appear that his muse was usually his to command.

A spring-time association with the unleashing of creative energies was certainly strongly seconded by Renaissance ideas about the influence of climate on intellect and temperament, in which Milton had been immersed. Z. S. Fink, in a paper “Milton and the Theory of Climatic Influence,” discusses the view that Renaissance lore held that peoples inhabiting cold countries were anti-intellectual, violent and barbaric compared with those inhabiting the more civilized, more intellectual and warmer south. (Milton himself might well have found this association between civilization and warmer climates reinforced from his travels in 1638-39 in Italy.) (Fink, 1941). Further, a slow, phlegmatic mind was supposed to be associated with a cold and dull personality and with a cold climate and a cold season, even as an imaginative and sanguine mind was associated with a warm and keenly alert personality and a warm climate and a warm season. These views are consistent with the theory of humors elaborated in Burton’s *Anatomy of Melancholy*, a book Milton greatly admired and whose prefatory poem may well have served as a direct influence on Milton’s virtuoso set-pieces *L’Allegro* and *Il Penseroso*.

Burton alleges that natural melancholy, whose characteristic is coldness, is “an inseparable accident” of old age. Milton would later echo this view in *Paradise Lost* in Gabriel’s admonition to Adam. As age comes on, Gabriel warns,

... in thy blood will reigne
 A melancholy damp of cold and dry
 To weigh thy spirits down, and last consume
 The Balme of Life.(Milton, 1674)

Pertinently, in the invocation to Book IX of *Paradise Lost*, Milton mentions England’s cold climate and the coming of age, both of which he fears will “damp” his “wing Deprest.” The concern about the coming of age can hardly have been exaggerated or a mere poetic conceit, since Milton did not begin work on *Paradise Lost* until quite late—most of it was composed when he was in his early fifties. He must have worried that his late-courted (and at least seasonally fickle) muse might abandon him before he was finished. (Fifty was already old age in the seventeenth century; remember, Shakespeare was already dead at fifty-two.) From the above passage, it would appear that Milton himself associated cold melancholy with old age, and both with England’s cold climate.(Stroup, 1943). Even if we are willing to concede that Milton’s adoption of the theories of climatic influence or humors was at least in part a sop to convention, it is hard to imagine that Milton would have associated the melancholy of old age with cold climate if he were one whose “vein never happily flowed but from the autumnal equinoctial to the vernal”—in other words, during the cold damp and gouty months of the year. Again, this line of evidence would appear to shore up Toland’s conjecture against the claims of Phillips, Aubrey, and Mrs. Milton and in support of springtime as the season of greatest poetic inspiration.

3. Neurophysiological Foundations of Poetry

3.1 Right and Left Hemisphere Functions

Poetry has been called (in contrast to prose) “the other way of using language. Perhaps in some hypothetical beginning of things it was the only way of using language or simply was language *tout court*, prose being the derivative and younger rival.”(Nemerov, 1993). Ben Jonson put it well: “poetry speaketh somewhat above a mortal mouth.” As with music—painting—and sculpture, poetry is more formal—more structured—than prose. Indeed, T. E.

Lawrence (Lawrence of Arabia) once perceptively commented that he believed that the poet's secret was technical mastery of words, but that "painting, sculpture, music and poetry were parallel activities, differing only in the medium used." (Graves, 1960, p. 298)

Linguists have long suggested that language consists of both spatial and temporal components. Thus: "The question arises whether spatial organization is in some sense fundamental to syntax. The specific hypothesis ... is that there are both temporal and spatial aspects to language, that the two are segregated (in the two hemispheres), and that interaction between them is central to the mode of operation of the human brain." (Crow, 1997). According to this view, the dominant (left) hemisphere is assumed to have a purely sequential (unitary and temporally organized) form; the key functional characteristic is not phonological or phonetic but involves sequence, i.e., linearity. Logical form and syntax, on the other hand, are spatially distributed (allowing an element of parallel processing) and as such located, at least in part, in the non-dominant (right) hemisphere.

Recent research offers growing support for this basic schema. Though it now appears that visual-spatial abilities may be distributed between both hemispheres, the functions associated with each are thought to be somewhat different: local processing—such as the selection and assembly of appropriate sounds and words when speaking and writing—is centered in the left hemisphere, global processing, including the creation of a coherent discourse, is the province of the right hemisphere. Obviously, the creation of poetry (and of prose too for that matter) requires critical inputs from both, but if one were to distinguish, one would say that the form elements of poetry—like melody in music—are right-hemisphere dependent.

The structure of poetry, including verse and rhyme—the way that the reader is guided by the balance and shift of the line in relation to the breath as well as the syntax—indeed give a shape to poetry that can be almost independent of the meaning. (One thinks of Swinburne, for instance; what he writes is clearly poetry—lovely, incantatory, musical—but what in the world does it mean, really?) When Eckermann commented to Goethe that among several young poets scarcely one had come out with good prose, Goethe knowingly replied: "That is very easily explained; to write prose, one must have something to say; but he who has nothing to say can still make verses and rhymes, where one word suggests the other, and at last something comes out, which in fact is nothing, but looks as if it were something." (Goethe, 1901) In part this may explain the seeming paradox that in all literary traditions, excellence in poetry precedes accomplishment in prose. It seems to be—at least under some definitions—"the primal and primary form of languages themselves." (Nemerov, 1993). Similarly, George Steiner suggests that verse "precedes prose... By not being prose, by having metre or rhyme or a pattern of formal recurrence, language imposes on the mind a sense of special occasion and preserves its *shape* in the memory" (*italics added*). (Ibid., 1993). The mnemonic power of poetry as related to shape suggests right-hemisphere processing, since shape is form—on the scale of a long poem or epic it requires the involvement of the right hemisphere's specialized visuo-spatial cognitions.

Poetry is non-lexical--involving neural processes that occur independently of the "lexical-semantic level" of the left temporal lobe in which the recognition of explicit word forms and their meaning take place. (Scott and Wise, 2004) Significantly, right-hemispheric deficits result in problems with the perception of music, not speech. (Griffiths, Rees, & Green, 1999). In particular, these deficits are associated with the loss of perception of melody which requires the ability to recognize pitch (and it is significant that the use of pitch in music, which underlies the ability to recognize the contours of melody, ultimately reflects the constraints of auditory mechanisms for identifying objects and separating sound sources. Thus they are neurally processed in the right hemisphere which is specialized for visuo-spatial cognitions.) In contrast with right hemisphere lesions, left-hemisphere injury does not invariably decimate musical skills. (Sergent, 1993, p. 168).

All of these findings are consistent with the notion that the right hemisphere is dominant for spontaneous production of music and poetry. (Gordon & Bogen, 1974). (Indeed, poetry without music would almost, by definition, be a form of prose; as the French poet Paul Valery once said, prose is walking, poetry dancing. While Milton himself, in his *Elegia Sexta*, a poetical letter to his friend Charles Diodati, had claimed that poetry belongs not only with feasting, but also with music, and dancing, and love.)

There are at least some analogies to the neural processes which allow for the production of song in birds, where the neural machinery involves sexually-dimorphic structures that are primed by hormones (testosterone and thyroid hormone). Notably, song is the province of male passerine birds and occurs in the mating season—spring. In humans, music and poetry involve (as noted above) the right hemisphere, whose development is itself to some extent sexually-dimorphic.

3.2 Testosterone and Visuospatial Abilities

As first hypothesized by Geschwind and Galaburda (1985), fetal testosterone retards the rate of growth of the left hemisphere and heightens development of the right hemisphere leading to increased visuospatial capacity. Presumably, the differences between male and female brain development emerged as a result of selective pressures during evolution (for example, a superiority of males for visuo-spatial tasks would have conferred advantages in stalking animals and throwing spears and other weapons in hunting, while the superiority of females for language tasks, for which empathy is important, would have been useful in nursing and child-rearing groups.) (Kimura, 1992). These differences are exquisitely dependent on priming of neural tissue at various stages by hormones, notably testosterone. Thus, according to a recent review:

Sex steroids are typically thought to produce two types of influences: organizational effects, which are permanent and more likely to occur during early life (prenatal or early postnatal periods), and activational ones, which are transient and more likely to occur in adulthood. It is clear that sex steroids shape neural development in many species during prenatal or early postnatal life and alter a variety of reproductive and nonreproductive behaviors; the behavioral effects often are assumed to result from hormone action on the nervous system. (Halpern & Collaer, 2005).

The way that testosterone influences brain development and produces organizational and activational effects that provide enhanced visuo-spatial abilities—especially among young males—is consistent not only with formal research results but with the anecdotal observation that certain types of cognitive tasks involving “dynamic acts of location,” such as music, mathematics, and chess, which are right-hemisphere based, are almost entirely the province of gifted males. Notably, they sometimes emerge in highly developed form even before puberty, as noted in an interesting essay by the literary critic George Steiner:

There are three intellectual pursuits, and, so far as I am aware, only three, in which human beings have performed major feats before the age of puberty. They are music, mathematics, and chess.... Reflecting, one is struck by two points. It looks very much as if the formidable mental energies and capacities for purposeful combination exhibited by the child-master in music, mathematics, and chess are almost wholly isolated, as if they explode to ripeness apart from, and in no necessary relation to, normally maturing cerebral and physical traits....

Symbolic counters are arranged in significant rows. Solutions, be they of a discord, of an algebraic equation, or of a positional impasse, are achieved by a regrouping, by a sequential reordering of individual units and unit-clusters (notes, integers, rooks or pawns). (Steiner, 1984).

Presumably feats involving “dynamic acts of location” depend on organizational effects on the brain for which the surges of testosterone that occur in utero (between eight and twenty-four weeks) and soon after birth (at about five months) are prerequisite. An aptitude for poetry is similar—but seems perhaps in addition to be dependent on the later pubertal surge—for poetic achievement, though often occurring in the mid- to late-teens (as in Milton’s own case, and in that of such prodigies as Thomas Chatterton, who died at seventeen) requires not only an aptitude for “dynamic acts of location”—prerequisite to the more formal, patterned and musical elements of poetry, such as meters and rhymes—but also language skills and having “something to say,” which are later in developing. Thus Milton, in the *Ad Patrem* of 1637 (a Latin verse composition to his father, who was himself musical and had written madrigals), suggests, in his biographer William Riley Parker’s paraphrase, that “songs without words and meaning ... are only for birds—not for human beings.” (Parker, 1996).

3.3 Testosterone and Seasonal Fluctuations

A number of studies have found that endogenous testosterone levels in young men show either a positive or curvilinear relationship with visuo-spatial abilities, where both low and high testosterone levels are found to be associated with suboptimal performance and the best results are obtained by those in intermediate range. (Christiansen & Knussmann, 1987). The optimum level for spatial ability seems to lie above the level of the average female but below that of the average male. In addition, testosterone levels show marked diurnal and seasonal fluctuations, and at least in the northern hemisphere, the levels are higher in men in autumn and lower in the spring. (Valero, & Fuentes, 1998). If lower testosterone levels within the normal range are associated with greater visuo-spatial abilities (enhanced right-hemisphere function) then one might expect that men’s scores on spatial tasks would be higher in spring than in fall—which indeed proves to be the case. (Kimura & Toussaint, 1991; Kimura & Hampson, 1994). Furthermore, among young males lower testosterone levels within the normal range and greater visuo-spatial abilities occur in the spring. To the extent that the spontaneous production of poetry—like music—is a right-hemisphere dominant process, we would expect that young poets would be more likely to break out in song—or break out more frequently into song—in the spring. Thus Milton’s youthful association of spring with the rising of the creative sap of inspiration fits well with what we know of seasonal hormonal variations and their effects on cognition. As a young man, he composed best in the spring—when his testosterone levels may have been in the low-normal range but his visuo-spatial abilities were sharpest. Thus far, it would seem that Toland was right.

3.3 Testosterone and Aging

But presumably this youthful pattern would alter over the lifespan as testosterone levels decreased. Peaking before age 30, testosterone levels in males begin to decline by 1-3% every year thereafter; by age 50, the average testosterone level has dropped by 20%, by age 80 by 50%. Might this not account in part for the observation that many poets—especially lyric poets—produce their best work young, then burn out or lose their poetic inspiration, turning in the end didactic and prosy. William Cullen Bryant wrote his best known poem, “Thanatopsis,” when he was still in his teens, and though he continued to be a prolix author into old age, never again approached that youthful accomplishment. The careers of many poets who excelled in writing lyrics were ended prematurely by death; thus Keats, Shelley, Byron, etc. No one can say what they might have written had they lived longer, but Wordsworth and Coleridge—who combined forces with their “Lyrical Ballads” when they were still in their twenties—have become case-studies for the failure of poetic inspiration. The effects of opium on Coleridge may provide a plausible explanation for why his poetic inspiration failed (though he wrote prose easily enough) but that hardly explains the sad case of Wordsworth who said—

I see by glimpses now; when age comes on
May scarcely see at all.....?

His “Ecclesiastical sonnets” show the verbal facility of the man who wrote “Lines Written a Few Miles from Tintern Abbey” and the *Prelude*, but none of the inspiration.

Matthew Arnold, as a young man able to write such pleasant and effective lyrical poems as “Dover Beach,” “Thyrsis” and “the Scholar Gypsy,” noted that at thirty he already felt “three-fourths iced over”; he devoted his later years to writing essays.

Consistent with the declining level of testosterone in males, visuospatial cognition declines at a faster rate than verbal cognition as people age. (Jenkins, Myerson, Joerding, & Hale, 2000). Evidently, exogenous testosterone administration to older males (in the attempt to reverse these age-related declines) appears to produce measurable effects for visuospatial and verbal memory, spatial working memory, and Block Design scores. (Cherrier, 1999; Janowsky, Chavez, & Orwoll, 2000; Janowsky, Oviatt, & Orwoll, 1994). These cognitive deficits—along with decreased libido and a general fading responsiveness to life—must go a long way to account for the general decline in poetic creativity with age (it may also explain why theoretical physicists are almost always said to be washed up by age thirty—but that’s another essay). At least one poet—the aged William Butler Yeats—suffering from ill health and depression in his sixties, submitted to the fashionable Steinach operation (essentially a vasectomy) in an attempt to achieve rejuvenation, and in his view did so successfully: “It revived my creative power, it revived also sexual desire; and that in all likelihood will last me until I die,” he said. In his case, at least, the effects cannot have been biological, but were obviously based on autosuggestion.

3.4 Blindness and Neurobiology

Milton is an unusual case in that, after a small and brilliant output of poetry in English by age thirty, he spent two full decades producing almost no poetry at all; these were years of struggle and controversy, devoted to writing controversial prose (like his divorce tracts) and in service as Latin secretary to Oliver Cromwell—decades in which he strained and severely damaged his eyesight. From the age of forty-one on, he was blind, though his was the “drop serene” (the lens of his eye was clear not clouded, as in victims of cataracts, which meant that he could still distinguish lights and shadows but not forms). (Hughes, 1957). Importantly, his circadian rhythms would have continued to be entrained through optic stimulation involving the retinal ganglion cells of the superchiasmatic nucleus—including, most significantly, the seasonal variation in hormonal levels (including testosterone) in contrast to completely blind individuals whose cycles are free-running. Thus we can still argue for direct seasonal hormonal variations even in the aged and blind Milton, and this may at last allow us to achieve a resolution of the problem of Milton’s poetic creativity.

It is plausible that Milton’s blindness may itself have led to increased development of right hemisphere functions related to visuo-spatial processes. In the invocation to Book III of *Paradise Lost*, Milton famously describes his blindness as compensated for by an uncanny process of visioning—of seeing by Inner Light:

... Thus with the Year
Seasons return, but not to me returns
Day, or the sweet approach of Ev’n or Morn,
Or sight of vernal bloom, or Summer’s Rose,
Or flocks, or herds, or human face divine;
But cloud instead, and ever-during dark
Surrounds me, from the cheerful ways of men

Cut off, and for the Book of knowledge fair
 Presented with a Universal blanc
 Of Nature's works to me expung'd and ras'd,
 And wisdom at one entrance quite shut out.
 So much the rather thou Celestial Light
 Shine inward, and the mind through all her powers
 Irradiate, there plant eyes, all mist from thence
 Purge and disperse, that I may see and tell
 Of things invisible to mortal sight. (*Paradise Lost*, p. 40-55).

3.5 Hypotheses Concerning Neurological Effects of Blindness

We suggest that because of his blindness, Milton experienced an intensification of eidetic as opposed to phonetic or symbolic memory. It is well-known that in blind individuals hearing and other senses are accentuated; they have enhanced discrimination of pitch and greater reliance on the auditory mechanisms for identifying objects and separating sound sources (as well as reliance on tactile information) for navigational purposes, rather than relying, as sighted people do, on visual cues. We maintain that Milton's blindness by itself may well have produced a crucially subtle shift in cognitions leading to increased right-hemisphere visual and musical abilities such as have been documented in individuals who suffer injuries to the left anterior temporal lobe, injuries that are associated with the paradoxical emergence of increased capabilities for both art and music. Findings of unexpected behavioral improvement (in some areas) following such injuries have been explained as a result of what Kapur has called "paradoxical functional facilitation." Kapur noted that "in normal subjects, inhibitory and excitatory mechanisms interact in a complex harmony.... The role of inhibitory processes may be critical in mediating specific restorative paradoxical functional facilitation effects." (Kapur, 1996). This is consistent with the observation that exceptional talent in one area is often accompanied by dysfunction in other spheres. Miller et. al., in a study of twelve patients with frontotemporal dementia who acquired, or sustained, new musical or visual abilities despite the progression of their dementia, hypothesize that "selective degeneration of left anterior temporal cortex led to decreased inhibition of the more right-sided and posteriorly located visual and musical systems, and dorsolateral frontal regions involved with working memory, thereby enhancing artistic interest and productivity." (Miller, Boone, Cummings, Read, & Mishkin, 2000). Milton's case did not, obviously, involve brain damage or dementia (!); but we find it plausible to argue that his blindness led to a relative attenuation of functions associated with the same anterior temporal and orbital frontal areas, with release of inhibition and functional facilitation the more right-sided and posteriorly located visual and musical systems needed for poetic composition on an epic scale (an epic is, after all, a vast architectonic whole, a spatially organized structure of daunting length, breadth, depth and complexity, organized through rich visual imagery and complex and intricately organized syntactical structures and rhythms).

3.6 Shift in Seasonal Inspiration with Age

We realize that ours is an intricate argument, containing many contingent points that must, in the nature of things, be suggestive rather than capable of final proof. We would add but one link more to the chain. Given the effect of testosterone on the development of the right hemisphere, might not seasonal variations in hormonal levels have had a subtle but important effect on the aging Milton's ability to compose? Whereas the young man apparently composed most easily in the warmer seasons of the year--when his testosterone levels were lower and his visuo-spatial abilities were therefore higher--the older man, having lower baseline levels of testosterone, might have needed diurnal and circannual surges in testosterone to boost his levels into the optimal range for visuo-spatial cognitions. Testosterone levels are highest in the morning hours as well as in the autumn of the year. The

early hours of autumn would presumably produce a synergistic effect, and these also happen to be the times that Milton seemed to have composed most easily. According to Aubrey, Milton was methodical in his daily routine:

He was an early riser, *sc.* At 4 o'clock *mané*, yea, after he lost his sight. He had a man read to him. The first thing he read was the Hebrew Bible, and that was at 4h. *mané*-4/2 h.+. Then he contemplated. At 7 his man came to him again, and then read to him and wrote till dinner; the writing was as much as the reading... After dinner he used to walk 3 to 4 hours at a time (he always had a garden where he lived): went to bed about 9. Temperate, rarely drank between meals. Extreme pleasant in his conversation, and at dinner, supper, &c. but satirical. (Aubrey, pp. 1022-1023).

As for the seasonal variation of Milton's poetic composition, we have already quoted Aubrey's testimony:

From Mr. E. Philips:--All the time of writing his *Paradise Lost*, his vein began at the autumnal equinoctial, and ceased at the vernal, or thereabouts (I believe about May)...(Aubrey, 1957, p. 1024)

Milton himself, however, gives the most evocative account of the nature of his poetic inspiration in the invocation to Book III of *Paradise Lost*, the passage addressed to the "Heavenly Light" which touches movingly on his blindness. It reads in part (lines 13-26):

Thee I revisit now with bolder wing,
Escap't the Stygian Pool, though long detain'd
In that obscure sojourn, while in my flight
Through utter and through middle darkness borne
With other notes than to th'Orphean Lyre
I sung of Chaos and Eternal Night,
Taught by the heav'nly Muse to venture down
The dark descent, and up to reascend,
Though hard and rare: thee I revisit safe,
And feel thy sovran vital Lamp; but thou
Revisit'st not these eyes, that roll in vain
To find thy piercing ray, and find no dawn;
So thick a drop serene hath quencht thir Orbs,
Or dim suffusion veil'd....

But his blindness has not deprived him of inspiration, or (an enhanced) ability to see by his Inner Light. The Heavenly Muse, he says, visits him nightly (*P.L.*, lines 26-32; 36-39):

... Yet not the more
Cease I to wander where the Muses haunt
Clear Spring, or shady Grove, or Sunny Hill,
Smit with the love of sacred Song; but chief
Thee Sion and the flow'ry Brooks beneath
That wash thy hallow'd feet, and warbling flow,
Nightly I visit...
Then feed on thoughts, that voluntary move
Harmonious numbers; as the wakeful Bird
Sings darkling, and in shadiest Covert hid
Tunes her nocturnal Note.

Once more, according to Aubrey, the early morning hours of still-darkness were the times "friendly" to Milton's Muse; so that he "waking early (as is the use of temperate men) had

commonly a good stock of verses ready against his amanuensis came; which if it happened to be later than ordinary, he would complain, saying *he wanted to be milked*.” (Anonymous, p. 1044). Further, he spent his evenings reading some choice poets, “by way of refreshment after the day’s toil, and to store his fancy against morning.” (Ibid.). The implication is that his mind worked unconsciously during the night on the materials stored—his mind “fed on thoughts”—and then found the “harmonious numbers” come to him through “voluntary” efforts when he set himself to it during the propitious times of composition. The nocturnal process is seconded by the invocation of the nightingale, which is famous, of course, as the bird which sings at night. Its song is also seasonal—it sings only during the spring, its mating season, between about March and May (and during the winter has migrated southward as far as Uganda). We suggest that here the nightingale suggests for Milton the “nightly visitation” of his Muse rather than the season of inspiration— as early as *L’Allegro* and *Il Penseroso*, he associates the sprightly lark with the lightness of dawn and the arrival of spring, but the more plaintive-sounding nightingale with contemplation and darkness. Milton’s early compositions which hailed the revival of poetic inspiration with the spring were the period of lark-like compositions; but now he is like the nightingale, singing “darkling,” and “in shadiest Covert” (the state of blindness) tuning his” nocturnal Note.” Perhaps he even heard the nightingale singing in his garden when he composed these “harmonious numbers.” If indeed Aubrey (on Phillips’ authority) is correct in saying that Milton was able to compose only from the “autumnal equinoctial until the vernal, or thereabouts (I believe about May),” we note that this includes the period of time when the nightingale is “singing darkling.”

4. Conclusions

We have attempted to show here that the seemingly inconsistent testimony of the various authors (and Milton himself) can be reconciled. In youth, as Toland says, Milton’s vein ran easiest in the spring; in age, he composed most easily from the autumnal to the vernal equinoxes (or thereabouts), as Phillips claimed and as Aubrey and the third Mrs. Milton also attested. Dr. Johnson was also right in supposing that Milton may have found different times of year favorable in different times of life. We suggest that the influence of hormonal fluctuations, which change with both the seasons of the year and the seasons of life, may partly account for these variations.

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