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**‘Thou single wilt prove none’: Counting, Succession and Identity in  
Shakespeare’s *Sonnets***

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“Sledge was right, you are one crazy white motherfucker.”

“How can you tell?”

“I counted.”<sup>1</sup>

The need to conjoin singularity and exemplarity drives a range of Shakespeare’s procreation sonnets in the young man sub-sequence. Standing for “a singularly perfect nature” as well as for “the yet more total perfection of the Nature of nature,” as Joel Fineman puts it, the young man “represents not only the particular token and general type of ideality, but, also . . . the harmoniously organic way these are related to one another.”<sup>2</sup> Often, these sonnets achieve their end by projecting the relationship between ideal and actual onto biology; they conflate the metaphysical “pattern” – to borrow a word from Sonnets 19 and 98 – embodied by the young man with the reproductive generation, potentially *ad infinitum*, of his likenesses. This underlying logic derives, as Fineman further notes in passing, from an engagement, more or less explicit, with an inherited mathematical tradition:

Only if we grant the unitary arithmetic of idealism does it make sense that the young man, multiplying himself after his own kind, will father the “many” that will prove him “One.” And only if we accept the tidy categoriality of genus and species will we understand how the young man spawns a series of particulars whose lineal succession embodies the young man’s universality: “Proving his beauty by succession thine.” (251)

Fineman’s evidentiary instance comes from Sonnet 2, where the notion of “succession” brings

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<sup>1</sup>Thomas Pynchon, *Inherent Vice* (New York: Penguin Press, 2009), 18.

<sup>2</sup>Joel Fineman, *Shakespeare’s Perjured Eye: The Invention of Poetic Subjectivity in the Sonnets* (Berkeley: University of California Press, 1986), 251. Subsequent citations indicated by page number in body of essay.

together the biological iteration of sameness with the sequential unfolding of cardinal numbers, “proving” the currency of this “unitary arithmetic” by opening a passage between the idea of a (real) biological series (“like father, like son”) and the series of whole numbers, based on the repeated addition of the idealised unit or the one.<sup>3</sup>

Since my own rumination here on the relationship between mathematics and Shakespeare’s verse will lean heavily on Sonnet 2, let me first reproduce it in its entirety:

When forty winters shall besiege thy brow,  
And dig deep trenches in thy beauty’s field,  
Thy youth’s proud livery so gazed on now,  
Will be a tottered weed, of small worth held: 4  
Then being asked, where all thy beauty lies,  
Where all the treasure of thy lusty days;  
To say within thine own deep sunken eyes,  
Were an all-eating shame, and thriftless praise. 8  
How much more praise deserved thy beauty’s use,  
If thou couldst answer this fair child of mine  
Shall sum my count and make my old excuse  
Proving his beauty by succession thine. 12  
This were to be new made when thou art old,  
And see thy blood warm when thou feel’st it cold[.]<sup>4</sup>

The plea expressed in these lines will no doubt be familiar to readers of the *Sonnets*, many of

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<sup>3</sup>Mary Crane points to the “ongoing abstraction of mathematics” as a necessary condition for “sum[ming] my count”: “Only if the ‘one’ attached to the father is conceived of as abstract can his ‘increase’ in the form of a son be commensurable with itself. Otherwise, father and son are two different individuals and cannot be added together.” See *Losing Touch with Nature: Literature and the New Science in Sixteenth-Century England* (Baltimore: Johns Hopkins University Press, 2014), 129. As we shall see below, this abstraction was already part of the Aristotelian legacy bequeathed to early modern arithmetic.

<sup>4</sup>I cite from Katherine Duncan Jones’ edition of *Shakespeare’s Sonnets* (London: The Arden Shakespeare, 1997), but follow the 1609 Quarto punctuation. Subsequent references to this edition indicated by page number in body of essay.

which ring inventive changes on the theme: father a son so that you can defy time, preserving yourself through him. Familiar too is the complexity with which the sonnet articulates an apparently simple idea. For instance, one's progress through the octet compromises the expectation of the straightforward "when-then" structure projected by the poem's opening line. A fleeting "then" is experienced in the course of lines 3 and 4 – even though the word does not occur there – insofar as we may read them as responding to the poem's opening "when." That is, when you reach the age of forty years, you will [then] have lost the beauty you now possess. However, the arrival immediately thereafter, in line 5, of the anticipated "then" forces a recalibration. Not only are we required to expand the scope of the "when" clause to include lines 3 and 4, but rather than encountering a direct description of the situation that would pertain at that time, we confront a convoluted hypothetical, concluding in subjunctive valuation: if you were asked then, where your beauty has gone, to reply [then] that it lies in you as you [then] will be, would be a shame.<sup>5</sup> And this judgment motivates the turn to the sestet which imagines a contrasting hypothetical response, the succession that redresses the condition intimated by the poem's opening : the inevitability of aging (and, ultimately, dying).

Though by no means undemanding, the sonnet's syntax nonetheless holds complexity in check, tightly coupling its temporal unfolding to the logic of its argument. And yet it does not take much to unloose these bonds and let the poem's paradoxes proliferate. Consider, for example, the final couplet. Despite claiming that numerical and biological succession preserve the ideal and singular beauty of the young man, these lines nonetheless reveal an inescapable fracture at the heart of that singularity by repeating the self-division that opens the poem, paradoxically redoubling the difference between the 'thee' now and the 'thee' forty years hence. After all, the couplet echoes the very situation imagined in the poem's opening line, the reverberating adverbs of "*when* thou art old" (13) and "*when* thou feel'st [thy blood]

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<sup>5</sup>We might note in passing that the implied "then" of the clause which answers the hypothetical situation (of being asked a question at some point in the future) is not quite the same as the temporal "then," primarily indicative in force, which opens line 5.

cold” (14) sharply maintaining the very distinction that succession seeks to overcome.

The continuity of blood may appear to bridge this gap, but only at the cost of emphasising a disjunction between discrete exemplars, the young man and his “fair child” (10). Thus, even here the poem enacts a paradoxical separation internal to the self, between the warm blood one sees and the cold blood one feels. The contrast between feeling and seeing marks the difference between the blood of one’s own body, knowledge of which is corporeal experience as such, and “thy blood” as something apart from the self, something external that can only be seen – that is, known mediatedly through perception – because it belongs instead to the child (whose blood is nonetheless the same as one’s own in the sense of the colloquial phrase “of my flesh and blood”). Helen Vendler’s remark on these lines is likewise apposite. “What we see,” she writes, “is a double exposure: the forty-year-old sunken-eyed bachelor feeling his blood cold in his veins superimposed on the forty-year-old proud father seeing his blood warm in his son.”<sup>6</sup>

The very weakness of the “and” connecting lines 13 and 14 offers the further possibility of undoing the dependence of the latter upon the former. In other words, rather than reading the final line as taking place at the same “when” as the penultimate, it can be read as temporally autonomous, specifying rather the effect of the poem’s own logic upon the youthful now, disturbing this very moment when one’s “proud livery” is so “gazed on” (3). The coldness felt in the present because of imagining one’s own inevitable decline is reversed by the thought of being perpetuated through one’s progeny, so that the immediately experienced warmth of one’s blood now becomes also a present object of knowledge, one’s current liveliness being seen as if from the outside.

How such repetition produces the non-identity of the self is central to Fineman’s claim that Shakespeare’s sonnets invent a new type of poetic subjectivity, one that “continually

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<sup>6</sup>Helen Vendler, *The Art of Shakespeare’s Sonnets* (Cambridge MA: Harvard University Press, 1997), 55. One might note, too, how the fiction of an ideal parthogenesis suppresses the actual reality of biological inheritance by eliding the child’s ‘other’ blood, derived from the mother who is absent here – but who will be recalled in Sonnet 8’s “Resembling sire . . . and happy mother” (127).

call[s] up and deploy[s] a poetics of ideal unity only to distance [itself] from that ideal at the very moment and in the very way” that it repeats it (250). As he argues, Shakespeare’s sonnets repeat an epideictic poetic tradition they inherit, but repetition always involves difference, and the poems internalise such difference in order to found upon it a new modality of selfhood. The “circuitous fracture or self-division” that Fineman demonstrates across a range of the sonnets (and not just the more obviously mathematically inflected ones) opens up “by implosion a heterogeneous internality in the very heart of the ideal, an unlocalizable *inside* that disrupts the smooth internal complexions of homogenous interiority” (247). “Reflections, echoes, doubles and souls do not belong,” Gilles Deleuze writes, “to the domain of resemblance or equivalence; and it is no more possible to exchange one’s soul than it is to substitute real twins for one another.”<sup>7</sup> My reading above of Sonnet 2’s concluding couplet grows out of these insights, registering how the internal echoes within the poem disrupt the posited ideality of succession and its desired consequence, the eternalisation of the young man’s singular beauty.

The twist that repetition provides is especially well captured in line 12: “Proving his beauty by succession thine.” The apparent simplicity of what the phrase says rests upon a complicated double movement. To echo Stephen Booth’s astute commentary: the words “proving” and “by succession” evoke a legal situation whereby “a son demonstrates his right to his deceased father’s possession (‘proving thine to be his’).” By contrast, “his beauty” and “thine” offer “a different but related demonstration” in that they present “evidence of the source of what the son indubitably possesses (‘proving his to be thine’).”<sup>8</sup> In repeating the father, the son succeeds him, taking possession of what was once the father’s property, but by the same token he establishes the property as always being the father’s (and thus his, insofar as he too will in time face the same dilemma, that is to say, will repeat his father by becoming a father himself).<sup>9</sup>

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<sup>7</sup>Gilles Deleuze, *Repetition and Difference* (London: The Athlone Press, 1994), 1.

<sup>8</sup>Stephen Booth, *Shakespeare’s Sonnets* (New Haven: Yale University Press, 1977), 138.

<sup>9</sup>Booth’s other observation regarding this line is also pertinent. Only upon hitting “thine” do we realise

As intimated earlier, though, “succession” also directs us to the sonnet’s investment in arithmetic. More particularly, it evokes the word’s etymological root in *arithmos* (ἀριθμός), the Greek term for number, whose meaning, as Jacob Klein emphasises, was determined by “the fundamental phenomenon . . . [of] *counting off* . . . of some number of things.”<sup>10</sup> In the remainder of this essay, I want to pursue the arithmetical underpinnings of Shakespeare’s poetics, to propose that the distinctive conjunction of repetition, identity and difference so evident in Sonnet 2 expresses (and indeed repeats) at its deepest stratum persistent issues in mathematical thought concerning the nature of numbers. Sonnet 2’s own arithmetical arc extends from the initial “forty winters” to which the young man’s face must, one by one, render account; to the child who redeems time by “sum[ming]” his “count”; and, finally, to the legal, biological and numerical “succession” through which the young man, in the language of Sonnet 38, “outlive[s] long date” by partaking the life of “eternal numbers.”

Operative throughout, too, is the dual early modern sense of “count,” as both enumeration and account.<sup>11</sup> Thus, on the one hand, the child’s beauty will settle his account by repaying a debt it never owed. By repeating the young man, the child compensates for the accumulated deficit of years gone by, and thereby eternalises his beauty as singular. On the other hand, the “One” of ideality also governs an additive process: each successor adds itself to the one that preceded, generating thereby the succeeding generation much as the lineage of natural numbers unfolds by repeatedly applying ‘one’ to the preceding number.

Indeed, for both Greek and early modern arithmetic, the simple value of the positive

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that line 12 has not in fact been spoken by the young man, whose ventriloquised voice had governed most of the preceding two lines (“this fair child of mine / Shall sum my count and make my old excuse”). Instead, the poem’s speaker has reasserted his possession over the poem. See *Shakespeare’s Sonnets*, 138). To Booth’s comments, we might add that the possessives “mine” and “thine” reiterate the question of who owns what (be it the treasure or the poetic line itself), encoding via their rhyming both repetition (the rhyme) and difference (between the initial consonants).

<sup>10</sup>Jacob Klein, *Greek Mathematical Thought and the Origin of Algebra* (Cambridge MA: MIT Press, 1968), 46.

<sup>11</sup>For a description of the dense network radiating out from counting and accounting, see Patricia Parker’s “Cassio, Cash, and the ‘Infidel 0’: Arithmetic, Double-entry Bookkeeping, and *Othello*’s Unfaithful Accounts,” in *A Companion to the Global Renaissance: English Literature and Culture in the Era of Expansion*, ed. Jyotsna G. Singh (Oxford: Blackwell Publishing Ltd., 2009).

integer has its basis, and indeed its ideal type, in the One, out of which all positive numbers are generated. Klein’s insistence that the different things being counted have to be taken as uniform, as being of a single kind, expresses precisely this dependence of ἀριθμός upon the one: “they are, for example, either *apples*, or apples and pears, which are counted as *fruit*, or apples, pears, and plates which are counted as ‘*objects*’.”<sup>12</sup> As Alain Badiou points out, the Greek conception of number expressed by Euclid makes the “being of number. . . entirely dependent upon the metaphysical aporias of the one.”<sup>13</sup>

Early modern mathematical treatises in turn faithfully echo the two sequential definitions available in Book 7 of Euclid’s *Elements of Geometry*: number “is a multiplicity composed of units” (Definition 2); and a unit is “that on the basis of which each of the things that exist is called one” (Definition 1).<sup>14</sup> Thomas Masterson’s oft-reprinted *Arithmetick*, for instance, reproduces the Euclidean definitions thus: “Unitie, unit, or one is, by which every thing that is, is said one.” The declaration that expands on this statement draws out more fully its epistemological and ontological implications:

Unitie, unit, or one is, by which we distinguish, discern, know, name, or expresse any thing that is, to be one: as one God, one spirit, one voice, one thing, one stroke, one world, one star, one house, one man, one yeare, one minute, one mile, one elle, one pound, one graine, one piece, &c. infinitely.

This remarkable sequence comes close to enumerating, one by one, a theological ladder descending from the essence of being, through language and time, to matter itself. Masterson’s brief definition of number follows directly from this conception: “Number is, a multitude or a many of units. . . by whiche we expresse what certaine quantity or multitude of those things, quantities, or magnitudes we desire to have named, knowne, or signified.”<sup>15</sup>

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<sup>12</sup>Klein, *Greek Mathematical Thought*, 46.

<sup>13</sup>Alain Badiou, *Theoretical Writings*, ed. and trans. by Ray Brassier and Alberto Toscano (London and New York: Continuum, 2004), 59.

<sup>14</sup>Cited in Badiou, *Theoretical Writings*, 59.

<sup>15</sup>Thomas Masterson, *Arithmetick. . . Newly set forth. . . by Humfrey Waynman* (London, 1634), 1



Implicit in Masterson’s exposition is the numerical peculiarity of the one or the unit. It echoes the long-standing debate over whether ‘one’ was a number at all or whether it was something that made counting possible without itself being a number – a conception no doubt strange to us but well-nigh commonplace in early modernity. Evidence of this debate abounds in Shakespeare’s verse, whether explicitly – as in Sonnet 136 where the speaker says “Among a number one is reckoned none” (line 8) – or implicitly – as in the paradox with which Sonnet 8 concludes, “Thou single wilt prove none” (line 14).<sup>16</sup> While echoing Euclid’s definitions, John Dee’s 1577 *Mathematicall Preface* to the English translation of the *Elements* further elaborates upon the subtle metaphysical distinction between unit and number:

Number, we define to be a certain Mathematicall Summe, of Units. And an Unit is that thing Mathematicall, Indivisible, by participation of some likeness of whose property, any thing, which is in deed, or is counted One, may reasonably be called One. We account an Unit, a thing Mathematicall, though it be no number, & also indivisible because of it materially, Number doth consist. . . .<sup>17</sup>

It may be recalled that “things mathematical” constitute for Dee an ontologically intermediate state between the immaterial, incorruptible, and unchangeable “things supernatural” and the material, compounded, and changeable “things natural.” Not only do things mathematical partake of both worlds, but the very form of their immateriality points towards the “the principal example or pattern in the mind of the Creator.”<sup>18</sup>

What succeeds is a remarkable paean to arithmetic:

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<sup>16</sup>See also Crane, *Losing Touch with Nature*, 127-131, on the idea that “a single unit doesn’t have an inherent, indivisible unity” (131).

<sup>17</sup>Euclid, *Euclides Elements of Geometry. . . whereunto is added. The Mathematical Preface of Mr. John Dee* (London, 1661), (a) 1v).

<sup>18</sup>Numbers “bridged the gap,” Margaret Healy’s book on Shakespeare and alchemy observes, “between the world of forms and that of matter – they were an accessible route to knowledge of absolute truth. The ‘shadowes of heavenly thing’ (*To the Hebrewes* 8: 5) were observable in numerical patterns. . . .” See *Shakespeare, Alchemy and the Creative Imagination* (Cambridge: Cambridge University Press, 2011), 82.

O comfortable allurements, O ravishing persuasion, to deal with a Science, whose Subject is so ancient, so pure, so excellent, so surmounting all creatures, so used of the Almighty and incomprehensible wisdom of the Creator, in the distinct creation of all creatures: in all their distinct parts, properties, natures, and virtues, by order, and most absolute number, brought from Nothing, to the Formality of their being and state. By Numbers property therefore... we may both wind and draw ourselves into the inward and deep search and view, of all creatures distinct virtues, natures, properties, and Formes: And also, farther, arise, clime, ascend and mount up (with Speculative wings) in spirit, to behold in the Glasse of Creation, the Form of Forms, the Exemplar Number of all things Numerable: both visible and invisible: mortal and immortal, Corporal, and Spiritual.<sup>19</sup>

As we see, Dee's numerology endows Number – and in particular the notion of the immaterial Unit of which Number is composed – with a singular and formal generative power. This potency derives from a fundamental distinction that turns up regularly in arithmetical texts of the period: between a thing as it is and a thing in so far as it counts-as-one. It underlies, too, the ensuing discussion in Dee's preface of the difference between “number numbered” (i.e. number as the ‘counting off’ of existing things) and “number numbering” (i.e. as a collection of pure units that makes the very existence of a certain number of things possible):

Number numbring therefore, is the discretion discerning, and distincting of things. But in God the Creator, this discretion, in the beginning, produced orderly and distinctly all things. For his numbring, then, was his Creating of all things. And his Continuall numbring of all things, is the Conservation of them in being. And, where and when he will lack an Unit: there and then that particular thing shall

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<sup>19</sup>Euclid, *Elements*, (a) 2r. This brief foray into the early modern contexts underlying Shakespeare's engagement with numbers draws on my essay, “Death by Numbers: Counting and Accounting in *The Winter's Tale*,” in *Alternative Shakespeares 3*, ed. Diana E. Henderson (London: Routledge, 2008), 158-80.

be Discreated <sup>20</sup>

Translated into Dee’s language, biological reproduction in Sonnet 2 is the “orderly” producing and “distincting” of successors on the pattern of the Unit which the young man embodies. Likewise, it is his “continuall” enumeration in his children that “conserv[es]” him (and them) “in being,” holding at bay lack, death, discreation.

A later stanza from Du Bartas’ 1605 *Devine Weekes and Workes* expresses a similar exultation over the powers of the One, separating the unit as the “roote” of all enumeration from the “infinite” numbers it makes possible, and thus locating the actuality of all other numbers in the ‘potentiality’ of the One:

Marke here, what figure stands for One, the right  
Roote of all Nomber; and of Infinite:  
Loves happiness, the praise of Harmonie,  
Nurserie of All, and end of Polymnie:  
No Nomber, but more then a Nomber yet;  
Potentially in all, and all in it.<sup>21</sup>

Precisely this sense of how singularity offers itself as the very pattern or basis, whose repetition produces and preserves reality, is shared by Shakespeare’s second sonnet – and, indeed, Du Bartas’ passing reference to music in the phrase “praise of Harmonie” should be borne in mind when we turn to Sonnet 8, later in this essay.

The fecundity of the distinction between a thing and its counting as one is not confined to the Greek past with which early modern arithmetic contends. Quite the contrary, the pressure that Shakespeare and Dee (among many others) exert on the ‘one’ remains vital in the futures to which number leads. To hear the resonance between the Shakespearean aesthetics of subjectivity and the modern mathematical conceptualisation of number, let us

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<sup>20</sup>Euclid, *Elements*, (a) 2r-v.

<sup>21</sup>Guillaume de Saluste Du Bartas, *Devine Weekes and Workes*, trans. Josuah Sylvester (London, 1605), 472. Also cited in Healey, *Shakespeare, Alchemy*, 84.

leap ahead to the nineteenth-century German logician Gottlob Frege's *Die Grundlagen der Arithmetik*, which develops – at least at first blush – a very different account of number. For all the vast difference between Shakespeare's arithmetical poetics and Frege's set-theoretical language, it is my contention that they are connected by the shared *sense* that inhered in all attempts to grasp the very nature of numbers, that is to say, to respond to the problem posed by the gap between our easy everyday use of numbers and the difficulty of providing a conceptual basis that would underpin their quotidian deployment. My use of *sense* here draws on Deleuze's complex unfolding of that term, and Claire Colebrook offers a lucid entry into one dimension of his concerns. "For Deleuze," she writes,

[a]ny language or system of signs... is only possible because of a prior *problem*. The formation of a language responds to a way of approaching the world, so that language is an action, or a constant question and creation in response to experience. So *words* are dependent upon tasks or paths... through which we approach what is other than ourselves; a word gives order to a sense which pre-exists it . . . .

Language is more than a set of *actual* words; it is also the *virtual* dimension of sense, or the problems that our words organise and articulate. Because language is always more than its actual elements, we can have the same concept or sense, but in different languages . . . . Philosophical concepts create new problems and new milieus of sense.<sup>22</sup>

Frege's own language for establishing numbers depends upon the mathematical resources made available by the freshly minted domain of set theory, and, unlike Greek or early modern arithmetic, he relies on the notion of ordinality rather than cardinality to define what a number is. (While a cardinal or counting number tells how many of something there are, ordinal numbers tell the order of something, that is, their position in a set or sequence.)

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<sup>22</sup>Claire Colebrook, *Gilles Deleuze* (London: Routledge, 2002), 20. See also Deleuze's discussion ...

It should be evident that, despite its reliance on the idea of ἀριθμός, Shakespeare’s use of “succession” in Sonnet 2 necessarily involves notions of both cardinality and ordinality – the question of how many is entangled with that of an ordered series of different samenesses stretching out in time. As I will argue below, the ‘one’ and the ‘none’ index the shared sense that flows alike through Shakespeare’s sonnets and Frege’s *Grundlagen*, giving rise to two languages, poetic and set-theoretical, which respond to the one’s paradoxical status as well testify to the enduring vitality of the metaphysical concerns it initiates.

Frege aims to institute a strictly logicist theory, in the sense that it would exclude entirely from number any whiff of the empirical reality that cardinal numbers exude. As we have seen in Aristotle, for instance, number remains closely tied to the things it enumerates. To cite Klein again:

These things, however different they may be, are taken as uniform when counted. . . .  
*Insofar* as these things underlie the counting process they are understood as *of the same kind*. . . . That word which is pronounced last in counting off or numbering gives the “*counting-number*,” the ἀριθμός of the things involved. . . . Thus the ἀριθμός indicates in each case a *definite number of definite things*. It proclaims that there are precisely so and so many of these things. It intends the *things* insofar as they are present in this number, and cannot, at least at first, be separated from the things at all.<sup>23</sup>

By contrast, Frege seems closer in this respect to Dee’s quasi-Platonic positing of numbers as ideal forms (number numbering) that make possible the actual counting of things (number numbered) – with the difference, though, that Frege’s account turns to logic rather metaphysics as the basis for number. For Frege, a number is less a concept in itself than a trait or name associated with or assigned to a concept. A concept in turn “is only defined and exists solely through the relationship which it maintains”<sup>24</sup> to the objects that fit it, that

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<sup>23</sup>Klein, *Greek Mathematical Thought*, 46.

<sup>24</sup>Jacques Alain Miller, ‘Suture (elements of the logic of the signifier),’ *Screen* 18.4 (1977/78): 27.

fall under that concept. This set of objects he calls the extension of the concept. Thus, for instance, the concept “is a sonnet by Shakespeare,” has as its extension all the objects for which it is true that they are Shakespeare’s sonnets, and it is assigned a number (154 in this case, if based upon the 1609 volume as published). But what does this number mean? And how do we construct it?

Before we can address these questions, though, a core feature of Fregean number needs to be emphasised. The system rests, as Jacques Alain Miller points out, upon a redoubled concept: the concept of identity to a concept. The concrete empirical thing such as a particular Shakespeare sonnet is not the same as the object that is contained in the extension of the concept “is a Shakespeare sonnet.” The sonnet has to shed all its characteristics, has to disappear as a thing, in order to become such an object; it retains only the minimal logical requirement that it counts as an object that is identical to or falls under the concept. It is this abstraction – different from the Aristotelian abstraction that understands the things being counted as being *of the same kind* – that makes numeration possible. Miller’s example makes this difficult idea clearer:

[I]f I group what falls under the concept ‘child of Agamemnon and Cassandra,’ I summon in order to subsume them Pelops and Teledamus. To this set I can only assign a number if I put into play the concept ‘identical to the concept: child of Agamemnon and Cassandra.’ Through the effect of the fiction of this concept, the children now intervene in so far as each one is, so to speak, applied to itself – which transforms it into a unit and gives it the status of an object which is numerable as such. It is this one of the singular unit, this one of identity of the subsumed, which is common to all numbers in so far as they are first constituted as units.<sup>25</sup>

This repetition of the concept, which relies only on the ostensibly logical condition of the

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<sup>25</sup>Miller, “Suture,” 28.

self-identity of a thing to itself, leads Frege to his general definition of number: “the number assigned to a concept F is the extension of the concept ‘identical to the concept F.’”

A way of grasping the intuition underlying Frege’s definition is to understand number as a trait shared by all sets that are “of the same size” as the extension of F (that is, the set of objects that fall under the concept F) – as long as we grasp the notion of being “of the same size” not in terms of counting the objects in a set (which would assume precisely what we need to define, that is, the series of natural numbers) but relationally, in terms of mapping each element of a set onto each element of another. To take Frege’s example, for a waiter to know that he has laid out the *same number* of forks as knives, it is not necessary that he first count the forks and knives separately. He need simply ensure that for each fork he lays down, he places a knife on the other side of the plate. The two sets are equinumerate and thus share the same number without our having enumerated each of the two sets individually. And it is upon this relationship of equinumeracy – which assumes only that each object in a particular set is identical to itself (and thus counts as one) – that Frege’s definition of number is built.<sup>26</sup>

The contrast with Aristotle – and thus with Greek and early modern conceptions of number more generally – is again instructive in this regard. Speaking in the *Physics* about the sense in which two numbers are to be considered equal, Aristotle remarks:

It is rightly said, too, that the number of the sheep and and dogs is the same if each is equal to the other, but the decad [that is, the group or set of ten] is not the same [in these cases], nor are the ten [sheep and dogs] the same ten things. . . .

The implication here is that number is always concrete or specified, a number *of something*, be these sheep or dogs, or even, “in the limiting case,” as Klein says, “‘pure’ units, accessible only to thought.”<sup>27</sup> And so Aristotle will continue, shifting his example from sheep to horses, “the [horse-]number and the [dog-]number do not differ by a difference in number [for in both

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<sup>26</sup>See Gottlob Frege, *The Foundations of Arithmetic* (Oxford: Basil Blackwell, 1953), 85ff.

<sup>27</sup>Klein, *Greek Mathematical Thought*, 48.

cases there are ten]; but the decad is not the same, for the things of which it is asserted differ; one group are horses, and the other dogs.”<sup>28</sup> By contrast, Frege’s account of equinumeracy, out of which the trait that is number emerges, eschews precisely this Aristotelian insistence on the concrete multiplicity of whatever is being counted.

Frege’s set-theoretical approach to numbers may seem far removed from early modern numerical conceptions, but in fact his theory revives issues very much of the moment in the earlier period. The sharp distinction Frege draws – between an empirical object (a knife, a fork, child of Agamemnon and Cassandra, or a Shakespeare sonnet) and that same object in so far as it counts-as-one in relation to a concept – presses precisely on the question of whether one was a number at all. Indeed, for Aristotle (as for many early moderns), only “that can be counted which is *not one*. Neither an object of sense nor *one* ‘pure’ unit is a *number* of things or units,<sup>29</sup>: the character of the unit is such as makes counting possible at all – but for this very reason, it cannot itself be a number. We simply apprehend one thing as one, but we only begin counting with two, when we apply this apprehension of *counting-as-one* to a multiplicity of things.

Locating both in Frege’s theory of number and, via Fineman, in Shakespeare’s sonnets, the intertwining of repetition, unity and identity brings us a good way towards grasping the relevance of mathematical thought to the *Sonnets*. But another set of steps need to be taken if we are to express the other central principle at work in Shakespeare’s verse: non-identity. For Frege’s general definition of number does not as yet lead in any obvious way to the whole numbers as we know them, that is, to a sequence in which each number naturally follows its predecessor *ad infinitum* – and it is, after all, just this notion of the child as natural successor to the father that remains key to how Shakespeare’s young man preserves his oneness, his singularity. To generate this sequence, Frege will call forth another special number, the zero, for, as will appear, it is out of the zero that all other numbers – including the one – will be

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<sup>28</sup>Aristotle, *Physics*, δ14 224a2ff, cited from Klein, *Greek Mathematical Thought*, 47. Translations modified.

<sup>29</sup>Klein, *Greek Mathematical Thought*, 49.



built.<sup>30</sup>

To recall: Frege's definition of number rests upon the principle of the identity of a thing with itself, a logical condition of truth and knowledge explicitly derived from Leibniz (who called it the identity of indiscernibles). To create from this principle the ordered succession of numbers, Frege proposes the following definition: 'zero' is the number associated with the concept 'not identical to itself.' Given the Leibnizian condition of truth, this is necessarily a concept whose extension is empty: since every thing that counts-as-one is identical to itself, there can be no object that falls under the concept 'not identical to itself.' And to this concept Frege assigns the number 0. Miller's comment brings out what is paradoxical about Frege's procedure: "the zero understood as a number, which assigns to the subsuming concept the lack of an object, is, as such a thing[,] *the first non-real thing in thought.*"<sup>31</sup>

Now, to generate a sequence of numbers from this paradoxical beginning, we simply need to define the number '1.' All the remaining whole numbers can be generated inductively thereafter via the notion of a successor (to the preceding number), with 0 and 1 responsible for getting the sequence going and establishing the rule of succession. 'One' is consequently defined by Frege as the number assigned to the concept 'identical to the concept of zero.' Since only one object – the number zero itself – satisfies this criterion, the extension of this concept contains only one object, thus providing a 'natural' definition for 1. And the rule of succession simply involves repeatedly applying this idea to each precedent number to generate its successor. So, for instance, once we have defined the number 3, say, this number serves to constitute the concept "member of the natural series ending with three."

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<sup>30</sup>It was only after completing this essay that I stumbled upon the very last footnote to Fineman's *Shakespeare's Perjured Eye*, to find – with some chagrin – that I here tread a line of thought that he had already, albeit fleetingly, envisaged. In a brief aside directed at Sonnet 136's concluding line ("Among a number one is reckon'd none"), Fineman suggests that Shakespeare here edges closer to "a more modern (Fregean) conception of number" in that the sonnet "seems to distinguish between ordinal and cardinal numbering: 'one' is the 'first' *because* it is 'none.' This ordinal conception sanctions cardinal numbering, "zero" now functioning as a placeholder that warrants counting" (357). This seems to me exactly right – though, as I have been claiming, we do not need to wait until the 136th sonnet in the sequence to experience how Shakespeare deploys the tension between cardinality and ordinality.

<sup>31</sup>Miller, "Suture," 30.

The extension of this set has four elements, viz., 0, 1, 2, and the number 3 itself; thus it is assigned the number 4. The procedure preserves the fundamental distinction between numbers and reality: “in the order of the real, the 3 subsumes 3 objects. In the order of number. . . it is numbers which are counted: before the 3, there are 3 numbers – it is therefore the fourth,”<sup>32</sup> and thus three serves to define the number four. By reconfiguring the idea of *counting-as-one* in terms of what Miller calls the “fiction” of the concept ‘identical to the concept,’ Frege shifts the basis of number away from cardinality – that is, counting how many of something there are – to ordinality or place in a succession. Cardinality emerges as the effect of ordinality, counting as the result of succession.

What returns this Fregean discussion back to Shakespeare is its central, constitutive paradox: at the heart of the principle of identity is non-identity, the impossible object of pure lack whose naming (as ‘zero’) is essential to secure oneness and succession. The lack of the object must be named as such: while excluded from the real as pure lack, the contradiction of the non-identical object must be repeated as name so that it can count-as-one, and thereby generate succession. No doubt, what spurs this common interest in the numerical fecundity of the zero is quite different: behind the interest of Shakespeare and his contemporaries in the one and the none lie such classical texts as Plato’s *Parmenides*, whereas for Frege, it is Cantor’s set theory that provides the philosophical impulse. But between Plato and Cantor is the mathematical revolution that would make earlier metaphysical concerns urgent yet again, albeit in a new form: the spread of Hindu-Arabic numeration, whose key difference from Greek or Roman numeration was that it explicitly introduced a sign for absence or no-thing, the zero. Anticipating Frege’s conclusion, if not his method, the sixteenth-century Dutch polymath Simon Stevin (remembered for his invention of decimal notation) would argue forcefully that while one was indubitably a number, zero was not – for, taking the place of the one, it was in fact zero that made counting possible, while not itself being a number.

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<sup>32</sup>Miller, “Suture,” 30-31.

“What belongeth to Numeration?,” Thomas Blundeville’s *His Exercises* asks, and answers as follows: “Two things, to know the shapes of the figures, and signification of their places.” And how many figures are there? “These ten,” Blundeville informs us, “1.2.3.4.5.6.7.8.9.0,” but immediately qualifies this list by insisting upon the zero’s exceptional status: “whereof the tenth made like an o. as you see here, is called a Cypher, which is no number of it selfe, but serveth only to fill up a number.”<sup>33</sup> The two central distinctions made here between the figure and its place, and between the cypher and regular numbers, echo a farrago of earlier arithmetical treatises. Humfrey Baker’s *The Well Spryng of Sciences*, for instance, describes the expression of value through numeration as deriving “partly by the diversity of the fygures, but chiefly of the places wherein they be orderlye set,” a place being in turn defined as “the seate or roome that a figure standeth in.” There are, he continues, “ten fygures. . . which are used in arithmetic, whereof nine of them are called signifyng figures, and the tenth is called a ciphar. . . and of it self signifieth nothinge, but it beyng joyned with any of the other figures, encreaseth their value . . .”<sup>34</sup> Or again, we read in Dionis Gray’s *The Store-house of Brevitie in woorkes of Arithematike*: “Ciphers made like the letter O[, t]he which being of no value in proper signification, the same notwithstanding. . . are of necessarie use in practise of Arithmetique, only to keepe the places, whereby is expressed infinite numbers, which without the help of them, the other figures could not performe. . . .”<sup>35</sup> The cipher operates via a principle quite different from that governing the so-called simple numbers: eschewing the monotonic repetition of a singular unity, it relies on the emptiness of its signification to produce the fullness of its effects. Its positionality or its site, that is, its ordinal relationship to the elements that go before it, lends it its supernumerary powers, allowing it to suture the gap, manna from heaven. It is equivalent, as Badiou puts it, to the empty or null set in Cantor’s set theory, “a pure mark. . . out of

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<sup>33</sup>Thomas Blundeville, *His Exercises* (London, 1613), 1)

<sup>34</sup>Humfrey Baker, *The Well Spryng of Sciences* (London, 1568), 2).

<sup>35</sup>Dionis Gray, *The Store-house of Brevitie in woorkes of Arithematike* (London, 1577), 1r-v. Parker gathers a number of other examples in “Cassio, Cash, and the Infidel 0,” 226.

which it can be demonstrated that all multiples of multiples are woven.”<sup>36</sup>

The concluding rhyme of the very different seeming Sonnet 8 echoes – an appropriate verb, given the poem’s sustained reliance on the metaphor of music – the earlier Sonnet 2’s intimation of the necessary relationship between unity and lack: “Whose speechless song, being many, seeming one, / Sings this to thee: ‘Thou single wilt prove none’” (127). Booth’s footnote to this couplet reminds us that the song’s warning to its hearer alludes “to the ancient mathematical principle that ‘one is no number,’ which – as the embodiment of the quibble on the number ‘one’ and ‘one’ as opposed to a multitude – became proverbial.”<sup>37</sup> Among other contemporaneous evidence, Booth cites Geoffrey Whitney’s *Choice of Emblemes* (1586): “The proverbe saith, one man is deemed none, / And life, is deathe, where men doo live alone.”<sup>38</sup> Whitney’s version of the adage makes explicit the threat voiced here (as well as in Sonnet 2): remaining unmarried, without establishing a line of succession, will lead to your extinction; thus, remaining alone, you will prove yourself to be nothing at all, a zero.

In Frege’s theory of numbers, as we have seen, the number zero itself proves necessary to define the number one, which is assigned to the concept ‘identical to the concept of zero.’ Thus, as Miller puts it, Frege’s system “is ...constituted *with the 0 counting as 1*. The counting of 0 as 1 (whereas the concept zero subsumes nothing in the real but a blank) is the general support of the series of numbers.”<sup>39</sup> Such a logic is arguably at work in Sonnet 8 as well. The assertion that one’s ideal unity demands a multitude – only through “being many” can the individual “seem[] one” – itself rests upon naming, in the poem’s final word, the absence, the “no[t-o]ne”, that will have “prove[d]” itself to be the truth of the “one” – unless generation intervene, producing from the one’s paradoxical singularity the multitude that will putatively ensure his permanence.

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<sup>36</sup>(Badiou, *Theoretical Writings*, 46).

<sup>37</sup>Booth, *Shakepeare’s Sonnets*, 147.

<sup>38</sup>Geoffrey Whitney, *Choice of Emblemes* (Leiden, 1586), 66. Cited in Booth, *Shakepeare’s Sonnets*, 147.

<sup>39</sup>Miller, “Suture,” 30.

Following the classical Greek categorisation, the medieval and Renaissance quadrivium designated music as the sister science to arithmetic. Proclus' commentary on Euclid, for instance, claimed that the Pythagoreans

considered all mathematical science to be divided into four parts: one half they marked off as concerned with quantity, the other half with magnitude; and each of these they posited as twofold. A quantity can be considered in regard to its character by itself or in its relation to another quantity, magnitudes as either stationary or in motion. Arithmetic, then, studies quantities as such, music the relations between quantities, geometry magnitude at rest, spherics [that is, astronomy] magnitude inherently moving.<sup>40</sup>

It is worth noting, too, how regularly Shakespeare's sonnets assert poetry's distinctive conjoining of arithmetic and music by drawing on the connotations afforded by the word "number." Sonnet 38, for instance, plays with arithmetical multiplication ("Be thou the tenth Muse, ten times more in worth / Than those old nine which rhymers invoke" lines 9-10, in order to set up the poem's own "eternal numbers" that may "outlive long date" (line 12), thereby connecting poetic creation with the potential infinity of arithmetical succession (187). In Sonnet 17, the speaker worries that to "write the beauty of our eyes, / And in fresh numbers number all your graces" (lines 5-6) would lead only to scorn, to the poet's repeated enumeration of the addressee's virtues being dismissed as "a poet's rage / And stretched meter of an antique song" (lines 11-12, 145). English poetry's characteristic coupling of rhyme and meter, of the aural and the numerical, these sonnets suggest, reveal its dual engagement with the related sciences of music and arithmetic.

It is not surprising, then, that Sonnet 8 unfolds the paradoxes inhering in numbers through a series of connected metaphors taken from music. To cite Booth's perceptive observation, "the wit" of the poem's opening quatrain "is derived from a playful perversity

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<sup>40</sup>Proclus, *A Commentary on the First Book of Euclid's Elements*, trans. Glenn Raymond Morrow (Princeton: Princeton University Press, 1992), 29-30.

in which a commonplace observation – that music often makes its listeners feel sad and that listeners enjoy the feeling – is treated as if it revealed a serious logical inconsistency.”<sup>41</sup> The sonnet opens with the query that it will subsequently address: “Music to hear, why hear’st thou music sadly?” (line 1, 127). The paradoxical lack inherent in singleness, with which the poem closes, is perhaps already anticipated here in the missing self, which we must supply in order to make sense of the question. That is, in order for the ostensible paradox to audible, we need to add a subject to the dependent clause: “[Thou being] music to hear,” or, as Booth proposes, “You, whose voice is music to hear.” (If we at first understand the opening phrase as “Given music to hear” or “In order music to hear,” this initial projection has to be corrected once we reach the line’s end.)

The reason behind the addressee’s contradictory behaviour, the poem goes on to suggest, lies in how music’s generation of singleness out of multiplicity reveals to the listener the contradiction that marks his own being, the fact that he “confounds / In singleness the parts that thou shouldst bear” (lines 7-8). The word “confound” is especially rich here. On the one hand, a substantial subset of its connotations – to waste, to destroy, to suppress, to confuse etc – functions to “chide” (line 7) the addressee for his mistaken insistence on the primordial singularity of his being. On the other hand, the etymological sense of “confound” – from the Latin *confundere*, meaning to pour or mix together – expresses exactly what the sonnet recommends as the alternative to his refusal to “bear” his “parts,” since the singleness of musical harmony or polyphony arises precisely out of the “confounding” of individual notes to produce the “true concord of well-tuned sounds / By unions married” (lines 5-6). For it is only in the commingling of many “parts” – musical, social, and personal – that true unity, that is, an eternally lasting unity, comes into being, by making succession possible. The simultaneity of many sounds producing one note turns thereby into a figure for a temporal succession that prolongs the ‘one’ in time, both negating his singularity and turning that negation itself into the means whereby singularity is preserved:

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<sup>41</sup>Booth, *Sonnets*, 144.

Mark how one string, sweet husband to another,  
Strikes each in each by mutual ordering,  
Resembling sire, and child, and happy mother,  
Who all in one, one pleasing note do sing: (lines 8-12, 127)

No doubt, the musical union invokes the paradox of the Holy Trinity here – the ur-figure for multiplicity in unity serving here as its converse, the unity arising out of multiplicity. But the punning echo of the “not” from lines 2 and 3 – “Sweets with sweets war not, joy delights in joy; / Why lov’st thou that which thou receiv’st not gladly” – in the “note” of line 12 signals that it is ultimately out of lack or absence that everything – and especially the re-iterated (and thereby divided) ‘one’ of this line – originates.<sup>42</sup> It is only apt that paradox-turned-proverb which this note sings be described as “speechless song” (line 13), the words emerging from wordlessness and silence.<sup>43</sup> In the beginning is the void.<sup>44</sup>

Let me conclude by returning to the sonnet that spurred my path through the thickets of number, classical, early modern and modern. At its heart is the imagined – and immediately rejected – answer to “being asked,” at the age of forty, “where all thy beauty lies” (5): “within thine own deep-sunken eyes” (7). The pit of himself (his eyes/ ‘I’s) into which the young man is forced to stare is the culmination of the inevitable temporal decay announced in the poem’s opening metaphor, which represents the forty years that will inescapably come to pass as digging “deep trenches” in the young’ man’s face, wrinkling him deep in time. That who he will be then is the living face of death itself, the stand-in for the void beyond temporal existence, is indicated by the military images of the sonnet’s opening lines, where

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<sup>42</sup>Booth points out that, while the two words were “apparently never homonyms, they may have been pronounced enough alike for a Renaissance reader to have heard a complex play on *not*, *note*, and ‘knot’ in this context of negation, music and union.” See *Sonnets*, 144. *Much Ado about Nothing* offers, of course, the most sustained Shakespearean engagement with the near-homophonic pair of noting and nothing, note and not.

<sup>43</sup>Or, as Keats’ version of this paradox would later assert, “Heard melodies are sweet, but those unheard / Are sweeter.” See “Ode on a Grecian Urn,” stanza 2, lines 1-2.

<sup>44</sup>See Badiou’s discussion of the axiom of the void in *Number and Numbers* (London: Polity Press, 2008), 56-57.

the deep trenches of the enemy's siege also suggest the graves of those fallen in battle. It is indeed there that the young man's beauty "lies," in the double sense of a physical outcome (there, in those very creases on your brow your beauty lives and dies) and of a constitutive untruth (your condition then will give the lie to your beauty now, to its claim to endure). And it is precisely in response to this void, which it rejects as "all-eating shame and thriftless praise" (8), that the poem's speaker will offer the generative alternative of numerical and biological succession. As numbers go, so go self and life.