

SHAKESPEARE'S

MACRO-SONNETS

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100-word SUMMARY

Shakespeare scholars have repeatedly expressed puzzlement concerning many thematic and formal patterns in Shakespeare's *Sonnets* (1609). This thesis investigates a theory that offers a unifying explanation. The overall sequence of 154 sonnets can be understood as comprising eleven sub-sequences, or 'macro-sonnets', with fourteen sonnets in each. The opening eight lines in each sonnet are called the 'octave', and that structure is repeated in the macro-sonnets. Further, each of these 'macro-octaves' mirrors a corresponding musical scale. Thus, Shakespeare's sonnet sequence can be understood as echoing the microcosmic-macrocosmic vision embodied in Renaissance theories of musical harmony.

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CHAPTER 1

Q: SHAKESPEARE'S

SONNETS AND COMPLAINT

1.1 THE PROBLEM OF THE RECEPTION

Shake-speares Sonnets, Neuer before Imprinted was published in London in 1609 by Thomas Thorpe together with a narrative poem entitled, *A Louers complaint, by William Shake-speare*,¹ and these two works were bound together in a Quarto volume that commentators commonly call Q.²

Shakespeare's *Sonnets* exhibits a number of uncontentious congruences between the numbering of an individual sonnet within the sequence and aptly corresponding numerical allusions within that sonnet. These congruences are sufficiently numerous to establish that these sonnets, as published, represent a

¹ Titles, year of publication and quotations will all be copied diplomatically from the cited sources. (In the sixteenth and seventeenth centuries the cited year of publication meant slightly different things, depending on the different times at which calendrical reforms were enforced within the relevant countries. But none of the crucial arguments in this investigation will turn upon this dating ambiguity, so the date cited will be the date as given in the cited source.)

² See for instance Katherine Duncan-Jones (2010, p. 1).

carefully designed sequence.³ There is no stable consensus on whether the print publication of this sonnet sequence was authorized; nevertheless, even if it was a pirate publication, it was clearly based on a manuscript that had been carefully ordered.

The question to be addressed is whether there is any literary significance to the particular ordering that is to be found in Q. Proposed explanations in the secondary literature will be surveyed; but an alternative proposed explanation will prove to be much more satisfactory.

The idea that there may be something that at least appears to call for explanation in this sonnet sequence can be made vivid by the way Don Paterson opens his commentary on sonnet 145: ‘Ha – bet you didn’t expect *this* ...’ and by the fact that he goes on to ask, ‘But what on earth is this poem *doing* here?’⁴ Other commentators, like Stephen Booth (‘Other commentators have felt that 145 might be Shakespeare’s but does not belong in this sequence’) and G. Blakemore-Evans (‘But 145 has proved an embarrassment to critics for more substantive reasons’), take a more scholarly tone but convey the same message.⁵

Against the faintly conspiratorial drift of thought that is associated with the very notion that there are ‘puzzles’ of some kind concerning Shakespeare’s sonnets,

³ Some of the most persuasive of these are summarized in the introduction to Duncan-Jones (2010, pp. 99-100).

⁴ Paterson (2010, pp. 143-145).

⁵ Booth (1977/2000, pp. 500-501), Blakemore Evans (1996/2006, pp. 247-8); and see also the *Variorum*, Rollins (1994).

some have said that there is really nothing in Q to be puzzled about and that the whole idea that Shakespeare's sonnets are in any significant way 'puzzling' is an unnecessary confabulation that is ungrounded in the actual sonnets themselves. Having first themselves raised a dust, the scholarly commentators then complain that they cannot see.

This deflationary line of thought can be found in John Benson's re-publication of most of Shakespeare's 1609 sonnets, in a collection of Shakespeare's *Poems* that was published in London and which probably first appeared in 1640. This did not include *A Louers complaint*, nor all of Shakespeare's 1609 sonnets, and it did include poems not by Shakespeare (falsely attributed to Shakespeare); but this was the first publication or re-publication of any of Shakespeare's sonnets after Thorpe's Q in 1609. In the preface, Benson expressed confidence that readers of these poems will 'finde them, seren, cleere and elegantly plaine, such gentle straines as shall recreate and not perplexe your braine, no intricate or cloudy stuffe to puzzell intellect, but perfect eloquence ...'.⁶

Booth aspires to a 'criticism that can admit the justice of John Benson's confidence that readers of Shakespeare's poems will find them' as described in the quote above.⁷ But Benson was trying to *sell* his 1640 publication. The wording of his Preface indirectly indicates that, given the nature of Shakespeare's reputation in 1640, potential buyers could well be expected to worry that this work might indeed be full of 'cloudy stuffe'. This rhetorical technique of 'protesting too much' can sometimes backfire. If a potential buyer was not

⁶ Shakespeare (ca 1640), cited in Booth (1977/2000, p. 516).

⁷ Booth (1977/2000, pp. 516).

already worried that this book might ‘perplexe his braine’, then a transparent attempt to inoculate him against that thought is likely to plant that very unwanted notion in his head. Manifestly, there is plenty in Q to ‘puzzell intellect’ – for all but the hastiest of potential buyers in a bookstore, superficially scanning Benson’s Preface in order to decide whether or not to buy the book.

Similarly, Shakespeare’s *First Folio* (1623) opens with an advertisement addressed by the editors Heminge and Condell ‘To the great Variety of Readers’. Heminge and Condell explicitly encourage customers to buy the book: ‘Iudge your sixe-pen’orth, your shillings worth, your fiue shillings worth at a time, or higher, so you rise to the iust rates, and welcome. But, what euer you do, Buy.’ And, as with Benson, this advertisement registers an awareness that some potential buyers might find some of Shakespeare’s lines *difficult*: ‘Reade him, therefore; and againe, and againe: And if then you doe not like him, surely you are in some manifest danger, not to vnderstand him’.⁸

It is also noteworthy that Heminge and Condell expressed concern for the ‘great Variety of Readers’: ‘we hope, to your diuers capacities, you will find enough, both to draw, and to hold you’. Heminge and Condell were Shakespeare’s fellow-actors and business partners. In his will Shakespeare left ‘to my ffellowes John Hemynge Richard Burbage & Henry Cundell xxvj^s viij^d [26 shillings and 8 pence] A peece to buy them Ringes’.⁹ There is every reason to think that Shakespeare had the same degree of concern that Heminge and Condell did for

⁸ Shakespeare (1623/1902, p. 7).

⁹ Chambers (1930, vol. 2, p. 172).

the ‘diuers capacities’ of a great variety of play-goers – at least when he was writing his plays.

Of course, one might raise the concern: might not Shakespeare’s sonnets be significantly different from his plays? Nevertheless, on reflection the sonnets do not appear to be altogether different from the plays in this respect. There is plenty in Shakespeare’s sonnets to occupy the minds of a great variety of readers. And this many-layered character of Shakespeare’s works is compatible with there being much also to draw and to hold those of his friends or patrons who might have been keen on the various different kinds of fairly complicated and abstract structural patterns that were quite often to be found in other celebrated Tudor and Jacobean sonnet sequences. Ambitious formal patterns of this kind would be easier to put into a sonnet sequence than into a play, because the writer could credibly have had greater control over the final product.

One possibility worth keeping in mind is that at some time between, say, 1600 and 1609 Shakespeare might have compiled a raft of pre-existing individual sonnets or shorter sonnet-sequences into the final sequence that appeared in Q. This is *prima facie* plausible, and there is also evidence to back it up.¹⁰

This project of compiling pre-existing sonnets into a sequence leaves open the possibility that when each of these sonnets had been originally written the author may have had no overarching architectonic whatever in mind for the entire sonnet sequence as a whole. When writing any one of these individual sonnets, he may

¹⁰ Persuasive evidence for this is marshalled for instance in Duncan-Jones (2010, pp. 12-27), and more will be surveyed below.

conceivably have been simply carried away by the *furor poeticus*, a compulsive outburst of unexpected and amazing creativity that appears to ‘come from nowhere’.¹¹ When Shakespeare asks his Muse, ‘Spendst thou thy furie on some worthlesse songe ...’ (sonnet 100), presumably it is that same kind of ‘furie’ that he has in mind. Nevertheless, no matter how ‘furious’, ‘inspired’ and ‘intuitive’ Shakespeare may have been when he originally wrote each of these individual sonnets, his ‘intellect’ may also have come to the fore years later when he compiled his sonnets into the particular sequence that we see in Q. And a variety of structural, formal, poetic patterns – *topomorphic* patterns – could conceivably then have emerged simply through a process of slightly re-ordering these sonnets and tinkering with the wording here and there along the way.

The term ‘topomorphic’ was introduced by Maren-Sophie Røstvig,¹² and it will prove useful as a blanket term for a wide variety of formal poetic structures arising from the order in which sonnets have been compiled into a sonnet sequence, or the ways in which lines, verses or any other poetic units have been assembled into a determinate order within a larger literary work. A handful of scholars have investigated a wide variety of theories all falling under the same

¹¹ This species of distinctively poetic creativity is presumably also a close cousin of the so-called *sacre furore*, the ‘sacred madness’, or ‘inspired frenzy’, by which Kepler claims to have been guided to his mathematical theory of ‘the music of the spheres’; Kepler (1619/1997, p. 391). Note that, although Kepler made errors in reasoning, and sometimes started with false premises, Kepler’s *furore* did not feature an absence, but an excess, of *calculations*.

¹² Røstvig (1980, 1994).

genus as those discussed by Røstvig, although they have not usually been presented by their exponents under the useful label that she has introduced, but rather, under a wide variety of alternative labels or descriptions, a miscellany of descriptions and labels which fails to highlight the common characteristics that they all share.

One especially pertinent illustration of topomorphic research, though advertised under another name, is furnished in the investigation by Tom W.N. Parker of what he calls ‘proportional form’ in poetic works of ‘the Pembroke circle’.¹³ Relatedly, there have been investigations of ‘calendrical’ patterns in sonnet sequences – as can be vividly illustrated by in the suggestion that there might be some significance in the fact that Petrarch’s famous *Canzoniere* contains 366 poems, and that the year in which he first set eyes on his beloved Laura was probably a leap year.¹⁴ Others have pursued theories that have been described as ‘numerological’, most notably those of Alastair Fowler and Thomas Roche.¹⁵ And many scholars who describe formal patterns in works of literature do so without bringing these formal patterns under any distinctive classificatory label.¹⁶ But the term ‘topomorphic’ will prove useful – and minimally ‘loaded’ with

¹³ Parker (1998/2011). Parker resolutely excludes Shakespeare from his investigations into ‘the Pembroke circle’; but the formal patterns he discloses will turn out to be closely relevant to the present topomorphic investigation of Q.

¹⁴ Petrarch (1373/2000).

¹⁵ Fowler (1964, 1970), Roche (1974).

¹⁶ A good example is found in the informative scholarly introduction to Sidney (2009).

negative connotations¹⁷ – as an umbrella-term under which to class a wide variety of theories. These theories are all broadly of the kind summarized in the Introduction to Arden Edition of *Shakespeare's Sonnets* – in a section suggestively entitled '*Sonnet structure, Sonnets structure*'.¹⁸

A vivid illustration of what is meant to be included under the term 'topomorphic pattern' can be furnished by the sonnet sequence *La Corona* by John Donne,¹⁹ which consists of a series of seven sonnets in which the last line of the last sonnet matches the first line of the first sonnet and the last line of each of the other sonnets is repeated word-for-word as the first line of the next sonnet – so that these sonnets are formally linked in a chain that 'wraps around' like a crown, this being a poetic form that originated with medieval Italian sonnet sequences.

¹⁷ The term 'numerological' clearly does have negative connotations. Thus, for instance, John Kerrigan referred dismissively to Fowler's 'essentially implausible numerological analysis of the Sonnets'; Kerrigan (1986, p. 66). And although Paterson repeatedly does consider several topomorphic possibilities – see for instance Paterson (2009, pp. 403-4, p. 445) – he also speaks scathingly of 'the sort of deranged numerological speculation that has sprung up round the Sonnets'; Paterson (2010, p. 146).

¹⁸ Duncan-Jones (2010, pp. 96-103); for some of her evidence, particularly on the authorship of *A Louers complaint*, Duncan-Jones draws significantly on work by Jackson (2005, 2008).

¹⁹ Donne (1650/1931, pp. 246-8).

A second and highly pertinent illustration is provided by the *Epithalamion* by Spenser²⁰ as described by A. Kent Hieatt.²¹ In this celebrated wedding-poem, the twenty-four stanzas in the poem transparently align with the twenty-four hours in Spenser's wedding-day. Hieatt is understandably puzzled by the fact that the last stanza contains only seven lines and is for this reason very obviously shorter than any of the other stanzas. One might therefore naturally wonder, 'was his wedding-night *cut short*?' Or is it just that it was it nearly but not quite dawn by the time he finally fell asleep? Or is this stanza short because February is a short month? Or is it all of the above? – or none of the above? This illustrates a distinctive feature of topomorphic patterns: any anomalies in a proposed pattern will reliably prompt questions about whether these perceived deviations have any 'significance'. And this will be important for the investigation of anomalies in proposed topomorphic patterns in Shakespeare's Q.

Furthermore, Hieatt also convincingly disclosed a further topomorphic pattern in this same poem – a much less obvious one, which was deliberately superimposed on the more obvious pattern that is established by the clearly marked 24 stanzas. This further pattern maps out 365 of the successive *lines* (rather than the stanzas) onto the 365 *days* in a year. Thus, Spenser's poetic representation of a year is superimposed on another poetic structure representing the hours of this wedding-day – with spring aligned with the dawn, summer aligned with the mid-day of this auspicious mid-summer's day in Ireland, autumn

²⁰ Spenser (1595/1912, pp. 579-84).

²¹ Hieatt (1960).

aligned with the evening festivities, and winter and night-time with the secret gestation of new life.

Hiatt's discovery was surprising because the superimposed pattern representing 365 days of the year had escaped notice by any of a great many curious, sensitive, intelligent, articulate, widely read and industrious commentators across the span of more than three centuries.²²

A third illustration can be furnished by another of Edmund Spenser's poems, 'The Ruines of Time', as examined by Kerrigan.²³ The last 28 seven-line stanzas in 'The Ruines of Time' are formally grouped into a numbered sequence of 14 stanza-pairs. Within each stanza-pair there is a rhyme-linkage, thus: *ababbcc-cdcddee*. Hence, as Kerrigan concludes, each stanza-pair can aptly be construed as a 14-line 'sonnet'. Furthermore, there are six stanza-pairs that Spenser

²² The annual pattern of '365 lines' is hard to spot – even in published editions that explicitly number the lines – because the poem contains not 365 but 433 lines altogether.

The poem contains 365 'long lines', punctuated at approximately but not quite regular intervals by 'short lines'. These 365 'long lines' are all pentameters – apart from 23 hexameters, with the hexameters closing all but the last of the 24 stanzas. Apart from stanzas 15, 23, 24, there are *three* 'short lines' in each stanza; and these 68 'short lines' are all trimeters – apart from two tetrameters, one in the first stanza and one in the last stanza.

²³ Kerrigan (1991, p. 139), Spenser (1591/1912, pp. 471-8). Note that this is the same Kerrigan who thought that Fowler's 'numerological' analysis of Shakespeare's *Sonnets* was 'essentially implausible'; Kerrigan (1986, p. 66).

explicitly numbers '1' to '6', followed by an un-numbered pair; and then there are six more numbered pairs plus an un-numbered pair called '*L'Envoi*'. Thus, as Kerrigan concludes, there is a formal '7+7' structure in each individual stanza-pair (each 'quasi-sonnet') that is also structurally marked in the overall 'macro-sonnet'.

A fourth illustration can be furnished by the ambitious Tudor poetic project of translating the Biblical Psalms into English verse forms, which was initiated by Sir Philip and completed by his sister Mary, the Countess of Pembroke. Topomorphic patterns in this sequence of Psalms have been extensively investigated in the scholarly introduction by Hamlin, Brennan, Hannay and Kinnamon.²⁴ The formal details that these commentators uncover in the Sidney Psalter are formidable. 'The Psalter contains 150 Psalms, including the 22 sections of the long Psalm 119, and among these the Sidneys repeat only one form (both stanza and metre) exactly'. The repeated form is 'rhyme royal', which is used in Psalms 51 and 63, and was reputedly invented by Geoffrey Chaucer.²⁵ Rhyme *royal* is 'an appropriate choice for the Psalm most closely with King David', namely Psalm 51.²⁶ Furthermore, it is no accident that the Psalm in which 'rhyme royal' is repeated is number 63, this being a numerologically notorious number known as 'the grand climacteric'. Psalm 3 is in trimeter, Psalm 4 is in tetrameter, Psalm 5 is in pentameter. And these topomorphic patterns are only the tip of the iceberg.

²⁴ Sidney (2009).

²⁵ Chaucer (*ca* 1390/1912).

²⁶ Sidney (2009, pp. xxiii, xxv).

There is no widely-recognized standard label for the genus covering all the various different species of topomorphic patterning; and Røstvig's term 'topomorphic' is well-suited to fill this taxonomic lacuna. The hypothesis to be investigated here is that there are topomorphic patterns of yet another species to be found in Shakespeare's *Sonnets* (1609).

However, before embarking on an investigation of this kind it must be acknowledged that, in the light of the critical history of Shakespeare's *Sonnet*, a topomorphic hypothesis concerning this particular sonnet sequence is *prima facie* highly improbable. Despite intensive study by numerous readers over several centuries, no consensus has been reached on the presence of any significant patterns of the relevant kind. One obvious explanation for this absence of discovery would be that there is nothing there to find.

As a consequence, the secondary literature does contain admirable and influential commentators who simply assume that there is no significant 'abstract' patterning to be expected within Shakespeare's Q. Some of their reasons will be examined below, but even before looking at the evidence it is worth considering the possibility that little in the way of topomorphic patterning has been found in Shakespeare's *Sonnets* in part because there is a widespread, low *prior expectation* that there would be anything there to find.

Given some of the obvious virtues in Shakespeare's writing, it is natural to assume that Shakespeare is much too 'concrete' and down-to-earth for any abstract patterns like the ones in the works of a few of his contemporaries that have been disclosed by a few industrious scholars, but seldom appreciated by a wide readership. Given that many people do not like topomorphic patterns, and

do like Shakespeare, there is a risk that the majority of scholars will be unlikely to search hard for something they hope not to find. There is so much in each of Shakespeare's individual sonnets that manifestly appears to be deeply *felt* – and this naturally prompts a reluctance to see this sonnet sequence as instantiating 'abstract' overarching intellectual patterns of any kind.

When overwhelming passions come in to play, what in fact often happens is that the faculty of reason does not cease to operate but, rather, goes into overdrive. This can generate conclusions that are, in one palpable sense, *unreasonable*: 'At random from the truth vainely exprest' (sonnet 147). It is then natural to misinterpret these 'unreasonable' conclusions as demonstrating that the faculty of reason must have ceased to operate: 'My reason the Phisition to my loue, / Angry that his prescriptions are not kept / Hath left me ...' (sonnet 147). Perhaps partly for this reason, the exceptionally obvious presence of hot, wet passion and imagery in both the *Sonnets* and the *Complaint* might understandably lead many readers and commentators to assume an absence of cold, dry and 'calculated' topomorphic patterning in Q.

In the critical history of Shakespeare's works, there is a deeply-rooted image of Shakespeare as an unschooled 'intuitive' writer. Thus, for instance, Milton assumed that 'Jonsons learned Sock' heralded offerings utterly unlike those of 'sweetest *Shakespear*, fancys childe' – who is said to 'Warble his native Wood-notes wilde'.²⁷ And Keats spoke of a '*Negative Capability* ... which Shakespeare possessed so enormously' – and which 'obliterates all consideration'.²⁸ This

²⁷ Milton (1952, p. 20), *L'Allegro*, lines 131-134.

²⁸ Keats (1969), correspondence, 21 December 1817.

conception of artistic creativity and the sensitive appreciation of works of art as ‘intuitive’ (as opposed to ‘calculating’) – and hence as *excluding* what Keats calls ‘all consideration’. This phrase introduced by Keats has resonated with many of those who create and appreciate works of art.²⁹ This image of the artist as ‘channelling’ some sort of supernatural ‘inspiration’ from above – or, conversely, dipping deep into some well full of archetypes within the unconscious mind – is a deep-seated archetype and sticks especially tenaciously to our image of Shakespeare. But it is not the whole truth about Shakespeare. He is passionate, but he is also intellectual.

An alternative image of Shakespeare is given by Ben Jonson in his dedicatory poem at the opening of the *First Folio*,³⁰ in which he stresses the importance of ‘Nature’ (meaning something at least in the same neighbourhood as ‘inspiration’) in the first stages of Shakespeare’s creative process, but also leaves room for ‘Art’, conceived as a systematic later *re-working* of these raw initial products of his creative genius:

Yet must I not giue Nature all: Thy Art,
My gentle Shakespeare, must enioy a part.
For though the Poets matter, Nature be,
His Art doth giue the fashion. And, that he,
Who casts to write a liuing line, must sweat,

²⁹ For illustration of sympathetic responses to Keats’s notion of ‘Negative Capability’, see for instance Bate (1939).

³⁰ Jonson, ‘To the memory of my beloued, The Author Mr. William Shakespeare: And what he hath left vs’, Shakespeare (1623/1902, p. 13).

(such as thine are) and strike the second heat
Vpon the Muses anuile, turne the same,
(And himself with it) that he thinks to frame;
 Or for the lawrell, he may gaine a scorne,
*For a good Poet's made, as well as borne.*³¹

That is (using Shakespeare's own words): when his sonnet sequence was 'richly compil'd', we should expect then to find every 'precious phrase by all the Muses fil'd' (sonnet 85).³²

Similarly, when Hieatt (1960) discovered deeply-concealed 'microcosmic-macrocosmic' pattern-weaving in Spenser's *Epithalamion*, he quite reasonably anticipated that 'many a modern reader will still prefer to follow an orchestration of our sense of mortality and of our paradoxical defenses against time in more direct terms – in those of Shakespeare's sonnets, for instance'.³³

Thus, for instance, Hieatt – at a time when he had just discovered topomorphic patterns in Spenser's *Epithalamion* – confidently assumed that Shakespeare's sonnets are utterly unlikely to contain any 'microcosmic-macrocosmic' remotely like the ones he had just disclosed so compellingly in the *Epithalamion*. And

³¹ Shakespeare (1623/1902, p. 14).

³² There is an irony in describing Shakespeare's craftsman-like practice by using these words from his own sonnet 85. In sonnet 85 Shakespeare was using these words to mock a rival poet. Hence, hasty readers might assume that Shakespeare was expressing a global distaste for 'theorizing'-poetry. But it is more accurate to see him as mocking only those who do it *badly* and *too obviously*.

³³ Hieatt (1960, p. 81).

Hieatt did, in fact, present arguments to back up this assumption. He argued that there is an abundance of poetic virtues in Shakespeare's sonnets that work on a reader in very much more 'direct terms' than the sort of formalistic pattern-weaving that he had just discovered in Spenser's *Epithalamion*. And he argued that this was a reason for concluding that Shakespeare's goals and methods must have been quite different from those of Spenser. For instance, Hieatt speaks of 'the direct bodying forth of meaning through imagery (which is a large part of Shakespeare's way of achieving lyrical effect)'. And he says that this 'bodying forth of meaning through imagery ... is denied in [Spenser's] mode'. Thus, Spenser's topomorphic mode cannot be expected to achieve those 'direct' and 'lyrical' effects 'because its effect – the glamour or the awe it evokes – is so strongly dependent upon the fact of covertness itself'.³⁴

However, Hieatt was manifestly mistaken in thinking there must be an inescapable antagonism between covert pattern-weaving and the 'direct' effects of imagery. Long before Hieatt's discovery of the covert patterns in Spenser's *Epithalamion*, commentators were full of praise of its 'highly wrought and richly coloured imagery'.³⁵ Spenser clearly took poetry that was brim-full of the poetic virtues of 'imagery' – and then *also* deliberately superimposed covert layers of 'proportional form'.

Likewise, the obvious presence of lyrical effects of 'imagery' in Shakespeare's sonnets does not disbar him from having also superimposed covert layers of

³⁴ Hieatt (1960, pp. 81-2).

³⁵ De Selicourt, Introduction to Spenser (1912, p. xxxvi).

‘proportional form’ as well, when he compiled an unruly and miscellaneous multitude of sonnets into a coherent sonnet sequence.

It is of course *highly likely – by chance alone* – that there will be a great many intricate mathematical patterns³⁶ to be found within any literary work as long and complicated as Shakespeare’s *Sonnets*. In any complicated system, no matter how things are arranged there will virtually always be countless intriguing mathematical regularities that can be objectively observed as embodied in the patterns of distribution for countless observable properties and relations among the parts of the system. But it is *prima facie* highly implausible that any ‘chance pattern’ of this kind should be one that could credibly be credited with any kind of ‘literary significance’.

The idea behind the relevant notion of ‘literary significance’, in this context, is illustrated by the examples cited above. There are two factors that should be distinguished. One is the observation of the relevant facts concerning the distribution of observable characteristics, the other is the judgment that this constitutes what is aptly *called* a ‘pattern’ – meaning a *significant* or *deliberate*

³⁶ Here the word ‘pattern’ is used in the mathematically general sense in which a *random pattern* is still a ‘pattern’ – and can be studied mathematically even if it is not the sort of thing that people would naturally *perceive as* a ‘pattern’. One and the same pattern (in this sense) can on one occasion be generated deliberately, and be given deep significance, and in another context the very same pattern may arise by a random process – as in the ‘thought experiment’ in which, given infinite time, a monkey banging a typewriter is imagined to have produced the complete works of Shakespeare.

pattern. For instance, it is one thing to show that there are 365 ‘long lines’ in Spenser’s *Epithalamion*; it is a distinct thing to maintain that this is a ‘significant’ – or ‘deliberate’ – pattern, one that did not arise by mere coincidence.

A simple illustration can be provided by the text of Psalm 46 in the King James translation of the *Holy Bible*. It is a directly observable fact that the 46th word from the beginning of Psalm 46 is ‘shake’, and the 46th word from the end is ‘spear’. This looks like it *might* be a topomorphic pattern, a kind of coded signature perhaps, indicating perhaps that the committee King James assembled to create the Authorized Version of the *Bible* might have given this Psalm to Shakespeare to re-translate. Earlier translations, like ‘the Geneva Bible’, ‘the Bishop’s Bible’ and so on, contained the same words ‘shake’ (or ‘quake’) and ‘spear’, but they are not located 46 words from the beginning or end. There is some evidence that the King James version of Psalm 46 is especially well-written: for instance, when President Obama read a poem at a ceremony commemorating the tragedy of the destruction of the World Trade Centre in New York, this is the poem he chose. For those who love Shakespeare, there is a severe danger of wishful thinking.

However, the memorable placement of ‘shake’ and ‘spear’ in this Psalm is not an instance of a recognized poetic pattern that already has a technical name – like an acrostic, corona, macro-sonnet or calendrical pattern. The lack of an established name automatically casts a shadow of doubt. It encourages the thought that this pattern might be *merely* coincidental, and of no significance at all.

It is intended that the topomorphic patterns in Shakespeare's *Sonnets*, which are to be investigated in the present study, will be ones for which the evidence is much more compelling than they are for a postulated covert significance behind the locations of the words 'shake' and 'spear' in Psalm 46.

Another illustration can be given by reference to Shakespeare's sonnet 13, which opens with the line 'O that you were yourself but loue you are'. This sonnet contains *fourteen* forms of the 'you' form of address in just the first *eight lines*, and there are *three* more in the closing couplet. This is *surely* a use of *you* 'in ouer-plus' (sonnet 135). If this had occurred in sonnet 17, it would have been even more tempting to think that this must be a deliberate pattern. But it is not a recognized poetic pattern with a name of its own, and that makes it harder to be sure what to make of it. There is no doubt that there are seventeen forms of 'you' in this sonnet – in a non-committal sense, it is indisputable that the sonnet does *contain* this pattern – but it is not clear whether it is a 'significant' pattern, one deserving of the name 'topomorphic pattern'.

Thus, although a careful scholar like Duncan-Jones does mention the fact that there are thirteen occurrences of 'will' (plus one 'wilt') in sonnet 135, she does not mention the fourteen occurrences of 'you'-forms in the octave of sonnet 13.³⁷ Similarly, although Paterson does mention that 'The first open declaration of love (albeit one quiet as he could make it) is in l. 13 of Sonnet 13'³⁸ – and so manifestly Paterson is, while reading this very sonnet, alert to numerical allusions – he nevertheless does not mention the high frequency of the occurrences of 'you'

³⁷ Duncan-Jones (2010, pp. 384).

³⁸ Paterson (2010, p. 44).

forms of address in sonnet 13. Nor is mention made by Booth (1977/2000), Vendler (1997), Dover Wilson (1966) or Blakemore Evans (1996/2006).

It is tempting to say that, in studies of this kind, the significant ‘patterns’ are the ones that are clearly ‘deliberate’: but that is a fraught notion if it is taken to suggest any mere speculations into the author’s private thoughts and intentions. There are many reasons for thinking that whatever may or may not actually have been going on in the author’s mind at the time of writing can have only tenuous links to the things that exist, as it were, ‘in the text itself’, and that therefore bear the relevant kind of literary significance. Hence, it is safer to mention a ‘pattern’ when it is one that has an established name in use by critics.

Nevertheless, obviously a writer might sometimes make up a new pattern that others have not yet used, and that has as yet no name. And yet this pattern may still have the relevant kind of literary significance. Any attempts to explain what, precisely, is involved in this notion that certain ‘patterns’ may be ones bearing some ‘literary significance’ will inevitably open a can of worms. But it is worth mentioning one contributing factor. Although it is important not to speculate in an undisciplined way about what was actually going on in the author’s mind during the process of writing the work, it is sometimes possible to establish, using objective evidence, that there were good reasons – publicly available to anyone in the author’s circumstances – for either consciously or unconsciously expecting that at least a few of his or her private friends or patrons would be capable of detecting these patterns, and would be likely to appreciate them if they did.

It is therefore important to investigate what is sometimes called ‘the intended audience’ of Shakespeare’s *Sonnets* – though again, purely private ‘intentions’

are not really the point. One thing that is often relevant, however, is the *availability* to the author of clear evidence to support a reasonable expectation that certain people would be sufficiently likely to read and appreciate this work.

Consequently, it lends initial credence to a topomorphic investigation of Q to find that there are many detailed poetic features within this sonnet sequence that commentators have regularly found stubbornly ‘puzzling’. This puzzlement is prompted with such regularity that an author like Shakespeare would have had available to him sufficient evidence to support a rational expectation that *puzzlement* would be a *frequent* response among virtually any collection of credible readers for this sonnet sequence.

There are really only three alternatives. Either Shakespeare was deliberately prompting readers to look for patterns – because there is a pattern there to find. Or he was teasing them – by prompting them to look for patterns even though there is nothing significant there to be found. Or else he simply did not notice (or noticed but did not care) that many readers would be likely to find these sonnets ‘puzzling’ – and that many of them would therefore consequently look for explanatory patterns that might satisfy their curiosity. The second and third of these possibilities are far from certain. Hence there are good grounds for concluding that, among these three possibilities, the first one is worth at least taking seriously.

And this is a conclusion that has been taken seriously, for instance, by Roche: ‘Our main difficulty as readers of sonnet-sequences is that we have not yet learned the rules of the game, have not learned to read beyond the plangent voices

of the poet lovers'.³⁹ And on this matter Roche is endorsed by Duncan-Jones:

'much remains to be discovered about the principles, or 'rules of the game', according to which sonnet sequences are organized. But that there are sophisticated principles of organization at work cannot be seriously doubted.'⁴⁰

Thus, the persistence of puzzlement among Shakespeare's commentators does suggest that there may be genuine clues here in Shakespeare's *Sonnets* that something is indeed going on behind the scenes. This also suggests that – as with the topomorphic patterns cited above in the works of the Sidneys and Spenser – it sometimes might be extremely hard to work out what exactly it is that is going on topomorphically under the surface of a literary work unless you have some prior clues about 'what to look for'. There are useful all-purpose rules of thumb (look for the mid-point, divide it into thirds, and so on); but sometimes these are not enough to set the searcher off on the right track.

Against that background, one of the most obvious of the questions immediately raised by the text of the 1609 *Sonnets* is one concerning who could credibly have been included within any of the relevantly 'intended audiences' for this particular sonnet sequence. If the reasonably anticipated audience for this sonnet sequence had consisted exclusively of a general readership among Shakespeare's contemporaries – followed by a lasting readership in future generations – then it would be *prima facie* deeply implausible to suppose that Shakespeare deliberately wove into this sonnet sequence a handful of topomorphic patterns that he also then hid so deep that virtually none of his future readers would ever detect

³⁹ Roche (1989, p. 461).

⁴⁰ Duncan-Jones (2010, p. 102).

them.⁴¹ The presence of deliberate patterns of this kind would be much, much more intelligible if this sonnet sequence had been compiled – at least initially, and at least in part – for some private friends or patrons who would ‘know what to look for’ and would appreciate formal structuring of this kind within a sonnet sequence.

As many commentators have remarked, each individual sonnet might well have been written years before the time when were all finally brought together and compiled into the 1609 sequence. Shakespeare might have hoped that, in one form or another, some or all of these sonnets might (like his plays) eventually be published in print. This is implied in some of the sonnets, as for instance when he says, ‘Your name from hence immortall life shall haue’ (although only the name suggested in the sonnets is ‘Will’) and then goes on to say:

Your monument shall be my gentle verse,
Which eyes not yet created shall ore-read,
And touns to be, your beeing shall rehearse,
When all the breathers of this world are dead.

(sonnet 81).

⁴¹ Compare with Spenser’s *Epithalamion*, which closes with the promise that, marking the brief interval of his wedding day, his ‘song’ will for his wife be ‘vnto her a goodly ornament, / And for short time an endlesse moniment’; Spenser (1595/1912, p. 584). And yet this ‘moniment’ contains a topomorphic pattern that no virtually commentators noted for over three centuries.

Nevertheless, there is also evidence to suggest that, especially during the years of 1603 to 1609, these sonnets might well already have been both written and compiled into a sequence or sequences that he could credibly have been expecting to be circulating only in manuscript and among private friends or patrons.⁴²

The temptation to biographical speculation has proved irresistible for virtually all commentators – and we must allow each of these commentators at least one or two loose speculations along the way, or else we would be left with virtually no commentators at all to call upon for guidance.

For instance, some of the best commentators have argued that Shakespeare probably received patronage in the early years of his career, that is, in the 1590s, from the Earl of Southampton – who undeniably was the potential patron to whom Shakespeare had (with extravagant humility) dedicated *Venus and Adonis* (1593)⁴³ and to whom a year later he had (expressing himself with much more confidence) dedicated *Lucrece* (1594).⁴⁴ These two published works kept

⁴² Duncan-Jones (2010, p. 27).

⁴³ *Right Honourable, I know not how I shall offend in dedicating my vnpolisht lines to your Lordship, nor how the worlde vvill censure mee for choosing so strong a proppe to support so vveake a burthen, onely if your Honour seeme but pleased, I count myself highly praised, and vowe to take aduantage of all idle houres, till I haue honoured you vvith some grauer labour*; see Shakespeare (1593/1905, p. 79).

⁴⁴ *The warrant I haue of your Honourable disposition, not the worth of my vntutord Lines makes it assured of acceptance*; see Shakespeare (1594/1905, p. 59).

appearing in new additions for the rest of his life, and always with exactly the same dedications.

The early life of the Third Earl of Southampton is relevant to the narrative. The Second Earl of Southampton laid it down in his will that his eldest son could inherit his father's title only if his mother, the Dowager Countess of Southampton, were prevented from playing any role in his upbringing. Hence the boy, Henry Wriothesley, was raised in the household of Lord Burghley, who was (amongst other things) in charge of the Queen's Wards. Thus, young Wriothesley was raised with Queen Elizabeth and Lord Burghley *in loco parentis*.⁴⁵ When the

⁴⁵These biographical facts would lend an added resonance, for the Earl of Southampton, to the opening of sonnet 124, 'Yf my deare loue were but the childe of state'.

It is also relevant to the narrative that the young King James had been separated from his Catholic mother, Mary Queen of Scots, and educated as a Protestant. Evidence of his program of education is found in his youthful work, *Essayes of a Prentice*, James (1585/1869). When Burghley's son Robert Cecil negotiated the succession of King James, one critical task was to ensure that the eldest son, Henry, should be separated from his Catholic mother Queen Anne and raised as a Protestant; see Cecil (*ca* 1602-3/1766). The Earl of Southampton's education was closely linked to that of James, Lord Burghley and Robert Cecil. See Haynes (1989) and Hulse (1991) for more on the ways in which Robert Cecil was not only linked to James, but also to the kinds of music that are topomorphically woven into Shakespeare's Q. See also Cecil's investment in a very expensive German-built organ for his own home (the German tuning systems are relevant to

boy came of age, Burghley arranged for him to sign a contract to marry Burghley's grand-daughter, Elizabeth de Vere. But young Henry broke the contract and was fined £5000 for doing so. Later, young Henry had an affair with one of the Queen's 'maids of honour', Elizabeth Vernon, who fell pregnant, and they married.⁴⁶

Queen Elizabeth I threw the Earl of Southampton in the Tower of London for his part in the Essex Plot. Almost immediately after her death, King James issued a decree from Scotland releasing him from imprisonment. He travelled north to accompany James's triumphal journey southwards to claim the English throne. Soon after arrival in England King James gave the Order of the Garter to his eldest son Henry – along with the Earl of Southampton and a mere handful of others.⁴⁷

When Shakespeare's school-mate from Stratford-upon-Avon, Richard Field, published Puttenham's textbook on *The Arte of English Poesie* (1589), he dedicated it to Lord Burghley.⁴⁸ It is not impossible that someone like Burghley

Shakespeare's Q): Bicknell (1996). See Hulse (1991) on Robert Cecil as a patron of musicians. See Loewe (2013) on Luther's enthusiasm for the teaching of music as a part of mathematics. See Elliot (1957) for King James's links to music before he left Scotland.

⁴⁶ For abundant historical detail and lengthy quotations from original sources, see Stopes (1922).

⁴⁷ De Lisle (2005).

⁴⁸ 'This book (right Honourable) coming to my hands, with his bare title without any author's name or any other ordinary address, I doubted how well it might

should have engaged someone like Shakespeare to write a sonnet sequence for Wriothesley's seventeenth birthday, urging him to marry. And Shakespeare's first seventeen sonnets (apart from sonnet 15) do urge an aristocratic young man to marry.

Nevertheless, some but not all of the commentators who acknowledge a role for the Earl of Southampton in Shakespeare's personal and professional life (as well as an obvious role in the Dedications of his first authorized publications), have also gone on to the further speculation that Shakespeare might at some stage have abandoned – or been abandoned by – that first patron, and that he might have shifted allegiance to (for instance) the Earl of Pembroke by the time he was assembling the *Sonnets* and *A Louers complaint* in the early 1600s.⁴⁹

On the other hand, some have reacted acerbically against all biographical speculations of this kind. Many of these sceptics have thought that speculations about the author's intentions are virtually always wrong-headed and undesirable – and that it is best to read these poems as sheer inventions. The 'I' that speaks in a given sonnet, and the 'thee' that this speaker addresses, should, they say, be taken as literary constructions – like fictional characters – with only tenuous and aesthetically uninteresting links to the author and the people he once knew.

become me to make you a present thereof ...'; the author of this book was not publicly established until the twentieth century; see Puttenham (1598/2007, p. 90).

⁴⁹ See for instance Duncan-Jones (2010, esp. pp. 68-9).

There are valuable insights in this ubiquitous doctrine of ‘the death of the author’. Nevertheless, it is perverse and unrealistic to expect to achieve a complete suppression of curiosity about the links, however tenuous, between the author and the authorial persona that has been created within the sonnets. Poets may tease and ‘play hard to get’; but, nevertheless, in poetry in general it is really just an inescapable part of the game for readers to wonder, at least a little bit, about the personal circumstances of the author. This is a game that was played in Shakespeare’s day, and incontestably he must have known that. Sonnets like these have persistently struck many as having a distinctly confessional ring to them – and that is the sort of audience response that a competent author like Shakespeare might reasonably have been expected to anticipate.

There is plenty of evidence that a Tudor or Jacobean readership was in fact intensely interested in who might have been the model for the poetic personas that are created within published poetry. For instance, when a pirate edition of *Astrophel and Stella* appeared in 1591,⁵⁰ the editor omitted just one of Sidney’s 108 sonnets – and it is likely that this sonnet was omitted because it too blatantly implied that the woman who was fictionally addressed as ‘Stella’ was actually modelled on a respectable married woman called Lady Rich, and the sonnet was disrespectful to Lord Rich.⁵¹ Similarly, there is evidence that one of

⁵⁰ Sidney (1591/1970).

⁵¹ See for instance Kingsley Hart’s editorial notes on ‘the jealous invective of Sonnet 37, clearly aimed at Lord Rich’: ‘The sonnets were circulated in manuscript during Sidney’s lifetime, with the probable exception of those referring to Lord Rich, numbers 25 [which opens, ‘Rich fools there be’] and 37’.

Shakespeare's comic characters was once called 'Oldcastle' – but evidently the Oldcastle family objected and the character's name was changed to 'Falstaff'.⁵²

As another illustration: in *Hamlet* 2.2, Hamlet plans to insert some dozen or sixteen lines into *The Murder of Gonzago*, to ensure that the fictional murder within this 'play within the play' will transparently allude to what Hamlet suspects to be what is (*for him*) the actual murder of his father.

Consequently, if Shakespeare did deliberately publish these sonnets in 1609 then he would have been simply obtuse if he had not anticipated that both contemporary and future readers might frequently wonder who the 'louely Boy' might be – and who the rival '*Alien pen*' might have been that was threatening to steal the patron's attention – and who the 'Mistersse' [*sic*] that became physically intimate with both the poet and the 'louely Boy' – and so on. Furthermore, he would also have been simply obtuse if he did not recognize that he had left precious few clues about how to answer any of these obvious questions that

On sonnet 37 the comment is made, 'This sonnet appeared for the first time in the Folio of 1598. It had doubtless been excluded from the earlier editions because of its transparent references to Stella's husband, Lord Rich'; see Sidney (1598/1959, pp. 14-15, 160).

⁵² Shakespeare (1623/2011, p. 361). Duncan-Jones (2001) assembles evidence that the name 'Falstaff' could be an inversion of 'Shakespeare', and Shakespeare could have been seen by his friends to be making fun of himself through this character. The relationship between Falstaff and Prince Hal might be seen as similar in some salient respects to the relationship between Shakespeare and some aristocratic patron, like the Earl of Southampton or the Earl of Pembroke.

would naturally spring to mind for almost any attentive and normal reader. Consequently, it is worth at least wondering whether perhaps this sonnet *sequence* might have been originally compiled primarily for private friends, amongst whom the answers might well have been either relatively obvious or else known to be irrelevant to the deeper purpose behind this work.

If there was someone among Shakespeare's contemporaries who knew – or who even just suspected – or who even just suspected that *others* might be likely to suspect – that *he* was the 'louely Boy', then there are numerous reasons for concluding that this person, whoever he was, would have had palpable grounds for wishing *not* to see these sonnets published in print. Virtually any aristocratic Jacobean would have had abundant reason for expecting that many of his contemporaries might find these sonnets embarrassingly lewd and personal.

The *Sonnets* are almost entirely free of scatological allusions, flatulence, urination or other such 'common' matters. Perhaps an exception is found in sonnet 69, 'But why thy odor matcheth not thy show, / The solye [*soil*] is this, that thou doest common grow." But, although the sonnets are not *dirty*, they are *bawdy* and *riské* – and would almost certainly be perceived to be so at the time of publication.

Thus, for instance, among only about a dozen surviving copies of the original 1609 publication, one of them bears the annotation after sonnet 154, 'What a heap

of Infidel Stuff'. And in one of these surviving first editions, sonnet 129, 'Th'expe[n]ce of Spirit in a waste of shame', has been 'entirely scored out'.⁵³

Further documentary evidence that a Jacobean audience might be uncomfortable about at least some of the sexual allusions in these sonnets can be found, for instance, in the publishing history of, say, Shakespeare's sonnet 122. In the 1609 collection this sonnet opens: 'Thy guift, thy tables, are within my braine / Full characterd with lasting memory'. In the context of the 1609 collection, the pronoun 'thy' could reasonably be presumed to refer to the same person as the 'he' in sonnet 101 that 'needs no praise', and the 'you' that is a 'faire friend' in sonnet 104, and the 'sweet boy' in sonnet 108. Nevertheless, when this sonnet was republished in 1640 by Benson, this poem was given the title: 'Vpon the receit of a Table Book from his Mistris'. Furthermore, the words 'sweet boy' (of sonnet 108 in the 1609 collection) have been replaced (in the 1640 collection) by 'sweet love'. And pronouns have been 'heterosexualized' throughout.

In a similar vein, in about 1711 a second edition of Thorpe's 1609 collection was prepared by Bernard Lintott, though evidently not printed. This proposed edition stuck extremely closely to the 1609 text. Nevertheless, the proposed re-publication was to be supplied with the brazenly misleading sub-title '*One hundred and Fifty Sonnets, all of them in Praise of his Mistress*'. The

⁵³ Duncan-Jones (2010, p. 69). A 'waste of shame' is another one of those images that can – plausibly all too easily – be assigned an embarrassing anatomical reference.

accompanying *A Louers complaint* was to be supplied with the odd title, ‘*A Lover’s Complaint of his Angry Mistress*’.⁵⁴

In the light of facts like these, it is obvious that many readers have felt uncomfortable about the kind of love that the poet at least appears to have been expressing to his younger male friend. As late as 1833 Coleridge said that ‘the sonnets could only have come from a man deeply in love, and in love with a woman, and there is one sonnet which, from its incongruity, I take to be a purposed blind’. Duncan-Jones takes this ‘one sonnet’ that Coleridge has in mind to be sonnet 20, ‘*A Woman’s face ...*’; and she is understandably unpersuaded by Coleridge’s suggestion that this is merely a ‘purposed blind’ (whatever Coleridge might have had in mind by that phrase).⁵⁵

It is not just potential suspicions of shadowy suggestions of a love that dare not speak its name that would furnish a motive for the ‘*louely Boy*’ of the *Sonnets* to feel uncomfortable about seeing the 1609 collection of sonnets published in print. It is also all too easy to read into many of these sonnets an embarrassing allusion to the young man’s propensity to masturbate. These allusions occur especially prominently in the context of the first seventeen sonnets in the sequence, where the poet is encouraging the young man to marry and father an heir to his estate. An example is found relatively early in the sequence in sonnet 4: ‘*Vnthrifty loueliness, why dost thou spend, / Vpon thy self thy beauties legacy?*’

It is also fairly obvious at various points in the sequence that the young man is being accused of fornicating with the poet’s mistress – as for instance in sonnet

⁵⁴ Duncan-Jones (2010, p. 42).

⁵⁵ Duncan-Jones (2010, p. 77).

41, where the young man's beauty and his straying youth 'lead thee in their ryot euen there / Where thou are forst to breake a two-fold truth: / Hers by thy beauty tempting her to thee, / Thine by they beautie being false to me.' The *place* that is described as 'euen there' in sonnet 41 is also described by the poet as 'my seate'; and it is anatomically obvious where that is. This anatomical allusion is even more obvious in, say, the reference in sonnet 137 to 'the baye where all men ride'. There are (arguably) indirect allusions to female reproductive anatomy in sonnets 41, 129, 133, 135, 136, 137, 144, 149, 150, 151, 153, 154 and in *A Louers complaint* lines 147, 150, 171, 254-6, 318.

It is worth noting that this level of interest in female reproductive anatomy is not plausibly consistent with the stereotypical profile of the kind of 'homosexual' who is (using Shakespeare's words) 'to base touches prone' (sonnet 141) with other men.⁵⁶ Euphemisms for the male member are nowhere near as common or as charged with conflicted lust. The two most obvious examples are in sonnets 20 and 151. In sonnet 20, nature 'prickt thee out for womans pleasure' by the 'addition' of something that is 'to my purpose nothing'. In sonnet 151 his 'grose' 'bodie' 'rysing at thy name doth pointe out thee' – where the 'thee' in question is the 'dark lady'. Here, the image appears to be one of lust for a woman, especially given all the euphemisms for a woman's parts that have been listed earlier. Hence

⁵⁶ For instance, Duncan-Jones (2001) and Duncan-Jones (2010, pp. 46-56) argues for an image of Shakespeare as both a misogynist and a homosexual and suggests that the 'dark lady' is not to be taken as literally as a woman: 'If the 'dark lady' is still to be sought in literal terms ...' (p. 54). See also, for instance, Hawkes (2000) on Shakespeare's imagery of 'sodomy' and 'usury'.

there is a case for interpreting these sonnets as expressing a powerful love for a man (but a love that is not too base touches prone) alongside a powerful lust for base touches with women (along with an intense anger towards a woman who leads him on and then betrays him with his best friend).

But if this is a viable ‘reading’ of this sonnet sequence, the evidence is manifestly inadequate to persuade numerous close and attentive readers (like Duncan-Jones). Furthermore, the difficulty lies primarily not in each sonnet, taken in isolation, but in the way they have been compiled into a *sequence* in which 126 are nominally addressed to a young man. As remarked by Sidney Lee, in discussing Benson’s ‘heterosexualization’ of these ‘poems’, ‘it is surprising how rare is any alteration of this kind necessary in order to adapt the sonnets to a woman’s fascinations’; see Shakespeare (1609/1905, p. 17).

Thus, the evidence presented in this sonnet sequence (as a sequence) has repeatedly proved – over the centuries – to be *very confusing* to many well-read and sensitive close readers. And this inescapably presents us with a dilemma. Either the author did not foresee this as a likely effect on his ‘intended audience’, or he did. The former option implies a level of writerly incompetence that is not credible, given the nature of Shakespeare’s works in general. But the alternative is baffling: what could be the aesthetic purpose of *confusing* readers in this way? The question is not asking for mere speculation into the mind of the author. Rather, it is a question about the *persona* of the literary creations that we are to understand as ‘the speaker’ and ‘the audience’ as we read these sonnets *as a sonnet sequence*. The puzzle would be solved, however, if this particular sequence had been compiled for a private circle of friends or patrons who had

inside knowledge of the sexual terrain concerning both the author and the intended audience.

Furthermore, homosexuality is only the tip of an iceberg. There are many other details in this sonnet sequence that suggest sexual misdemeanours on the part of the ‘young man’. And these furnish multiple further reasons why any such ‘young man’ (if there was one) would have compelling reasons for wishing these sonnets to be kept private, not published. For instance, sonnet 152 (‘In act thy bed-vowe broake ...’) implies that this woman is married to someone other than the poet – and also other than the young man. And commentators also suspect a handful of oblique allusions to venereal disease, as for instance in the line, ‘Till my bad angel fire my good one out’ (sonnet 144). Duncan-Jones suggests both that ‘as completed and published in 1609 the sequence strongly invites a reference to Pembroke’ and that Pembroke might have paid Thorpe and Shakespeare ‘between ££5 and £10’ to see this work published in print.⁵⁷ But – even if ‘the young peer would not have minded’⁵⁸ being represented publicly, in print, as a homosexual, it is unlikely that he would also ‘not have minded’ being represented as a masturbating fornicator with venereal disease.

The embarrassingly *personal* allusions in Q are found not only in the *Sonnets* but also in *A Louers complaint*. There is even a ghost allusion to the seldom publicly mentioned topic of menstruation: ‘Experience for me many bulwarkes builded / Of proofs new-bleeding which remaind the foile / Of this false Iewell,

⁵⁷ Duncan-Jones (2010, pp. 59, 69).

⁵⁸ As Duncan-Jones quotes from Rowse: Duncan-Jones (2010, p. 51), Rowse (1973, p. xxv).

and his amorous spoile'.⁵⁹ A 'ghost' reading is a reading that predictably comes to mind, and although on second thoughts it can be seen that this cannot be taken as the literal meaning it nevertheless predictably lingers in the mind as somehow relevant to the poetic context.⁶⁰

Shakespeare's reference to 'proofs new-bleeding' in line 153 cannot literally bear an allusion to menstruation; and commentators find other sustainable possible readings.⁶¹ But, in the context, the young woman has just said that she 'Reseru'd the stalke' but 'gaue him al my flower' (line 147) – that is, presumably, she was avoiding penetrative intercourse but was sailing close to the wind. Consequently, every month bleeding would reassure her that she was not carrying the young man's bastard child. And word 'bastards' does appear a few stanzas later, in line 175 – and again with only a *ghost* allusion to the child she would fairly obviously have frequently feared she might be bearing – because the *literal* reference of these words is only to the *characters* and *words* that are 'bastards of his foule adulterat heart'. Note also that the word 'adulterat' here applies literally to his heart – but it too carries a ghost allusion to the fact that both the woman and the man are adulterers.

The young man in *A Louers complaint* protests that although he has been sexually intimate with many women, it is they who have been pleading him to let them have their way with him – 'And when a woman woes, what womans sonne,

⁵⁹ *A Louers complaint*, lines 152-3.

⁶⁰ Thus, in *Hamlet* 2.2, when Hamlet plans to insert lines into *The Murder of Gonzago*, his plan is in fact to create a *ghost* allusion to the murder of his father.

⁶¹ Duncan-Jones (2010, p. 441).

/ Will sourely leaue her till he haue preualiled'? (sonnet 41). The young man of *A Louers complaint* is like a twentieth-century rock star, assailed by groupies. Yet another embarrassing anatomical detail concerning women is the way that sexual desire can sometimes prompt the secretion of noticeable quantities of fluid – not only by men but also by women. This, together with the existence of an implacable prohibition on masturbation, is part of what lies behind the very first thing the young man is reported to have said to the young woman: 'Gentle maid: / Haue of my suffering youth some feeling pittie' (lines 177-8). Seeing women lust after him evidently and understandably fills this young man with desire, and he becomes desperate to find an outlet for this desire. Thus, for instance, later, when he sees the young woman 'All melting', she says that this 'did him restore' (lines 300-301) – presumably meaning that it restored his erection.

Having seen the 'broken bosoms' of so many women, the poor young man's prostate is presumably filled to bursting point – which is poetically registered when he says that these women who have lusted after him 'Haue emptied all their fountains in my well'. Now he directs all this accumulated desire towards the young woman: 'And mine I powre [*pour*] your Ocean all amonge' (lines 254-6).

The imagery permeating *A Louers Complaint* is flooded with copious quantities of various different fluids. The final straw that breaks the camel's back – and 'resolu'd my reason into teares' (line 296) – was the sight of the young man in tears. When she sees this 'invndation of the eies: / What rocky heart to water will not weare'? (lines 290-91).

The climax of the poem falls in the last stanza, in which five lines open with the orgasmic expostulation, 'O ... / O ... / O ... O ... / O ...', concluding with:

O all that borrowed motion seeming owed,

Would yet againe betray the fore-betrayed,

And new peruert a reconciled Maide.

Shakespeare's *Venus and Adonis* explored powerful female desires; and so did *A Louers complaint*.

It is of course possible that, in the above discussion, more is being read into some of these lines than these lines will truly bear. Witness for instance Vendler's comment concerning sonnet 134: 'The poem is not improved, I think, by the sexual pun some commentators insist on seeing in the word *whole*'.⁶²

Nevertheless, even if Vendler is right in thinking that this anatomical pun does not 'improve' the poem, it is not far-fetched to imagine that Shakespeare could reasonably have anticipated that many commentators would indeed suspect a sexual pun here – especially given the lewdness of the next sonnet. In sonnet 135 Vendler manages to distract attention from lewdness for most of her commentary. But at the end, she acknowledges the suggestion that the poet is aroused by the woman's promiscuity. She even takes it that 'lines 11-12 explicitly say' that the poet does not just ask for 'a turn' at her 'rich will' – but, rather, he wants the woman to 'cram him in as well' – at the same time. This sexual allusion is easy to miss – indeed it is easy to miss it even when reading Vendler's commentary, unless you pay close attention. But Vendler (rightly) takes it to be so unarguably 'in' the poem itself that she says it is what the lines 'explicitly say'.⁶³

⁶² Vendler (1997, p. 572).

⁶³ Vendler (1997, p. 575).

A large proportion of these alleged sexual allusions would – if noticed – be likely (for many people and in many contexts) to be experienced as *embarrassing*. If a reader is strongly motivated to ‘improve’ these poems, then there is much in them that can be used to distract the mind into alternative channels. And they are virtually all carefully hedged with credible deniability. In the case of ‘ghost readings’, the author could always protest – ‘but that is *not* what I *said*’. In all the other cases, too, there is at least one innocent reading as well as all the embarrassing ones, and the author could always protest, ‘no, there was no such offensive matter in my thoughts’. Nevertheless, for the author to deploy this defence would really be, in at least a great many of these cases, implicitly to confess to a lack of skill in his chosen craft. It does not really matter what was in his mind, if the poetic associations are palpably (in the relevant sense) *in* the work itself.

Puttenham gives a very explicit discussion of these matters:

Now haue ye other vicious manners of speech, but sometimes and in some cases tolerable, and chiefly to the intent to mooue laughter, and to make sport, or to giue it some pretty strange grace, and is when when we vse such words as may be drawne to a foule and vnshamefast sence, as one that would say to a young woman, *I pray you let me iape with you*, which in deed is no more but let me sport with you. Yea and though it were not altogether so directly spoken, the very sounding of the word were not commendable, as he that in the presence of Ladies would vse this common Prouerbe,

Iape with me but hurt me note,

Bourde with me but shame me not.

For it may be taken in another peruerse sence by that sorte of persons that heare it, in whose eares no such matter ought almost to be called in memory, this vice is called by the Greekes *Cacemphaton*, we call it the vnshamefast or figure of foule speech, which our courtly maker shall in any case shunne, least of a Poet he become a

Buffon or rayling companion, the Latins called him *Scurra*.⁶⁴

Further evidence that Tudor readers did have thoughts like these about lewd readings is found in an anonymous play performed at Cambridge around 1598-1600 containing a fictional character, Gulio, who has remarkably many striking characteristics in common with the Earl of Southampton.⁶⁵ Gulio protests at a

⁶⁴ Puttenham (1589/2007, p. 340).

⁶⁵ Anonymous (1606/1949, pp. 80-82). The three 'Parnassus' plays were performed at St John's College, which was the college of Lord Burghley, the Earl of Southampton, Robert Cecil, John Dee, and other influential figures just a few handshakes from Shakespeare. Furthermore, in the second of these plays, the character Gulio is comically head over heels in love with Shakespeare: 'O sweet M^r Shakespeare, Ile haue his picture in my study at the courte' (*Return from Parnassus*, Part 1, lines 1032-3, p. 185).

In the introduction to his edition of the *Parnassus* plays, J.B. Leishman says that Gulio *cannot* be the Earl of Southampton – because other characters in the play clearly say that he is not an aristocrat but a fraud who only pretends to be an aristocrat. Nevertheless, Leishman lists *so many* characteristics that Gulio shares with the Earl of Southampton that, for an audience at St John's around 1600,

sample poetic passage that is recited to him, purporting to be an imitation of Chaucer. He objects in part because this passage included the word ‘iape’ [*jape*], which was slang for carnal knowledge. Gulio protests: ‘thou shouldest haue insinuated soe much, and not toulde it plainlye’. When he is told, ‘Sir, the worde as ‘Chaucer vseth it, hath noe vn honest meaninge in it, for it signifieth a ieste’, Gulio’s reply is that ‘Chaucer is a foole’. He is wrong to think that Chaucer is a fool, but right to think that his failure to notice a secondary and ‘vn honest meaninge’ is, by itself, not a sufficient excuse.

Likewise, when presented with an imitation of Spenser, ‘A gentle pen rides prickinge on the plaine, / This paper plaine, to resolute my loue ...’, Gulio objects – and the ground for his objection is that: ‘Though thou comes somewhat neare my meaninge, yet it doth not become my gentle witt to sett it downe soe plainlye’.⁶⁶

If Shakespeare anticipated that he might hope for any readers remotely like this fictional fan of ‘sweet M^r Shakespeare’, then his *Sonnets* and *Complaint* would furnish plenty of materials comparable to Chaucer’s offensive ‘iape’ and Spenser’s ‘prickinge on the plaine’. Indeed, sonnet 20 contains the striking line: ‘But since she [‘nature’] prickt thee out for womens pleasure’.

there would almost certainly be an entertaining ‘ghost allusion’ behind this fictional fraud, Gulio.

⁶⁶ *First Return*, lines 1170-190; Anonymous (1606/1949, pp. 191-2).

As a contrast to Shakespeare, it is worth quoting someone who more closely fits the stereotype of a ‘Platonist’. In a dedication of one of his works, in 1584, to the Pope, the Italian composer Giovanni Palestrina wrote:

There are too many poems with no other subject matter than loves alien to the Christian profession and name. These poems, written by men truly carried away by fury, corrupters of youth, a great many musicians have chosen as the material for their skill and industry, and while they have been distinguished by the praise of their talent, they have equally given offense to good and serious men. I blush and grieve to admit that I was once one of their number. But now, when past things cannot be changed and things done cannot be undone, I have changed my purpose.⁶⁷

That is, Palestrina had written madrigals in his youth, but he mended his ways. If there are any poems that would superficially appear to have ‘no other subject matter than loves alien to the Christian profession and name’, then Shakespeare’s sonnets are certainly among them.

In the present context, allegations of the lewdness of Q have been hammered home at such great length because it is important to the present project that it be noted not only that there are some lewd allusions in Shakespeare’s *Sonnets*, but that there are *so many* of them. There are lewd allusions in the plays, too, and they were repeatedly performed. But though they were performed, they were not given an *authorized* publication in print. Furthermore, throughout Shakespeare’s lifetime there were Puritans who tried hard to have all his plays banned.

⁶⁷ Palestrina, dedication of *Motettorum liber quartus*, Strunk (1950, pp. 323-4).

Furthermore, many of these sonnets are also allegedly addressed to a particular aristocrat – and the lewd allusions clearly refer to that man’s private life.

All this furnishes grounds for the conclusion that Shakespeare’s Q is relatively likely to have been originally compiled primarily for circulation – at least initially – in manuscript among private friends. Whether or not Q was compiled with the additional intention that it receive eventual publication to a wide audience, the evidence supports the conclusion that there was an initial, select, ‘intended audience’ who might have been expected to appreciate the numerous, deliberate, lewd allusions in these sonnets – many of which have often escaped notice by the general reader. Furthermore, this conclusion will be further supported in the next section by details concerning the critical history of Q.

All these various different, independent sources of evidence will all, in turn, help to boost the credibility of the hypothesis that Q might also have contained topomorphic patterns that only a restricted, private readership might reasonably have been expected to appreciate.

1.2 THE CRITICAL HISTORY OF Q

In 1598 there was a rumour of the existence of sonnets by Shakespeare that were in private circulation, ‘sugar’d sonnets among his priuate friends’;⁶⁸ and the existence of this rumour suggests that there probably was, at that time, a significant degree of curiosity, at least in some quarters, concerning what these private sonnets by Shakespeare might be. Duncan-Jones describes Meres’s account of Shakespeare’s ‘sugred sonnets’ as ‘mouthwatering’.⁶⁹ Surely she is right to think that there was likely to be fairly widespread curiosity about these rumoured sonnets.

That conclusion is further corroborated by the fact that, in 1599, a collection of verses appeared entitled *The Passionate Pilgrime*, edited by William Jaggard, containing poetry purportedly by Shakespeare.⁷⁰ This collection opened with two sonnets that almost certainly are by Shakespeare and which eventually appeared as sonnets 138 and 144 in the 1609 collection. And it also contained a handful of poems from his plays. But otherwise it contained a miscellany of verses that were mostly demonstrably by other poets, falsely attributed to Shakespeare. It seems relatively obvious that a greedy printer was trying to make a profit by using

⁶⁸ Meres (1598/1938).

⁶⁹ Duncan-Jones (2010, p. 1).

⁷⁰ Shakespeare (1599/1905).

Shakespeare's name without his permission. Presumably, therefore, the printer expected there to be a market, in 1599, for poetry by Shakespeare.

Nevertheless, between 1599 and 1609 no further poems by Shakespeare appeared in print. If Meres's rumour was true, then the 'private friends' among whom his sonnets were said to be circulating do seem to have been friends that could be trusted not to betray him to a greedy printer. When a publication finally did appear containing sonnets that manifestly are by Shakespeare, it was entitled *Shake-speares Sonnets, Neuer before Imprinted*, which plausibly does sound like a title that would be selected not by an author but by a publisher – to boost sales.⁷¹

Apart from sonnets 138 and 144, all the other sonnets in the 1609 sonnets had, indeed, been '*Neuer before Imprinted*'. And this sonnet sequence was immediately followed by a completely new narrative poem, a *Complaint*, also explicitly attributed to Shakespeare, with the same seven-line stanzas and the same rhyme-scheme ('rhyme royal', *ababbcc*) as Shakespeare's earlier and relatively popular *Lucrece*.

Richard Field, Shakespeare's school-mate and friend of the family from Stratford-upon-Avon, had published both *Venus and Adonis* and *Lucrece*. But he was not the publisher for the *Sonnets* and *Complaint*. And there was no 'proper'

⁷¹ Duncan-Jones (2010, pp. 85-6) reflects on the oddity of the title, and similarities to the title of the 1581 pirate edition of Sidney's *Astrophel and Stella*; and she also refers back to her own earlier publication, 'What are Shakespeare's sonnets called?', Duncan-Jones (1997).

dedication to the *Sonnets* – no formal dedication like the ones to *Venus and Adonis* and *Lucrece* – just an enigmatic dedication signed ‘T.T.’, presumably referring to the publisher, ‘Thomas Thorpe’, not the author.

The reception of this publication of 1609 was markedly different from the reception of the earlier publications *Venus and Adonis* (1593) and *Lucrece* (1594). Those earlier publications had been instantly popular, and evidently remained so for the rest of Shakespeare’s life. They were frequently mentioned and discussed by his contemporaries. As Lee has documented, each of them went through many successive editions; and the copyright for each one was purchased re-purchased several times. Thus, for instance, in the case of *Venus and Adonis* there were distinct editions from which at least one copy has survived, in 1593, 1596, 1599, 1600, 1617, 1620, 1627, 1636, 1675. Furthermore, ‘The number of extant copies of all these early editions are very few, and it is possible that there were other editions, of which every exemplar has disappeared. Malone mentions editions of 1596 and 1602, but no editions dated in either of these years have come to light.’ And Lee has also documented:

eight formal transfers of the copyright of the poem with due payment of fees in the course of sixty-two years – a proof that the volume retained throughout that long period a marketable value in the sight of publishers. The authorized London editions numbered at least eleven; a serious attempt was made to infringe the copyright in London in 1607, and there was a surreptitious issue at Edinburgh in 1627.⁷²

⁷² Shakespeare (1593/1905, pp. 47, 54).

Lucrece appears not to have been quite as spectacularly lucrative for publishers, but there were distinct editions published in 1594, 1598, 1600, 1607, 1616, 1621, 1632, 1655. Around 1604, Gabriel Harvey remarked that, ‘The younger sort take much delight in Shakespeare’s *Venus and Adonis*. But his *Lucrece* and the tragedy of *Hamlet*, Prince of Denmarke, have it in them to please the wiser sort.’⁷³

The reception of the 1609 *Sonnets* and *Complaint* contrasts markedly with the reception of his earlier poems. Thus, for instance Lee says: ‘The copyright proved of no marketable value. Thorpe retained it till he disappeared in 1625, and then no one was found to take it off his hands. ... No less than thirty-one years elapsed before a second publisher repeated Thorpe’s experiment.’⁷⁴ Furthermore, when Thorpe’s experiment was repeated, around 1640, ‘it may be doubted whether Benson depended on Thorpe’s printed volume ... Benson’s text seems based on some amateur collection of pieces of manuscript poetry, which had been in private circulation.’⁷⁵

The notion that Shakespeare’s sonnets might have been circulating privately both before and after 1609 – and circulating in manuscript independently of the published Thorpe text of 1609 – is not altogether surprising because ‘All occasional poetry, and especially poetry for patrons ‘in the liver vein’, was

⁷³ Gabriel Harvey; see Shakespeare (1594/1905, pp. 23, 37), and *Variorum*, Rollins (1944, vol. 2, p. 369).

⁷⁴ Sidney Lee, Introduction to Shakespeare (1609/1905, pp. 51-54).

⁷⁵ Shakespeare (1609/1905, pp. 56-57).

usually ‘kept in private’ in the Elizabethan era. It was ‘held back from publishing’. It circulated only among the author’s or the patron’s friends”.⁷⁶

There is no consensus among commentators on what reasons there might have been that could credibly explain why the reception of Shakespeare’s *Sonnets* and *Complaint* was so very different from the reception of *Venus and Adonis* and *Lucrece*. Some have suggested that by 1609 sonnets had gone out of fashion. But by itself that explanation does not bear sustained scrutiny when set against the evidence; and furthermore, the *Complaint* was not a sonnet, it was a narrative poem, and narrative poems had not gone out of fashion. And this narrative poem was formally similar to other narrative poems, like *Venus and Adonis* and *Lucrece* and Samuel Daniel’s *The Complaint of Rosamond*,⁷⁷ which did continue to appear in further editions after 1609. The suggestion has been made that Shakespeare’s *Complaint* was of inferior quality⁷⁸ – so could *that* be the reason why this poem was so roundly ignored? But no, that possibility, too, is not backed by persuasive evidence.

If Shakespeare had high hopes for this publication in 1609 – either that this collection would sell well and hence help him pay his bills⁷⁹ – or else that they would fan the flame of his fame over the next few centuries⁸⁰ – then manifestly he was profoundly out of touch with the temper of the times. Q cannot credibly

⁷⁶ Shakespeare (1609/1905, pp. 26-7).

⁷⁷ Daniel (1592/1998).

⁷⁸ Vickers (2007).

⁷⁹ As argued by Duncan-Jones (2010, pp. 7-10).

⁸⁰ As argued by Duncan-Jones (2010, p. 33).

have made any substantial profit either for him or for the publisher. And for almost two centuries after his death Q did nothing or little to fan his fame but rather, if anything, threatened to do completely the reverse. Even when the sonnets were grudgingly included in a ‘Complete Works’ edited by Malone, this decision evidently had to be excused – on the grounds the sonnets do contain some good lines, and they might cast light on the plays. ‘Not till the nineteenth century was reached, did the tones of apology or denunciation cease.’⁸¹ Furthermore, Malone’s accurate republication of the 1609 sonnets had ‘relegated the *A Lover’s complaint* to the very end of the volume, interposing *The Passionate Pilgrime* and *The Phoenix and the Turtle* before it.’⁸² And in the next edition in 1793 edited by Steevens the *Sonnets* were emphatically excluded: ‘We have not reprinted the Sonnets, &c. of Shakspeare, because the strongest act of Parliament that could be framed, would fail to compel readers into their service’.⁸³

The suggestion that, in 1609, Shakespeare and his publisher had both deliberately decided to publish – and that, thereby, both of them were radically misestimating the subsequent and virtually unanimous public perception – is a hard pill to swallow. In countless other respects both Shakespeare and Thorpe seem always to have had their fingers very reliably on the pulse of public taste.

For reasons like these, the suggestion has been made by some commentators that the 1609 edition may have been unauthorized, and that this pirate publication

⁸¹ Lee, in Shakespeare (1609/1905, p. 61).

⁸² Duncan-Jones (2010, p. 43).

⁸³ Shakespeare (1793), quoted in Duncan-Jones (1997/2007, p. 75).

was then fairly successfully suppressed by swift legal or private action initiated either by Shakespeare himself or else by his patron or patrons. This sort of thing was not unprecedented. In 1591, when a pirate collection of poems appeared including Sidney's *Astrophel and Stella*, the publication of this volume was followed by a law suit that ordered the suppression of all unsold copies.⁸⁴ No legal action is recorded for the suppression of Shakespeare's sonnets; but something analogous could have happened without formal legal proceedings.

There are many further factors that can be cited to bolster the same conclusion. The dedication signed by 'T.T.' expresses – to someone who is here called 'M^r. W.H.' – the wish for 'that eternitie promised by ovr everliving poet'. And this 'M^r. W.H.' is described as 'the onlie begetter of these insving sonnets'. Lee⁸⁵ and others have thought the 'onlie begetter' of these sonnets was the young man to whom most of them are addressed (ignoring the mistress who presumably was the 'begetter' of the last 28 of these sonnets). But a number of other commentators have wondered if this 'W.H.' might have been the person who brought the manuscript to Thorpe, and not the young man addressed in the sonnets – and some have wondered whether, in this context, 'begetter' could have meant 'procurer'. Alternatively, Thorpe might have been presented with the manuscript by someone, other than Shakespeare, who merely *claimed* to be the one who had

⁸⁴ Sidney (1591/1970).

⁸⁵ See for instance Lee's introduction to Shakespeare (1609/1905, p. 37).

commissioned these sonnets, intending to reassure Thorpe that they were his to publish if he chose.⁸⁶

However, the interpretation of the dedication to 'M^r. W.H.' is so uncertain that it can be given virtually no weight to counterbalance all the other circumstantial evidence suggesting that the 1609 *Sonnets* might have been yet another pirate venture like the 1591 *Astrophel and Stella* or the 1599 *Passionate Pilgrime*.

Against all these reasons for thinking that Q might have been an unauthorized private publication, Duncan-Jones has maintained that, 'Contrary to what most previous editors have maintained, there is good reason to believe that the 1609 Quarto publication of *Sonnets* was authorized by Shakespeare himself.'⁸⁷

⁸⁶ Here is one plausible scenario that has been advanced by Stopes (1922) and endorsed by Rowe in the introduction to Lanier (1611/1978). Mr. William Harvey (W.H.) was the third husband of the Dowager Countess of Southampton. She died in 1608 and Harvey immediately remarried and he and his new wife took possession of the house in which the Countess had been living before she died.

Given that Shakespeare's *Venus and Adonis* and *Lucrece* were dedicated to the Earl of Southampton, it is not altogether unlikely that a manuscript of Shakespeare's *Sonnets* and *Complaint* might have been found somewhere in his mother's house after she died. If so, then Harvey could have found it and asked Thorpe to publish it – claiming that he was the patron who had commissioned these sonnets. The dedication that is signed 'T.T' would then make doubly good sense, whichever meaning were chosen for 'begetter'.

⁸⁷ Duncan-Jones (2010, p. 33). The text of Duncan-Jones (2010) is compatible with the possibility that she interpreted overwhelming evidence that the order of

Consequently, it is rational to suspend judgment and to keep an open mind. But it should be borne in mind that, although the hypothesis that the 1609 publication was authorized has been plausibly defended by at least one influential and rightly respected commentator, there is nevertheless still a body of weighty evidence supporting the view of ‘most previous editors’.

Consequently, although we know virtually nothing for certain about the private life of Shakespeare and his manuscripts before publication, we can know for certain that, despite the efforts of commentators like Duncan-Jones to prove that Shakespeare *authorized* publication in 1609, nevertheless the opinion of ‘most previous editors’ still remains a live epistemic option. And that certainty – that there are *many open possibilities* concerning the intended audience for this sonnet sequence – is all that is really required, as background evidence to boost the *prima facie* credibility of the hypothesis that there *may* be some species of significant topomorphic patterning in the 1609 text of Shakespeare’s *Sonnets* and *Complaint*.

the sonnets was under the author’s control as evidence that Q was ‘authorized’.

This obscures the possibility that the author might have controlled the ordering within a manuscript, but that someone else might have brought this manuscript to Thorpe for publication.

1.3 THE PROBLEM OF THE ORDER

Almost any scholarly edition of the *Sonnets* will contain editorial notes registering the fact that numerous previous commentators have been puzzled by the ordering of the sonnets in this sequence. Comments on puzzling features of the 1609 ordering of the sonnets can be found widely differing commentaries on the *Sonnets*, including for instance the scholarly work of say Booth or Duncan-Jones, or the more aesthetically focussed assessments of Vendler, or a lively account of a practicing poet's experience of reading the entire sequence, in order, from beginning to end, at the rate of about two a day, as recorded by Paterson.⁸⁸

For an initial illustration, see comments by Booth, Vendler, Paterson and others on sonnets 36 and 96. They all wonder whether or not it is a mere accident that the last two lines of sonnet 36 are repeated *verbatim* as the last two lines of sonnet 96. Paterson for instance wonders (naturally enough) whether it might be a significant fact that there are 60 sonnets between 36 and 96 ('Is his hour up?').

Another illustration of this kind of puzzlement among commentators can be found in the comments of Booth, Duncan-Jones, Vendler and Paterson on sonnet 145. Sonnet 145 is the only one in the sequence that is not in iambic pentameter. It is in iambic tetrameter. But that is only one of several respects in which this

⁸⁸ Booth (1977), Duncan-Jones (2010), Vendler (1997), Paterson (2010).

sonnet stands out like a sore thumb, differing very obviously from the other sonnets that surround it in this sequence.

Vendler argues at some length that the quality of this sonnet is nowhere near the quality of other sonnets in the sequence: 'In the contorted opening sentence that constructs itself over the first twelve lines of this two-sentence tetrameter "sonnet," there are no less than fourteen subjects and verbs, a disproportion so grotesque as to render the sentence entirely unidiomatic'. Paterson says it is 'unbearably jaunty', 'clichéd', 'incompetently rhymed', ... 'and tasteless'. He concludes: 'All this leaves us with a poem *so* bad, there are only two real explanations. The first is that WS didn't write it. ... The most charitable and plausible excuse for this mess is that its author was very young.'⁸⁹

Commentators often remark that this sonnet appears to have been written in Shakespeare's youth, perhaps having been originally addressed to Anne Hathaway before Shakespeare married her.⁹⁰ But it is incongruously placed right in the midst of his much more many-layered and cynical sonnets to his mistress. The scholarly Booth and the poetic Paterson are both struck by the fact that sonnet 145 seems painfully out of place in its published location, right in the midst of the 'dark lady' grouping. They both note that it is an oft-mentioned possibility that the publisher could have inserted this sonnet into this position by mistake – but they also note that this particular instance of alleged editorial interference seems relatively unlikely, because there is also clear evidence that

⁸⁹ Paterson (2010, p. 444).

⁹⁰ Gurr (1971).

sonnet 145 closely echoes the imagery in sonnet 144, echoing even in some of the most salient words (especially ‘fiend’ and ‘hell’).

Indirectly, it is good supportive evidence for a topomorphic theory to find that Paterson is drawn to speculate that this sonnet might be “a truly desperate bit of padding: ‘Aw god – I’m still three short ... what do I have in the drawer?’ ...”, and Paterson adds, “(see my note to Sonnet 133)”. Paterson’s note to sonnet 133 is the tip of the iceberg: there are many other sonnets that prompt not only Paterson but also many other commentators to wonder whether Shakespeare was aiming at a topomorphic pattern of some kind that required 154 sonnets in the entire sequence, and hence called for ‘padding’ here and there. Paterson playfully even imagines Mrs Shakespeare saying to her husband, ‘Are you going to stick in that lovely one you wrote for me, y’know, when you had hair? You remember – the one with me in it? About how I saved your life and that?’ – with Shakespeare replying ‘Oh yeah. Definitely. It’s sort of a ... y’know ... *miscellany* anyway.’ The sense of a ‘miscellany’ at this point in the sequence has been noted by other commentators, and is reinforced by the nature of sonnet 146, which is ‘Shakespeare’s only explicitly religious poem’, and is one in which ‘the absence of any explicit allusion to a love-object is unusual’⁹¹ – and which is clearly a sonnet that contrasts markedly with the *domestic* imagery in sonnet 143, the *tormented* imagery in sonnet 144, the *childish* tone of sonnet 145, and the ‘frantick’ imagery of sonnet 147.

Paterson’s fantasy that WS could conceivably have been trying to placate Mrs Shakespeare is deliberately ludicrous, and it wittingly transgresses the standard

⁹¹ Duncan-Jones (2010, p. 408).

rational prohibition on loose speculation about what might have been going on in the mind of the author. But it is nevertheless instructive and relevant evidence to find that a reader like Paterson does confess to speculative thoughts of this kind, in wildly casting about for a satisfying reading of sonnet 145. A writer like Shakespeare would surely not have failed to anticipate that many readers would find the location of this sonnet, as sonnet 145 – between the very different sonnets that have been selected to be 144 and 146 – intensely puzzling.

Paterson is not alone among commentators in expressing a sense that sometimes (as here, with sonnet 145) the 1609 ordering seems like a *miscellany*, whereas at other times it irresistibly seems to be building up the beginnings of a narrative arc. For instance, Dover Wilson identifies sonnet 145 as one of a handful of ‘independent’ sonnets, an ‘occasional sonnet, having no connexion with the series’.⁹² Dover Wilson is one of those who considered the possibility of editorial re-shuffling, but Paterson is right to think that a *better* and *tempting* possible explanation for this kind of ordering-inconsistency could be that the author was nudging his compilation towards some sort of topomorphic pattern.

Although some patches in the sequence do seem miscellaneous, sometimes a story-line does undeniably begin to emerge, spanning several sonnets. And these tempting hints of an emerging ‘plot’ reliably do tempt readers into looking for an overarching narrative. For instance, there is a group of sonnets complaining about a ‘rival poet’ (sonnets 78 to 86), and this is followed by a ‘Farewell’ grouping (a

⁹² Dover-Wilson (1966, p. 261).

‘macro-quatrain’ in fact – sonnets 87 to 90), where the poet appears to have been abandoned by his patron:

Farewell thou art too deare for my possessing (sonnet 87),

When thou shalt be disposed to set me light (sonnet 88),

Say that thou didst forsake me for some falt (sonnet 89),

Then hate me when thou wilt, if euer, now (sonnet 90).

But then, as we read onwards through the sequence, it is never made even remotely apparent whether this supposed rift between poet and patron was ever healed, or whether perhaps a new patron may have replaced the old one.

The only dependable effect of the many puzzling details like these in the 1609 ordering of these sonnets has been to perplex a significant number of attentive readers. That perplexity manifestly has had the consequence of creating a sense of mystery. This feeds a natural pattern-hunting hunger that probably traces back to an evolutionary origin among our hunting and gathering ancestors.⁹³ But that happy bi-product does not by itself furnish a satisfying explanation for any of the many particular and puzzling local details in the unexpected twists and turns that are to be found in the 1609 ordering of these sonnets.

Furthermore, the many narrative ambiguities and inconsistencies in this sonnet sequence have regularly struck those commentators who have noticed them as serving no credible aesthetic purpose – although there is also a tendency for

⁹³ See Boyd (2012) for an examination of the way the difficulties in finding a satisfying narrative have drawn and held the attention of generations of readers.

commentators to mention anomalies only when there is an available aesthetic *excuse* that can plausibly be suggested on Shakespeare's behalf. Some have even ventured to help Shakespeare out by suggesting various re-orderings that will make more sense.

'Helpful' re-orderings of this kind in fact began with the first re-issue of many of these sonnets, in the miscellaneous collection of *Poems* edited by Benson in 1640. This edition left out some of the 1609 sonnets, placed them in a very different order, and added about thirty poems that are demonstrably by poets other than Shakespeare. Benson does not call them 'sonnets', but just 'poems', and 'At times he runs more than one together, without break. But on each detachment he bestows an independent descriptive heading'.⁹⁴ Presumably the descriptive headings serve the purpose of supplying each of these poems with its own intelligible narrative context.

In the twentieth century, however, there was a spate of analogously 'helpful' attempts to supply an overarching narrative – but this time not by manufacturing a different narrative context for each 'poem', but by re-ordering the sonnets into carefully chosen larger sub-sequences. It was intended that these re-ordered larger groupings would draw them into some detectable narrative structure with a wider scope. For instance, in one of the 'New Cambridge' editions, Dover Wilson assembles a grouping of 'Liaison Sonnets', another group concerning 'The Rival Poet', another grouping of 'Farewell Sonnets', and so on.⁹⁵ Others have even aspired to fashion a narrative that extended across the entire sonnet sequence

⁹⁴ See editorial notes by Lee to Shakespeare (1609/1905, pp. 54-59).

⁹⁵ Dover Wilson (1966, pp. 268-73).

taken as a whole (although almost never going so far as to include *A Louers complaint* under the same narrative arc).⁹⁶ Reviewing all the secondary literature up to his time, Schoenbaum concluded, ‘Few close students believe that all 154 poems of the cycle follow the sequence that their creator intended, although nobody has succeeded in rearranging them persuasively’.⁹⁷

Later commentators, however, have overturned those conclusions of that earlier majority of ‘close students’ of Shakespeare’s *Sonnets*, and have demonstrated persuasively that the order of the sonnets has in fact been carefully controlled. Many of these commentators have consequently voiced the strong suspicion that something is going on in Shakespeare’s sonnet sequence, even though they do not yet know quite what it is.

In the closing pages of the *Apologie for Poetrie* by Sir Philip Sidney there is an evocative description of one distinctive feature of at least some products of the craft of poetry: ‘beleue with me, that there are many misteries contained in Poetrie, which of purpose were written darkely, least by prophane wits, it should be abused.’⁹⁸ Shakespeare’s *Sonnets* have repeatedly seduced attentive readers

⁹⁶ For instance, consider the title of Bray (1977/200): *The Original Order of Shakespeare’s Sonnets*. An otherwise scholarly ‘New Cambridge’ edition offers another extensively-argued re-ordering of the sonnets in Dover Wilson, (1966, pp. xxv-xxxv, 268-73). Fowler (1970) considers topomorphic patterns that extend over both the *Sonnets* and *Complaint*, taken together, but this does not supply any *narrative* arc that embraces both.

⁹⁷ Schoenbaum (1977, p. 268).

⁹⁸ Sidney (*ca* 1581/1595/1905).

into suspicions that there may indeed be ‘misteries’ of exactly that kind, darkly written into Shakespeare’s *Sonnets* for the benefit of a few readers, whose wits were, he trusted, not ‘prophane’.

1.4 TOPOMORPHIC HYPOTHESES CONCERNING Q

A considerable quantity of Tudor and Jacobean poetry embodied poetic forms that fairly obviously measured out regular intervals of time, like Years, or Seasons, or Months, or Days, or as for instance in a devotional text like a ‘book of hours’. An obvious illustration is *The Shepheardes Calender Contayning twelue Æglogues proportionable to the twelue monethes* by Spenser.⁹⁹

Some commentators have considered the possibility that Shakespeare might have embodied complicated calendrical patterns into his *Sonnets*, comparable to the ones that are found in Spenser’s *Epithalamion*. For instance, if successive lines in Shakespeare’s sonnets were aligned with successive days of the year, then twenty-six sonnets would span 364 days; and it has been suggested that perhaps that is why one of the sonnets (sonnet 99) includes one extra line, to boost the number of lines in one particular grouping of 26 sonnets up to 365 lines altogether.¹⁰⁰

Prima facie, if Shakespeare had reason to expect some of his readers to look for topomorphic patterns in his *Sonnets*, then he would also have had reason to expect some of them to look for calendrical patterns. Hence, he would have had reason to try to weave in a few rewards for any readers who did look for

⁹⁹ Spenser (1579/1912, pp. 415-67).

¹⁰⁰ Fowler (1970, p. 195).

calendrical patterns. And there is evidence that quite strongly supports that prediction.

Sonnet 12 opens: ‘When I doe count the clock that tels the time, / And see the braue day sunck in hideous night’. The position of this sonnet as *twelfth* in the sequence was visually very obvious in the 1609 edition, because the sonnet was clearly numbered with the Arabic numeral ‘12’ at the head of the sonnet. Thus, the printed image of this sonnet could credibly prompt an image of an old-fashioned ‘analogue’ clock, which also characteristically would have a ‘12’ at the top of the clock-face. In any case – whatever the mental mechanism might be whereby this association has been so regularly generated – many commentators have indeed registered the aptness of the congruence between the content of the first two lines of this sonnet and the number that was printed above them in the 1609 printing of Shakespeare’s *Sonnets*. This regular response in attentive readers is the kind of thing that Shakespeare could reasonably be expected to have anticipated and most commentators take the *numbering* of this sonnet to be carrying part of its poetic content.

Commentators in fact go further than this, and generally note that the fact that this sonnet is numbered 12 in the sequence almost certainly alludes to an ancient and widespread method of measuring time, which is mentioned in the Biblical Psalm 90, according to which there are twelve hours in the day and twelve hours in the night. (This is known as the system of ‘unequal hours’, because in geographical latitudes further from the equator than from one of the poles a twelfth of the day is noticeably longer in summer than it is in winter, and *vice versa* for a twelfth of the night.)

By contrast, under a system of ‘equal hours’ there are sixty (equal) minutes in every hour. And these ‘equal hours’ are also registered by a topomorphic congruence in this sonnet sequence. Sonnet 60 opens like this: ‘60 / Like as the waues make towards the pibled shore, / So do our minuites hasten to their end’.

These numerological allusions in sonnets 12 and 60 are well-attested by many commentators. And there are numerous further examples of this same kind. As Duncan-Jones observes: ‘Many more numerological finesses may be discerned’. And hence, as she rightly concludes, ‘that there are sophisticated principles of organization at work cannot be seriously doubted.’¹⁰¹

Thus, there is evidence of calendrical topomorphic patterns in Shakespeare’s *Sonnets*. Nevertheless, the evidence supporting another topomorphic pattern is even stronger, and that will be the subject of the present investigation. The presence of one of these topomorphic patterns is not inconsistent with the presence of others. On the contrary, if Shakespeare had motives for crafting poetic rewards for those who looked for topomorphic patterns of any kind whatever in his *Sonnets*, then he had motives for crafting poetic rewards for those who looked for calendrical patterns. Consequently, if he were to have entered the ‘topomorphic game’ at all, then he would have had every reason to expect some of those readers to look for patterns of several different kinds, all superimposed on one another in something like the way that a diurnal pattern of 24 hours is superimposed on an annual pattern of 365 days in Spenser’s *Epithalamion*.

¹⁰¹ Duncan-Jones (2010, pp. 101-2).

Moving on from calendrical patterns, Fowler also shifts attention to a numerological pattern of a different kind, taking guidance from a Biblical passage in which Jesus miraculously grants fishermen a draught of 153 fishes.¹⁰² Biblical commentators note that:

$$1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17 = 153.$$

It has been wondered whether this might be the reason why there are 154 sonnets in Shakespeare's sonnet sequence.

To explain away the slight discrepancy between 153 and 154, it might be noted that Cabalistic traditions standardly enjoined code-makers to hide their secrets by always, at the very end of the process, adding or subtracting just 1 or 2 – presumably so that the pattern will not be too obvious. In fact, there are deep Pythagorean roots for the idea that you should always 'smudge' the pattern just a little. After all, there are *slightly more* than 28 days in each lunar month; *slightly more* than 13 lunar months in the year; *slightly more* than 365 days in the year; and so on. The microcosm of a work of art should imitate the macrocosm.

Others have noted that sonnets 153 and 154 can be read as different versions of the same sonnet, and that could bring the count of Shakespeare's sonnets down from 154 to 153. Fowler offers an alternative way of reducing the number of sonnets to 153 – by leaving out sonnet 136 on the grounds that it contains the line, 'Then in the number let me pass untold'. Duncan-Jones (2010, p. 99) comes up with yet another fruitful strategy to explore, by suggesting that a much more convincing pattern emerges if you leave out sonnet 126 – after all, sonnet 126 is

¹⁰² Fowler (1970, pp. 183-191).

not a sonnet (it has only 12 lines) but can be construed instead as an '*Envoi*', which is interpolated *after* the young-man segment of the sonnet sequence. The interpolation of 'sonnet' 126 might be seen as analogous to the way that Sidney's sonnets are interspersed with 'songs' – with sonnet 126 could be reconstrued as a kind of 'song'. The resulting pattern, suggested by Duncan-Jones, takes the following form: ¹⁰³

¹⁰³ Duncan-Jones (2010, pp. 99-100).

Seventeen sonnets urging a seventeen-year-old young man to marry:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

plus one hundred and eight in homage to Sidney's *Astrophel and Stella*:

18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33

34 35 36 37 38 38 39 40 41 42 43 44 45 46 47 48

49 50 51 52 53 54 55 56 57 58 59 60 61 62

63 64 65 66 67 68 69 70 71 72 73 74 75

76 77 78 79 80 81 82 83 84 85 86 87

88 89 90 91 92 93 94 95 96 97 98

99 100 101 102 103 104 105 106 107 108

109 110 111 112 113 114 115 116 117

118 119 120 121 122 123 124 125

then 126 [an *Envoi*]; then twenty-eight sonnets to his mistress:

127 128 129 130 131 132 133

134 135 136 137 138 139

140 141 142 143 144

145 146 147 148

149 150 151

152 153

154

Fowler gives reasons why a ‘pyramidal’ structure like this would be likely to have appealed to many poets and their patrons in that era.¹⁰⁴

It is also worth adding that – although Fowler and other commentators generally make little or no mention of King James – from 1603 onwards Shakespeare did have prudential reasons for wishing to please his King. And there is evidence that King James would have appreciated a pyramidal poetic structure of broadly the kind described by Fowler, Roche, Duncan-Jones, and others.

King James wrote ‘Ane Metaphoricall Invention of a Tragedie called Phoenix’.¹⁰⁵ King James’s ‘Phoenix’ is preceded by a Preface which is described as a ‘Colomne of 18 lynes’ – and which takes the form of a series of three triangular, or pyramidal, arrangements of lines. There is one syllable in the first line, two in the second line, ... and so on up to 12 syllables in the two longest

¹⁰⁴ Fowler (1970, p. 184-9) notes a tradition of Biblical scholarship surveyed by Hoskyns (1947, pp. 553-6) and ‘reviewing the interpretations of Origen, Cyril of Alexandria, Ammonius, Severus and especially St Augustine, as transmitted through various catenas or Biblical commentaries’.

Puttenham, Book 2, Chapter 12, deals with ‘shaped poems’, including ‘the Triangle or Triquest’; Puttenham (1598/2007, pp. 183-4). It is not a huge leap to transfer this poetic form within a sonnet to a topomorphic ‘macro-triangle’ within a sonnet sequence.

¹⁰⁵ It is a relevant auxiliary fact that another puzzling poem, which is often credited to Shakespeare as at least a joint-author, is called *The Phoenix and Turtle*.

lines, and then the lines contract down to one syllable again. The number of syllables in each line is explicitly registered by a numeral that is placed at the opening of the line and then repeated symmetrically at the close of the line:¹⁰⁶

1 Eif 1

2 Echo 2

3 help, that both 3

... and so on ...

After the line-lengths have expanded up to 12 syllables, then back down to 1 syllable again, making the shape of a diamond. Then the line with 1 syllable is followed by a line with 3 syllables, then a line with 5 syllables, then 7, then 9. There is no explanation of *why* these last line-lengths should track the series of odd numbers 1, 3, 5, 7, 9; but the pattern is clearly deliberate.

King James describes this lozenge-shaped ‘pattern poem’ as a ‘Columne of 18 lynes’. The very same words in the pattern-poem of this ‘Columne’ are then rearranged, on the next page, into an ordinary sequence of 18 lines of iambic pentameter. This rearrangement is described as ‘The expansion of the former Colomne’. And this ‘expansion’ has been constructed in such a way as to create a double acrostic. The first 16 of the lines in this ‘expansion’ are printed with the first and last letter of each line off-set and capitalized. To illustrate, the first two lines are printed:

¹⁰⁶ This makes what Puttenham calls a ‘Lozenge’ – with an added ‘Triangle’ at the base; Puttenham (1598/2007, pp. 181-2).

E If Echo help, that both together w E

(S ince cause there be) may now lament with teari S

This printer's layout makes the resulting vertical acrostic very obvious. We can read

E(SMESTEWARTDWIKE

down the left-hand side, and

ESMESTEWARTDVIKE

down the right-hand side.¹⁰⁷

Esmé Stewart was the great love of King James's life; and James made him a Duke, much to the resentment of many in the Scottish nobility. Under political pressure from all sides, this beloved friend was banished. When he died overseas, James arranged for his heart to be returned to Scotland for burial.

Thus, evidently King James did love poetical 'puzzles' that are strikingly reminiscent of the 'pyramidal' arrangement that Fowler proposed for Shakespeare's sonnets. Evidently, however, most of those lovers of literature who deeply appreciate and write about Shakespeare's works do not warm to riddles and puzzles and topomorphic patterns of this kind. Without Shakespeare at hand to reassure us that (say) Fowler – or Roche – or Duncan-Jones – or someone else – has finally 'got it right', interpretations like these are treated as mere speculations, and have failed to achieve any substantially overlapping consensus.

¹⁰⁷ James (1585/1869, pp. 40-41).

An illuminating illustration of a hostile critical response to ‘numerological’ theories can be found in a chain of thought that was recorded by Paterson, in response to Shakespeare’s sonnet 49, which begins, ‘Against that time, ...’. Paterson is prompted to compare this with sonnet 63, which begins, ‘Against my loue ...’. He is prompted to make this comparison between sonnets 49 and 63 because $7 \times 7 = 49$ and $7 \times 9 = 63$, and 63 was famously the ‘grand climacteric’ and the focus of numerological superstitions. Paterson’s mind then moves on to thoughts about *why* Sidney’s *Astrophel and Stella* might have contained 108 sonnets. Then his mind leaps onwards to thoughts about Fibonacci numbers, ‘the Golden Ratio’, ‘Lucas numbers’, ... and finally, he reaches the conclusion:

I include this idle nonsense only as a self-generated example of the sort of deranged numerological speculation that has sprung up round the Sonnets. Trust me –compared to some of it, this is a model of sanity. But it’s too easy to do, and you see how quickly it can all get out of hand. The trouble is, it’s likely some of the numbers really *are* significant’ but this kind of metatextual play on the poet *and* the reader’s part is almost never, ever worth it, as it inspires or pursues just the wrong sort of intrigue, and takes us further and further from the poems.¹⁰⁸

There is an insight here. Numerological interpretations do rapidly reach a point of diminishing returns. And often they do indeed distract attention away from ‘the poetry’.

¹⁰⁸ Paterson (2010, p. 146).

Nevertheless – as Paterson says – it is likely that at least some of the numbers really are significant. And Shakespeare certainly did have a motive for pandering to his King’s preferences – either to please the King himself, or else to please one or another among the many powerful courtiers that King James drew into his circle – many of whom shared his interest in formal pattern-weaving in sonnet sequences and other learned pursuits of the same kind and may indeed have received his favour in part because they shared those interests.

Yet *is* it credible that there should be any significant ‘extemporal’ Platonic *abstractions* in Shakespeare’s *Sonnets*? In *Shakespeare’s sonnets*? Mathematical *rigour* would surely seem to be antithetical to the intensely felt passions and the free play of imagination that is manifestly to be found in virtually all great literature, including Shakespeare’s sonnets. Two pieces of literature could scarcely differ more than Shakespeare’s *Sonnets* and, say, Euclid’s *Elements*.¹⁰⁹ A perceived antagonism between great literature and pure mathematics is well expressed in Virginia Woolf’s early novel *Night and Day*:

... strangely enough, she would rather have confessed her wildest dreams of hurricane and prairie than the fact that, upstairs, alone in her room, she rose early in the morning or sat up late at night to . . . work at mathematics. No force on earth would have made her confess that. Her actions when thus engaged were furtive and secretive, like those of some nocturnal animal.

¹⁰⁹ Euclid (*ca* 300 BCE/1570).

And Woolf goes on to reflect on the possible reasons why a woman from a celebrated literary family might desire so fervently to hide her instinctive interest in mathematics:

Perhaps the unwomanly nature of the science made her instinctively wish to conceal her love of it. But the more profound reason was that in her mind mathematics were directly opposed to literature. She would not have cared to confess how infinitely she preferred the exactitude, the star-like impersonality, of figures to the confusion, agitation, and vagueness of the finest prose.

This rings true to my own experience. Pure and applied mathematics both do indeed appear to be experienced as alien to many who love literature. And yet, it will be argued here that nothing human is alien to Shakespeare – not even topomorphic patterns.

The critical history of Shakespeare's *Sonnets* – universal neglect, followed by rampant speculations – is consistent with the theory that is to be defended below. In brief, that theory will run as follows.

Shakespeare wrote many good sonnets that were intended, at least in the short term, only for private circulation. Then at some later time he recollected, re-ordered and rewrote them, compiling them into the sequence that was published in 1609; and in doing this, he evidently wove some unobvious formal patterning into the sequence. His historical context afforded him rational grounds for an expectation that a handful of readers would know what to look for and would be able to find it. However, when a wide public finally did begin to read this sequence closely – several centuries later, and without any introductory clues about what to look for – many of the most attentive of these readers manifestly

did pick up plenty of perfectly genuine clues that there is indeed something afoot, but they were unable to figure out what it was.

1.5 EVIDENCE AGAINST SIMPLE MACRO-SONNETS

Shakespeare could reasonably have anticipated that at least some of his readers would be likely to look for various kinds of topomorphic patterning in his *Sonnets*. The question arises, whether it would have been prudent for him to care about the likely responses of readers with proclivities of this broadly numerological, or ‘Pythagorean’, character. If so, then one thing he could prudently have done would have been to place a few strategic ‘poetic rewards’ to guide them in their topomorphic pursuits. (These could then plausibly be experienced as a little like ‘Easter eggs’ in a treasure hunt; and a related metaphor is also used to describe a sequence of rewards or in-jokes in a video game or in computer programming.)

Against this background, consider for instance the fact that the number of sonnets in the entire sequence is not 153 but 154, which is a multiple of 14; and 14 is of course also the mandated number of lines in each sonnet. Furthermore, these 154 sonnets are grouped into two subgroups: there is a grouping of 126 sonnets predominantly addressed to a young man, and then there is a grouping of 28 that are primarily concerned with a ‘dark lady’. And ‘126’ and ‘28’ are both multiples of 14.

If you think of a deliberate grouping of 14 successive sonnets as a ‘macro-sonnet’, then the first macro-sonnet will open with a ‘macro-octave’ comprising sonnets 1 to 8. Sonnet 8 is all about music: ‘Mvsick to heare, why hear’st thou musick sadly? And it is all about *harmonies* between distinct musical notes. The

most fundamental of these harmonies, after unison, is the octave. An allusion in sonnet 8 to the musical *octave* could plausibly then call to mind (for some readers) not only the musical octave but also the traditional division of a sonnet into an ‘octave’ of eight lines, followed by a ‘sestet’ of six lines. And that would be apt, if sonnet 8 is seen as completing a ‘macro-octave’ – that is, a sequence of eight sonnets instantiating a formal pattern analogous to the familiar pattern formed by the first eight lines in each individual sonnet.

Thus, there is at least one initially promising poetic indication that the first eight sonnets might perhaps be grouped into a ‘macro-octave’. Encouraged by these happy coincidences, the hunter of topomorphisms might then note that first fourteen sonnets share a common theme – that of encouraging a young man to marry and procreate. Sonnet 15 is the first one that does *not* register that theme. Sonnet 15 is the first one to introduce a new theme: that the poet can offer the young man immortality in verse. And this new theme is developed especially clearly in the macro-quatraine of sonnets 15 to 18, which closes with the line, ‘So long liues this, and this giues life to thee’.

The Procreation theme extends beyond the close of the first macro-sonnet. But this should not be seen as a weighty objection to the topomorphic hypothesis. The hypothesis is, after all, that macro-sonnets should contain poetic structures that are analogous in some salient way to the poetic structures within individual sonnets. And the themes in one individual sonnet do often spill over into the next sonnet. Thus, for instance sonnet 5 closes with the lines:

But flowers distil’d though they with winter meete,

Leese but their show, their substance still liues sweet.

And sonnet 6 opens:

Then let not winters wragged hand deface,

In thee thy summer ere thou be distill'd,

But this 'distillation' theme persists only for the first quatrain of sonnet 6 and then the rest of this sonnet is occupied with the theme of usury. The way that the Procreation and Immortality in Art themes of the first and second macro-sonnets noticeably overlap is closely analogous to the thematic and verbal overlap between sonnets 5 and 6.

The second macro-sonnet closes with an apt macro-couplet: 'Weary with toyle, I hast me to my bed ...' (sonnet 27), paired with, '... And night doth nightly make greefes length seeme stronger' (sonnet 28).

Elaborating on these observations, the entire sequence can then be divided into nine macro-sonnets nominally addressed to a 'man right faire' (sonnet 144), followed by two macro-sonnets nominally addressed to a 'woman collour'd il' (sonnet 144).

At least some of the formal features of this grouping into macro-sonnets do initially appear to have some plausible poetic significance. For instance, some commentators have noted that the number of sonnets in the 'dark lady' grouping may well be of some symbolic significance – since 28 is approximately the number of days in the lunar cycle, and in a woman's menstrual cycle.¹¹⁰

¹¹⁰ Duncan-Jones (2010, p. 100).

As another illustration, it may be noted that the fifth macro-sonnet will close with sonnet 70, which is the number of years that are allotted for a man's life according to *Psalms* 90.10. This biblical association of 70 years with the Biblical life-span is registered by other poets who influenced Shakespeare; for instance, Spenser's *Amoretti*, sonnet 70, closes with the lines 'Make hast therefore sweet loue, whilst it is prime, / for none can call againe the passed time.'¹¹¹ Hence it should occasion no surprise to find Shakespeare also echoing this biblical association poetically.

This biblical reference is in fact reinforced by the fact that after saying 'threescore years and ten' the Psalm continues, '... and if by reason of strength they be fourscore years [80], yet is their strength labour and sorrow'. And Shakespeare's sonnet 81 opens, 'Or I shall liue your Epitaph to make, / Or you suruiue when I in earth am rotten'. In fact, in the 'rival poet' grouping (from sonnets 78 to 86), sonnet 81 is the only one that does *not* mention the rival poet in any way. Instead of developing the 'rival poet' theme, sonnet 81 in fact harks back to the 'when I am dead' theme in sonnets 71 to 74. And sonnet 81 also echoes sonnet 18 – in imagery, key words and theme (immortality in verse) – especially in their closing couplets.

Furthermore, the manner in which Shakespeare poetically echoes the biblical life-span of 'three score years and ten' is of considerable interest in the present context. In Shakespeare's 1609 sonnet sequence, the sixth macro-sonnet will open

¹¹¹ Spenser 1595/1912, p. 574).

with a macro-quatrain embracing sonnets 71 to 74. And these four sonnets all reflect on what will follow upon the poet's death:

Noe longer mourne for me when I am dead (sonnet 71);

... After my death (dear loue) for get me quite (sonnet 72);

That time of yeeare thou maist in me behold (sonnet 73);

Bvt be contented when that fell arrest,

Without all bayle shall carry me away (sonnet 74).

After sonnet 74, there are three relatively *miscellaneous* sonnets 75, 76, 77, that lead up to the mid-point in the entire sequence of 154 sonnets altogether. Then the second half of the sequence opens with an invocation of the Muse and the introduction of the theme of a Rival Poet's *Alien* pen' in sonnet 78, 'So oft haue I inuok'd thee for my Muse'.¹¹² Again, there is a clear case for the contention that these topomorphic patterns might credibly be perceived as having some quite striking degree of poetic significance both for the poet and for his credibly intended audience.

In this sonnet sequence there are just two deviations from the rule that every sonnet should contain 14 lines. 'Sonnet' 99 has fifteen lines – *one extra* line – and it falls *immediately after* the position, sonnet 98, that marks the predicted

¹¹² The significance of the fact that this sonnet at the midpoint of the sonnet sequence is reinforced by the fact that the midpoint of Sidney's *Astrophel and Stella* is marked by a similar opening line for his sonnet 55: 'Muses, I oft invok'd your holy aid', Sidney (1578/1959, p. 71).

Topomorphic evidence of this kind can be multiplied further. But is it credible that Shakespeare might have considered the possibility of grouping his sonnets into macro-sonnets? It may seem unlikely that all these coincidences should have arisen by chance alone; but we are notoriously bad at estimating how likely such things are to arise by chance alone. And (some might ‘maliciously object’¹¹³) is it not *even more* improbable that a great poet – especially a great poet *like Shakespeare* – should have deliberately constructed topomorphic patterns of this kind? Did *anyone else* in those times ever group sonnets into macro-sonnets?

Spenser's 'Ruines of Time' opens with images of a riverbank where there is 'A Woman sitting sorrowfullie wailing'. Shakespeare's *Complaint* opens with very similar imagery, similarly expressed. Its seven-line stanzas have the same rhyme-

¹¹⁴ Kerrigan (1991, p. 139); Spenser (1591/1912).

scheme as the seven-line stanzas of 'Ruines of Time'. Furthermore, after 'The Ruines of Time' the next poem in Spenser's *Complaints*, when published in 1591, was 'The Teares of the Muses' – which was certainly familiar to Shakespeare.¹¹⁵

Shakespeare could plausibly have picked up the notion of macro-sonnets either from Spenser himself or else from the same earlier (or 'extemporal') source – whatever it might have been – that had originally suggested this notion to Spenser in the first place.¹¹⁶

But, whether or not he got the idea from Spenser, were Shakespeare to have set out to mirror sonnet-structure in macro-sonnets, then he need not have mirrored Spenser's eccentric '7+7' macro-pattern. Rather, he could reasonably have been expected to mirror his own familiar '4+4+4+2' groupings instead. And that would involve compiling his 154 sonnets into *eleven* groupings, with each of these groupings comprising three sub-groupings into 'macro-quatrains', followed by a concluding 'macro-couplet'.

The perils of cherry-picking, and an initial rejoinder:

This proposed hypothesis, that Shakespeare's *Sonnets* was deliberately organized into eleven macro-sonnets, immediately faces a number of very obvious

¹¹⁵ It is certain that Shakespeare knew this work, because he alludes to it in *A Midsommer Nights Dreame*, Act 5: 'The thrice three Muses, mourning for the death of learning, late deceast in beggerie'.

¹¹⁶ Kerrigan (1991) demonstrated that Spenser's 'Ruines' directly influenced Shakespeare's *Complaint*. And Hieatt (1983) shows that Spenser's 'Ruines' also directly influenced Shakespeare's *Sonnets*, particularly sonnets 115-126.

obstacles. One initial objection arises out of the fact that some of the pieces of evidence that are used to support a topomorphic pattern can all too easily be suspected as arising from ‘cherry-picking’ only the positive evidence and ignoring the presence of equally obvious negative evidence.

As a very immediate illustration, consider the fact that, whereas sonnets 27 and 28 do make a natural macro-couplet, and so do sonnets 153 and 154, nevertheless, sonnets 13 and 14 do not. In particular, sonnet 13 is the first ‘you’ sonnet (containing *seventeen* ‘you’-s), whereas sonnet 14 is yet another ‘thou’ sonnet. This observation runs counter to predicted expectations under the macro-sonnets hypothesis. In investigations of this kind it is more important to look for counter-evidence than just to cherry-pick a great weight of positive evidence.

Thus, the clear contrast between sonnets 13 and 14 is initially counter-evidence against the theory. This powerfully undermines, or effectively *falsifies*, a simplistic theory that postulates a deliberate patterning into macro-sonnets – without any extra elements in the theory that would explain why sonnets 13 and 14 will not reliably strike readers as an obvious ‘macro-couplet’.

The only way to *rescue* the theory of macro-sonnets, therefore, is by *modifying* it. And when modifying a theory, in order to accommodate an unexpected observation, it is rationally essential to ensure that the modification is not entirely *ad hoc*. That is, it is important to ensure that the modification is independently motivated, and that it entails new predictions that can be used to test this new theory.

It turns out that there are some rhyme-anomalies in sonnet 3, and that these rhyme-anomalies credibly possess a distinctive species of topomorphic

significance. In sonnet 3, the rhyme ‘husbandry’ / ‘posterity’ (lines 6, 8) is immediately echoed by ‘thee’ / ‘see’ (lines 9, 11). This kind of proximate repetition of rhymes was roundly disapproved.¹¹⁷ In sonnet 6, ‘posterity’ is rhymed with ‘thee’; hence in sonnet 3 lines 6, 8, 9, 11 *all* rhyme. This is not intrinsically ‘illegal’; but it is a deviation from the familiar rhyme-scheme *abab cdcd efef gg*.

This initial rhyme-repetition is then further compounded by the fact that, in sonnet 3, the rhyme ‘thee’ / ‘see’ (lines 9, 11) is then echoed in the end-rhyme for the couplet, ‘be’ / ‘thee’ – and thus, the very same *word* ‘thee’ is used as an end-rhyme *twice* in the same sonnet. Furthermore, the couplet rhyme ‘be’ / ‘thee’ in sonnet 3 is exactly the same as the couplet rhyme ‘be’ / ‘thee’ in sonnet 1.

Commentators, however, do not remark upon these rhyme-anomalies in sonnet 3: see for instance Dover-Wilson (1966), Booth (1977/2000), Blakemore-Evans (2006), Duncan-Jones (2010). (*Rime riche* is vanishingly rare in competent

¹¹⁷ When King James catalogued the ‘Revlis and Cautelis’ of ‘Scottis *Poesie*’, the very first caution was: ‘That ze ryme nocht twyse in ane syllabe’; James (1585/1869, p. 57). Likewise, Puttenham warns poets ‘not to rime too many like sounding words together’, and more specifically that they should not, for instance, rhyme *constrain* with *restrain*, or *aspire* with *respire*: ‘this maketh no good concord, because they are all one’. By contrast, it is acceptable to rhyme, say, *restrain*, *refrain*, *remain*, or *aspire*, *desire*, *retire*; see Puttenham (1589/2007, p. 170). The term *rime riche* was used for the rhyming of identical syllables. Clearly proximate ‘rhyming’ of a whole word *with itself* is an extreme species of the various poetic misdemeanours under this genus.

Elizabethan poetry: how does *Shakespeare* get away with it – so many times – in his *Sonnets*?) To emphasize the point further, it may be noted that Paterson (2010) opens his commentary on sonnet 3 with the remark: ‘A better poem, this one, and an elegant and straightforward affair’, and he never mentions any rhyme-anomalies.¹¹⁸ This omission of mention is made even more emphatic in Vendler (1997), who opens her commentary on sonnet 3 by saying: ‘No single repeated significant word links the couplet of sonnet 3 to the body of the poem; this absence is very unusual.’¹¹⁹ Obviously, ‘thee’ is a single repeated word that links the couplet to the body of the poem, and that is why she adds the qualification: ‘no single repeated *significant* word’. Evidently, for Vendler this repetition of a rhyme-word is so insignificant as to be unworthy of mention - even in the context of commentary that focuses on repeated words linking the couplet to the body of the poem.

Nevertheless, under an independently motivated revised topomorphic theory, rhyme-anomalies will be given a considerable degree of significance. More specifically, under this revised theory the presence of these formal anomalies in sonnet 3, near the opening of the first macro-sonnet, will entail revised expectations about what can credibly be predicted to occur near the close of this same macro-sonnet.

Often, elements that appear at the close of an individual sonnet will ‘hark back’ to the opening of that sonnet. Hence, it is to be predicted that we should expect similar ‘wrap-around’ patterns within macro-sonnets. Under the revised theory in

¹¹⁸ Paterson (2010, p. 13).

¹¹⁹ Vendler (1997, p. 58).

question, it will turn out that the precise location for sonnet 3 will bear a distinctive species of topomorphic significance. And the precise location for sonnet 13 will bear exactly the same species of topomorphic significance. In sonnet 3, this significance is registered by rhyme-anomalies. In sonnet 13 the same species of topomorphic significance is registered, but in a different way – because sonnet 13 is the *only* one in this macro-sonnet that uses the adult ‘you’ form of address.¹²⁰

Rhyme-anomalies:

Thus, the crucial evidence for the topomorphic theory of macro-sonnets will, further down the track, rest heavily on minor rhyme-anomalies that are generally not noted by commentators. The question therefore arises, whether these minor anomalies should be given the substantial degree of significance that the theory requires. Most commentators do not mention these rhyme-anomalies; consequently, it may be legitimately questioned whether Shakespeare could credibly have expected anyone in his intended audience to have noticed them.

For most readers, most of the time, when reading or hearing Shakespeare’s sonnets, attention is fully occupied in the attempt to understand what thoughts and feelings are being expressed; and this leaves a lowered likelihood that readers will notice (*consciously*) the subtle variations in Shakespeare’s rhymes and rhythms (though that is compatible with those variations having significant effects *subliminally*).

¹²⁰ See footnote 255.

Nevertheless, it is possible for a select few readers to both read and re-read Shakespeare's sonnets; and on re-reading at least some of them might intently look for minor rhyme-anomalies. The hypothesis under present investigation is that, given the literary culture of Tudor and Jacobean England, it would have been reasonable for Shakespeare to anticipated that at least some of his readers might look for minor rhyme-anomalies in this sonnet sequence.

Against that context, it was not beyond the capabilities of a handful of Shakespeare's private friends or potential patrons to notice the rhyme-anomalies in sonnets 3 and 6; and, if they did, it would not have been beyond their capabilities to notice that these sonnets are neatly aligned with with the tritone in a corresponding musical scale for the Dorian mode.

CHAPTER 2.

AN IAMBIC MICROCOSM

2.1 RELIABILITY AND SURPRISE

One of the strands in the present investigation draws upon the Pythagorean doctrine that the microcosm mirrors the macrocosm. The hypothesis is that Shakespeare may have reflected this doctrine by compiling his sonnet sequence in such a way as to constitute a series of macro-sonnets, whose structure is in some salient way analogous to the internal structure of individual sonnets.

Hence it is important for the present investigation to take close note of the internal structure of individual sonnets. The first thing to note is that, if Shakespeare was pursuing the Renaissance microcosmic-macrocosmic vision, then the microcosm in which he is working is *iambic pentameter*. The iambic rhythms pulse through both the *Sonnets* and the *Complaint*.

Another important feature to be noted is that, on the one hand, these sonnets are very regular in their formal structure – and yet, on the other hand, within those very striking constraints these sonnets and stanzas are surprisingly varied in many, many other respects. And there is also a meta-rule that governs this sonnet sequence. For every rule that these sonnets obey (including this meta-rule), there is at least one sonnet that breaks that rule. Here are three examples: every sonnet has fourteen lines *except* sonnets 99 and 126. Every sonnet is in iambic pentameter *except* sonnet 145. And every sonnet closes with a rhyming couplet,

with no exceptions – except *perhaps* for sonnet 126 (the last two lines rhyme, and feel like a ‘closure’, but they are not in the expected position, as lines 13 and 14, which in Q are both left blank and flanked by brackets).

This regularity – with just a handful of exceptions – applies not only to formal similarities and differences but also to thematic, stylistic, imagistic similarities and differences. But this time, the shoe is on the other foot. Instead of each sonnet being *formally* ‘the same’ as the others (apart from a few exceptions), in other respects each sonnet is ‘strikingly different’ from the others (apart from a few exceptions).

Thus, for instance, sonnets 153 and 154 are almost like two very similar ‘drafts’ of one and the same sonnet. Commentators struggle to find a significant difference between them: Vendler opens her discussion of them by saying, ‘Sonnets 153 and 154 are close in plot, but not identical’¹²¹ – nevertheless this is the only case in which she discusses two sonnets not separately, but as a pair. And there are a few other cases in which one sonnet is strikingly similar to another. For instance, Vendler opens her discussion of sonnet 137 by saying, ‘Sonnets 137 and 148 are in a sense the “same” poem.’¹²² And the closing couplet of sonnet 36 is repeated word-for-word as the closing couplet of sonnet 96. But otherwise, each of Shakespeare’s sonnets differs from the others very significantly in content, imagery, and other respects. But the situation is reversed with respect to formal matters like metre and rhyme-schemes.

¹²¹ Vendler (1997, p. 648).

¹²² Vendler (1997, p. 581).

The hypothesis to be tested is that this sonnet sequence is topomorphically grouped into macro-sonnets – but to this is added the prediction that, for virtually every regularity that is to be found in virtually all of these macro-sonnets, there will also be one or two exceptions. And – conversely – it is also to be predicted that, for virtually every instance of macro-rule-breaking in the macro-sonnets, there will probably be an analogous instance of macro-rule-breaking in at least one of the individual sonnets.

Thus, for instance, it is initially to be predicted that each macro-sonnet should contain fourteen sonnets. Hence it is initially to be predicted that the seventh macro-sonnet should close with sonnet 98, and the next macro-sonnet should open with sonnet 99. But inspection of these two sonnets immediately shows that sonnets 98 and 99 belong together. That there is manifestly no way that sonnet 99 could credibly be seen as having been deliberately placed as the opening of a new macro-sonnet. The next macro-sonnet could credibly be taken as opening with sonnet 100: ‘Oh truant Muse what shalbe thy amends, / For thy neglect of truth in beauty di’d?’ But not with sonnet 99: ‘The forward violet thus did I chide ... More flowers I noted, yet I none could see, / But sweet, or culler it had stolne from thee’. The allusion in sonnet 99 to the ‘forward violet’ may *foreshadow* a new macro-sonnet that is soon to arrive. However, the ‘violet’ does not link poetically with flowers in any of the sonnets that follow, but with the flowers in sonnets 94, 95 and 98. Furthermore, the reference in sonnet 99 to the Seasons, implicit in the ‘forward violet’, links back to sonnets 97 and 98. As tacked onto the end of the seventh macro-sonnet, sonnet 99 is itself a kind of ‘forward violet’. It could be *chided* for containing too many lines.

The evidence that sonnet 99 does *not* open a new macro-sonnet does not immediately falsify the hypothesis that Shakespeare has grouped his sonnets into macro-sonnets. On the contrary, it is compatible with the hypothesis that the seventh macro-sonnet might have been deliberately augmented to comprise one extra sonnet. Initially, this might look like a desperate attempt to rescue the theory against an obvious refutation. The trouble with *ad hoc* revisions is that they too often make the theory virtually empty of predictions, and hence the theory becomes completely untestable. But that stern judgment seems much less compelling when it is noted that this supposedly augmented fifteen-sonnet macro-sonnet closes with sonnet 99, which contains fifteen lines.

For these reasons, it is important to commence with a close study of the formal structures within Shakespearean sonnets. If macro-sonnets are to mirror sonnets, it is important to be clear about the internal structure of individual sonnets. If regularities are to be sought in macro-sonnets, it is important to be clear about *how regular* they would need to be, if they were to mirror the formal regularities within the individual sonnets.

2.2 IAMBIC SYLLABLE-PAIRS

... marshalling the metres ... doth alter the nature of the
Poesie, and make it either lighter or grauer, or more merry,
or mournfull, and many ways passionate to the eare and
hart of the hearer, seeming for this point that our maker by
his measures and concords of sundry proportions doth
counterfeit the harmonicall tunes of the vocall and
instrumentall Musickes.¹²³

The very first line in sonnet 1, ‘From fairest creatures we desire increase’, is a straightforward example of iambic pentameter.¹²⁴ Underlining is here used to mark what may be thought of as the ‘strong beat’.

It is explanatorily helpful to think of the beat as taking the form of alternating ‘strong’ and ‘weak’ beats. It is also explanatorily important to group these beats into five iambic ‘feet’, each foot comprising a weak beat followed by a strong beat. So iambic pentameter can be usefully represented by the following ‘matrix’:

w S – w S – w S – w S – w S.

¹²³ Puttenham (1589/2007, p. 174).

¹²⁴ Iambic pentameter is a pattern of enormously more theoretical depth than it seems: see Groves (2013).

The iambic beat can be understood as a pulse of a quasi-muscular nature. However, this ‘pulse’ exists primarily in the mind (or brain) and need not necessarily involve any actual muscular movement. It should instead be thought of as essentially a pulse that is occurring only in what might be thought of as the ‘muscular imagination’ – a muscular analogue of ‘the mind’s eye’. It *can* be marked by a physical movement – or by audible variations in duration, pitch, or volume – but it need not be.

In English poetry this pulse is tightly constrained by the two factors of phonological stress and syntactic (or grammatical) stress. In the first place, in English words of more than one syllable some syllables are obligatorily given greater stress than others. For instance, in the line, ‘Making a famine where abundance lies’ (sonnet 1, line 6), phonology and syntax requires the stress to fall: ‘Making a famine where a-boun-dance lies’. (A *beat* also falls on ‘where’ but not a *stress*; ‘where’ is a pro-adverbial and hence is syntactically unstressed.)

It follows that in sonnet 1, line 6, the first foot takes the *trochaic* form ‘Sw’, not the expected iambic form ‘wS’. Following tradition, the poet Robert Hass calls phenomena like this as requiring a ‘substitution’ of one kind of foot for a foot of another kind.¹²⁵ In the example given, an *iambic* foot would need to be ‘Making’, but that is impossible. Consequently, the first iambic foot needs to be *replaced* by the *trochaic* foot ‘Making’. But there are several subtly different ways of thinking about these things. Hass’s way of describing things does not invite us to think of

¹²⁵ ‘This way of establishing a pattern and then upending it from time to time is called *substitution*’, Hass (2017, p. 400).

‘reversing’ the weak and strong beats within a foot, but of ‘substituting’ a trochaic for an iambic foot.

In other examples, the strong beat in one iambic foot can be seen as ‘swapping places’ with the weak beat in the next foot. For instance, in the line, ‘Were an all-eating shame, and thriftlesse praise’ (sonnet 2, line 8), the syntax mandates the stresses to fall: ‘Were an all-eating shame and thriftlesse praise’, ww-SS-wS-wS-wS. The traditional terminology that Hass is using does not invite us to think of ‘swapping’ the strong beat in one foot with the adjacent weak beat in the next foot, but of ‘substituting’ the first of these iambic feet for a pyrrhic foot (unstressed-unstressed, ww), and the next iambic foot for a spondee (stressed-stressed, SS).

If that is the way that a poet like Hass is thinking about it, then perhaps that is a good way to read his poetry. Nevertheless, at least in the case of Shakespeare’s *Sonnets* there are significant explanatory advantages to seeing it the way Groves does, not in terms of ‘substitutions’ but in terms of ‘switches’ (either ‘swaps’ or ‘reversals’).¹²⁶ And this is in effect to think not in terms of ‘substitutions’ but rather in terms of either ‘*prematurely* hitting’ – or ‘*anticipating*’ – the strong beat – or else ‘*deferring*’ or ‘*postponing*’, the strong beat – and in either case

¹²⁶ Groves (2013); the following exploration of Shakespeare’s iambic pentameter closely follows Groves. For the background in the science of linguistics lying behind the microcosm of iambic pentameter, see Abercrombie (1967), Attridge (1974), Halliday (1970), Osmond (1968), Selkirk (1986), Sipe (1968), Woods (1984), Wright (1988).

perceiving these shifting locations of the strong-beats *in relation to* the underlying *iambic* matrix.

This alternative way of construing things encourages us to think of reversing the stress *within* an iambic foot – as though this iambic foot continues to exist and continues to be an ‘originally iambic’ foot – even though it has taken on an unnatural shape. It need not feel as though *another foot* has been substituted for the expected iambic foot, but rather, the line can be ‘heard as’ a line of five ‘iambic’ feet in which the first foot has not been exchanged for something else but has just been pulled (temporarily, as it were) into a different shape.

Phonological rules governing stress within each individual word thus supplies one of the factors that can force a shift in the strong beat within a poetic line. But these phonological rules are supplemented by syntactic rules, which mandate more stress on some words than others within any given grammatical construction. For instance, in the line, ‘Feed’st thy lights flame with selfe substantiall fewell’ (sonnet 1 line 5), the syntax requires stress to fall on ‘flame’: ‘Feed’st thy lights flame with selfe substantial fewell’. The three words ‘thy lights flame’ form a syntactic unit in which ‘flame’ dominates, ‘lights’ modifies ‘flame’, and ‘thy’ modifies ‘lights flame’. This grammatical dominance-ranking mandates a strong beat on the word ‘flame’.

In Shakespeare’s poetry, the beat of English iambic pentameter is tightly constrained by the *non*-subjective factor of grammatical stress. Even if you recite the line with a strong *emphasis* or *accent* on ‘thy’, the strong *beat* still falls on the word ‘Feed’st’. Much interpretive work in poetry is ‘subjective’, but for present

purposes it is important to remember that some of the facts about Shakespeare's iambic pentameter are as 'objective' as any observational facts can ever be.

There are also a number of further ways in which a reversal can be mandated within a line of iambic pentameter. For instance, it is possible for a reversal to be mandated neither 'lexically' nor 'syntactically', but either 'semantically' or 'pragmatically'. Some of these reversals are just as 'objective' as the lexical rules governing stress contours within a single word, like 'Making', or the grammatical rules governing the subordination of 'thy' to 'flame'. But here, focus will be primarily on lexically and grammatically mandated switches in the beat, because they are the easiest ones on which we can quickly establish a stable consensus.

The locations of grammatical stress in a poetic line are not determined in a simplistic way, which would select certain words (independently of context) as *always* carrying a strong beat, and other words as *always* carrying a weak beat. Rather, the locations of strong and weak beats is determined by a stable and objective *ranking* of the grammatical roles of different parts of speech. Whether a syllable carries a strong or a weak beat can depend on what syllables that lie on either side of it. Thus, for example, in Shakespeare's line, 'Making a famine where aboundance lies' (sonnet 1, line 6), the word 'where' ranks below words like 'famine' or 'aboundance' in the stress-hierarchy. Nevertheless, in this line the word 'where' does obligatorily carry the strong beat – because it is flanked by the syllables '-ine' and 'a-' that fall even lower in the stress-ranking.

Thus, the rules that determine the locations of strong beats are somewhat intricate, and difficult to articulate accurately without technical terminology. But anyone who is fluent in English iambic pentameter will have a tacit understanding

of these rules. And these rules are not just subjective projections of each individual reader of the sonnets but are as ‘objective’ as the rules of grammar.

The beat can, in principle, be emphasized by utilizing slight alterations in three orthogonal factors: pitch, duration and volume. But it need not be and over-emphasizing the beat sounds notoriously amateurish. Furthermore, it is important to realize that variations in pitch, duration and volume can be utilized for other purposes than that of marking or emphasizing the beat. By marking the beat only gently, variations in pitch, duration and volume can then be reserved for other purposes.

Thus, for instance, change in pitch (generally, but not exclusively, a shift *upwards* in pitch) can be used for various kinds of emphasis, particularly contrastive stress. This can be illustrated by the line, ‘Thou doost loue her, because thou knowst *I* loue her’ (sonnet 42, line 6), with italic font indicating an upward inflection for the word ‘*I*’. Here the word ‘*I*’ may well be given an increase in duration, as well as pitch, and in principle it could also receive an increase in volume – and yet no matter how much the word is emphasized, utilizing any of these three dimensions, it would still not constitute the ‘strong beat’ in the metre. In this line, a strong beat on ‘knowst’ and ‘loue’ is mandated by the grammar and will be ‘perceived’ in ‘the mind’s ear’ (as a kind of ‘auditory illusion’, if you will) whether or not it is accompanied by any measurable physical variations duration, pitch, or volume.

Iambic pentameter pulses through Shakespeare’s entire sonnet sequence like a heartbeat – with only one significant deviation, in sonnet 145 (which is in iambic tetrameter). The first two lines of sonnet 1 firmly establish this underlying matrix

for iambic pentameter, without any swaps or reversals of any of the five strong beats. Along the way, there are ‘switches’ that vary the beat, but that does not disrupt an stable underlying sense of ‘regularity’.

Furthermore, when the pulse does begin to ‘skip a beat’, this always occurs only within fixed and prescribed limits. The rule that fits the evidence is a simple one:

Groves’s Rule:

Starting with the initial matrix, it is permissible (but not obligatory) successively to switch one or more of the strong beats with an adjacent weak beat – provided that neither that strong beat nor that adjacent weak beat has yet been switched from the original position in the matrix, and provided this switched pair is immediately followed by a beat remains unswitched from its original position in the matrix.

Any pattern resulting from the matrix by zero or more applications of Groves’s Rule may aptly be called one of the possible ‘templates’ for iambic pentameter.¹²⁷

To this should be added one more variation that is also allowed under this Rule: any given template can optionally be supplemented with an extra weak beat at the end of the line – this extra beat being called a ‘feminine ending’ because it was modelled on a grammatically feminine ending for French adjectives.

¹²⁷ Groves (1998, pp. 108-9), Groves (2013, pp. 35-6, p. 49).

Thus, for instance, the adjective ‘Thracienne’, modifying the feminine noun ‘la harpe’, has an extra syllable added at the end. The following line of Alexandrine in French can serve as an instructive illustration:¹²⁸

‘Que n’a y-je, encor la harpe Thraciennne’.¹²⁹

Grammatical details of this kind were demonstrably of interest to Shakespeare, both in the plays and in the sonnets. For instance, in sonnet 11 the masculine endings for lines 1 and 3, ‘grow’st’ / ‘bestow’st’, are pointedly contrasted with the feminine endings for lines 2 and 4, ‘departest’ / ‘conuertest’. An exercise in ten *versus eleven* syllable lines is an apt topic for sonnet 11.

For another illustration: there is a feminine ending for every line of Shakespeare’s sonnet 20. This is the only sonnet in which all fourteen lines have a feminine ending.¹³⁰ These feminine endings in sonnet 20 are almost certainly deliberate, because this sonnet is about a young man who is described in the

¹²⁸ Du Bellay (1558/1966, p. 299): *Les Antiquitez de Rome*, sonnet 25, line 1.

(This work strongly influenced both Spenser and Shakespeare.)

¹²⁹ The ‘Thracian harp’ alludes to a story that is told by Ovid about Orpheus and his harp. The links between French sonneteers like Du Bellay and the English sonneteers involve not only formal details but also many other poetic concerns.

¹³⁰ The first sonnet in the so-called ‘Farewell’ sequence, sonnet 97, comes close; it features twelve feminine endings (and the two masculine endings, in lines 2 and 4, are very limp).

sonnet as being very feminine in appearance – and who presumably has 20 fingers and toes – but who is also ‘prickt out for womens pleasure’.¹³¹

Thus, the evidence strongly suggests that Shakespeare’s use of feminine endings was not merely intuitive, but also consciously considered. The evidence also strongly suggests that Shakespeare was sensitive to numerous other variations from the basic matrix for iambic pentameter.

Any pattern that results from the matrix by the application of Groves’s Rule may conveniently be called a ‘template’. Since these are all intuitively to be *heard as* variations on the matrix for iambic pentameter, they should be understood not as ‘departures’ from iambic pentameter, but as transformations *within* the intuitively understood rules for Shakespeare’s iambic pentameter.

Here is an illustration. In the first quatrain of sonnet 1, lines 1, 2 and 4 fit the matrix, with no switches at all. And although line 3 does technically require a reversal in the first foot, in actual performance this is a scarcely noticeable deviation from the matrix. This rhythmic closeness to the matrix is mimetically appropriate because this quatrain describes a relaxed sense of harmony, with expectations being reliably met, and with beautiful creatures passing their beauty onwards to the next generation.

But the second quatrain opens with the word ‘But’ – which signals a significant change of direction. And this sense of a change of direction is swiftly amplified by the rhythms:

But thou contracted to thine owne bright eyes, line 5

¹³¹ See Duncan-Jones (2010, pp. 101, 150).

Feed'st thy lights flame with selfe substantiall fewell, line 6

S w – w S – w S – w S – w S (*strong beat anticipated in foot 1*).

Making a famine where abundance lies, line 7

S w – w S – w S – w S – w S (*again, anticipation in foot 1*).

Thy selfe thy foe, to thy sweet selfe too cruell: line 8

Shakespeare's changes in rhythms virtually always function like a good soundtrack in a movie – or a bit like crescendos, decrescendos, rallantandos, and so forth in a musical composition.

Here is a dramatic example from sonnet 107:

Not mine owne feares, nor the prophetick soule, line 1

S w – w S – S w – w S – w S (*anticipating in 1 and 3*).

Of the wide world, dreaming on things to come, line 2

w w – S S – S w – w S – w S (*deferring to 2, anticipating in 3*).¹³²

There is another example, taken from sonnet 127:

In the oulde age black was not counted faire, line 1

w w – S S – S w – w S – w S (*deferring to 2, anticipating in 3*).

¹³² Lines that permit initial swaps are always alternatively performable with initial reversals.

The complete tally of all the possible templates generated by Groves's Rule can be conveniently laid out in the following Table, with each template accompanied by a sample line from Shakespeare's *Sonnets* that fits it. There are 28 templates all together (and the number really comes up to 56 if you count the feminine endings separately).

Templates:**Description:****Frequency:**

1. w S – w S – w S – w S – w S [*matrix plus zero switches*]

1153 lines (53.83%)

Example: sonnet 1.1 From fairest creatures we desire increase,

One switch:

2. **S** w – w S – w S – w S – w S [*reversal in foot 1*]

533 lines (24.88%)

Example: sonnet 1.7 Making a famine where abundance lies,

3. w **S – S** w – w S – w S – w S [*reversal in 2*]

9 lines (0.42%)

Example: sonnet 27.14 For thee, and for my selfe, noe quiet finde.

4. w w – **S S** – w S – w S – w S [*swap (1 to 2)*]

78 lines (3.64%)

Example: sonnet 2.8 Were an all-eating shame, and thriftlesse praise.

5. w S – w **S – S** w – w S – w S [*reversal in 3*]

94 lines (4.39%)

Example: sonnet 1.13 To eate the worlds due, by the graue and thee.

6. w S – w w – **S S** – w S – w S [*swap (2 to 3)*]

16 lines (0.75%)

Example: sonnet 12.13 And nothing gainst Time's siethe can make defence,

7. w S – w S – w **S – S** w – w S [*reversal in 4*]

51 lines (2.38%)

Example: sonnet 13.9 Who lets so faire a house fall to decay,

8. w S – w S – w w – **S S** – w S [swap-(3 to 4)]

52 lines (2.43%)

Example: sonnet 1.8 Thy selfe thy foe, to thy sweet selfe too cruell:

9. w S – w S – w S – w w – **S S** [swap-(4 to 5)]

35 lines (1.63%)

Example: sonnet 6.4 With beautits treasure ere it be selfe kil'd:

Two-switches:

10. **S** w – w **S – S** w – w S – w S [reversals in 1 and 3]

46 lines (2.15%)

Example: sonnet 15.6 Cheared and checkt euen by the selfe-same skie:

11. **S** w – w w – **S S** – w S – w S [reversal in 1, swap-(2 to 3)]

2 lines (0.09%)

Example: sonnet 2.13 This were to be new made when thou art ould,

12. **S** w – w S – w **S – S** w – w S [reversals in 1 and 4]

29 lines (1.35%)

Example: sonnet 10.11 Be as thy presence is gracious and kind,

13. **S** w – w S – w w – **S S** – w S [reversal in 1, swap-(3 to 4)]

17 lines (0.79%)

Example: sonnet 14.5 Nor can I fortune to breefe mynuits tell,

14. **S** w – w S – w S – w w – **S S** [reversal in 1, swap-(4 to 5)]

20 lines (0.93%)

Example: sonnet 8.14 Sings this to thee thou single wilt proue none.

15. w **S – S** w – w **S – S** w – w S [reversals in 2 and 4]

2 lines (0.09%)

Example: sonnet 19.14 My loue shall in my verse euer liue young.

16. w **S – S** w – w w – **S S** – w S [reversal in 2, swap-(3 to 4)]
1 line (0.05%)

Example*: sonnet 72.6 To doe more for me then mine owne desert,

17. w **S – S** w – w S – w w – **S S** [reversal in 2, swap-(4 to 5)]
1 line (0.05%)

Example: sonnet 22.10 As I not for my selfe, but for thee will,

18. w w – **S S – S** w – w S – w S [swap-(1 to 2), reversal in 3]
9 lines (0.42%)

Example: sonnet 32.10 Had my friends Muse growne with this growing age

19. w w – **S S** – w **S – S** w – w S [swap-(1 to 2), reversal in 4]
1 line (0.05%)

Example: sonnet 23.7 And in mine owne loues strength seeme to decay,

20. w w – **S S** – w w – **S S** – w S [swaps-(1 to 2), (3 to 4)]
4 lines (0.19%)

Example: sonnet 8.5 If the true concord of well tuned sounds,

21. w w – **S S** – w S – w w – **S S** [swaps-(1 to 2), (4 to 5)]
3 lines (0.14%)

Example: sonnet 42.9 If I loose thee, my losse is my loues gain,

22. w S – w **S – S** w – w w – **S S** [reversal in 3, swap-(4 to 5)]
1 line (0.05%)

Example: sonnet 118.8 To be diseas'd ere that there was true needing.

23. w S – w w – **S S – S** w – w S [swap-(2 to 3), reversal in 4]
1 line (0.05%)

Example: sonnet 71.7 That I in your sweet thoughts would be forgot,

24. w S – w w – **S S** – w w – **S S** [swap-(2 to 3), (4 to 5)]

2 lines (0.09%)

Example: sonnet 35.8 Excusing their sins more then their sins are:

Three-switches:

25. **S** w – w **S – S** w – w w – **S S** [reversals in 1 and 3, swap-(4 to 5)]

1 line (0.05%)

Example: sonnet 115.13 Loue is a Babe, then might I not say so,

26. **S** w – w w – **S S – S** w – w S [reversals in 1 and 4, swap-(2 to 3)]

1 line (0.05%)

Example: sonnet 2.13 This were to be new made when thou art ould,

27. **S** w – w w – **S S** – w w – **S S** [reversal in 1, swaps-(2 to 3), (4 to 5)]

1 line (0.05%)

Example: sonnet 84.1 Who is it that sayes most, which can say more,

28. w w – **S S – S** w – w w – **S S** [swap 1 to 2, rev in 3, swap 4 to 5]

1 line (0.05%)

Example**: sonnet 152.9:

For I haue sworne deepe othes of thy deepe kindnesse:

* Note: Line 72.6 does not technically require template 16, because it is not syntactically obligatory to give ‘make’ the strong beat; but in the context of Shakespeare’s times template 16 is nevertheless a preferred candidate reading for this line.

** Note: Line 152.9 does not require template 28 under phonological and syntactic rules for grammatical stress; but equally firm pragmatic rules strongly support template 28 for this line. (There is a pragmatic rule requiring that ‘othes’ should shed stress when the linguistic context ensures that the words ‘oaths’ and ‘vows’ constitute what is called ‘background information’.)

There is no room for rational disagreement about whether templates 1 and 2 fit the lines with which they have been paired. An attempt has been made to keep the standard of ‘objectivity’ equally high across all the examples cited above. In nearly every case it is beyond reasonable doubt, on a careful reading of the line in context, that the mandated reading of this line matches the template with which it has been paired.¹³³

¹³³ As a further check against ‘wishful thinking’, the above pairing of templates with exemplars has been taken from data that was compiled by Groves at a time when he was *not* testing the hypothesis that every template can be illustrated by at least one of the lines in Shakespeare’s *Sonnets*.

The frequency-data for use of these templates within lines of iambic pentameter is similar across various different writers of the era. Here is a summary of some examples:

Shakespeare's *Sonnets*

template 1 (71%)
over 71%)

templates 2 to 9 [i.e. one switch] (26%)

templates 10 to 24 [i.e. two switches] (almost 3%)

templates 25 to 28 [i.e. three switches] (just over 0%)
(0.0%)

Venus and Adonis

[no switches] (just

[one switch] (27%)

[two switches] (1.4%)

[three switches]

Sidney's *Astrophel and Stella*

template 1 (59%);
over 72%)

templates 3 to 9 [i.e. one switch] (38%);

[template 2 (21%), templates 3 to 9 (17%)]

templates 10 to 24 [i.e. two switches] (2.2%);

templates 25 to 28 [i.e. three switches] (0.0%).
(0.0%)

Spenser's *Amoretti*

[no switches] (just

[one switch] (25%)

[two switches] (1.8%)

[three switches]

With a sample size as large as Shakespeare's *Sonnets* (2139 distinct lines of iambic pentameter), the chances are extremely high that the observed frequency will lie within a close margin of the underlying propensity – if these frequencies are indeed a product of some stable underlying configuration of propensities. And the similarity in frequencies between Shakespeare, Sidney and Spenser is evidence that these frequencies evidently are a product of some stable underlying configuration of propensities.

This immediately entails that Shakespeare and other poets of the time must have had instincts or preferences (whether conscious or unconscious) whose resultant effect is that template 1 ranks well above the templates (2 to 9) that introduce a single switch within a line, and these in turn rank well above the templates (10 to 24) that introduce two switches, which in turn rank well above the templates (25 to 29) that introduce three switches.

In conclusion, textual evidence supports the conclusion that Shakespeare was sensitive not only to the rhythmic contours of lines of iambic pentameter, but also to the *rarity* of certain rhythmic configurations within the particular sequence that he was compiling.

This investigation is complicated further by the fact that it is possible for some switches in the iambic rhythm to be *permitted* by lexical and grammatical constraints, without being *mandated*. And there is room for subjective interpretation, when introducing one of the templates that is not mandated, but is permitted, under the grammatical constraints of English.

An illustration can be furnished by the third quatrain of sonnet 105:

Faire, kinde, and true, is all my argument,

line 9

Faire, kinde and true, varying to other words, line 10

And in this change is my inuention spent, line 11

Three theams in one, which sondrous scope affords. line 12

The three words ‘faire’, ‘kinde’, and ‘true’ in line 9 are repeated in line 10, without varying to other words – the only chance is the omission of one comma. So what is meant in line 11 by ‘this change’? Duncan-Jones interprets the lines like this: “By repeating the three epithets from the preceding lines the speaker exemplifies the *constancy* of his verse, yet immediately undercuts it in ‘varying to other words’.”¹³⁴ But she does not consider the possibility of not only varying the *words* but *also* varying the beat.

One way to make more sense of these lines is by varying the template within the established constraints of iambic pentameter. In line 10 there is a mandated reversal in the third foot, ‘varrying to’. As Booth says, ‘varrying’ needs in this context to be disyllabic; and the beat must be carried by the first syllable – and Booth registers this alteration in the beat: ‘disyllabic, by syncopation’.¹³⁵

Against this background, upon a second reading of this line, in anticipation of the coming reversal in the third foot of line 10, it is possible to create an appealing rhythmic chiasmus by introducing an earlier reversal within the first foot as well: ‘Faire, kinde and true, varrying to other words’, S w – w S – S w – w S – w S. Punctuation cannot be trusted in the 1609 text of Shakespeare’s *Sonnets*, but in this case even the punctuation reinforces this possible reading. Changing

¹³⁴ Duncan-Jones (2010, p. 130).

¹³⁵ Booth (1977/2000, p. 338).

‘Faire, kinde, and true’ to ‘Faire, kind and true’ does encourage a shift from ‘wS-wS’ to ‘Sw-wS’.

Booth says, ‘the syntactic awkwardness of the phrase [‘varying to other words’] invites thought and thus opens the way for a reader’s mind to stray into the clownish absolutism of perversely applying strict logic to idiomatic speech; compare the gravedigger in *Ham* V.i.115-32’.¹³⁶ Not everyone’s mind will stray to Hamlet’s gravedigger; but the sonnet is clearly one designed to engage the intellect, not just the passions: ‘Because of its absence of metaphor, the sonnet has been called “dull” and “tautologous” by several of its critics (Weiner, Vickers, and Kerrigan among them) who prefer a visibly imagistic poetics to a poetics of wit. Of the early editors, only Wyndham (1898) saw its Platonic implications’.¹³⁷ After Wyndham, commentators regularly highlight the Platonic trinity of Truth, Beauty and Goodness, as contrasted with the Christian Trinity in the Athanasian Creed. But it is possible for Shakespeare to have overlaid attention to rhythms, as well as scholarly allusions, in the construction of this exercise in the ‘poetics of wit’.

Hence, close reading of this individual sonnet independently corroborates the conclusion drawn frequency-data across the entire sonnet sequence, that there are rhythmic patterns here that are very probably deliberate, and not merely a product of chance alone. Hence, this evidence weighs against the image that some commentators have had of Shakespeare – as an author who writes his lines in an

¹³⁶ Booth (1977/2000, p. 339).

¹³⁷ Vendler (1977, p. 445).

entirely ‘intuitive’ manner, and then never exercises his intellect in revising those lines.

Indirectly, therefore, this helps to support the hypothesis that he might also have overlaid topomorphic patterns of some kind on his sonnet sequence of 1609.

Corollary concerning rhymes:

If Shakespeare was deliberately or subliminally attending to rhythms, to the degree that the textual evidence indicates, then he was probably also similarly attending to rhymes.

The rhyme-scheme of sonnet 1 falls unambiguously into the standard Shakespearean pattern: *abab cdcd efef gg*. The last two lines form a rhyming couplet: ‘Pitty the world, or else this glutton be, / To eate the worlds due, by the graue and thee.’

Sonnet 2 continues the Procreation theme that was launched in sonnet 1, and this sonnet also shares the same rhyme-scheme. And none of the end-rhymes in sonnet 2 repeat any of the end-rhymes in sonnet 1.

Sonnet 3 further develops the same Procreation theme, and also the same iambic pentameter (though this time it opens with template 2). However, sonnet 3 deviates significantly from sonnets 1 and 2 in its rhyme-scheme.

In sonnet 3, lines 6 and 8 feature the end-rhyme ‘husbandry’ / ‘posterity’, and lines 9 and 11 feature the end-rhyme ‘thee’ / ‘see’. But this is breaking the tacit rules of the game, because the first pair rhymes with the second pair – and it is

‘illegal’ to repeat a rhyme more than once under the ubiquitous rhyme-scheme for Shakespeare’s sonnets.¹³⁸

Furthermore, in sonnet 3 the end-rhyme for lines 6, 8, 9 and 11 returns yet again in the closing couplet, lines 13 and 14: ‘But if thou liue remembred not to be, / Die single and thine Image dies with thee.’ Thus, the rhyme-scheme for sonnet 3 is in fact: *abab cdcd dede dd*. In fact, the very same *word*, ‘thee’, occurs as an end-rhyme twice in one and the same sonnet. Furthermore, the rhyme-words for the closing couplet in sonnet 3 repeat the very same words, in the very same order, ‘be’ / ‘thee’, as the closing couplet for sonnet 1.

Commentators do not comment on these rhyme-anomalies; so presumably many readers do not even notice them. There is plenty to enjoy, and to puzzle over, in these sonnets 1 and 3 without paying any heed to formal details of this kind. Nevertheless, Shakespeare could also have anticipated that some of his readers might be sticklers for formal rules. And if those readers were rival poets or potential patrons, then that would have afforded him prudential reasons for caring about their responses to his sonnets. It cannot be assumed without evidence that the *only* things of poetic significance are the ones that *most* attentive readers will notice.

There are two quite distinct ways of reading sonnets, and these are nicely illustrated in Shakespeare’s *As You Like It* (3.2) when Rosalind and Celia find

¹³⁸ Evidence that ‘husbandry’ does – for Shakespeare – rhyme with ‘thee’ can be found in sonnet 6, where in the second quatrain ‘vsery’ is rhymed with ‘thee’, and in the third quatrain ‘thee’ is rhymed with ‘posterity’.

poems pinned to trees. The poems are addressed to 'Rosalind', but are unsigned. Celia suspects that the Rosalind to whom they are addressed is her friend Rosalind. From the contents of these poems it seems that the author has fallen head over heels in love with Rosalind. Naturally, Celia is therefore curious about the identity of the author. But, when she raises the question with her friend, all Rosalind will talk about is whether there are too many feet in some of the lines.

For most readers, most of the time, when reading or hearing Shakespeare's sonnets attention is normally occupied primarily in trying to understand exactly the thoughts and feelings that are being expressed; and this leaves a lowered likelihood that readers will explicitly notice the subtle variations in Shakespeare's rhymes and rhythms. And, given what the sonnets seem to be saying, curiosity is then naturally also aroused by questions that are rather more like Celia's than Rosalind's – questions, that is, about the life and times of the writer of these sonnets. Nevertheless, the current investigation doggedly is directed by curiosity more like Rosalind's than Celia's.

2.3 IAMBIC LINE-PAIRS

In Shakespeare's sonnets, the lines are nearly always syntactically grouped into pairs: line 1 often continues smoothly into line 2; but then there is usually a fairly clear syntactic break at the end of line 2. Then line 3 often flows into line 4; but then there is almost always a sharp syntactic break between the first and second quatrain. And so on. Thus, Shakespeare's lines are very regularly syntactically grouped into pairs, <1, 2>. <3, 4>, ... and, in general, <odd, even>,

It is only rarely that this 'marching' pattern, within individual sonnets, is smudged by any enjambments between an even-line and the next odd-line. As with nearly every other rule, there are just a few exceptions. There is a striking series of enjambments in sonnet 79. And, in a handful of cases, the octave does spill over into the sestet, as for instance in the famous, lust-driven sonnet 129, '... to make the taker mad. / Made in pursuit ... '. Presumably there is a typographical error here, and the lines should read ' ... mad, / Mad in pursuit ... ', thereby creating a very effective anadiplosis. But in Shakespeare's sonnets these cases of 'spill-over' are relatively rare, and virtually always motivated by the content. For instance, in sonnet 129 a 'spill-over' mimetically emphasizes the impetuosity of the lust that is being described. In the vast majority of cases, however, there is a syntactic break at the end of each even-line – and the existence of that background regularity helps to make the exception in sonnet 129 even more effective.

More particularly, the break between the first and second quatrain, or between the third quatrain and the couplet, are transgressed even more rarely than the octave. There is one sonnet, sonnet 35, in which the syntax fails to offer a break between line 12 and line 13. In this sonnet, the effect is to create a syntactic grouping in the pattern $((4+4) + (3+3))$, echoing Petrarchan sonnets. And it is possible to construe several of Shakespeare's sonnets as mirroring this Petrarchan structure *thematically*. But sonnet 35 is the only one that marks it syntactically, and none mark it in the rhyme-scheme.¹³⁹

Similarly, there is only one sonnet, sonnet 63, in which the syntax fails to break between lines 4 and 5. Thus, sonnet 63 is *exceptionally* anomalous, and so is sonnet 35. In this context, therefore, it might be worth noting that 35 and 63 are both multiples of 7. It is not out of the question that this numerological detail might have been noticed by Shakespeare. The number 63, the 'grand climacteric', was invested with especially great significance in Elizabethan times.

Thus, there are exceptions to the general rule that sonnet lines are grouped in the pattern <odd, even>, <odd-even>, But if these exceptions to the rules are subliminally effective, then this is precisely because they are so rare – 'Therefore are feasts so solemn and so rare, / Since seldom coming in the long yeare set, / Like stones of worth they thinly spaced are, / Or captain jewells in the carconet'

¹³⁹ The only sonnet that comes close to marking a Petrarchan pattern for the sestet in the rhyme-scheme is sonnet 46, whose rhyme-scheme is, *efef ff*, which could perhaps be grouped *efe fff*.

(sonnet 52). The rarer the exceptions to a poet's chosen rules, the more significance it is possible for that poet to invest them with.

2.4 IAMBIC SONNET-PAIRS

The Pythagorean notion that the microcosm mirrors the macrocosm, as outlined in Plato's *Timaeus*, carries with it a plausible aesthetic theory. This theory arises as a generalisation from elements in Pythagorean music theory.

When two notes, sounding simultaneously, approach the same frequency, then there is a physical effect that occurs, an interference pattern that emerges from the physics of sound waves, and that is naturally perceived as discordant. When two notes hit unison, the interference pattern disappears, and the effect is naturally perceived as a harmony. It is not necessary to grasp this nugget of music theory consciously and intellectually in order to perceive the effects that this music theory aims to explain.

Pythagoreans generalize. Often there are effects that are instinctively perceived by people, even when they do not intellectually register the physically instantiated mathematical patterns that cause those effects. Thus, when the rhythm of iambic feet, within the individual lines of a sonnet, are echoed by a syntactic pairing of the successive lines within that sonnet, then it is at least possible that this underlying pattern may have a subliminal effect on the reader.

A closely analogous pattern recurs in the macrocosm of the sonnet sequence, taken as a whole. Shakespeare's sonnets, as ordered in the published sonnet sequence of 1609 – like the lines within each individual sonnet – and like the

syllables in each line – often form natural pairs.¹⁴⁰ Whether Shakespeare noticed this or not, it does seem to be a pattern that is indeed fairly robustly instantiated within his sonnet sequence. In most cases the pairs take the form <odd, even>. A good example is found in the pairs <27, 28> / <29, 30>. The first pair concerns sleepless nights when absent from the beloved. The second pair concerns the way that ‘thy sweet loue remembred’ can ensure that ‘All losses are restord, and sorrowes end’.

There are exceptions to the ‘odd-then-even’ rule, as for instance with the cluster of ‘even-then-odd’ pairs <44, 45>, <46, 47>, <50, 51>. But the existence of exceptions does not necessarily invalidate the rule. Notice what the Pythagorean hypothesis entails, when sympathetically understood. Shakespeare’s rhythms are always iambic pentameter; but they are also flexible. Likewise, Shakespeare’s line-pairings are remarkably regular; but there are occasional deviations. A Pythagorean hypothesis should predict an analogous pattern to emerge yet again for sonnet-pairs; and, indeed, the evidence cited above demonstrates that it does.

The upshot helps to answer a worry that beset the investigation earlier. Sonnets 27 and 28 form a natural poetic pairing, and so it is tempting to take this as evidence that they qualify as a ‘macro-couplet’. Against this, however, it may be

¹⁴⁰ Spiller (1992, pp. 151, 170-73). Spiller lists the following thirteen pairs: <5, 6>, <15, 16>, <27, 28>, <44, 45>, <46, 47>, <50, 51>, <67, 68>, <73, 74>, <89, 90>, <91, 92>, <113, 114>, <135, 136>, <153, 154>. But (apart from <153, 154>) these are just the ones that Spiller lists as ‘developmental’ pairs. There are many other credible pairings (when you look for them), as for instance <29, 30>, <33, 34>, and so on.

objected that sonnets 13 and 14 do not similarly strike the reader as a natural pair. And conversely, sonnets 29 and 30 *do* clearly qualify as a natural pair – even though they are not in the right place to be counted topomorphically as a macro-couplet.

Thus, it is apparent that in this sonnet sequence there are many poetic grouping of sonnets into pairs – either because one develops the themes in another, or just on the grounds of especially close similarities linking the two members of the pair. These pairings do not *all* correspond topomorphically to the locations of macro-couplets, but some do.

This is, however, not a decisive disconfirmation of the theory. Rather, it is a natural consequence of the deep Pythagorean principle that the microcosm mirrors the macrocosm. Poetic pairings of lines within a sonnet do not always constitute a closing couplet, but some of them do; and the same applies to poetic pairings between distinct sonnets. The fact that the rules have exceptions makes the theory harder to test, but not impossible. What is required is to establish not *exceptionless* regularities, but regularities with exceptions that are sufficiently rare and always or virtually always poetically motivated.

2.5 IAMBIC-FOOTED TIME

Ay, but the feet were lame, and could not bear themselves
without the verse, and therefore stood lamely in the verse.

As You Like It 3.2.164-167.

And do what ere thou wilt swift-footed time

To the wide world and all her fading sweets:

Sonnet 19.6.

In sonnet 5 Shakespeare reflects on the way that the hours, and the days, and the seasons measure out our life. And they do so in what might easily be seen as iambic feet: *di-dah* / *di-dah* / ... – *tick-tock* / *tick-tock* / ... – *day-night* / *day-night* / ...

... the braue day sunck in hidious night ...

... – *summer-winter* / *summer-winter* / ...

For neuer resting time leads Summer on,

To hidious winter

Shakespeare must surely have at least contemplated the possibility of mirroring a calendar in poetic forms. A number of his famous English predecessors did this; and, furthermore, Shakespeare's narrative poem *Lucrece* (1594) was based

primarily on Ovid's *Fasti*, which Ovid deliberately constructed as a mirror of the then-new Julian Calendar in poetic forms.¹⁴¹

As regularly mentioned by commentators, there are several examples of credible allusions in Shakespeare's *Sonnets* to numbers that mark the passage of time. These include references to day and night in sonnet 12, and the fact that in sonnet 60 we find the words 'our minuites'.

There are 52 weeks in the year, and in sonnet 52 an analogy is drawn between the cycle of a year and the golden circle of a crown: 'Therefore are feasts so sollemne and so rare, / Since seldom coming in the long yeare set, / Like stones of worth they thinly laced are, / Or captaine Iewells in the carconet'.

If this alignment of the words 'in the long yeare set' with sonnet 52 were intentional, that would entail a likelihood that sonnet 104 might consequently contain an allusion to *two* years. And there is indeed, as expected, a prominent mention of *years* in sonnet 104. However, instead of an allusion to *two* years we find an insistent reference (*five times over*) to *three* years: 'Three Winters colde, / Haue from the forests shooke three summers pride, / Three beauteous springs to yellow *Autumne* turn'd, / In processe of the seasons haue I scene, / Three Apirll perfumes in three hot Iunes burn'd, / Since first I saw you fresh which yet are greene.'

On completing 'two years', the initial expectation might be that Shakespeare should make an allusion to those two years that have just been completed. But it is also possible that Shakespeare was deliberately trying not to be utterly

¹⁴¹ Ovid (1567/2000).

Admittedly, some commentators have thought that these parentheses were not authorised by the author but may have been merely introduced by the printers, presumably to hold the space for the two lines that (they feared) might well have been mislaid, and (they hoped) might turn up before the final printing. But, given that the argument of the poem seems complete as it stands, this speculation is no more secure than all the rest. These ‘empty lines’ do fall at a very significant position in the overall sequence: at the close of the sequence addressed to the poet’s male friend and immediately preceding the ‘hell’ of his relationship with his dark mistress. Hence it is not *merely ad hoc* to rescue the ‘52-hypothesis’ by adding the auxiliary hypothesis that the entire sequence may have been truncated by the deliberate omission or removal of two sonnets.

To show that this hypothesis is not outrageously *ad hoc* is not to show it is true. But the proof would have to emerge in stages, by a process of gradual corroboration against further textual evidence.

Thus, for instance, the ‘52-hypothesis’ entails the likelihood that there will be poetically rewarding consequences of aligning the successive sonnets in this sequence with the 52 successive weeks in each of three successive years. Each year can presumably be divided into four equal Seasons, with 13 weeks (91 days) in each. And this will generate the following alignment between Shakespeare’s sonnets and the weeks in each of three calendar years.

FIGURE 1: A *THREE-YEAR CALENDAR*

Year 1														
Spring:	1	2	3	4	5	6	7	8	9	10	11	12	13	
Summer:	14	15	16	17	18	19	20	21	22	23	24	25	26	
Autumn:	27	28	29	30	31	32	33	34	35	36	37	38	39	
Winter:	40	41	42	43	44	45	46	47	48	49	50	51	52	
Year 2														
Spring:	53	54	55	56	57	58	59	60	61	62	63	64	65	
Summer:	66	67	68	69	70	71	72	73	74	75	76	77	78	
Autumn:	79	80	81	82	83	84	85	86	87	88	89	90	91	
Winter:	92	93	94	95	96	97	98	99	100	101	102	103	104	
Year 3														
Spring:	105	106	107	108	109	110	111	112	113	114	115	116	117	
Summer:	118	119	120	121	122	123	124	125	126 ()	()	127	128		
Autumn:	129	130	131	132	133	134	135	136	137	138	139	140	141	
Winter:	142	143	144	145	146	147	148	149	150	151	152	153	154	

Does this Table aptly align the Seasons with any pregnant poetic allusions in the corresponding sonnets? Yes, it does.

To begin with, sonnet 3 mentions April. The first seventeen sonnets urge a young man to marry and beget children; and 'Procreation' is a poetically appropriate subject matter for sonnets set in the Spring and early Summer. Autumn and Winter should be expected to allude to things like discontent, absence, betrayal, estrangement, 'the Winter of our Discontent', and so forth. And sonnet 26 closes the first Summer with a letter that the poet writes to his absent friend. Sonnets 27 and 28 then form a pair in which the poet is sleepless because he is far from his beloved. And this Autumn theme of estrangement persists into Winter. For instance, sonnets 41, 42, 43 concern the jealousy the poet feels when his mistress fornicates with his friend. In sonnet 44 the poet is painfully far from his beloved. In sonnet 48 he is setting off on a trip, and so also in sonnet 50. In sonnet 51, while still travelling away from his friend, he imagines joyfully running to be reunited with his beloved. And so on. But then, as the next Spring approaches, sonnet 54 prominently features flowers.

This pattern can also be found in the Second Year. Late in the second Autumn we find what is generally described as a 'Farewell' grouping, which opens with sonnet 87, 'Farewell ...'. Winter includes sonnets 97, 98, 99, which are again concerned with separation, with imagery of Winter, and so on.

But perhaps most telling of all is the fact that the third Winter, which comprises the 'Dark Lady' grouping, contains sonnets concerned with the very same sexual betrayal that, in sonnets 40, 41, 42, contributed to the painful estrangements of the first Winter.

Commentators who have tried to read these sonnets autobiographically have found it very puzzling that the love triangle involving the ‘Dark Lady’ also makes an earlier appearance in sonnets 40, 41, 42. For instance, in Dover Wilson’s introduction to the *New Cambridge* edition of the *Sonnets*, this evidence is taken to support the conclusion that some of the ‘Dark Lady’ sonnets must somehow have become separated from the rest, and then the Editor re-inserted them – but inserted them into some superficially (but only superficially) appropriate position earlier in the sequence.¹⁴² When re-assessed instead under a Calendrical ordering of the sonnets, it makes much better sense for sonnets covering the third Winter to be a recurrence of one of the themes from the first Winter.

These alignments between poetic allusions in the sonnets and three cycles of the seasons are relatively persuasive. But Calendrical patterning is not the primary subject of the present investigation. In all work of this kind, there is a severe risk of wishful thinking. And the poetic alignments established by the above Table are not perfect. For instance, there are betrayals and departures in the third Summer, as for instance in sonnet 109, and thus these themes are not *exclusively* aligned with Winters. Another bad omen is the fact that three-year calendrical alignments were examined by Fowler and found wanting. He preferred an alternative calendrical alignment.¹⁴³ It is to be hoped that a *musical* scheme might meet with even more robust evidential support than this calendrical scheme.

¹⁴² Dover-Wilson (1966, p. xxxi).

¹⁴³ Fowler (1970, pp. 192-7). He abandons the three-year pattern described above and suggests instead a scheme in which a Year is marked by the block comprising sonnets 77 to 102, in part because this block includes 365 lines, and also in part

because it creates a calendrical arrangement that interlocks with *A Louers*

Complaint. Fowler is topomorphically drawn to the *mid-point* not of the *Sonnets*

but of the whole of Q.

CHAPTER 3

A MUSICAL HYPOTHESIS

3.1 FIRST TEST (SONNETS 3 AND 6)

Here is a concise sketch of the evidential route to the eventual destination for this investigation.

(i) Poetic anomalies:

Nearly every one of Shakespeare's sonnets is significantly different from all, or nearly all, of the others. And yet each sonnet is nearly always also *the same* as nearly all the others – particularly in its rhyme-scheme and iambic rhythms. There are a few exceptions, but the exceptions are rare enough still to count as 'anomalous' – to strike a discordant note, as it were.

(ii) Musical discords:

In the current investigation it is to be argued that the locations of the formal poetic anomalies within Shakespeare's overall sonnet sequence will be found reliably to mirror the locations of salient musical discords in a corresponding series of musical scales. And it will be argued that the degree of seriousness of these poetic anomalies will track the degree of seriousness of the corresponding musical discords.

Thus, for instance, it will be argued that, in the relevant series of musical scales, the formal anomalies in sonnets 3 and 6 will correspond to the musical notes F and B, which are separated by the discordant musical interval of a *tritone*.

This alignment of sonnets 3 and 6 with the notes F and B arises under a relatively straightforward alignment of Shakespeare's first six sonnets with the first six notes in a musical scale for the Dorian mode:

Notes:	DEFGAB ...
Sonnets:	1 2 3 4 5 6 ...

The Dorian mode was the canonical hub of the Renaissance system of modes. Just as the Signs of the Zodiac are canonically listed as starting with Aries, so too most canonical lists of the Renaissance modes started with the Dorian mode.

(iii) Rhyme-anomalies are aligned with musical discords:

Thus, if we align the first eight sonnets with the notes of a rising scale for the Dorian mode then, in this scale, the 3rd and 6th notes will be separated by a dissonant tritone:

Sonnet 3 = F

Sonnet 6 = B.

If we continue to align the rest of the successive sonnets with successive notes in a series of ascending-then-descending musical scales, then the tritone might be expected to crop up a handful of times in that series of scales – about half a dozen or a dozen times (depending on details about how the downward scales, in particular, are organized). But within these musical scales the alignment of the tritone with sonnets 3 and 6 is especially salient – because it is the *first* tritone in the sequence.

It can readily be confirmed by inspection of any edition of Shakespeare's *Sonnets* that sonnets 3 and 6 both deviate from Shakespeare's distinctive rhyme-scheme *abab cdcd efef gg*. Sonnet 3 has the anomalous rhyme-scheme (*abab cdcd dede dd*). And sonnet 6 too has an anomalous rhyme-scheme: (*abab cdcd ecec ff*). Furthermore, it is acutely anomalous that the very same word 'thee' appears not only in sonnet 3 (lines 9, 14) but also in sonnet 6 (lines 7, 9). In Elizabethan poetry this kind of proximate repetition of the very same word as an end-rhyme is rare. Hence, for instance, in the 1609 *Sonnets*, lines 10 and 12 rhyme 'losse' with 'losse' – but editors all confidently correct the second one to 'cross'. Evidently editors expect a typographical error to be more likely than finding the very same word 'rhyming' with itself.

(iv) Feasibility

In the years leading up to publication of the *Sonnets* in 1609, it would not have been impossibly difficult for Shakespeare to have undertaken the task of compiling some of his already-existing sonnets into a sonnet sequence, and to have pondered what patterns might emerge if that sequence were to open with an alignment successive sonnets against a musical scale for the Dorian mode. And, in the context of the times, it would not have been inconceivably difficult for a select few of Shakespeare's readers to notice the poetic anomalies in sonnets 3 and 6 – especially if something had prompted them to look out for rhyme-anomalies. And, if something had also prompted them to look for correspondences with musical scales, then it would not have been unduly improbable that they might guess that these anomalies in sonnets 3 and 6 might aptly be seen as poetic echoes of the notorious tritone within a musical scale for the Dorian mode.

The hypothesis to be investigated here is that, in Shakespeare's sonnet sequence, all the significant formal anomalies in the rhyme-schemes will reliably align – in analogous ways – with correspondingly significant discords in a corresponding series of musical scales.

3.2 TWELVE MONTHS, TWELVE MODES

There are some examples of overarching formal patterns that are utterly obvious in poetry of the times. But Hieatt also demonstrated that Spenser's celebrated *Epithalamion*¹⁴⁴ embodies the following exceedingly un-obvious calendrical structure (where the 'long lines' are either the ubiquitous lines of pentameter or else the minority of lines of hexameter, which close all but the last stanza):

'long line' 1 = day 1 (Hieatt suggests: possibly 1 March?)¹⁴⁵

'long line' 2 = day 2 (perhaps 2 March?)

'long line' 3 = day 3 (perhaps 3 March?)

...

'long line' 365 = day 365 (perhaps 28 February?).

Aligning poetic forms with measures of time automatically also aligns them with the cyclical motions of the planetary spheres. Each planetary sphere was traditionally associated with one of the Muses. And each of the Muses was associated with one of the musical 'modes' in Renaissance music theory.¹⁴⁶ There

¹⁴⁴ Hieatt (1960). This ground-breaking work was followed up by Fowler (1964), Fowler (1970), Roche (1989), Parker (1998/2011).

¹⁴⁵ See Hieatt (1960, pp. 69-74). Some textual evidence in the 'Epithalamion' suggests starting on 1 March; but Hieatt considers other possibilities as well and concludes that there is no proof either way.

¹⁴⁶ This is graphically represented by the title page of the monumental *Dechachordon* by Glareanus (1547/1965). With respect to the modes, Morley says he is following the path opened up by Glareanus, and he also discusses a

were precedents, salient for Shakespeare, for poets aligning a sequence of poetic units of one kind or another with each of the nine Muses.¹⁴⁷ And each mode could be canonically embodied within a corresponding musical scale.

With this in mind, it is worth at least wondering whether Shakespeare might conceivably have tried out a schema that is loosely analogous to Spenser's – but substituting successive musical notes for successive days of the year:

sonnet 1 = musical note 1 (plausibly D, as tonic for the Dorian mode?)

sonnet 2 = musical note 2 (perhaps E?)

sonnet 3 = musical note 3 (perhaps F?)

...

sonnet 154 = musical note 154, (perhaps D again, completing a 'cycle'?)

And then these successive notes could plausibly have catalogued a canonical cycle of musical scales for the musical modes.

The canonical system of the Renaissance modes has its roots in an exposition of Pythagorean doctrines summarized in Plato's *Timaeus*.¹⁴⁸ The investigation here

variety of ways of aligning each mode not only with one of the Muses but also with one of the Planets, with one of the chemical elements, ... and so on; see Morley (1597/1973, pp. 108-110, 300).

¹⁴⁷ Thus, for instance, Spenser's 'The Teares of the Muses' assigns to the nine Muses, in order, *ten stanzas* to each; Spenser (1591/1912, pp. 480-86).

¹⁴⁸ Plato (*ca* 360 BCE/1997, pp. 1224-1291). The *Timaeus* was available in almost any scholarly library in any substantial monastery throughout the Medieval and Renaissance period, in a Latin translation by Calcidius. And the central elements of the Pythagorean and Platonic musical mathematics were relayed to the

will draw primarily on the summary of the system of modes that is given by Thomas Morley.¹⁴⁹

The modes comprise all possible ways of constructing a scale of eight notes – a ‘diatonic division of the octave’ – using just the seven notes ABCDEFG.¹⁵⁰ These labels ‘A’, ‘B’, and so on are here used to signify a pattern of relative frequencies that approximately (but not exactly) matches the pattern of relative frequencies for the notes played by the ‘white keys’ on a modern piano.¹⁵¹

A *mode* is generated by selecting one of the seven notes ABCDEFG as the ‘tonic’. If the tonic is set at the bottom of a scale of eight notes, this generates an ‘authentic’ mode, as for instance the Aeolian mode **A**BCDEFG (marking the

Renaissance through the central Roman and Medieval textbook on arithmetic (the counterpart to Euclid on geometry), by Nicomachus (*ca* 100/1926), and also through Boethius – see for instance Boethius (2009), this being a translation of Boethius by Queen Elizabeth I.

¹⁴⁹ Morley (1597/1973, pp. 300-304).

¹⁵⁰ Except that there were two alternative tunings for the note B, see Morley (1597/1973, pp. 10-12) – one being *B-natural*, and the other being an ancestor of the modern *B-flat*. When the tonic is F, the frequency for B was lowered in order to avoid dissonance with the tonic.

¹⁵¹ Modern pianos are generally tuned under ‘equal temperament’ and the relative frequencies of the Renaissance notes ‘A, B, C, ...’ all deviate *slightly* from the frequencies of equal temperament. Nevertheless, the notes played by a modern piano’s white keys can still be ‘heard’ as *approximations* of the very ‘same notes’ ABCDEFG that were also *approximated*, or *aimed at*, in the Renaissance modes.

tonic in larger, bold print). If the tonic is set in the middle of the scale, that generates a ‘plagal’ mode, as for instance ABC**D**EF G (the HypoDorian mode).

Thus, each mode has both an ‘*ambitus*’ (bounded by the highest and lowest notes), and a ‘*finalis*’ (or tonic or home note) – or a ‘scope and tenure’,¹⁵² to borrow words from Shakespeare’s sonnet 61.

In the canonical articulation of the modes, first come the ecclesiastically endorsed¹⁵³ Eight Church Modes:

‘Odd’, or ‘Authentic’ modes:

‘Even’, or ‘Plagal’ modes:

1. Dorian: **D** EFGABCD^o

2. HypoDorian: ABC**D** EFGA^o

3. Phrygian: **E** FGABCD E^o

4. HypoPhrygian: BC**D** EFGAB^o

5. Lydian: **F** GABCD E F^o

6. HypoLydian: CDE**F** GABC^o

7. Mixolydian: **G** ABCDEFG^o

8. HypoMixolydian: DEF**G** ABCD^o

Modes 1 and 8 have the same *ambitus* D-D^{o154} and differ only in their *finalis*. Extrapolating: for each of modes 1-7 we can preserve the *ambitus* but transpose the *finalis*, and that will transform these first seven modes into modes 8-14:

¹⁵² The words ‘scope and tenure’ = *scope and tenor*: Booth (1977, p. 242).

¹⁵³ Morley (1597/1973, p. 249) speaks of ‘the Eight Tunes’ of ‘the churchmen’; and this is explained more fully in his ‘Annotations upon the third part’ (pp. 300-304).

¹⁵⁴ In the present usage, ‘D^o’ or ‘E^o’ (or whatever) are being used to mean ‘an octave above the relevant D or E (or whatever) most recently mentioned or implied’.

- | | |
|--------------------------------|--------------------------------------|
| 9. Aeolian: A BCDEFGA° | 10. HypoAeolian: EFG A BCDE° |
| 11. Locrian: B CDEFGAB° | 12. HypoLocrian: FGAB B CDEF° |
| 13. Ionian: C DEFGABC° | 14. HypoIonian: GABC C DEFG° |

... and the pattern now comes full circle,

because after tonic **C** comes tonic **D** again.

To anyone with Pythagorean leanings, it is striking that this ‘8+6’ pattern mirrors the pattern of an ‘octave’ plus a ‘sestet’ that is embodied in the rhyme-scheme for a Petrarchan sonnet.

Nevertheless, there are compelling musical reasons for distorting, in a number of substantial ways, the abstract mathematical symmetries in this initial ‘Table of Modes’. To begin with, there is, as Morley explains,¹⁵⁵ a powerful musical reason for excising the Locrian modes from the system.

Morley’s stated reason for ‘justly rejecting’ the Locrian modes is that, when **B** is the tonic, then *there is no* note in the diatonic scale that stands a harmonious fifth above the tonic. The interval spanned by the *five* notes **B**CDEF is *not* a ‘fifth’ but is an interval that was at the time regarded as outrageously dissonant. And a harmonious fifth above the tonic was so important in Renaissance music, both harmonically and melodically, that the Locrian modes were judged to be musically unusable.

¹⁵⁵ Morley (1597/1973, p. 303).

After excision of the Locrian modes from the canon, the resulting ‘*Dodecachordon*’¹⁵⁶ of twelve modes will no longer fit the pattern of an ‘octave’ and ‘sestet’. But the new set of twelve modes will instead open up the possibility of a neat alignment with the twelve calendar months of the year.¹⁵⁷

¹⁵⁶ This is the title of the magisterial work by Glareanus (1547/1965), which Morley cites as his primary authority on the modes.

¹⁵⁷ An especially detailed and fully explicit alignment of the 365 days of the year with the notes in musical scales for the modes is found, long after Shakespeare’s day, in Roussier (1770/1966).

3.3 MUSIC IN THE WORLD'S SOUL

Near the opening of *The Merry Wives of Windsor*, Slender cannot find his 'book of *Songs and Sonnets*' – which he also calls 'the *Book of Riddles*'. There is evidence that, at the earliest performances of *The Merry Wives of Windsor*, at least an influential few in Shakespeare's audience would have been likely to take this reference to Slender's 'book of *Songs and Sonnets*' to be an allusion to Sir Philip Sidney's *Astrophel and Stella*.

If Shakespeare was referring to Sidney's compilation of sonnets and songs as a '*Book of Riddles*', what sorts of 'riddles' might he have found there? For a start, the first sonnet in the sequence is in iambic hexameter, mirroring the twelve-syllable lines in the sonnets of Ronsard, Du Bellay and the other French sonneteers that Sidney was obviously imitating.¹⁵⁸

Sydney's next sonnet in *Astrophel and Stella* is in iambic pentameter, and indeed most of the succeeding sonnets are in iambic pentameter. The next one in hexameter is sonnet 6. And there are six, and only six, sonnets in this sequence that are in iambic hexameter. The way these 'sixes' crop up – in *sonnet* 6 and in *six* sonnets – reeks of topomorphic patterning.

¹⁵⁸ And just like the 'Ane quadrain of Alexandrin verse' that precedes King James's sonnet sequence of 1585: James (1585/1869). Spenser drew especially on Du Bellay (1558/1961. 1966); see Hieatt (1983).

Sidney varies the metre and rhyme-scheme in his sonnets enormously and intersperses his sonnets with ‘Songs’. But all his sonnets have fourteen lines, and in the 1598 edition they were presented in a sequence comprising 108 sonnets altogether. There is some evidence that the number 108 may have had some sort of numerological significance, though careful scholars have been slow to reach any consensus on this.¹⁵⁹

Nevertheless, even if we do not know what the significance might have been, it does seem almost certain that there being 108 sonnets in this sequence did have some significance for the author – for the following reasons. In the authorized 1598 publication, the Sonnets were interspersed with Songs. The first Song is interposed immediately after sonnet 63; and the number 63 was in Tudor England regarded then as numerologically highly significant and was called the ‘grand climacteric’. And there are altogether 108 stanzas in the Songs.

¹⁵⁹ The number 108 is the number of species of desire that the Buddhists must conquer if they are to achieve release from the cycle of rebirth. And that is only the tip of the iceberg. It is given deep significance in many world religions.

It is also the number of the amorous ‘suitors’ that Homer’s Odysseus must kill, when he returns to his wife Penelope – and ‘Penelope’ is also the name of the real-life English woman who receives 108 unsuccessful ‘suitors’ from Sidney, in the form of sonnets.

Parker also plausibly traces the significance of 108 to the ‘Lambda Formula’ that constitutes the musical and mathematical structure of the World Soul according to Plato’s *Timaeus*; see Parker (1998/2011, pp. 29, 73). See also Parker (1995).

Furthermore, the number 108 seems to have been thought by other poets to have had significance, because there were a handful of published imitations. For instance, Alexander Craig's *Amorous Songs, Sonnets and Elegies* (1606) number 108.¹⁶⁰ And Spenser's *Astrophil* comprises 2×108 lines; and this is followed by 108 lines that Spenser says he is just copying from a poem written by 'Clorinda' ('Astrophel' and 'Clorinda' alluding respectively to Sir Philip Sidney and his sister Mary).

In pondering the possible significance of the number 108 for the Sidneys and Spenser, there is one possibility that deserves further investigation. This is a possibility that has been mooted in ground-breaking work by Parker (1998/2011) into the works of Sir Philip Sidney and 'the Sidney circle'.

Parker investigated a number of key works from within and around the Sidney circle, and assembled evidence that these works can be shown to contain deliberate formal poetic echoes of an abstract mathematical and musical pattern that Parker identifies as Plato's numerical scheme for the 'World Soul'.

The musical and mathematical structure of the World Soul is described in a 'creation story' that is recounted in Plato's *Timaeus* 35a-36b.¹⁶¹ This structure

¹⁶⁰ Craig (1606), Klein (1984); see also Fowler (1970, pp. 175-176), and Klein (1984).

¹⁶¹ See Plato (*ca* 360 BCE/1997, p. 1239). The idea that these Platonic ideas wove their way into poetry is investigated in considerable detail by Parker (1998/2011, esp. pp. 28-34). (This ground-breaking work of Parker's began as a doctoral dissertation under the supervision of Katherine Duncan-Jones.)

begins with the recitation of a sequence of numbers: 1, 2, 3, 4, 9, 8, 27 (in that order: note that '9' comes before '8'). These numbers are said to represent the *ratios* that hold between the *portions* of some fundamental substance, which is being laid out in Space to constitute the material world.

The numbers $(1+2+3+4+9+8) = 27$; hence, the initial sequence of numbers that form what may be visualized as the 'spine' of the World Soul sums to 54. This is half of 108,¹⁶² and Parker suggests that this might be why 108 is significant for Spenser.

The mathematical patterns in Plato's World Soul also afforded Sidney deeper reasons for taking an interest in these numbers, beyond just the 'numerological' significance that could be attached to them. The numbers in Plato's World Soul afford a music theorist enormous potential in explaining musical harmonies.

After the initial numbers 1, 2, 3, 4, 9, 8, 27 Plato's creation-story goes on to add further numbers as the 'arithmetic' and 'harmonic' means between the numbers in the 'double' and 'triple' intervals. And then the remaining intervals in the ratio of 4:3 are then filled with notes that create smaller steps in the ratio of 9:8, leaving a residual fraction in the ratio of 256:243.

Plato scholars have noticed that if all these numbers are taken as either the wavelengths or the frequencies of musical notes, then these notes will almost

¹⁶² In the *Timaeus*, the numbers measure out 'portions' of the cosmos; and, just a little later in the story, each of these 'portions' is divided in half. Hence *doubling* 54 to get 108 is not a gratuitously arbitrary speculation but does have a relatively straightforward textual grounding.

exactly correspond to the notes within the familiar diatonic division of the octave into the notes ‘*ut, re, mi, fa, sol, la, ti*’.

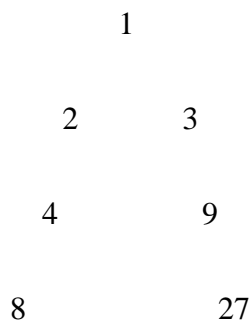
Thus, the numbers that fix Pythagorean tuning are exactly the same as the numbers that appear in the Platonic version of the creation story in the *Book of Genesis*, in the *Timaeus* 35a – 36b. This story in the *Timaeus* says that the World Soul is governed by what are in fact the Pythagorean tuning-ratios of 1:2 (the octave), 2:3 (the fifth), 3:4 (the fourth) and 9:8 (the Pythagorean whole-tone) and 256:243 (the Pythagorean ‘semitone’ – which is less than half a whole tone). In particular, Plato’s text uses these ratios in the explanation of the ratios governing the orbits of the Sun, the Moon, the Planets, and the Stars.

Furthermore, Plato’s *Timaeus* 43a – 44c then follows this Creation Story with a Platonic counterpart of the Biblical story of the Fall. It is said that our souls began their first existence in a state of perfect harmony with the World Soul, but then when we became embodied in a material form sensory experiences and passions confused us, and the courses of our souls deviated from the ratios of 1:2 (the octave), 2:3 (the fifth), 3:4 (the fourth) and 8:9 (the Pythagorean whole-tone ratio). Our task in this bodily life is to restore the original harmonies within our bodies, minds and souls. Until we can restore those original harmonies we will be locked into a cycle of suffering – and we will be reborn again and again into this vale of tears until we do.

This story entails that we need to nudge our souls back into harmony with the frequency-ratios of Pythagorean tuning. Plato’s World Soul is of deep significance in this tradition largely because it describes the numbers of Pythagorean tuning as governing both the orbits of the heavenly spheres and the

deep courses of the human soul. The microcosm mirrors the macrocosm, and the macrocosm dances to the tune of the celestial harmonies.

These ratios, governing the most immediate overtones of any given note, are the ones that form the backbone of what Plato characterizes as the ‘World Soul’ in his *Timaeus* 35a-36b.¹⁶³ The backbone of this structure is recited as a sequence of numbers: 1, 2, 3, 4, 9, 8, 27 (in that order, with ‘9’ before ‘8’). Like many commentators¹⁶⁴ Parker lays out these numbers in the following ‘lambda’ pattern:



(Thus, in Plato’s recitation of the numbers for the World Soul, ‘9’ comes before ‘8’ because both ‘4’ and ‘9’ are square numbers, ‘8’ and ‘27’ are cubes.)

¹⁶³ Plato (*ca* 360 BCE/1997, p. 1239).

¹⁶⁴ Some, like Proclus, have forced the numbers into a single line (re-ordering the 9 and 8, eliminating repetitions that arise from the construction of the arithmetic and harmonic means in the double and triple intervals, and so forth). But, as Proclus says, ‘Adrastus, that lover of technique, arranges the double and triple series in the shape of a Λ , as we said (170.31-171.4)’; see Proclus (2007, p. 162). Indeed the Λ arrangement was used not only by Adrastus but also by Plutarch, Clearchus, Theon of Smyrna and Macrobus, as well as Parker (1998/2011, p. 32).

Plato scholars have noticed that if these numbers are taken as the wavelengths of musical sounds, then the left-hand side leaps down in octaves, while the right-hand side leaps down in intervals of an octave-plus-a-fifth (the subscript ‘o’ is used here to indicate transposition down an octave, thus for instance ‘E_o’ means ‘the E an octave below the E last mentioned’ ... and so on):

	1 E	
	2 E _o	3 A _o
	4 E _{oo}	9 D _{ooo}
	8 E _{ooo}	27 G _{oooo}

Here, the numbers are interpreted as wavelengths, so the corresponding notes progress downward in *undertones*. (Reinterpreting the numbers as frequencies, the corresponding notes would map out ascend *overtones*.)¹⁶⁵

¹⁶⁵ The Λ arrangement in fact emphasizes not only the construction of the diatonic scale, but also transposition in octaves (the double series), as contrasted with the cycle of fifths (the triple series).

Commentators can get lost in the numbers, if they do not see the essentially musical point behind the *Timaeus* story. For instance, Proclus (2009, pp. 4-13) insists on arranging the numbers in a single line and eliminating repetitions. He then gives the numbers numerological significance; but he misses a musical pattern that is much clearer if the pattern sticks closer to the text of the *Timaeus* and is laid out in the form of a Λ.

When the arithmetic and harmonic means are placed in the double and triple intervals, and the intervals of 4:3 are filled with intervals of 9:8 the result is a musical scale that fills each of the double intervals.¹⁶⁶ For instance, following Plato's instructions will generate a downward scale filling the interval from 1 to 2, divided into two downward *tetrachords*, EDCB AGFE_o (with the subscript here meaning 'the E an octave below the previously mentioned E'):

¹⁶⁶ See Cornford (1937/1997) for an early attempt to tease out the Pythagorean music theory implicit in the numbers for the World Soul in Plato's *Timaeus*.

THE FIRST OF PLATO'S DOUBLE INTERVALS:

1 E

There is an interval of 4:3

D

between 1 and $(4/3)$:

C

The harmonic mean between 1 and 2 is $(4/3)$:

B

The arithmetic mean between 1 and 2 is $(3/2)$:

A

There is an interval of 4:3

G

between $(3/2)$ and 2:

F

2 E_o

Down the triple intervals on the right-hand side of the Platonic Lambda, following the same Platonic instructions to the letter, the first of the triple intervals will lie between the numbers 1 and 3. Placing the arithmetic and harmonic means in this interval and then filling any resulting intervals of 4:3 with intervals of 9:8 will have the following result, interpreting the numbers as wavelengths for musical notes:

THE FIRST OF PLATO'S TRIPLE INTERVALS:

1 E

There is an interval of 3:2

between 1 and $(3/2)$;

The harmonic mean between 1 and 3 is $(3/2)$:

A

There is an interval of 4:3

G

between $(3/2)$ and 2:

F

The arithmetic mean between 1 and 3 is 2:

E_o

There is an interval of 3:2

between 2 and 3:

3 A_o

Thus, following the instructions in Plato's *Timaeus* – to the letter – results in the construction of the tetrachord DFGA. Continuing this recipe further down the 'triple intervals' (the musical equivalent of the 'cycle of fifths') then generates all the other possible tetrachords within the diatonic division of the octave.

These numbers and musical notes in fact have deeper significance than just registering a culturally specific music theory that happened to dominate Europe for at least two thousand years. They also register mathematical and physical facts that transcend culture. The intervals catalogued on Plato's Lambda are the intervals that are physically present in the overtones and undertones for all

musical notes. The *significance* that Europeans invested in these overtones and undertones, ‘beats’ and ‘sweet spots’ was culturally specific. But the music in every culture does need to negotiate with these same physical facts, and given our human physiology it is hard to completely ignore them.

One of the key insights in Parker’s theory, one which is especially useful for present purposes, is Parker’s emphasis on *proportions between* numbers, rather than the actual numbers themselves. Parker avoids the assignment of just one fixed and particular significance for each particular number. This emphasis on ‘relationships of proportion’ is nicely illustrated in music theory, where what is most important is usually (except for the minority of people with ‘perfect pitch’) not the exact frequency of a note, but the frequency-ratios between this note and other notes in the relevant musical context. The key to the identification of ‘which note’ is being played is to identify the *ratio* of its frequency to the frequency of some other note that ‘sets the context’ and is called the *tonic*.

To illustrate, Parker suggests that, in Sidney’s *Astrophel and Stella*, the sonnet numbered 81 might have been given some distinctive significance not because the number 81 has some intrinsic significance, but because there are 108 sonnets in the entire sequence of sonnets in *Astrophel and Stella*, and 81 is *three quarters* of 108 – and because the ratio 4:3 is also the frequency-ratio for a musical fourth, as for instance the interval between the notes C and F.¹⁶⁷

¹⁶⁷ Parker (1998/2011, pp. 12-13).

Parker's notion of 'proportional form' builds on the fruitful work on 'topomorphic patterning' by Maren-Sofie Røstvig.¹⁶⁸ As both Røstvig and Parker make clear, the idea that there might be such a thing as a mathematical and musical World Soul was in Shakespeare's day much less unexpected than might naturally be supposed by scholars from later centuries, who have not themselves been educated in the Renaissance manner.

In addition, also in the air in Shakespeare's day, there was the notion that 'the microcosm mirrors the macrocosm'. So smaller things – like say an individual human soul, or even just a sonnet sequence that is rehearsed within an individual human soul – might very well be invested with formal structures that could mirror the mathematical and musical structures within the World Soul. Rehearsing a well-tuned sonnet, therefore, might conceivably help to nudge a soul closer to its original harmonies with the World Soul.

One of the towering geniuses of the seventeenth-century scientific revolution in Europe was Johannes Kepler; and he enthusiastically embraced this Pythagorean idea that there might be such a thing as the 'World Soul'.¹⁶⁹ Shakespeare, too, was manifestly aware of the Renaissance idea of the World Soul. This awareness is evident, for instance, in his lines: 'Not mine owne feares, nor the prophetick soule, / Of the wide world, dreaming on things to come' (sonnet 107).

¹⁶⁸ Røstvig (1980, 1994).

¹⁶⁹ This Pythagorean theme is abundantly evident throughout Kepler's masterwork on *The Harmony of the World*; see Kepler (1619/1997). The primary source on Kepler is Caspar (1959); and for Kepler on music theory, Dickreiter (1973).

Nevertheless, although Parker is a champion of ‘proportional form’ and ‘the World Soul’, he draws the line at trying to read anything remotely of this kind into the works of Shakespeare. Thus, for instance, he offers the deflationary speculation that Shakespeare’s poetic allusion in sonnet 107 to the prophetic soul of the wide world ‘may be Shakespeare’s comment on the decline of the fashion for this brand of formal arrangement’. And he concludes that Shakespeare offers only what Parker calls a ‘dismissive glance’ towards the methods of ‘proportional form’ that were used by his contemporaries within the Sidney circle.¹⁷⁰

To play the devil’s advocate, and to develop sympathetically Parker’s reading of Shakespeare’s sonnet 107, the idea would therefore presumably also be that the methods of ‘proportional form’, as used within the Sidney circle, might be what Shakespeare was distancing himself from in sonnet 76, when he asks, ‘Why do I not glance aside / To new-found methods and to compounds strange?’

That is, Parker apparently concluded that Shakespeare’s works stand diametrically opposed to the kind of formal pattern-weaving that he had himself disclosed within a number of significant sonnet sequences that had been concocted from the poets who were working within the Sidney Circle. And Parker was not alone in making this assumption about Shakespeare’s works.

Parker’s work on ‘proportional form’ builds on Hieatt’s watershed discovery of very sophisticated calendrical structure in Spenser’s *Epithalamion* (1595).¹⁷¹ But – just like Parker – Hieatt assumes that the sort of microcosmic/macrocosmic

¹⁷⁰ Parker (1998/2011, pp. 75, 222).

¹⁷¹ Spenser (1595/1912), Hieatt (1960).

pattern-weaving that he had found in Spenser would be completely foreign to the spirit of Shakespeare.¹⁷²

Thus, both Hieatt and Parker were importantly right about the importance of the ‘topomorphic’ or ‘proportional’ forms that they have observed in Tudor and Jacobean poetry other than Shakespeare’s. But *absence of observation* is not the same thing as the *observation of absence*. The absence of any direct observations, by commentators, of musical patterns in Shakespeare’s *Sonnets* should not be misconstrued as an observation that there are no such covert patterns there to be found.

¹⁷² Hieatt (1960, p. 81).

3.4 COMPARING DISCORDS WITH ANOMALIES

The hypothesis that is to be tested is that, when Shakespeare's sonnets are appropriately aligned with musical scales, poetic anomalies will reliably align with corresponding musical discords. To this is added a further hypothesis: that the degree of salience of the various poetic anomalies matches the degree of salience of the corresponding musical discords. The evidence above concerns only the coincidence in location between the tritone F-B and rhyme anomalies in sonnets 3 and 6. Consider now the degree of salience of the relevant poetic anomalies and the corresponding discord.

(i) Repetitions of rhymes

The end-rhyme in the closing couplet for sonnet 1, 'be' / 'thee', is repeated as the end-rhyme in the closing couplet for sonnet 3. And the very same two words occur (in reverse order), 'thee' / 'be', as the end-rhyme in the closing couplet for sonnet 4. It is therefore important also to check whether this rhyme is equally frequent anywhere else in this sonnet sequence. And it is.

This raises a significant objection to the line of inquiry sketched above. If the rhyme 'be' / 'thee' is extremely frequent in this sonnet sequence, then it could crop up as technically illegal (but easily overlooked) misdemeanours a few times by chance alone. Hence the rhyme-anomalies in sonnets 1, 3, 4, 6 might have arisen by chance alone, or else by some mechanism that has no deep theoretical significance at all.

It is also worth noting the impressions that one acquires, once one begins to scan through this sonnet sequence for rhyme-repetitions. One relatively quickly notices not only that variations around the 'thee' / 'be' end-rhyme are extremely

frequent, but also that certain other rhymes are also strikingly frequent – as for instance ‘heart’ / ‘part’, and close variations on that rhyme. There is an instance in sonnet 46 that is so blatant, ‘heart’ / ‘part’ / ‘part’ / ‘heart’, with the very same word ‘part’ standing at the end of adjacent lines. And this instance is so obvious as to draw comment: for instance, in Spiller (1992, p. 159), Vendler (1997, p. 235), and Duncan-Jones (2010, p. 202). But less obvious rhyme-anomalies seldom draw comment in any of the leading commentaries.

Patterns like these do not draw comment in part because it is rational for commentators to assume that patterns like these need not be significant but may have arisen by chance alone – or perhaps that repetitions like these might arise just as a result of some ‘tick’ that the author happens to have and does not need to cure because it does no noticeable harm.

For example, sonnet 46 has the rhyme-scheme *abab cdcd efef ff*. Spiller catalogues all the minor rhyme-anomalies of this kind. He comments on very few of these anomalies, but he says the effect of this one in sonnet 46 is *clumsy*.¹⁷³ Vendler does not catalogue formal anomalies of this kind, but she does note and give an aesthetically positive appraisal of this one: ‘as *heart* and *part* rhyme in Q₃, *part* and *heart*, in an “illegal” couplet repetition of the same rhyme, seal the chiastic pact.’¹⁷⁴ Duncan-Jones, too, gives a positive response: ‘The internal rhyme in *heart’s part* gives additional emphasis to the chiastic repetition, in the

¹⁷³ Spiller (1992, p. 159).

¹⁷⁴ Vendler (1997, p. 235).

rhymes at 10, 12, 13, 14, of *heart ... part ... part ... heart*.¹⁷⁵ Unlike Spiller, commentators like Vendler and Duncan-Jones tend to remark upon such details only when they can cite an aesthetic up-side for the relevant anomaly. There are about two dozen less obvious rhyme-anomalies of this kind, most of which have no immediately evident aesthetic justification and hence nearly always pass unnoticed.

However, it is also rational to be aware that patterns like these could conceivably also have arisen by design. And it is natural for anyone of a broadly Pythagorean bent to cast about for possible ways in which they might be significant. Hence, although the evidence does not yet ‘prove’ that such patterns *are* significant, *nor* is it reasonable to be overly confident that these patterns must surely be insignificant.

To illustrate, consider King James, who was a firm supporter of one of Shakespeare’s potential patrons, the Earl of Southampton. In his early verse, King James does seem to have used rhyme-repetitions in ways that make them seem as though they might well be deliberate. For instance, in ‘The twelf Sonnets of Inuocations to the Goddis’, we find the rhymes ‘sound’ / ‘abound’ (sonnet 4), ‘profound’ / ‘round’ / ‘sound’ / ‘abound’ (sonnet 7), ‘resound’ / ‘found’ (sonnet 11).¹⁷⁶ Given the internal resonance between these repetitions of rhymes with the word ‘resound’ – and the meaning of the word ‘resound’, together with the

¹⁷⁵ Duncan-Jones (2010, p. 202). This sonnet is replete with such chiasmic repetitions, as for instance in ‘Mine eye, my heart thy picture’s sight would bar; / My heart, mine eye the freedom of that right’ (lines 3, 4).

¹⁷⁶ James (1585/1869, pp. 14-18).

imagery of the music that echoes around ‘*Parnassis* flowing fountaine’, Shakespeare could have been forgiven for speculating that King James’s rhyme-repetitions here might have been deliberate. And imitation is the sincerest form of flattery.

Repetitions of rhymes with ‘sound’ and ‘ground’ also occur repeatedly in Golding’s translation of Ovid’s story of Echo, a ‘babbling Nymph’.¹⁷⁷ Surely these are deliberate. It is known that Shakespeare studied Ovid closely. It is not reasonable to be overly confident that Shakespeare was *not*, like King James, deliberately manipulating the patterns of proximate rhyme-repetitions in his sonnet sequence.

That there is a rhyme-repetition of ‘be’ / ‘thee’ linking sonnets 1, 3, 4 and 6 is easy to miss, though it is relatively striking once it is brought to attention. But it is not strictly ‘anomalous’, under the explicit rules for sonnet-construction. However, these same words ‘be’ and ‘thee’ are also closely bound up with repetitions of rhyme-words that *are* strictly anomalous.

The very same word ‘thee’ occurs as an end-rhyme *twice* in sonnet 3 (lines 9 and 14). And ‘thee’ also occurs as an end-rhyme *twice* in sonnet 6 (lines 7 and 10). This is indisputably anomalous. Formal anomalies of this kind have a low frequency in this sonnet sequence (and in *A Louers complaint*), and this will be investigated further in due course. And yet this formal anomaly is seldom noted

¹⁷⁷ Ovid (1567/2000, pp.73-4); the story of Echo is told in Book 3, lines 443-500; repetitions of rhymes with ‘sound’ and ‘ground’ are found in lines 471-2, 499-500.

by commentators; nor do any of them puzzle over whether these repetitions might have any interesting explanation of some kind or other.

In a sonnet sequence like Shakespeare's, if any sufficiently striking patterns did arise – whether by 'chance, or natures changing course vntrim'd' (sonnet 18) – then there is evidence to suggest that the author is the kind of writer who would have been very likely to notice them. Having noticed them, he would then have had the opportunity to move, revise, remove or amplify them – or else to just leave them where they were. Even if patterns of the relevant kind in fact first appeared by sheer coincidence, in Shakespeare's case the fact that they are still there in the published sequence is relatively likely to be a matter of design, not mere chance.

(ii) The historical significance of the tritone

The hypothesis that is being tested is that musical discords in Renaissance musical scales will align with corresponding poetic anomalies in Shakespeare's *Sonnets*, and that both the locations and the degree of seriousness of those musical discords will match both the locations and the degree of seriousness of the corresponding poetic anomalies. Consider now the degree of seriousness of the relevant musical discords.

The history of the tritone is relevant to the line of argument that is guiding this investigation of Shakespeare's *Sonnets*. If this discord were of little interest to any credible readership for Shakespeare's *Sonnets*, then that would make it much less credible that he would have taken the trouble to align poetic anomalies with the first occurrence of this discord within the musical scales that he was aligning

with these sonnets. There is, however, an abundance of evidence that this discord was not only of musical interest in Shakespeare's time, but for all time.

From the nineteenth century onwards, the musical interval of the tritone has come to be used more and more frequently in musical compositions and performances. But this is not because 'we' ('moderns') can no longer *hear* the quality in this 'imperfect consonance' that 'they' (in the Renaissance) found 'imperfect', 'dissonant', or 'discordant'. On the contrary, the quality that 'they' shunned is, arguably, precisely the very same quality in this interval that 'we' often find expressive and interesting.

Thus, for instance, in Wagner's *Die Meistersinger von Nürnberg*, throughout the opera the members of the traditional guild of singers pointedly shun the tritone F-B. In the climactic song competition one of the contestants, Beckmesser, opens his song in the key signature with one sharp, F-*sharp*, emphasizing the notes B and F-*sharp* on his lute – and thus pointedly avoiding the tritone F-B. The last note of his song is in the key signature with one flat, B-*flat*, again pointedly avoiding the tritone F-B. And he is hooted off the stage.¹⁷⁸

The hero, Walther, then wins both the singing competition and the eager maiden with a song in the key signature for C-major – a key in which there are no sharps or flats to deflect the dreaded tritone F-B. And Walther's song closes with the triumphant climax: '... am lichten Tag der Sonnen, durch Sanges Sieg gewonnen Parnass und Paradies!'.¹⁷⁹ This is sung to *two* 'in-your-face' tritones,

¹⁷⁸ Wagner (1910/1976, pp. 478-9, p. 755).

¹⁷⁹ '... in the bright day of the Sun, through victorious Song, I had won not only [Greek and Roman] Parnassus, but also [Hebrew and Christian] Paradise!'

downward intervals F-B, the first one sung to ‘Tag der’ and second one landing squarely on ‘Sieg ge-[wonnen]’ – ‘Victory winning’ – while the orchestra is instructed to play ‘*cresc.*’, then again ‘*cresc.*’, and then ‘*molto cresc.*’, then finally ‘*dim.*’ and ‘*p*’ for ‘und Paradies’.¹⁸⁰ Wagner is right: shunning the tritone has been important in the history of music, but it is better not to shun it altogether, but rather, to seek ways of utilising its power.

The tritone F-B contributes to the gut-wrenching, famously ambiguous first chord in Wagner’s *Tristan und Isolde*, the ‘Tristan chord’ (FBD[#]G[#])¹⁸¹ – expressing a tension that is only fully resolved, musically, a few hours later in the opera, in the key of B-major, when Isolde finally dies with Tristan dead in her arms. Her last words are ‘höchste Lust!’, under the key signature of B-major,¹⁸² sung to the harmonious notes B and F-sharp – not the dissonant tritone F and B. And the orchestra closes with the peaceful harmony of B and F-sharp. This occurs the key of B-major – where B plays the role corresponding to the tonic in the Renaissance modes. In Shakespeare’s day the modes with tonic B, the Locrian modes, were ‘justly rejected’ because of the tritone.¹⁸³ Thus, the opera closes with musical details that pointedly celebrate the liberation of music from an excessive aversion to the tritone.

The tritone also unmistakably carries a sense of unrequited love in the opening word of the aria ‘Maria’, from *Westside Story* by Leonard Bernstein (which can

¹⁸⁰ Wagner (1910/1976, pp. 988-90).

¹⁸¹ Wagner (1910/1978, p. 7). The key signature is that of C-major (or A-minor).

¹⁸² Wagner (1910/1978, pp. 654-5). The key signature (five sharps) is for B-major.

¹⁸³ Morley (1597/1973, p. 303).

be sung to the notes B-F-B^o – or F-B^o-F^o). The same discord accompanies visual depiction of the punishment of a naughty boy (Bart Simpson, who might be described as ‘a bit of a devil’) in the opening credits of the cartoon show ‘*The Simpsons*’ – these three syllables being singable to the three notes B-F-B^o – or F-B^o-F^o. Again, we do not fail to hear the distinctive quality that the Renaissance ‘master singers’ found ‘discordant’: we have just found ways of using it.

The historical importance of the tritone is important to the line of argument that is to be mounted here, concerning Shakespeare’s *Sonnets*. The claim to be made here is that Shakespeare’s *Sonnets* poetically echo the *first* occurrence, within his sonnet sequence, of this *dramatically important* discord in music. In this context, it is important to register that this discord is ‘important’ not only in Shakespeare’s time, but for all time. At the opening of the *First Folio*, Ben Jonson said of Shakespeare that ‘*He was not of an age, but for all time !*’¹⁸⁴ The same is true of the musical importance of the tritone, and the other Renaissance musical harmonies and discords that are all mirrored poetically (it will be argued) in Shakespeare’s *Sonnets*.

(iii) Identifying other discords:

If Shakespeare were to have set out to mirror harmonies and discords in musical scales, then he would have been entering a minefield. The dissonant tritone is only the tip of the iceberg.

In sixteenth and seventeenth century Europe, the Churches held strong opinions about which tuning system (if any) God wanted to hear in his churches. Just two men in England controlled both the importation and the publication of all music

¹⁸⁴ Shakespeare (1623/1902, p. 14).

in Elizabethan England (and even the publication and distribution of the music-papers that are used in composing music): Tallis and Byrd. And Tallis and Byrd held firm opinions on music theory. In particular, they stuck fast to what is known as ‘Pythagorean tuning’.¹⁸⁵ So did Thomas Morley, in his standard textbook on music theory. It would have been recklessly imprudent for Shakespeare to offend any of these power-brokers in the world of music – either wittingly or unwittingly. They clearly had the ear of the Sovereign. Nevertheless, it is also possible that the Sovereign might have been enamoured of one in particular among the various rival practical tuning systems that were in widespread practical use and gaining ground in the sixteenth century – in competition with the pure theory of Pythagorean tuning that was taught in the standard theoretical syllabus of the Quadrivium.

In competition with the Pythagorean tuning of Tallis and Byrd, there were several rival tuning systems, some that come under the label of ‘just intonation’, some under the label of systems of ‘temperament’. These tuning systems were all created in order to make minor adjustments to the size of some intervals as they occur in the natural harmonic series. They resulted in some intervals having some degree of audible ‘beats’ in order to make them ‘harmonious’ in all chords and vertical harmonies in diverse keys. The anomaly is that the perfect fifth, the essential building block of Pythagorean tuning, makes a ‘perfect’ sound on its own, but is too wide when used within a full harmonic system. Other intervals need slight modification in order to compensate, and this gave rise to a plethora

¹⁸⁵ ‘Pythagorean tuning’ is achieved by minimizing interference ‘beats’ in the overtones for all the intervals in a ‘cycle of fifths’: F-C-G-D-A-E-B.

of temperaments. Thus, for instance, an early version of temperament is described by Schlick (1511), in his advice to organ-tuners: ‘... do not make it [one of the fifths] high enough, or completely pure, but hovering somewhat lower, as much as the ear can stand’.¹⁸⁶

Although it is possible to deviate from a ‘sweet spot’ – ‘as much as the ear can stand’ – when tuning a musical instrument, it is harder to reliably achieve a *precise degree* of deviation from a ‘sweet spot’ with the voice. Probably the best way for a singer to match some non-Pythagorean tuning system is by first tuning an instrument, and then trying to sing in unison with that instrument. Kepler argues that the voice is a more perfect instrument than any mechanical device. And he takes it that the voice, coming from the soul, will adjust to the tuning system that God used in creating the material world, particularly the orbits of the planets. In opposition both to strict Pythagorean tuning and to systems of temperament like that of Galilei, and to some of the tuning systems of Aristoxenus and Ptolemy, he urged that although it is possible to tune an instrument to these various proposed frequency-ratios, it is not possible to *sing* them.¹⁸⁷ Systems of *temperament* can be implemented on instruments; but (following Zarlino) Kepler’s enthusiasm for systems of *just intonation* was linked with the harmonies that come naturally in *singing*. But Kepler was overlooking the fact that someone with a soul can deliberately wish to harmonize with the notes played by a musical instrument – which in turn can be tuned to the dictates of a ‘theorist’. Hence it is not impossible for singers to adjust to a system of

¹⁸⁶ Schlick (1511/1980, pp. 75-76).

¹⁸⁷ Kepler (1619/1997, p. 138).

temperament, not just of just intonation. This notion is enunciated in the Prologue to Monteverdi's *L'Orfeo*.¹⁸⁸ 'Music' says that he aims to 'inspire souls with a longing / for the sonorous harmony of heaven's lyre'.¹⁸⁹ And near the opening of Act 1, a 'Nymph' sings: 'and while we today / on well-tuned strings / invoke Hymen's favour on our Orpheus, / let your singing accord with our playing.'¹⁹⁰

If Shakespeare were to have set out to weave poetic echoes of a tuning system, then he would of necessity have needed to choose *whose* tuning system to follow. Unavoidably, he would thereby run the risk of offending all those who passionately backed one of the rival theories. And that could have had bad consequences for him personally, if one of those he was offending turned out to be someone that it would be prudent for him to please, like say Thomas Morley, the Earl of Southampton, Lord Burghley, Robert Cecil or King James.

The theory to be investigated here is that Shakespeare chose to back a tuning system that he had reason to believe that King James I of England favoured – perhaps for philosophical if not for musical reasons. We do not know what clues would have been available to Shakespeare, apart from King James's youthful publication of *Essayes of a Prentice*.¹⁹¹ But with hindsight we do have a clue about what that tuning system might have been, because Kepler described it in

¹⁸⁸ Monteverdi (1607/1609/2002).

¹⁸⁹ ...*e in questa guise a l'armonia sonora / de la lira del ciel più l'alme unvoglio* (*op. cit.*, p. 290).

¹⁹⁰ ... *e mentre oggi propizio al nostro Orfeo / invochiameo Imeneo / su ben temprate dorde / sia il vostron canto al nostro suon concorde* (*op. cit.*, p. 294).

¹⁹¹ James (1585/1869).

detail in his masterwork on *The Harmony of the World* – and, in dedicating this work to King James, he called this mathematical music theory a ‘basis’ for ‘your Davidic harp, glorious King’.¹⁹²

That, in a nutshell, is a sketch of the argumentative arc that will lead to the eventual destination for this investigation.

¹⁹² Kepler’s tuning system can be achieved by minimizing ‘beats’ in the overtones for just the thirds C-E-G-B (which is a truncated segment extracted from the full cycle of thirds) – and then tuning the remaining three notes A, D, F by harmonizing the relevant fifths.

To *hear* Kepler’s segment of the ‘cycle of thirds’, listen to ‘The Ride of the Valkyries’. In its first appearance in *Die Walküre*, this melody gallops up the thirds C-E-G-B; see Wagner (1910/1978, p. 175).

CHAPTER 4

SWEETENING THE THIRDS

4.1 MUSIC AND MAGIC

There is abundant evidence that Shakespeare was deeply influenced by Arthur Golding's English translation of *Metamorphoses* by Ovid;¹⁹³ and Ovid's text gives abundant information about the ancient traditions of Pythagoreanism, including stories about Orpheus and the preternatural powers of music. Theorists who wrote about music regularly told and retold a distinctive stock of tales that were intended to illustrate the power and the moral significance of the right kinds of music. A standard example is found in one of the most influential music texts of the Renaissance, the *Micrologus* of Guido of Arezzo:

So it is said that of old a certain madman was recalled from insanity by the music of the physician Asclepiades. Also, that another man was

¹⁹³ Ovid tells the stories of Venus and Adonis, of Pyramus and Thisbe, of Ganymede, and many of the other stories that Shakespeare echoes in his works. Thus, for instance, Prospero's final invocation, 'Ye Elues of hils, brooks, standing lakes & groves ...', is adapted directly from Golding's 7.265 *ff*, 'Ye Ayres and windes: ye Leves of Hilles, of Brookes, of Woods alond, / Of standing Lakes, ...'; Ovid (1567/2000, p. 168).

roused by the sound of the cithara to such lust that, in his madness, he sought to break into the bedchamber of a girl, but, when the cithara player quickly changed the mode, was brought to feel remorse for his libidinousness and to retreat abashed. So, too, David soothed with the cithara the evil spirit of Saul and tamed the savage demon with the potent force and sweetness of this art.¹⁹⁴

Stories like this are echoed by Shakespeare. For instance, in *The Merchant of Venice* 5.1, Jessica says to her new husband, Lorenzo, that music always makes her melancholy. This prompts Lorenzo to launch into Ovid's stories about Orpheus and the magical powers of music. Jessica would do well to take heed that the man she has just married is a man who thinks that:

The man that hath no musicke in himselfe,
Nor is not moued with concord of sweet sounds,
Is fit for treasons, stratagems, and spoyles,
The motions of his spirit are dull as night,
And his affections darke as *Erebus*,
Let no such man be trusted: marke the musicke.

Clearly Shakespeare is aware, presumably largely through Ovid, of the supreme importance of music according to the ancient Orphic and Pythagorean traditions.

However, the earlier and most authoritative source for information about Pythagoreanism – and especially information about the critical details in

¹⁹⁴ Guido (*ca* 1030/1978, p. 70), Chapter 14.

Pythagorean mathematical music theory – lies not in Ovid but in one of Plato’s dialogues, the *Timaeus*. Plato’s *Timaeus* emphasizes the importance of music. And Plato says that if an artist works by merely following his senses and intuition then what he produces will be only echoes of echoes of other artists. To create something truly ‘good’, Plato says, it is necessary to understand the mathematical and musical patterns that inform all beautiful things. More particularly:

... harmony, whose movements are akin to the orbits within our souls, is a gift of the Muses, if our dealings with them are guided by understanding, not for irrational pleasure, for which people nowadays seem to make use of it, but to serve as an ally in the fight to bring order to any orbit in our souls that has become unharmonized and make it concordant with itself. Rhythm, too, has likewise been given us by the Muses for the same purpose, to assist us. For with most of us our condition is such that we have lost all sense of measure, and are lacking in grace.¹⁹⁵

Again, the wrong kinds of music can lure us down the paths of wickedness; but the right kinds can encourage us down the paths of righteousness that will lead us to our final enlightenment and salvation.

Shakespeare could have been influenced by the music theory in Plato’s *Timaeus* either directly, or else through a number of other intermediaries besides Ovid. The character of Prospero in *The Tempest* was almost certainly modelled, at least in part, on a colourful Elizabethan character called Dr John Dee; and Dee’s library at Mortlake contained at least four copies of the canonical Latin

¹⁹⁵ *Timaeus* 47 d-e; Plato (ca 360BCE/1997, p. 1250).

translation by Calcidius.¹⁹⁶ And we know that Shakespeare's acting company was at least sometimes located near Dee's library because, for King James's first Christmas in England, in 1603, Shakespeare's company was paid for traveling 'from Mortlake' to perform for the King.¹⁹⁷ It is also possible that either the Earl of Southampton, or the Earl of Pembroke, or Lord Burghley ... or someone else ... had allowed Shakespeare to work in one of their extensive libraries, any one of which would almost certainly have included Plato's *Timaeus*.

Against this background, it is worth investigating the possibility that Shakespeare's *Sonnets* might contain formal poetic patterns that in some significant way *mirror* the musical patterns that self-styled 'Pythagoreans' and 'Platonists' in Shakespeare's day referred to as 'the music of the spheres'.

Anything that appears to display 'action at a distance', without any visible or tangible material mediating mechanism, does carry a strong suggestion of what has been traditionally understood to be 'sympathetic magic'. Witness for instance the following passage from the great philosopher René Descartes, in the opening page of his youthful book about musical harmony:

The human voice seems most pleasing to us because it is most directly attuned to our souls. By the same token, the voice of a close friend is more agreeable than the voice of an enemy because of sympathy or antipathy of feelings – just as it is said that a sheep-skin stretched over a drum will not

¹⁹⁶ French (1987, p. 46).

¹⁹⁷ Chambers (1930, vol. 2, p. 329).

give forth any sound when struck if a wolf's hide on another drum is sounding at the same time.¹⁹⁸

Many of superstitious Pythagorean stories of sympathetic magic, like this story of Descartes's, presumably will not stand up to rational scrutiny (if it is taken literally). But it is a mistake to throw the baby out with the bathwater.

Imagine a harp with strings that play notes which range over the span of several octaves. (A harp like that is in fact lying horizontally inside a grand piano.) If the tensions in the strings are adjusted in the right ways, then when one of the longest strings is caused to vibrate, some but not all of the shorter strings will immediately begin to vibrate as well – *as if* by magic. Descartes was impressed by the demonstration that you not only can you hear the notes from those shorter strings, by you can even *see* them beginning to vibrate. The vibration of the longest string appears to be causing a 'sympathetic' response in the shorter strings by some sort of 'action at a distance'. When the longest string produces its characteristic note, the other strings that begin to vibrate will be playing all the *overtones* of that note.

Consider also the lute. 'Sympathetic vibrations' were a well-known phenomenon in the tuning of lutes, and some commentators have thought this to be relevant to the interpretation of Shakespeare's sonnet 8, 'Mvsick to heare, why hear'st thou musick sadly?' Thus, for instance, Booth makes the following comment on lines 9-11: 'The metaphor here is of lute strings, which are tuned in pairs; when one is plucked, the other of the same pitch produces a sympathetic

¹⁹⁸ Descartes (1618/1961, p. 11).

vibration'.¹⁹⁹ And indeed not only other strings tuned to the same pitch, but also strings tuned to the overtones of the given note will also produce sympathetic vibrations, though not quite as obviously.

The frequency-ratios for overtones form a neat mathematical series of whole-tone ratios. Doubling the frequency of a note yields the octave, which is the first overtone. Tripling the initial frequency yields a third note, which lies a harmonious *fifth* above the second note. And so on. Even those who do not believe in magic can find something magical in this mathematical pattern of overtones or natural harmonics, which can be not only heard – and seen – and even felt – and scientifically measured – in the strings of a harp.

From time immemorial musicians have been living with the observable physiological consequences of overtones, undertones, interference beats, and other such physical facts governing the sounds that are received through the sense of hearing. And some have surely noticed some of the most important consequences in their everyday musical practice. Thus, for instance, Descartes spoke of observations he had made:

I have proved this by experimenting with the strings of a lute (any other instrument whatsoever will do equally well). If we pluck one of its strings, the force of its sound will set in vibration all the strings which are higher by any type of fifth or major third, but nothing will happen to those strings which are at the distance of a fourth or any other consonance.²⁰⁰

¹⁹⁹ Booth (1977/2000, p. 146).

²⁰⁰ Descartes (1618/1961, p. 21).

Descartes is at least partly right about this. The sympathetic vibrations that he observed can not only be heard, but often they can be *seen* and *felt* and scientifically measured.

If you sound a lowish note loudly, say C₀, then the harmonic series is predicted to run: C₀ C G C^o E^o G^o . . . and, from there on, the harmonics will become fainter and fainter until they disappear altogether. It is on the basis of these observations that Descartes constructs his own exposition of a familiar version of the musical theory called ‘just intonation’.

Descartes’s descriptions, as quoted here, of the sympathetic vibrations for octaves, fifths and major thirds, are not so very hard to verify by observation.²⁰¹ But in any case, musicians and music theorists, from antiquity onwards, did regularly record observations that *indirectly* register sympathetic vibrations in the overtones. Sympathetic vibration in the overtones is precisely what musicians are in fact registering, every time a note that is played above another note, sounds either ‘in tune’, or else just a little ‘sharp’ or just a little ‘flat’. When two of the overtones from two distinct notes are separated by an interval that is creating

²⁰¹ It is to be predicted that, apart from octaves, the sympathetic vibrations will be much less clear if the observations are made on a modern piano, because the piano is standardly tuned to ‘equal temperament’. Systems of ‘temperament’ deliberately create a small degree of dissonance in various of the other intervals, apart from the octaves.

beats, then, in the words of an organ-tuner in 1511, one of the notes will be perceived as ‘too high, horrid, and hard’ in relation to the other one.²⁰²

²⁰² Schlick (1511/1980, p. 75).

4.2 MUSIC AND HERESY

Although musicians all react instinctively to overtones, many shun any explicit intellectual or mathematical *theorizing* about them. Mathematical theories about overtones, like the one Descartes articulates, are not everyone's cup of tea. Hostile sentiments are well expressed, and persuasively argued, for instance in an article by Barbour, entitled 'Just intonation confuted', where it is argued that:

Serious advocacy of just intonation as a practical system was confined to a few later mathematicians, such as Kepler and Descartes ...

Just intonation has always been a beautiful theory. Its devotees have been drawn chiefly from the ranks of mystics and philosophers – mathematicians who knew no music and musicians who knew no mathematics. It can be fully attained in some acoustical fourth dimension.

The practical man need but recognize it for what it is, and keep it firmly in its place, hidden in the pages of a physics text.²⁰³

Barbour and others give persuasive reasons for concluding that there is no ground for assuming that there was ever any widespread use of Ptolemy's, Zarlino's or Kepler's versions of just intonation among practical musicians. If Barbour were right, then some might find it natural and tempting to anticipate that Shakespeare would stand on the 'intuitive' side of the ledger and would side with the 'math-phobic' practical musicians – and hence that we can be relatively confident that

²⁰³ Barbour (1938, p. 60); see also Barbour (2004).

he would *not* have woven poetic echoes of any abstract, mathematical version of just intonation into his *Sonnets*.

Nevertheless, there is evidence suggesting that King James may well have taken seriously some of the ‘mystics’, the ‘devotees’, that Barbour describes. One of them, Kepler, in fact dedicated his musical theory to King James. Consequently (as will be argued below) it is not altogether improbable that Kepler’s system of just intonation may be hidden not only in the pages of ‘physics texts’, but also in Shakespeare’s sonnets.

When two *pure* notes (without audible overtones) are further apart than a whole tone, then they will not be predicted to produce noticeable ‘beats’. For instance, with the high notes of a flute, the overtones are of such a high frequency that they lie beyond our range of hearing. Nevertheless, when two simultaneously sounding notes distinct notes are not ‘pure’, but are accompanied by a full gamut of overtones, then they will virtually always produce ‘beats’ in the overtones – and in some cases these beats will be loud enough to be perceptible. The ‘sweet spots’, where ‘beats’ are minimized, are relatively rare – and correspond to the notes in the diatonic scale.

For instance, consider the notes F and B. The note B is a *little more than a perfect fourth* above F. (A fourth would fall on B-flat.) And B is a *little less than a perfect fifth* above F. (A fifth would fall on C.) The physics of sound waves and the physiology of human hearing together entail that there will virtually always be noticeable ‘beats’ in the relatively proximate harmonics for these two notes F and B when they sound together, loud enough and long enough.

By contrast with the tritone, two notes that are separated by a major third can manifestly be tuned in such a way that they sound ‘sweetly’ together. This perceived harmony is in fact achieved when these notes are tuned in such a way as to achieve a local minimum in the ‘beats’ that occur in their audible overtones. When the notes are tuned to this ‘local minimum’, then whenever the gap between these notes is slightly *increased* the ‘beats’ in the overtones will perceptibly increase. And the same effect follows if the gap between the notes is slightly *decreased*. The ‘sweet spot’ is the ‘perfect mean’, where it is experientially felt that the ‘beats’ are reduced to a local minimum.

In Shakespeare’s time there was intense interest in the scientific study of the pattern of harmonies and discords within the standard ‘diatonic’ division of the octave into the familiar notes ABCDEFG. Different tuning systems produced different distributions of dissonance among the overtones of these notes. And the choice of a tuning system was invested – both by many musicians and by many theorists – with an unreasonable degree of importance. Choosing the wrong tuning system was sometimes perceived as tantamount to heresy.

Since the Church took a close interest in morality, it also took an interest in the kinds of music that are ‘the food of [carnal] love’, and the contrary kinds of music that promote the love of God. Thus, choice of the wrong tuning system was regarded as a serious matter. Here is a text from someone in the twelfth century (whose identity is not well known):

Since it is established that the one Lord is pleased by one faith, one baptism, and complete unanimity of morals, who would not believe that he also is offended by the manifold disagreement of singers, who wrangle, not reluctantly or unwittingly, but wilfully? Therefore it has not befitted

us, who by God's favour have come to know the right way of singing, to tolerate error; nor should we be greatly concerned if certain foolish singers, stubborn in their faults, do not give way to the truth, so long as we can bring it about that some of sound judgment forgo their errors and freely reform.²⁰⁴

This is the familiar language of litigation for heresy, and of the Holy Inquisition.

One landmark in music theory came with Guido of Arezzo, who died in 1050 CE, and who established the 'lines and spaces' notation, and the '*sol-fa*' notation for singing the notes in the diatonic division of the octave. In Raphael's *School of Athens*, below the figure representing Plato is a figure representing Pythagoras, and he is reading from a slate that is being held before him by an angel. And on this slate, there is a Table that lays out the Pythagorean theory of harmonies, exactly as it was explained by Guido.²⁰⁵

The Renaissance music theory that had been built on Guido was explained in a textbook in English by Thomas Morley (1597/1973). There are numerous reasons for thinking that Shakespeare would probably have been familiar with at least the outlines of the music theory that is laid out in this textbook. In Renaissance music theory, as recorded by Morley, who said that only unison, octaves, and fifths are perfectly harmonious.²⁰⁶

²⁰⁴ John (*ca* 1100/1978, p. 152), Chapter 22.

²⁰⁵ Hall (1997), Rowland (1997).

²⁰⁶ Morley (1597/1973, p. 141, p. 205).

In particular, major thirds (or ‘ditones’) always have been (and still are) commonly perceived as ‘too wide’ – *if* they are generated by strict Pythagorean tuning. This Renaissance problem with thirds was well known in Antiquity; Ptolemy discusses it and traces the issue back to one of Plato’s contemporaries, ‘Archytus the Tarentine, who of the Pythagoreans had the greatest interest in music.’²⁰⁷

Another text from just before Shakespeare’s times, which explicitly notes the theoretical Pythagorean dissonance of thirds, was translated into English by John Dowland in 1609. There we have a table on p. 16, which explicitly sets out all of the following thirds:

ut-mi; and *fa-la*; and *re-fa*; and *mi-sol*,

as intervals that ‘least agree’. But this rejection of these thirds is tempered a few pages later: ‘And also because *Aristotle* doth deny Musick to be meerly Mathematicall. For Musick must be so tempered, that neither sense be against reason, nor reason against sense.’²⁰⁸

Dowland’s translation in 1609 of this text from 1517 is evidence closely relevant to musical interests in circles that clearly overlapped with Shakespeare’s circles of friends, colleagues and patrons. Like Morley’s *Plaine and Easie* textbook, the *Ornithoparcus* text shows an interest in both musical practice and Pythagorean music theory. Dowland and Morley graduated from Oxford at the same time. And Robert Sidney (one of the less famous of the sons of the Countess of Pembroke) was the godfather of Dowland’s son (also called Robert,

²⁰⁷ Ptolemy (*ca* 150 / 2000, p. 42), Bk. 1, Ch. 13 [section 30.3].

²⁰⁸ *Ornithoparcus* (1517/1609/1969, p. 22), Book 1, Chapter 7.

and who was also a musician).²⁰⁹ Dowland worked for years in Denmark - and King James's wife, Anne, was Danish. There are multiple threads, in the tapestry of the times, that link Renaissance music theory indirectly to Shakespeare, and more specifically, that link Shakespeare either directly or indirectly to the kind of music theory, the theory of just intonation, that Kepler eventually published in his great work of 1619.

The tempering of reason to sense, and sense to reason, was a recurrent theme among advocates of just intonation. This theme is also the hallmark of what Kepler called his '*a priori* method'. Kepler followed his own intuitive, mathematical, *a priori* conjectures; but he also tested them rigorously against observations.²¹⁰ And a paradigm case study in this balancing of theory with observation is found in the debate about Pythagorean tuning, and the question of whether 'major thirds' (also called 'ditones') are harmonious, or discordant.

The trouble with 'sweetening the thirds and sixths' is that there is no way of doing this without creating trouble in the fourths and fifths. This trade-off between fifths and thirds was recognized not only by theorists but also by practical musicians, including for instance organ-tuners – as described clearly by a great German theorist from more than a generation before Shakespeare's time, Schlick (1511).²¹¹ It was also known to the leading music theorists in Shakespeare's circle of acquaintance, as for instance Thomas Morley.

²⁰⁹ Hay (1984), Hawkes (2000).

²¹⁰ Kepler (1619/1997, pp. 137-138).

²¹¹ Schlick (1511/1980, p. 75).

Nevertheless, in practice musicians do manage to produce thirds that are experienced as harmonious – despite the purported Pythagorean arithmetical proofs that this must necessarily be impossible. Ptolemy says that ‘The association of consonance with only these [unison, octaves and fifths] ... and not with others – by ‘others’ I mean (5:4) ... – created not insignificant difficulties for the Pythagoreans’.²¹² Kepler, similarly, protests vehemently against the ‘tyranny’ of the Pythagoreans and pleads for theorists to believe the evidence of their senses and to acknowledge that musical thirds can be harmonious.²¹³

Kepler offers a mathematical explanation of how it can be arithmetically possible for at least some of the thirds to be harmonious, despite the purported proofs of the Pythagoreans. And the mathematical techniques he employs for sweetening the thirds were however not an original discovery, but yet another rediscovery of the wisdom of the Ancients like Ptolemy.

The arithmetic of the early Pythagoreans was unassailable. But there are ways of deflecting its force into channels where it will do minimal harm. Experience shows that it is possible to create harmonies in some (but not all) of the thirds in the diatonic scale. But it is arithmetically impossible to do this without creating at least some dissonance in at least one of the fifths. Nevertheless, there are umpteen different ways of harmonizing at least *some* of the thirds, while preserving the original harmonies in just *nearly all* of the fifths.

In 1575 in England, Tallis and Byrd were granted by Elizabeth I the exclusive right to import music, and to publish or print either music or music paper. Morley

²¹² Ptolemy (*ca* 150 / 2000, pp. 20-21).

²¹³ Kepler (1619/1997, pp. 137-138).

dedicated his Pythagorean textbook to Byrd; and Byrd of his own free will disposed of this licence to Morley.²¹⁴ Surprisingly, at least Tallis and Byrd stuck tenaciously to the Catholic faith – and though many Catholics were effectively marginalized under Elizabeth and James. Byrd, in particular, retained his central role as a power-broker in the world of music right through the lifetime of Shakespeare. And Tallis, Byrd, and Morley all stuck like glue to Pythagorean tuning.

Nevertheless, some musicians and music theorists resisted Pythagorean strictures on musical performance. Among these heterodox composers, performers, and theorists were included some of the Catholics in Italy (especially ones who lived in Venice), and some of the Protestants in Germany – as for instance Fogliano, Zarlino, Monteverdi and Vincenzo Galilei (the father of Galileo) in Italy, and Lasso and Kepler and others in Germany.

Thus, for instance, in Monteverdi's *L'Orfeo* Orpheus sings to his lyre: '... the stars shall dance to your sound in cycles, now slowly, now quickly'.²¹⁵ And this opera opens with one of the singers enjoining everyone to aim for the same notes as the ones that are played by the well-tuned lyre of Orpheus. Note also, in this passage, that Monteverdi suggests that music might be not literally sung, but danced, with ratios among frequencies of notes being echoed by ratios among the velocities of the planets. A similar idea is expressed by Sidney, who refers to 'the Plannet-like Musick of Poetrie' in the concluding pages of his *Apologie for*

²¹⁴ Poulton (1972, p. 41).

²¹⁵ '*in gir'hor tard'hor presti*', Monteverdi (1609), Act 4.

Poetrie.²¹⁶ And it is also expressed by John Donne: ‘The Spheares have Musick, but they have no tongue, / Their harmony is rather danc’d than sung.’ In Dee’s Introduction to Euclid’s *Elements*, he says, ‘*Astronomie* and *Musike* are Sisters, saith Plato’.²¹⁷

If Shakespeare’s *Sonnets* were intended for circulation among private friends with a broadly Pythagorean mind-set – that is, a mind-set like the ones expressed by say King James, Kepler or Monteverdi – then one way to please friends of that kind could surely have been by echoing the macrocosmic harmonies of the world within the microcosm of the formal structures within a sonnet sequence – if only he could find out what precisely those friends or patrons thought that the ‘harmonies of the world’ actually were.

²¹⁶ Sidney (1595/1905, p. 72).

²¹⁷ Euclid (*ca* 300 BCE/1570, p. 15).

4.3 MODES AND EMOTIONS

A calendrical scheme inevitably carries a raft of poetical associations of ideas: night and winter might suggest (say) absence and discontent; dawn and spring (say) ‘the business of generation’;²¹⁸ and so on. Analogously, a poet could conceivably draw comparably rich poetic associations from the modes. It is well to be warned that, as Kepler warns at the opening of his discussion of modes and emotions,²¹⁹ it is possible to express any emotion in any mode. But this does not stop him from suggesting natural pairings of modes with emotions, comfortable bedfellows, as it were. Furthermore, flexibility is not a vice – especially not for a poet. There may well be useful poetic resources in various ideas about how musical modes might be used to evoke shifts in poetic mood.

To illustrate: the great English composer Thomas Tallis (1567) set eight Psalms to eight brief snatches of music, in order to illustrate the potential moral and emotional useful associations for the Eight Church Modes:

The first is meeke: deuout to see,

The second sad: in maiesty.

The third doth rage: and roughly brayth,

The fourth doth fawne: and flattry playth.

²¹⁸ ‘The business of generation’ is what Kepler (1619/1997, p. 241) reads into the coupling of a major third (male) and a minor third (female) to make a perfect fifth.

²¹⁹ Kepler (1619/1997, pp. 238-246).

The fifth delight: and laugheth the more,
The sixth bewayleth: it weepeth full sore.
The seuenth tredeth stoute: in forward race,
The eyghte goeth milde: in modest pace.²²⁰

Puttenham's *The Arte of English Poesie* similarly says that each mode 'breedeth a variable and strange harmonie not onely in the eare, but also in the conceit of them that heare it'.²²¹ Kepler devotes a chapter to the question of which musical notes, intervals, and modes best serve which emotions.²²² In fact, there were many different, but also overlapping, ideas about how to relate modes to emotions.²²³

In Shakespeare's time, the earlier system of Eight Church Modes was faced with a rival system of Twelve Modes, the 'Dodecachordon' of Glareanus.²²⁴ But

²²⁰ Tallis, (1567/2015, p. 851); see Blom (1947, p. 48).

²²¹ Puttenham (1589/2007, p. 174). Puttenham augments the Eight Church Modes by adding the '*Eolien*' and '*Ionien*' modes.

This textbook was published by Richard Field – without identifying the author – and it was dedicated to Lord Burghley. Field and Shakespeare were schoolfellows in Stratford-upon-Avon. And Field published Shakespeare's *Venus and Adonis* and *Lucrece*. Circumstantial evidence strongly suggests that Shakespeare would probably have read this textbook on the art of poetry relatively closely.

²²² Kepler (1619/1997, pp. 238-246).

²²³ See for instance Palisca (2006, pp. 80-90).

²²⁴ Glareanus (1547/1965).

the earlier system was still influential. In England, one of the most frequently published of all the Continental composers was Lasso. When Kepler reaches for detailed musical examples, he reaches for Lasso.²²⁵ For these reasons, it is of some interest to find that: ‘It is well known that Lasso held to the traditional system of eight modes rather than adapting the twelve-mode system propounded by Glareanus and Zarlino’.²²⁶

Hence, it is not far-fetched to suppose that Shakespeare might have echoed the system of Eight fairly prominently within his sonnet sequence. And the evidence suggests that Shakespeare did exactly that, in compiling his sonnet sequence.

There are eight macro-sonnets cataloguing the Eight Modes, then one more as an Envoy; and then the remaining, and rejected, modes are aligned with the Dark Lady sequence, followed by *A Louers Complaint*.

Are there any further poetic structures in Shakespeare’s *Sonnets* that could be aligned in memorable ways with plausible poetic associations for the canonical Renaissance catalogue of modes? Yes, there are.

Canonically, the Dorian mode comes first; and this mode was sometimes symbolically associated with devoutness and duty,²²⁷ or with marriage,²²⁸ or with the Sun.²²⁹ Sonnet 7 is the only one in the sequence that is all about the Sun. And correspondingly, the sonnets that come first in Shakespeare’s published sequence,

²²⁵ Kepler (1619/1997, p. 233, p. 253).

²²⁶ Bergquist (1999, p. 204).

²²⁷ Galilei (1581/2003, pp. 180, 181).

²²⁸ Kepler (1619/1997, p. 245).

²²⁹ Morley (1597/1973, p. 110).

sonnets 1-14 (plus 16 and 17), all urge an aristocratic young man to ‘be not self-willed’, and to do his duty, to marry, and to father an heir to the estate that he will inherit.

Shakespeare’s sonnets divide into a larger group (of 126 sonnets), which are all nominally addressed to a pretty, rich young man, presumably always the same one that is encouraged, in sonnets 1 to 17, to father an heir. These are followed by a smaller group (of 28 sonnets) that are notionally addressed to the ‘Dark Lady’.

Thus, the sonnets addressed to the young man could aptly be aligned with the Eight Church Modes. And the ‘Dark Lady’ grouping of 28 sonnets could then be aligned with the modes that were proscribed by the Church, namely the Aeolian, Locrian and Ionian modes.

Furthermore, in the 1609 edition of the *Sonnets* the sonnets to the Dark Lady are followed by *A Louers Complaint*. This *Complaint* is voiced by a fallen woman – ‘Aye me I fell’ (line 321) – who has fallen pregnant out of wedlock to a young man very like the one we find in the *Sonnets*. Hence this *Complaint* could aptly be aligned with one of the modes that are proscribed by the Church.

Thus, adapting some of Shakespeare’s own words, it might be worth wondering whether Shakespeare may have compiled ‘deepe brain’d sonnets that did amplifie / Each [*mode*’s] deare Nature, worth and quality’. That is, it might be worth wondering whether, in compiling his sonnet sequence, Shakespeare may have tried to ensure that ‘each seuerall [*mode*], / With wit well blazond smil’d, or made some mone’.²³⁰

²³⁰ Shakespeare (1609/1905, K4v-L), replacing precious *stones* by musical *modes*.

But one should beware of wishful thinking. And as Kepler rightly says, ‘one thing of which the philosophical reader must be warned, is that our musicians express all emotions promiscuously in all tones [=modes]’.²³¹ This ‘promiscuity’ renders correspondences between modes and emotions potentially useful to poets, but of little value as evidence to guide readers in search of an interpretive theory. And so, it is important to seek somewhat more ‘objective’ ways of testing a speculative interpretive hypothesis of the kind sketched above.

²³¹ Kepler (1619/1997, p. 245).

4.4 SACRED FIFTHS, SENSUAL THIRDS

In the Renaissance, many believed that music amplifies our lustful appetites; and so, they aimed to ban music altogether, along with plays and other frivolous pastimes. These Puritans were sometimes loosely called ‘Stoics’. By contrast, ‘Pythagoreans’²³² agreed that music can indeed be the food of love – but then added that the right kinds of music can be the food of spiritual rather than carnal love. Church music, they held, can amplify our love of God, and it can help us to suppress our carnal appetites.

In my lifetime, analogous beliefs were voiced by American fundamentalists who said that jazz is the devil’s music, and who feared that rock ‘n’ roll would break the moral backbone of the nation. I hear that Muslim fundamentalists ban music; recitation of, for instance, the call to prayer is, of course, a good thing, but they insist that this is not music.

Among other things, Shakespeare’s sonnets are deeply concerned with Platonic love – and its opposites. The Renaissance notion of Platonic love was deeply entangled with a number of other Platonic notions, some of which were borrowed from the Pythagorean brotherhoods that had spread through the Greek world in the centuries immediately preceding Plato. The Pythagoreans were sworn to secrecy; but in a dialogue called the *Timaeus* Plato ‘spilled the beans’. In

²³² See Morley (1597/1973, p. 10).

particular, Plato borrowed the notion that love, as understood by Pythagoreans, is analogous, in some deep way, to musical harmony.

The Pythagorean notion of ‘the celestial harmonies’ dates back to ancient times; and it was of intense interest to Shakespeare and his contemporaries. It begins with the division of the octave into what is called the diatonic scale, which is the familiar sequence of notes G A B C D E F, or *ut* (or *doh*) *re mi fa sol la* and *ti* (or *si*). The Pythagorean theory is that each of these notes should be harmonized, as far as possible, with an optimal number of the other notes in the scale. And the theory is that a ‘harmony’ between two notes requires that a significant mathematical relationship of some kind should hold between those two notes.

The *Timaeus* theory of harmony was reiterated in ancient times by great figures like Euclid and Ptolemy and was enthusiastically and evangelically rediscovered in the Renaissance. The Pythagorean Christians were especially enthusiastic about Plato’s doctrine concerning the dangers of music that appeals only to the ‘sensory’ pleasures of ‘fools’. That enthusiasm turned these Pythagorean Platonists into bullies.

In particular, these Pythagorean fundamentalists insisted that harmonizing thirds – in the pursuit of mere ‘sensory pleasure’, as opposed to intellectual understanding – was positively sinful. Plato’s text mentions only unison, the octave, and fifths as ‘perfect consonances’. Other intervals are to be used in music only as transient *discords* that strain to be ‘resolved’ in the nearest ‘harmony’. Thus, for instance, the discord of a semitone strains to be resolved in unison; a seventh (*ut-ti*) strains to be resolved into the octave (*ut-ut^o* – or

alternatively *ti-o-ti*) as commonly happens with a closing ‘*Ah-men*’. Trills eventually settle on one of several adjacent notes. And so on.

Plato’s Pythagorean list of ‘harmonies’ includes only the unison, the octave, the fifth (and perhaps the fourth); and so implicitly this excluded the musical interval of a third (which is for instance the interval between *ut* and *mi*). Thus, Pythagoreans deemed thirds to be discordant: a third can be heard as straining to be resolved in a fourth, which strains to be resolved in a fifth. And they tried to impose this opinion on all Church music.²³³ For this reason, Kepler protests against the ‘tyranny’ of ‘the Pythagoreans’ – because it does ‘violence to the natural prompting of hearing’.²³⁴

Thus, the history of music theory is a wonderful case study in the methodological dispute between ‘empiricists’, who let experience be their guide, and ‘rationalist’, who thought that sensory observations manifestly cannot be trusted, because they often contradict one another, and only mathematical reasoning from self-evident premises is guaranteed to be reliable. Kepler spoke of his own method as an ‘*a priori* method’,²³⁵ by which he meant that he did use intuition, mathematics, and logical inferences – but he also took heed of empirical

²³³ Thus, for instance, under Elizabeth I, Byrd and Tallis controlled all music publications in England. Thomas Morley was Byrd’s student and his textbook on music was dedicated to Byrd; and he explicitly says that only unison, octaves, and fifths make a ‘perfect consonance’, and that even the fourth ‘mightily offendeth the ear’; see Morley (1597/1973, pp. 141, 205).

²³⁴ Kepler (1619/1997, pp. 137-8).

²³⁵ See Kepler’s correspondence, Baumgardt (1951, p. 61), Caspar (1995, p. 96).

observations whenever they manifestly contradict the predictions of the hypotheses and calculations that might at first have seemed to him to be self-evident. The senses deceive us; but reasoning relies on judgments of self-evidence – and on memory, whenever we engage in a protracted series of inferences – and these are just as reliable-and-unreliable as the senses. God speaks to us not only in the Holy Scriptures and through the natural light of Reason, but also through the Book of Nature – which we cannot read in any other way but by using the senses that God gave us. Kepler’s version of Pythagoreanism was closely tuned to the emerging discovery in Europe of what is now called ‘the scientific method’.

The hypothesis to be explored here is that these harmonies and discords among the successive notes in musical scales may be aligned in significant ways with formal poetic patterns that have been woven into the successive sonnets that were compiled into the sonnet sequence that was published under Shakespeare’s name in 1609.

Tritones and ditones:

Under Pythagorean theory, the *four* notes FGAB will span *three* whole-tone intervals, or a ‘tritone’. And this interval was judged to be intensely discordant, both according to Pythagorean theory and according to most people’s ears.²³⁶ It is sometimes called ‘the Devil’s interval’. The ‘tritone’ evokes the trident, or pitchfork, that is associated with Satan. But Pythagoreans were not to be blamed

²³⁶ The physical basis for this is perceived discord is that this interval will cause perceptible interference effects called ‘beats’ in the overtones.

for introducing this discord into the musical scale. This discord is *mathematically* inescapable – not just for Pythagoreans, but for everyone – and not just theoretically but also in practical experience.²³⁷

However, there was also another, and an even more vexing consequence of Pythagorean theory. Just as the *four* successive notes FGAB span a ‘tritone’, so too will the *three* adjacent notes CDE span *two* whole-tone intervals, or a ‘ditone’. In fact, in the diatonic scale there are *three* groupings of adjacent notes (CDE, FGA, and GAB) that will all span ‘ditones’.

And these three ditones all create recalcitrant musical problems. The trouble is, that under this frequency-ratio for the whole-tone interval, not only will *tritones* be discordant, but *ditones* will be discordant too. In the Pythagorean diatonic scale there is only *one* tritone, F-B – but there are *three* ditones in the diatonic scale, G-B, C-E and F-A.

And yet, for Pythagoreans, even though these ‘ditones’ are discordant, they also are identified with the interval that is also called a ‘major third’.²³⁸ And for a

²³⁷ If the fifth note above E is tuned as B-*natural*, then the interval E to B-*natural* is a harmonious fifth – but F to B will then be a dissonant tritone. If the dissonance with F is removed by *flattening* the B, then F to B-*flat* will be a harmonious fourth – but the interval E to B-*flat* then becomes a dissonant tritone. Push down the bump in the carpet, and it just pops up somewhere else.

²³⁸ The interval spanned by *ut-re-mi* spans a major third, because there is a ‘whole tone’ interval between *ut* and *re* and a second ‘whole tone’ interval between *re*

great deal of music it is extremely important to ensure that major thirds are tuned in such a way as to make them maximally harmonious. Yet, making thirds agreeably harmonious will entail (both theoretically and in practice) a significant *deviation* from Pythagorean tuning.

This was well understood by at least some musicians in Shakespeare's time. For close to two hundred years, musicians had been grappling a tension between the intellectual understanding of music based on Pythagorean foundations and the experiential reality of the joyous sound of music built from harmonized thirds ('harmonized' in the sense that involves minimization of interference 'beats' in the overtones). English musicians, in particular, from the early fifteenth century, such as John Dunstable, used thirds prominently. But this harmonization of thirds was inconsistent with a strict Pythagorean tuning, as described for instance in the standard Tudor music textbook by Morley – who even puns on the name of Dunstable, calling him a dunce.²³⁹

The difficulty of reconciling theory with practice was still unresolved for many theorists in the early seventeenth century. The experiential harmony that can be

and *mi*. By contrast, *re-mi-fa* spans a 'minor third', because there is only a 'semitone' between *mi* and *fa*.

²³⁹ '... as some dunces have not slacked to do, yea one whose name is John Dunstable', Morley (1597/1973, p. 293) – a footnote confirms that the editors see this as a pun. The particular detail on which Morley is casting harsh judgment does not concern the harmonious tuning of thirds. Nevertheless, this negative attitude is fairly striking, this being Morley's only reference to Dunstable in this textbook.

achieved in thirds was difficult to explain using just the ‘Pythagorean’ ratios mentioned in Plato’s *Timaeus*: (1:2, 2:3, 3:4, and the arithmetical consequences of these, 8:9 for the whole tone and 243:256). For instance, harmonizing thirds was used as the backbone of the tuning system for organs, as described in a German textbook in the early sixteenth century.²⁴⁰ And another German theorist (translated into English in the seventeenth century) acknowledged the existence of the Pythagorean ditone: ‘The dissonant Tryas is that which arises from seconds’ – and yet he then adds, on the same page, that ‘*The Harmonical Tryas is the Root of all the Harmony that can be invented.*’²⁴¹ The mathematical problem for theorists was succinctly expressed by Kepler:

For the Pythagoreans were so given over to this form of philosophizing through numbers that they did not even stand by the judgment of their ears, though it was by their evidence that they had originally gained entry to philosophy, but they marked out what was melodic and what was unmelodic, what was consonant and what was dissonant, from their numbers alone, doing violence to the natural prompting of hearing. This harmonic tyranny of theirs lasted up until Ptolemy, who was the first, one thousand five hundred years ago, to uphold the sense of hearing against the Pythagorean philosophy, and accepted as melodic not only the proportions stated above, and the proportion of one and an eighth to one as equivalent to a Tone, but also admitted the proportion of one and a

²⁴⁰ Schlick (1511/1980).

²⁴¹ Alstedt (1664/1967, p. 56).

ninth to one as equivalent to a minor tone, and that of one and a fifteenth to one as equivalent to a semitone.²⁴²

Kepler was looking for *one perfect* system of just intonation – the one that guided God in the construction of the planetary orbits. He overlooked the possibility that the best musical results might be achieved in actual performance if a singer ‘flip-flops’ among several alternative systems. Consider for instance the description of Renaissance singing by Smith: ‘Thus singers needed to remain flexible in their tuning, slightly adjusting the pitch of specific notes within the musical context, while still remaining at the same level overall’.²⁴³ Moving a note slightly in order to harmonize a given third will draw that note out of tune with the notes a fifth above or below it – but when that becomes a problem in another musical context, the note can be restored to its original position. This is something that singers can do instinctively, just by subliminally listening for ‘beats’ in the overtones and automatically adjusting the level of the note accordingly.

Some musical instruments allow for flexibility during performance, but some do not. Kepler assumed that God’s Great Organ, the planetary system, must be tuned to a perfect system. And when he worked out what that system was, he dedicated it to King James. This project of finding ‘the right’ tuning system is deeply ‘Pythagorean’.

²⁴² Kepler (1619/1997, pp. 137-8).

²⁴³ Smith (2011, p. 51).

Thus, on Pythagorean *tuning* Kepler was outspokenly *anti*-Pythagorean. But do not be misled: in deeper respects no one could have been more Pythagorean in spirit than Kepler. To the Pythagorean list of harmonious numerical ratios, Kepler adds 4:5 for the major third, 5:6 for the minor third, and 15:16 (instead of the *Timaeus* ratio of 243:256) for the semitone. But he resisted methods of temperament that deliberately tolerate (or even deliberately create) some slight detectable degree of dissonance ('beats') – even in some of the intervals that are to be used *as if they were* 'harmonies', because they are *near enough for practical purposes*.²⁴⁴ Near enough is not good enough for the celestial harmonies.

Thus, the harmonic status of musical thirds was a contentious issue – before, during, and long after Shakespeare's lifetime. And, for any 'Pythagorean' with a head for fractions, this is an extremely intriguing intellectual problem. Thomas Morley, a contemporary of Shakespeare, wrote a textbook that purported to be *A Plaine and Easie Introdvction to Practicall Mysicke* that preached the Pythagorean theory that deemed all musical thirds to be dissonant ditones.²⁴⁵ Some protested that this Pythagorean theory was contradicted by the manifest

²⁴⁴ See for instance Kepler's many references to Galilei; and his attitude to tuning that tolerates 'beats' is implicit in his remark on how 'it may be possible for strings to be tuned in that way, seeing that as they are inanimate they do not interpose their own judgement but follow the hand of the foolish theorist without the least resistance'; Kepler (1619/1997, pp. 137-8).

²⁴⁵ Morley (1597/1973, *passim*).

evidence of the senses.²⁴⁶ However, some recalcitrant Pythagoreans acknowledged that thirds could indeed, in practice, be ‘sweetened’ in such a way to appeal to the senses – but they then added, as a rejoinder, that this lure of merely sensory pleasures would lead us away from the straight and narrow path.

At Shakespeare’s time, music was evolving rapidly. Something that had not yet arrived, but was beginning to appear on the horizon, was the technique of accompanying a melodic line with a ‘chord progression’, as perhaps might be strummed on a guitar. Especially useful accompanying chords are found in ‘triads’, as for instance C-E-G, or G-B-E.

Furthermore, even before melodies were standardly accompanied by strumming a chord progression, triads were already implicitly important in guiding the ‘shape’ of a melody. The importance of triads, in ‘shaping’ a melody, was described by Kepler, in a chapter on ‘What Naturally Tuneful and Suitable Melody Is’.²⁴⁷ But, in order to accompany a melody by strumming a chord progression, it is necessary to employ a tuning system that makes the relevant thirds sufficiently harmonious.

²⁴⁶ Schlick (1511/1980) describes organ-tuners as trying to make thirds harmonious (even though this has the side-effect of damaging some of the fifths). See also Kepler (1619/1997, pp. 137-138) and Descartes (1618/1961); and the mathematical trick that Kepler and Descartes use to harmonize thirds traces back to Zarlino (1571/1996) and – even earlier – to Ptolemy (*ca* 150/2000).

²⁴⁷ Kepler (1619/1997, p. 218).

The minor third D-F did, does, and always will pose an *especially* recalcitrant tuning problem. For one thing, the Dorian mode was the fulcrum around which the entire system of Renaissance modes revolved: and the dissonance of F with D is, in the Dorian mode, a dissonance with the *tonic*. Pythagorean tuning makes *all* the thirds discordant, but this inflicts *special* damage in the case of the dissonance **D-F** in the Dorian mode. But the problem has even deeper roots in the arithmetic of the diatonic scale, which is grounded in the series of natural harmonics. If you harmonize thirds (minimizing ‘beats’) in ‘cycle of thirds’, FACEGBD, then this arithmetically creates an inescapable dissonance for the final third, connecting the end-points of this harmonious cycle: namely, a dissonance in the minor third D-F.

The problem of harmonizing thirds was not only a Renaissance problem, but continued long afterwards, and in fact even to the present day, as a recalcitrant problem for tuning instruments. Witness for instance Bach’s 1722 work for *The Well-Tempered Clavier* – whose subtitle runs: ‘Preludes, and Fugues through all the tones and semitones, including those with a major third or Ut Re Mi as well as those with a minor third or Re Mi Fa. ...’.²⁴⁸ In the title of this work, Bach singles out the problematic minor third ‘Re Mi Fa’, spanning the interval D-F. Evidently, Bach had a method of solving the problem of the dissonance of various intervals,

²⁴⁸ Bach (1722/1983). Some have claimed that Bach used equal temperament, but in fact that is very unlikely. It is not known *exactly* which version of temperament he was describing as ‘*well-tempering*’. Interestingly, “Barnes’ Bach” introduces a method that aims, ideally, to adjust the *degree* of dissonance in any given third to the *frequency* with which that third appears in Bach’s *Well-Tempered Clavier*; see Barnes (1979). Again, note the importance of harmonizing the *thirds*.

notably the minor third D-F, under both Pythagorean tuning and just intonation. Bach did not tell us what that method was; but he was keen to show off the fact that, whatever it was, it makes it possible to compose for both major and minor keys, no matter which note is chosen as the tonic. And the problem of the interval D-F was clearly still a problem for Bach and was salient enough to make it into the sub-title of his *Well-Tempered Clavier*.

By the end of the seventeenth century, various versions of temperament were in widespread practical use by those who constructed musical instruments, and by those who tuned and played those instruments. But among theorists, just intonation had definitely gained ground over Pythagorean tuning. Thus, for instance, in 1618 Descartes wrote an exposition of what is in fact the ‘Ptolemaic’ system (which Zarlino had articulated in full detail in 1571); but this work by Descartes did not appear in print until 1656 in Latin, and soon afterwards in English translation.²⁴⁹

Later in the century, in 1693, John Harrington wrote to Isaac Newton with some excitement, having found a way to construct all the harmonious intervals of Zarlino’s or Descartes’s system of just intonation from a ‘3-4-5’ right-angled triangle. Newton replied with cautious enthusiasm: ‘I was favoured with your Demonstration of the Harmonic Ratios, from the Ordinances of the 47th of

²⁴⁹ Zarlino (1571/1996), Descartes (1618/1961).

Euclid. I think it very explicit and more perfect than the Helicon of Ptolemy, as given by the learned Doctor Wallis.’²⁵⁰

In this correspondence with Harrington, Newton shows himself to be very much in the grip of the Pythagorean microcosmic/macrocosmic vision: ‘In fine, I am inclined to believe some general laws of the Creator prevailed with respect to the agreeable or unpleasing affections of all our *senses*; at least the supposition does not derogate from the wisdom or power of God and seems highly consonant to the macrosocsm in general.’²⁵¹ The connection to music is also very explicit, because he writes of ‘the ditone four to five, and the minor tierce six to five, which are the chief perfections of the diatonic system, and without which the ancient system was doubtless very imperfect’. On the usefulness of the ‘3-4-5’ triangle in this connection, however, he does sound a note of caution: ‘I presume you have consulted Kepler, Mersenne, and other writers on the construction of figures.’²⁵²

²⁵⁰ Harrington (1779/1968); this John Harrington was a descendent of the John Harrington who was the best friend of King James’s son Henry. James’s descendants continued to take an interest in mathematical music theory for generations, down to the German Princess for whom Euler created an entire educational program, starting with the mathematics of just intonation; see Euler (1795/1997).

²⁵¹ On Newton’s interest in music and ‘the mysteries’, see McGuire and Rattansi (1966).

²⁵² Harrington (1778/1968, vol. 2, pp. 104-110). This John Harrington, who corresponded with Newton on musical mathematics, was a member of the same

When Newton spoke of ‘the minor tierce six to five’, he was speaking of the minor third D-F, and the harmonization of this interval under just intonation. Again, the historical background demonstrates that there were, in Shakespeare’s time, and continued to be long afterwards, deep problems surrounding the minor third D-F.

Against this background, it is to be predicted that *if* Shakespeare were mirroring musical discords by corresponding poetic anomalies, then one of the *significant* discords that would be most worth mirroring would be the discord between the notes D and F.

noble family as the earlier John Harrington who had been a close friend of Prince Henry and gratified his desires by sending him intellectually demanding poetry (*ibid*, p. 143).

4.5 SECOND TEST (SONNETS 1 AND 3)

The Dorian mode was canonically the ‘first’ of what are called the Renaissance ‘modes’. Suppose successive sonnets in the 1609 sequence were aligned with the successive musical notes in a musical scale for the Dorian mode, which begins: **DEFGABCD**²⁵³. Suppose sonnet 1 is notionally to be paired with the note **D**; sonnet 2 = E; sonnet 3 = F; ... and so on.

Sonnet 8 will then complete the first octave. And sonnet 8 opens: ‘Mvsick to heare, why hear’st thou musick sadly ...?’ This sonnet is all about the musical harmony that results when ‘one string sweet husband to an other, / Strikes each in each by mutuall ordering’. This harmonising of vibrations between two strings is compared to a happy marriage, because it can be seen as ‘Resembling sier, and child, and happy mother’.

The Church music of Gregorian chants is restricted to a single melodic line; and the Church valued celibacy. Shakespeare, by contrast, in sonnet 8 is urging marriage; and he is also favourably disposed to the harmonizing of three different notes, sounding simultaneously.

²⁵³ D⁰ being an octave above **D**, and **D** printed in **bold** type because it is the ‘home note’, ‘*finalis*’, or ‘tonic’ in the Dorian mode. Here, the letters ‘A’, ‘B’, and so on refer to notes that result from Renaissance tuning systems; and these are approximately (but not exactly) the same as the ones played by the ‘white notes’ on a modern piano. Details will follow below.

In the musical scale for the Dorian mode **DEFGABCD^o** there are a number of especially salient musical intervals that separate the various notes in this musical scale. The most significant of the musical intervals within this scale will be the intervals separating each note in the scale from the initial note, **D**, which in the Dorian mode is the *tonic*. The most important of these musical intervals is the *octave* **D-D^o**; the next most important is the *fifth*, the interval which separates the tonic **D** from the fifth note above **D**, namely **A**. Another of these important intervals is the one separating **D** and **F**.

Sonnets 1 and 3 both close with the same end-rhyme: ‘be’ / ‘thee’; and the very same word ‘thee’ is used twice as an end-rhyme in sonnet 3. Hence, poetically, sonnet 3 is aptly describable as ‘discordant’; and it is ‘discordant’ *with relation to* sonnet 1. Analogously, in Renaissance tuning systems for the Dorian mode, the note **F** is ‘discordant’ – not discordant *in itself*, but discordant *with relation to* the tonic, **D**.

The ‘musical hypothesis’ receives significant corroboration from the evident alignment of the dissonant third **D-F** with rhyme anomalies in sonnets 1 and 3. It can be further tested by returning to an earlier, unresolved problem for the theory.²⁵⁴ This problem arises because sonnets 13 and 14 do not form as neat a macro- couplet as the theory of macro-sonnets would initially predict that they should.

A musical scale for the Dorian mode opens with the ascending notes ‘**D-E-F**...’; and it could plausibly close with the descending notes ‘... **F-D**’, aligning **F**

²⁵⁴ See footnote 120.

with sonnet 13 and **D** with sonnet 14. Here is the alignment, with * marking the severe rhyme-anomalies in sonnets 3 and 6, plus another kind of anomaly in sonnet 13. Also marked are the notes in the corresponding scale that stand either a dissonant third or a dissonant sixth above the tonic (under both Pythagorean tuning and just intonation):

Sonnets: **1** 2 3* 4 5 6* 7 8 9 10 11 12 13* **14**

Notes: **D** E F* G A B* C D C B* A G F* **D**

The resulting alignment of formal poetic anomalies with significant musical discords is suspiciously close. The one sour note is that there is no severe rhyme-anomaly in sonnet 10, when it is taken in isolation. But it does close with the rhyme ‘me’ / ‘thee’, and the word ‘thee’ is used in the closing rhymes for sonnets 1 and 3 and is also used as an end-rhyme twice in sonnet 6.

Sonnet 13 stands out as formally anomalous within this sequence, because it is the only one using the formal mode of address, ‘you’: and it uses this form seventeen times within just ten of its lines. Sonnet 14 reverts to ‘thee’; but then sonnets 15, 16, 17 return to ‘you’ (then sonnet 18 reverts to ‘thee’). If the order were reversed for sonnets 13 and 14, then all the initial thirteen ‘thee’ sonnets would be neatly followed by four ‘you’ sonnets.

Why, then, is the first ‘you’ sonnet followed by *just one* reversion to ‘thee’, and then *three* more ‘you’ sonnets? It could be that the choice of ‘thee’ or ‘you’ was just random, with no topomorphic plan behind it whatsoever. Or there could be some poetic reason other than the one supplied by a musical-topomorphic hypothesis.

Nevertheless, it is also worth further investigation of the hypothesis that the ordering of the 'you' and 'thee' sonnets 13 and 14 has been deliberately selected, because then the formal anomaly of *seventeen* 'you'-s in sonnet 13 will fall on the note F, which is seriously discordant with the tonic in the corresponding musical scale. Sonnet 13 does not contain a rhyme-anomaly like the one in sonnet 3. But in this macro-sonnet it is anomalous in another way, because it is the only one that exchanges 'thee' for 'you', and it does so seventeen times.

CHAPTER 5

TONICS AND TRITONES

5.1 FINDING THE RIGHT SCALES

But, if Shakespeare were to have begun his scales with the notes D, E, F, G, A, B... and so on, then how could he have credibly extended that opening sequence in such a way as to align appropriate sonnets with appropriate notes all the way through to the end of his sonnet sequence?

If Shakespeare were to have expected a select few of his readers to look for formal poetic echoes of musical scales, then presumably it would probably have been best if those scales were ones that the intended readers would be relatively likely to have memorized already ²⁵⁵ – like one of the ‘tables’ that Shakespeare describes in sonnet 122: ‘Thy gift, thy tables, are within my braine / Full characterd with lasting memory ...’.

One suitably memorable example is furnished by scales called ‘the gamut’ or ‘the Gam’, of which Morley says: ‘you must get it perfectly without book, to say it forwards and backwards’.²⁵⁶ In *The Taming of the Shrew* 3.1 Bianca says ‘Why, I am well past my gamouth long agoe’.

However, when Morley describes the Gam he says: ‘There be in music but six notes, which are Ut, Re, Mi, Fa, Sol, La’, which we are told to sing in the pattern:

²⁵⁵ On the importance attributed to memory exercises, see for instance Yates (1966) and Berger (2005).

²⁵⁶ Morley (1597/1973, p. 10).

‘ut-re-mi-fa-sol-la-la-sol-fa-mi-re-ut’ [= 6+6].²⁵⁷ And Shakespeare’s 154 sonnets cannot credibly be divided into groups of six or twelve. Furthermore, the Gam is built exclusively on the ‘sol-fa’ (‘major key’) modes, the scales with tonics G, C or F, and not ‘minor key’ modes like the Dorian mode. And this, too, misaligns the scales with Shakespeare’s sonnet sequence.

In particular, the selection of scales from the Gam would conflict painfully with the topomorphic theory that is presently under investigation. To illustrate: the tritone aligns with rhyme-anomalies in sonnets 3 and 6 only if we commence the topomorphic pattern with a scale for the Dorian mode. And the scale for the Dorian mode is not on the Gam because the Dorian mode is a ‘minor key’ mode, and its signature scale opens with the minor third D-F.

Alternatively, if the scales were to run up and down a series of different *eight-note* octaves, then each scale would initially be expected to comprise either 8+8=16 or 8+7=15 notes. But Shakespeare’s 154 sonnets cannot credibly be divided into groups either of fifteen or sixteen.

When, at the end of his textbook, Morley describes the modes, he then divides the octave *not* into two disjoint tetrachords, but into an *overlapping* fifth-then-fourth (for authentic modes), or fourth-then-fifth (for plagal modes).²⁵⁸ But, because these are *overlapping* divisions of the octave they result in more or less the same upshot as the upward and downward scales of ‘8+8’ or ‘8+7’. This arrangement of groupings of ‘8+8’ or ‘8+7’ will still yield painfully few promising signs of any alignments with Shakespeare’s sonnet sequence.

²⁵⁷ Morley (1597/1973, p. 13).

²⁵⁸ Morley (1597/1973, pp. 301-303).

Nevertheless, there is at least one possible ‘table’ of musical scales that would fit at least a large handful of very salient poetic patterns in the *Sonnets* relatively eagerly. This ‘table’ is also one, like the Gam, that could readily be summoned up at will before the ‘soules imaginary sight’ (sonnet 27). And it is generated by following two relatively simple mnemonic techniques.

The first step is to imagine grouping Shakespeare’s 154 sonnets into eleven successive subgroups, with fourteen sonnets in each subgroup.

The second step is to superimpose these successive ‘macro-sonnets’ onto a corresponding series of musical scales for the modes, taken in the canonical order – the first macro-sonnet with the Dorian mode, the second with the HypoDorian mode, and so on.

5.2 THE PROBLEM OF THE COMPLAINT

The puzzling critical history of *A Louers complaint* (1609) is of especially close relevance to the current investigation; and this is so for the following reason.

The pattern that best fits Shakespeare's *Sonnets* is one that groups these sonnets into eleven macro-sonnets – and then aligns each of these macro-sonnets with a corresponding musical scale that is selected from the canonical list of Renaissance 'modes'.

However, it is hard to imagine why someone would choose to construct poetic mirrors of *eleven*, but *just eleven*, of the Renaissance modes. It would be easy to find musical precedents, among music theorists, for choosing to echo *four*, or *eight*, or *twelve*, or *thirteen*, or *fourteen* modes. *Eleven*, by contrast, would be an extremely odd number to choose, when cataloguing either Ancient or Renaissance modes. But ... *perhaps* numerological reasons could be found for selecting just eleven of the modes? Strictly speaking, a topomorphic theory concerning the *Sonnets* does not absolutely *need* to be accompanied by any theory whatsoever about the accompanying *Complaint* in the 1609 text.

Nevertheless, for various reasons it would be much, much more credible to imagine someone choosing to mirror *twelve* musical modes. If you are going to the trouble of mirroring as many as eleven, then why not mirror all *twelve* of the modes in the canonical system that Glareanus vividly called the *Dodecachordon*?²⁵⁹

²⁵⁹ Glareanus (1547/1965).

Consequently, a topomorphic musical pattern in Shakespeare's *Sonnets* would fall into place very, very much more neatly if the *Sonnets* were to be read as deliberately paired with the accompanying *Complaint*, with the two works together standing as two complementary parts of a single overarching pattern, both thematically and topomorphically. Then eleven of the canonical musical modes could be reflected in the *Sonnets*, and the twelfth (which will turn out to be the HypoIonian mode) could be reflected in the accompanying *Complaint*. For these reasons, the critical history of *A Louers complaint* is of keen relevance to the current investigation.

A Louers complaint was published in 1609 alongside the *Sonnets* in a single volume; and that pattern is remarkably similar to the pattern that is found in an earlier publication by Samuel Daniel of a sonnet sequence, *Delia*, which was paired with a narrative poem, *The Complaint of Rosamond*.²⁶⁰ This work by Daniel was frequently reprinted. But Shakespeare's formally similar companion pieces were never reprinted in his lifetime. Furthermore, Shakespeare's *Complaint* is at least formally similar not only to Daniel's *The Complaint of Rosamond* but also to Shakespeare's own earlier narrative poems *Venus and Adonis* and *Lucrece*. It is reasonable to find it at least moderately puzzling that *A Louers complaint* (1609) was utterly ignored – while, at the same time, *Venus and Adonis* and *Lucrece* were still selling almost like hot-cakes – and Daniel's *The Complaint of Rosamond*, too, came out in many revised editions, and even in a seventh edition as late as 1611.²⁶¹

²⁶⁰ Daniel (1592/1998).

²⁶¹ Daniel (1592/1998, p. 239).

The history of the abject neglect of Shakespeare's *Complaint* continues with the fact that there are only two substantial, recognized, seventeenth century literary echoes of this *Complaint*. One is found in the opening of Mary Wroth's work *Urania*.²⁶² The other one appears a few decades later, in Suckling's play *Brennoralt*, about a woman who disguises herself as a man.²⁶³ When many of Shakespeare's sonnets appeared in the Benson miscellany of 1640, they appeared without the accompanying *Complaint*. When a 'Complete Works' was assembled by Johnson, Steevens and Malone in 1778 and 1780, the *Complaint* was separated from the sonnets and placed among works of doubtful attribution to Shakespeare. Even when the *Sonnets* rose in public estimation, the *Complaint* did not. It is still omitted from most editions of the *Sonnets*. It was even omitted from an edition of Shakespeare's 'Complete Works', published by the Royal Shakespeare Society in 2007.²⁶⁴

Nevertheless, there are many reasons supporting the conclusion that the *Complaint* is by Shakespeare, and that the *Sonnets* and the *Complaint* should be appreciated together as a single overarching literary achievement. And *topomorphic* evidence furnishes still further grounds supporting this conclusion.

One of the key pieces of evidence for topomorphic musical patterning in the *Sonnets* will be found in proximate repetition of rhyme-words. Thus, for instance, there is a repetition of the closing rhyme 'be' / 'thee' in sonnets 1 and 3, and the

²⁶² Wroth (1621/1995).

²⁶³ Suckling (1646/1971); see Duncan-Jones (2010, pp. 72-4).

²⁶⁴ Shakespeare (2007).

same word ‘thee’ appears as an end-rhyme *twice* in sonnet 3, and twice also in sonnet 6.

There are very similar proximate repetitions of rhyme-words in *A Louers complaint*. For instance, the repeated ‘be’ / ‘thee’ rhyme in the *Sonnets*, in sonnets 1, 3, 4, 6, are echoed by repeated rhymes in the *Complaint*:

stanza 15: ‘free’ / ‘see’ / ‘bee’

stanza 27: ‘see’ / ‘be’

stanza 28: ‘free’ / ‘monarchy’

stanza 29: ‘sent me’ / ‘lent me’; ‘modesty’ / ‘outwardly’

stanza 32: ‘be’ / ‘me’.

These rhyme-repetitions are scarce enough in the *Complaint* to count as anomalous.²⁶⁵ But they are frequent enough to raise the suspicion that they might constitute a significant topomorphic pattern. And this pattern across the stanzas can be seen to draw even closer to the patterns of rhyme-repetitions in the *Sonnets*, when it is noted that each stanza in the *Complaint* comprises just 7 lines, whereas each sonnet comprises 14 lines.

Consequently, it would be good news for a tomomorphic theory about the *Sonnets* if they could be seen as part of a larger overarching structure that also

²⁶⁵ In addition to the repetitions cited above, we also find ‘grace’ / ‘face’ / ‘place’ echoing through stanzas 12, 17 and 38, 41, 46. The rhyme ‘wind’ / ‘find’ / ‘minde’ echoes through stanzas 13, 20, 27. And ‘wo’ is an end-rhyme in stanzas 3 and 9.

includes not only the story of the poet, his friend, and their dealings with a ‘dark lady’, but also the accompanying *Louers complaint*. Unfortunately, however, this puts the topomorphic theory out on a limb, far from the mainstream. From the very beginning, the mainstream of critical commentary on Shakespeare has marginalized the *Complaint* and has almost universally treated the *Sonnets* in complete isolation from the *Complaint*.

When Brian Vickers noticed some of these repetitions of rhyme-words in the 1609 *A Louers complaint*, he said that this ‘shows a paucity of invention not found in Shakespeare’, and he highlighted this evidence (citing it on page 2) as one of the most persuasive all the arguments within his book-length ‘proof’ of his controversial (and wrong-headed) conclusion that this narrative poem was not written by Shakespeare.²⁶⁶ It is interesting – and evidence relevant to the present topomorphic investigation – that when Vickers noted (with disapproval) proximate rhyme-repetitions like this in *A Louers complaint*, he obviously did not even check the *Sonnets*, but just assumed that this sort of repetition is not the sort of thing that Shakespeare would do. This is further evidence that the distribution of proximate repetitions of end-rhymes is something that escapes notice by nearly all readers, even though it is perfectly obvious (and strikes readers as anomalous) when it is brought to attention. This helps to explain how Shakespeare’s topomorphic patterns could have managed to escape notice for so many centuries.

The reason for the exclusion of the *Complaint* from this 2007 edition of the ‘complete works’ is nowhere acknowledged until it is finally mentioned in a brief

²⁶⁶ Vickers (2007).

aside that accompanies a description of the sonnets.²⁶⁷ Evidently, this aside explains, the editors had been persuaded by Vickers, in a book published earlier that same year, that this work was not by Shakespeare.²⁶⁸ Evidently, the editors assumed that the readers that cared about the *Complaint* were so few that they assumed that this work could safely be omitted – with no explanation until, on page 2397, there is just a brief footnote citing Vickers.

This exclusion of the *Complaint* from the canon was an affront to the earlier scholarly opinion of Roche, that ‘*A Lover’s Complaint* is an integral part of the sequence’,²⁶⁹ and to the scholarly credentials of Duncan-Jones’s 1997 Arden Edition of Shakespeare’s sonnets, which had endorsed the judgment of Roche. As a rejoinder, a revised Arden Edition appeared a few years later, citing and augmenting abundant evidence that the *Complaint* is indeed by Shakespeare, and integrally related to the *Sonnets*.²⁷⁰

Despite their neglect in the seventeenth and early eighteenth centuries, by the nineteenth century Shakespeare’s *Sonnets* began to in popularity – first with Romantic poets like Keats, and then with a wider public. In a lecture on Donne in 1819, Coleridge said in passing that Shakespeare is (unlike Donne) never positively bad ‘even in the sonnets’.²⁷¹ In 1827 Wordsworth wrote a sonnet enjoining us to ‘Scorn not the Sonnet’ – telling us that it was with sonnets that

²⁶⁷ Shakespeare (2007, p. 2397).

²⁶⁸ Vickers (2007).

²⁶⁹ Roche (1970, p. 107).

²⁷⁰ Compare Duncan-Jones (1997) and Duncan-Jones (2010, p. xv, pp. 87-96).

²⁷¹ Coleridge (1818/1930/2010, p. 75).

‘Shakespeare unlocked his heart’.²⁷² The idea was that it was especially in the sonnets that Shakespeare expressed his private feelings – and, for the Romantics the honest expression, amplification, and celebration of the author’s own private feelings is more important than anything else. Shakespeare’s sonnets have been held in high esteem ever since. But not *A Louers complaint*. Evidently prying into the mind of Shakespeare is more fascinating than imagining the thoughts and feelings of a naughty girl who got herself pregnant out of wedlock.

In *A Louers complaint*, the complaining woman explains that she was seduced – and she explains that she succumbed to this transparently deliberate seduction because the young man in question brought to bear extraordinary acting skills. In particular, he could blush, blanch, faint, or weep ‘on cue’, as it were. These bodily signs of inner feelings are normally not under voluntary control, but in this young man they are ‘but an art of craft’:

Of burning blushes, or of weeping water,
Or sounding paleness: and he takes and leaues,
In either’s aptnesse as it best deceiues:
To blush at speeches ranck, to weepe at woes
Or to turn white and sound at tragick showes.

A Louers complaint, lines 304-8.

These descriptions of this young man in the *Complaint* are strikingly similar to descriptions of the young man who stars in the *Sonnets* – for instance especially

²⁷² Wordsworth (1827/1970, p. 394).

in sonnet 94, ‘They ... / That doe not do the thing, they most do showe’ – and sonnet 96, ‘How many Lambs might the sterne Wolfe betray, / If like a Lambe he could his lookes translate’.

Furthermore, the descriptions of the young man in the *Complaint* are even more closely similar to descriptions of one of the travelling players in *Hamlet*, who prompted Polonius to say, ‘Looke where he ha’s not turn’d his colour, and ha’s teares in’s eyes’ – and who caused Prince Hamlet to muse on how this Player ‘Could force his soule so to his whole conceit, / That from her working, all his visage wann’d; / Teares in his eyes, distraction in’s Aspect, / A broken voice, and his whole Function suiting / With Formes, to his Conceit?’²⁷³

In *A Louers complaint*, the young woman who falls for a consummate actor’s charms is not presented merely as an unwitting, passive victim. She acknowledges repeatedly that she knew all along, full well, that the young man was only acting. And yet, she explains, his acting was so effective that it implanted in her desires of her own, desires that were so powerful that they overthrew her faculty of reason:

For lo his passion but an art of craft,
Euen there resolu’d my reason into teares,
There my white stole of chastity I daft,
Shooke off my sober gardes, and diuill feares,
Appeare to him as he to me appears:

²⁷³ *The Tragedie of Hamlet*, Act 2, scene 2.

All melting ...²⁷⁴

She was not just a passive victim – because her action did stem from her own desires – even though she did know full well that those desires were being cynically inflamed by the young man.

²⁷⁴ *A Louers complaint*, lines 295-300.

5.3 THE INITIAL TABLE

What is set down below is only an *initial* table. The hypothesis is that Shakespeare could reasonably have expected a select few of his readers to commence with an investigation of musico-poetic correspondences that match the patterns laid out on this Initial Table. But if that were so, then he would also have reasons to expect any such readers to consider the possibility of excising the Locrian modes from the system – in line with the judgments of Glareanus (1547/1965), Morley (1597/1973, p. 303) and others. And that excision might then reasonably be followed by a number of further downstream re-adjustments.

It follows from this initial theory, therefore, that Shakespeare should reasonably have anticipated that a few of his readers might be prompted to begin testing a series of ‘Better and Better’ Tables – in search of a progressively better and better understanding of ‘the celestial harmonies’.

Nevertheless, it is possible begin with an Initial Hypothesis – that Shakespeare expected a select few of his readers to commence their investigations by thinking about the Initial Table – before embarking upon any speculations about on any of the ‘Better Tables’ that this Initial Table might or might not be foreshadowing.

Data required for initial testing of this hypothesis:

1. Sonnets:

On the Table below, there are one hundred and fifty-four sonnets; and among these, rhyme-anomalies are found in the following twenty-two sonnets: 3, 4, 6, 24, 29, 43, 44, 45, 46, 51, 55, 66, 90, 96, 99, 122, 125, 126, 133, 134, 135, 136. There is also a similar frequency of rhyme-anomalies in the *Complaint*.

2. Music theory:

All Renaissance tuning systems for the diatonic scale acknowledged two very serious dissonances: the ‘tritone’, F-B and its sister, the ‘augmented fourth’, B-F^o.

Under the now ubiquitous system of ‘equal temperament’, these two intervals are equal. In the Renaissance, however, the tritone and the augmented fourth were slightly different. (This was because ‘semitones’ were not exactly equal to half a ‘whole tone’.)

Nevertheless, no matter which Renaissance tuning system was adopted the tritone and the augmented fourth were both intervals lying somewhere *between* a fourth and a fifth. Both of them physically generated readily noticeable ‘beats’ in the overtones when the notes F and B are sounded together. And both are known as ‘the devil’s interval’ or the *diabolus in musica*. I have not found the metaphor of ‘the devil’s interval’ used in any of the published texts I have consulted from the sixteenth or seventeenth centuries.²⁷⁵ Nevertheless, the relevant interval was

²⁷⁵ Instead, in the Renaissance dissonant intervals like these were sometimes known as ‘the wolf’. Thus for instance, the Pythagorean ‘cycle of fifths’ throws up a ‘wolf fifth’ at the end of the cycle: ‘In Pythagorean tuning, the only tuning system described up until the middle of the 15th century, the fifths are pure with

indisputably regarded as intensely ‘discordant’ in Shakespeare’s day, and so was the devil.

Notation:

In the Table below, the letters A, B, C, D, E, F, G indicate the familiar notes in the diatonic scale. (Here, these letters indicate only a pattern of relative not absolute frequencies; and furthermore, these relative frequencies may vary slightly, depending on the choice of a particular tuning system.) Some notes are left anonymous, and simply marked ‘♯’, because it is prudent to leave the ‘downward scales’ initially undecided. The evidence for the downward scales is less overwhelming than for the upward scales.

Larger, bold font indicates the tonic in each given mode. ‘A^o’ signifies ‘an octave above the ‘A’ last mentioned or implied’, and likewise for the other notes and their octaves. Numerals signify the sonnets as numbered in Shakespeare’s *Sonnets* (1609). **Shading** marks the four tetrachords **FGAB** that are aligned with macro-quatrain in the corresponding macro-sonnets.

In this hypothesized topomorphic structure, stanza-pairs from *A Louers Complaint* are treated as quasi-sonnets, as in the ‘macro-sonnet’ in the *Complaints* by Spenser (1591/1912, pp. 476-8). The first ten stanzas are merely

the exception of the “wolf fifth” ... ’; Smith (2011, p. 50). Organ-tuners sometimes used a ‘cycle of thirds’, which also chases a perceived dissonance to its lair at the end of the cycle: ‘the discord which organ builders call the wolf (*wolff*)’; Schlick (1511/1980, pp. 75-76). Schlick chases this dissonance to the note G#, where he says it will do least harm.

introductory, and the *Complaint* only begins in earnest with stanza 11: ‘Father she saies, though in mee you behold ...’.

FIGURE 2: AN INITIAL TABLE

<i>Dorian mode</i>													
D	E	F	G		A	B	C	D ^o	♪	♪	♪	♪	♪
1	2	3	4		5	6	7	8	9	10	11	12	13 14
<i>Hypo-Dorian mode</i>													
	A	B	C	D	E	F	G	A ^o	♪	♪	♪	♪	♪
	15	16	17	18	19	20	21	22	23	24	25	26	27 28
<i>Phrygian mode</i>													
E	F	G	A		B	C	D	E ^o	♪	♪	♪	♪	♪
29	30	31	32		33	34	35	36	37	38	39	40	41 42
<i>Hypo-Phrygian mode</i>													
	B	C	D	E	F	G	A	B ^o	♪	♪	♪	♪	♪
	43	44	45	46	47	48	49	50	51	52	53	54	55 56
<i>Lydian mode</i>													
F	G	A	B		C	D	E	F ^o		♪	♪	♪	♪
57	58	59	60		61	62	63	64	65	66	67	68	69 70
<i>Hypo-Lydian mode</i>													
	C	D	E	F	G	A	B	C ^o	♪	♪	♪	♪	♪
	71	72	73	74	75	76	77	78	79	80	81	82	83 84
<i>Mixolydian mode</i>													
G	A	B	C		D	E	F	G ^o	♪	♪	♪	♪	♪
85	86	87	88		89	90	91	92	93	94	95	96	97 98
<i>Hypo-Mixolydian mode</i>													
	D	E	F	G	A	B	C	D ^o	♪	♪	♪	♪	♪
	99	100	101	102	103	104	105	106	107	108	109	110	111 112
<i>Aeolian mode</i>													
A	B	C	D		E	F	G	A ^o	♪	♪	♪	♪	♪
113	114	115	116		117	118	119	120	121	122	123	124	125 126
<i>Hypo-Aeolian mode</i>													
	E	F	G	A	B	C	D	E ^o	♪	♪	♪	♪	♪
	127	128	129	130	131	132	133	134	135	136	137	138	139 140
<i>Locrian mode</i>													
B	C	D	E		F	G	A	B ^o	♪	♪	♪	♪	♪
141	142	143	144		145	146	147	148	149	150	151	152	153 154
<i>Hypo-Locrian mode</i>													
<i>A Louers complaint [stanza-pairs]:</i>													
	F	G	A	B	C	D	E	F ^o	♪	♪	♪	♪	♪
	[11,12][13,14][15,16][17,18]	[19,20][21,22][23,24][25,26]				[27,28][29,30][31,32][33,34]				[35,36][37,38]			

5.4 THIRD TEST (LOCATING ALL THE TRITONES)

Against this background, one hypothesis worth testing is as follows: that Shakespeare could reasonably have anticipated that a select few among his readers might *commence* a ‘Pythagorean’ investigation into his sonnet sequence by inspecting, in their ‘soules imaginary sight’ (sonnet 27), a simplistic initial musical pattern that groups Shakespeare’s sonnets into macro-sonnets, and then aligns these *eleven* successive macro-sonnets with *eleven* corresponding musical scales for the first *eleven* of the canonical catalogue of the *fourteen* mathematically possible Renaissance modes. The mechanical continuation of this topomorphic pattern would then align eleven modes with the *Sonnets* and the *twelfth* with the accompanying *Complaint*.

The Initial Table aligns sonnets 3 and 6 with the notes F and B, respectively, as discussed above. And this is the very first appearance of the dissonant tritone on the Initial Table. Subsequent to this, further tritones appearing in the Initial Table will sometimes be relatively non-salient, and relatively unproblematic (musically speaking) – provided that this dissonant interval does not involve the *tonic* in the relevant scale. But tritones will always be extremely troublesome when they span a tritone *from the tonic*.

That happens when, and only when the tritone spans a tetrachord FGAB that is aligned with one of the *macro-quatrains* on the Initial Table. And there are just *three times* that this happens in the Initial Table.

(1) Sonnets 47, 48, 49, 50

On the Initial Table, sonnets 47, 48, 49, 50 comprise the first time that one of the macro-quatrains is to be aligned with the defective tetrachord FGAB.

In Renaissance music, like that of the English composers Tallis, Byrd and Morley, it is sometimes possible to dodge the discord in the tetrachord FGAB by lowering the frequency of B to something close to that of the modern B-flat. (Indeed, that was the *raison d'être* for the introduction into the diatonic scale of two versions of the note B, one of which corresponds closely to the modern B-flat.)

However, sonnets 47, 48, 49, 50 fall within a musical scale in which E is the tonic. The harmonious fifth above the tonic E falls on B natural. B-flat is a dissonant augmented fourth, the devil's interval, above the tonic. Hence, in this mode B-flat cannot be used to dodge the discord that is spanned by the tetrachord FGAB.

Consequently, it is predicted that there should probably be salient poetic anomalies in the neighbourhood of sonnets 47, 48, 49, 50. And there are indeed plenty to be found.

Sonnet 46, in particular, deviates strikingly from Shakespeare's usual rhyme-scheme, featuring the following repetitions of rhyme-words: 'heart' / 'hearts part' // 'part' / 'heart'. And there is also a deviant rhyme-scheme in sonnet 51.

The anomalous rhyme-schemes in sonnets 46 and 51 are also locked into a raft of further anomalous repetitions of end-rhymes linking neighbouring sonnets. For instance, there is another anomalous rhyme-scheme in sonnet 43, a 'fourth' below sonnet 46. And furthermore:

['see' / 'me' // 'see thee' / 'thee me'] in 43

is echoed by ['me' / 'thee'] in 47

and by ['me' / 'thee'] in 50.

['show' / 'so'] in 43

is echoed by ['woe' / 'know'] in 50

and by ['slow' / 'know' // 'slow' / 'goe'] in 51.

['mind' / 'behind'] in 50

is echoed in ['find' / 'wind'] in 51.

['heart' / 'part' // 'part' / 'heart'] in 46

is echoed by ['heart' / 'part'] in 47

and by ['art' / 'part'] in 48

and by ['desart' / 'part'] in 49.

Thus, there is a striking abundance of poetic anomalies falling all around the first location where the tritone inflicts especially grievous melodious and harmonic harm in the corresponding musical scales.

(2) Sonnets 57, 58, 59, 60

Sonnets 57, 58, 59, 60 are aligned with the notes FGAB at opening of the fifth mode. But the fifth mode is the Lydian mode, and the tonic is **F**; and so, in Renaissance music, this discordant tritone above the tonic would be eliminated by changing B to B-*flat*.²⁷⁶ Hence no rhyme-anomalies are to be predicted as highly likely in or around sonnets 57 to 60; and none are to be found.

(3) Sonnets 145, 146, 147, 148

²⁷⁶ See for instance Blom (1947, p. 242); and see the 'Gam' in Morley (1597/1973, p. 11, and fn. 2).

In the third formative tetrachord **FGAB** on the Initial Table, the note F is aligned with sonnet 145. This F stands not a harmonious fifth but a dissonant augmented fourth above the tonic, **B**. This is an especially grievous harmonic problem in the scales, as registered for instance by Morley (1597/1973, p. 303). Hence it is to be predicted that there should probably be comparably salient poetic anomalies associated with the corresponding sonnet 145. And indeed there are.

Sonnet 145 the only one in the sequence that is not in iambic pentameter. It is in iambic tetrameter. It is striking that there is *only one* augmented *fourth* above the tonic in these scales, and that this discord is aligned with the *only* sonnet in iambic *tetrameter*.

Sonnet 145 is also ‘dissonant’ in many other ways as well. Commentators have chosen words like ‘disproportion so grotesque’, ‘unidiomatic’, ‘preposterous’, ‘bizarre’, ‘cacophony, not euphony’ and ‘deliberately awkward’.²⁷⁷

Sonnet 145 is set in the midst of a sequence comprising 28 sonnets, numbered 127 to 154, which are addressed to a so-called Dark Lady, a woman who fornicates with both the poet and his friend, and was probably married to yet another person (sonnet 152). Nearly all of these sonnets are dark, complex and unhappy – whereas, set in the midst of them, sonnet 145 is light, simple and has a happy ending. Many commentators have found persuasive the suggestion that this sonnet might originally have been written for Ann Hathaway before her marriage

²⁷⁷ Vendler (1997, pp. 608-9).

to Shakespeare, long before the poetic persona of the 'Dark Lady' had entered his literary life.²⁷⁸

One leading commentator says of this, 'the slightest of the sonnets': 'Many commentators have hoped that it is not by Shakespeare (see *Variorum*, 372-73). One cannot be certain that the sonnet is Shakespeare's, but ...'.²⁷⁹ Another commentator uses words like 'anomaly', 'an embarrassment to critics and editors', 'trifle', 'inferiority' and says that 'its sudden 'intrusion' between 144 and 146 (both weighty and 'serious' sonnets) is difficult to explain or justify', adding that:

whoever was responsible for its present position must have known the Sonnets intimately and chose the place where 145's light and conventional amatory use of the theme of damnation and salvation might seem to set up superficial, if misleading, resonances with the same theme, treated with strong emotional engagement, in 144 and 146 (145 echoes three key words in 144 – 'fiend', 'heaven', 'hell').²⁸⁰

When looking for poetic echoes of something that is now called 'the devil's interval', it is striking to find in this sonnet the three critical words: 'fiend', 'heaven', and 'hell'.

²⁷⁸ Gurr (1971); and see disparaging comments on sonnet 145 by Booth, Vendler, Blakemore Evans and others.

²⁷⁹ Booth (1977, p. 500).

²⁸⁰ Blakemore Evans (2006, pp. 247-8).

Against this background it is not drawing a long bow to suggest that this sonnet might have been deliberately selected for the position numbered 145 in the sequence precisely because it is ‘discordant’ with the sonnets around it.

(4) *A Louers complaint*

On the Initial Table the stanzas in *A Louers complaint* are topomorphically aligned with a musical scale for the Hypo-Locrian mode.

This topomorphic alignment was not arbitrarily designed *ad hoc*, just in order to align rhyme-anomalies in the *Complaint* with the dissonant tritone in the corresponding scales. It was a genuine surprise to find that, on the Initial Table, the dissonant tritone does, indeed, align very neatly with rhyme-anomalies not only in the *Sonnets* but also in the *Complaint*.

In the present investigation, the hypothesis that is being tested is not aiming to find the *best* topomorphic alignment of musical scales with the *Sonnets*. It is just the hypothesis that Shakespeare could reasonably have anticipated that some of his friends or patrons might *commence* an investigation by exploring the topomorphic patterns created by the Initial Table. The proposed alignment with *A Louers complaint* is just an obvious *first* pattern to test, as a natural continuation of the preceding pattern for the *Sonnets*. If anyone were aligning the *Sonnets* with musical scales, then a natural pattern to check *first* would be the one

Stanza-pairs from *A Louers complaint* are treated as quasi-sonnets, following a topomorphic precedent for macro-sonnets that is found in Spenser’s *Complaints*.²⁸¹ The first ten stanzas of Shakespeare’s *Complaint* are merely

²⁸¹ Spenser (1591/1912, pp. 476-8).

introductory, and the woman's complaint only begins in earnest with stanza 11:

'Father she saies, though in mee you behold ...'.

A hypothesis is made about how the first eight quasi-sonnets in this *Complaint* will align with a musical scale that rises up one octave. The hypothesis is that this scale should represent the Hypo-Locrian mode, and hence should open with the notes FGAB**C**DEF, with **B** as the tonic. This is merely the result of the mechanical continuation of the pattern established earlier in the Table. This incompleteness of the scale for *A Louers complaint* is just a continuation of the incompleteness of all the musical scales for the *Sonnets*. The downward continuation of these scales is left as an open question for further investigation.

On the Initial Table, we find the following topomorphic alignment between rhyme-anomalies in *A Louers complaint* and musical notes:

Stanzas 11, 12: Note: F: Rhymes: 'grace' / 'face' / 'place',

Stanzas 17, 18: Note: B: Rhymes: 'grace' / 'case' / 'place'.

This is strikingly analogous to the following pattern of rhyme-repetitions in the first macro-sonnet, where rhyme-repetitions link sonnets 3 (which is aligned with note F) and 6 (which is aligned with note B).

Checking the other repetitions of rhyme-words in *A Louers complaint* then deepens the analogy deepens between the topomorphic patterns in the *Sonnets* and the *Complaint*. Consider the following further example:

Stanzas 21, 22: Note: D: Rhymes: 'heart' / 'part' / 'art',

Stanzas 25, 26: Note: F: Rhymes: 'art' / 'heart'.

This is strikingly analogous to the following pattern of rhyme-repetitions in the first macro-sonnet:

Sonnet 1: Note: D: Closing rhyme: 'be' / 'thee',

Sonnet 3: Note: F: Closing rhyme: 'be' / 'thee',

(plus 'husbandry' / 'posterity' / 'thee' /

'see').

Thus, a topomorphic pattern of repetition of rhyme-words aligns not only with the dissonant tritone F-B but also with the dissonant minor third D-F – both in the *Sonnets* and in the *Complaint*.

CHAPTER 6

KEPLER'S WOLF FIFTH

6.1 RIVAL TUNING SYSTEMS

There is a credible alignment between the dissonant tritone, on the Initial Table, and some of the salient, formal poetic anomalies in Shakespeare's sonnet sequence. But there are further formal poetic anomalies in Shakespeare's sonnet sequence in addition to the ones that align with the tritone.

In particular, on the Initial Table sonnet 126 is strikingly anomalous. And sonnet 126 sits plumb in the middle of the two Aeolian modes. Neither of the Aeolian modes faces any especially salient problem over the tritone. Hence there is no credible alignment of sonnet 126 with any salient occurrence of the tritone in the corresponding scales on the Initial Table. Consequently, the question arises whether sonnet 126 can credibly be aligned with some significant discord other than the tritone.

But here we meet an obstacle. Apart from the tritone, the whole tone or semitone, and the major or minor sevenths, the harmonic status of virtually all of the other intervals in the diatonic scale will critically depend on the choice of a tuning system. And there were several rival tuning systems viciously vying for allegiance in Shakespeare's time.

Whichever tuning system is used, that system will unavoidably throw up not only the tritone but also – *on its own reckoning* – approximately two dozen

further salient discords on the Initial Table.²⁸² And there are approximately two dozen rhyme-anomalies in Shakespeare's *Sonnets*.²⁸³ That is a good omen.

But different tuning systems generate different discords. Hence, to test the theory more rigorously we need to delve more pedantically into the devilish details of all the rival Renaissance tuning systems. As reassurance that Shakespeare could conceivably have had a private interest in some of the difficulties involved in Renaissance tuning practices, witness for instance:

²⁸² Suppose that, as some find intuitively plausible, seconds, sevenths, the tritone and the augmented fourth are taken as the only seriously discordant intervals in the diatonic scale. Then in the 11 scales on the Initial Table there would be predicted to be $2 \times 11 = 22$ notes that lie either a second or a seventh from the tonic, plus a handful of times that a note will fall at 'the devil's interval' from the tonic.

²⁸³ Spiller (1992, pp. 158-9) says there are nineteen sonnets for which one of the rhymes in the octet is repeated in the sestet; I take it these are 3, 4, 6, 24, 29, 43, 44, 45, 51, 55, 66, 90, 96, 122, 125, 133, 134, 135, 136. And he cites three further rhyme-anomalies: 46, 99, 126.

This list assumes that 97 ('yeare' / 'where' // 'cheere' / 'neere') is not a rhyme-repetition. And it assumes typographical errors in 34 (where the second 'losse' presumably should be 'crosse'), 68 ('end' should be 'due'), 144 ('sight' should be 'side').

Under these assumptions, the number of sonnets featuring rhyme-anomalies is 22. And this is very close to the number of musical discords on the Initial Table, as estimated in the preceding footnote.

Hort. You'll leaue his Lecture when I am in tune?

Luc. That will be neuer, tune your instrument.

...

Bian. Let's heare, oh fie, the treble iarres.

...

Hort. Madam, tis now in tune.

Luc. All but the base.

...

How fiery and forward our Pedant is.

The Taming of the Shrew 3.1.

6.2 THE DAVIDIC HARP

Some practical tuning systems are much smarter than the people who learn them, use them, and teach them to others. I know this because I once learned, used, and then taught a tuning system for the guitar. And I had no idea how smart that tuning system actually is. There is evidence that Kepler heard about a tuning system that he heard of under the description ‘the Davidic harp’ and that he then tried to work out mathematically how it works. But even Kepler did not fully understand quite how smart this practical tuning system really was.

Kepler described his mathematical theory of the ‘divisions of the octave’ as a ‘basis’ for King James’s ‘Davidic harp’. What, precisely, was this ‘Davidic harp’? He did not say, and we may never know for sure. But it could credibly have been a practical *tuning system* for (say) the harp or lute. It could credibly have been a tuning system whose reliable practical upshot could be predicted to *approximate* the precise mathematical frequency-ratios that are laid down in Kepler’s mathematical theory.

Virtually all of the alternative, rival, theoretical and practical Renaissance tuning systems can be taxonomized and illuminated by thinking through the following possible practical steps in tuning a lute.

In the following simplified and idealised procedures, the frets will be ignored – in order to illuminate the underlying explanation of why these procedures work as well as they do. The following procedures could, in principle, be used to check ‘by ear’ whether any given practical rules for placing the frets do in fact work as well as people think they do. This procedure can even be backed up sometimes

‘by eye’: when two strings are ‘perfectly’ tuned to a harmonious frequency-ratio (like an octave, fifth, or fourth) it is then sometimes possible to *see* sympathetic vibration commence in a second string when the first one is plucked.

In practice, however, the frets are often placed not by ear (or by seeing sympathetic vibrations) but by geometrical measurement of distances along the fretboard, and by following a list of rules. Then these frets are used to tune each of the strings. Stopping the lowest string at the appropriate fret, you tune the next open string to play in unison with the stopped-string. This is supposed to ensure that the first two open strings will play notes separated by the interval of a *fourth*. And so on.

In a lute, the strings run above a fret-board. When a finger presses a string down just beside a fret, that shortens the effective length of the string that is free to vibrate, and this raises the note that it plays. But pressing the string down just beside a fret not only shortens the free portion of the string, it also slightly increases the tension in the string. And this increase in tension further raises the frequency of the note that is played. The precise amount of this increase in frequency, due to tension, depends on the material from which the string is made.²⁸⁴ The nut, frets and bridge are fixed, but the strings are occasionally replaced. Hence, in constructing a lute, it will inevitably become clear – in practice – that ‘near enough has to be good enough’. It is not possible to hope for ‘mathematical perfection’ in the placement of the frets.

The geometrical rules for placing the frets are almost never explained, but in practice they do seem to work ‘well enough’. Vincenzo Galilei (Galileo’s father)

²⁸⁴ Mitchell (1972, p. 453).

was one of the early pioneers who published geometrical rules for placing the frets but no one, not even he, adequately explained why these rules work as well as they do. Following the rules just seems to work ‘by magic’ – though a friendlier description would be that that these geometrical rules are established ‘by the empirical method’. Nevertheless, it is possible to see Pythagorean theory playing a tacit, formative, theoretical role underlying these practical and empirical rules.

The Pythagorean whole-tone interval is supposed to aim for the frequency-ratio of 9:8. So Galilei’s rule for placing frets begins by marking off the open length of a string into 18 equal lengths, and then setting the first fret at the first of these marks. Repeat the procedure with the remaining length; and continue in this way down the fretboard. This system results in something close to what is known as ‘equal temperament’. And that works well enough.

In Shakespeare’s day in England, a different method was used; and this different method is also manifestly guided by Pythagorean theory, though in a slightly different way. An explanation of this method was given by Dowland.²⁸⁵ This method involves finding the *half-way* point and putting a fret there (for the octaves); finding the position a *third* of the way along the remaining length and putting a fret there (for fifths). These initial length-ratios of 1:2 and 2:3 clearly come from Pythagorean tuning. But when following through with the procedure

²⁸⁵ Dowland (1610/1958); in Poulton (1972, pp. 450-59). For further background see for instance Meyer (1982) and Strunk (1950).

he describes, a little further down the track some significant *compromises* begin to appear, such as the very *un*-Pythagorean ratio of ‘two-elevenths’.²⁸⁶

Sometimes, however, it is impossible to see the lay of the woodland if you stay too deeply immersed among the trees. In the present context it will help if we stop fretting about the frets and think instead only about the notes played by the open strings.

On a modern guitar, the open strings are tuned to the notes E₀, A, D, G, B, E⁰. Note that the intervals between adjacent notes are all *fourths* except for one, G-B, which is a major third. In Shakespeare’s day, in Spain one of the most significant instruments was the *vihuela de mano*, which evolved into the modern guitar. Its tuning was very similar to that of the lute. And the lute was the predominant instrument in Shakespeare’s England. The lute was tuned so that the open strings played either the successive notes A₀, D, G, B, E⁰, A⁰ (‘A-tuning’), or else G₀, C, F, A, D⁰, G⁰ (‘G-tuning’). But in either case, the principle is the same: the intervals are all *fourths*, except for one *major third*.²⁸⁷

Without loss of essential structure, therefore, we can for convenience focus on the example of the tuning of a modern guitar. Forget the frets. Imagine we are just tuning the open strings entirely *by ear*. And imagine that the tuning is done in such a way as to ensure that the intervals between the notes played by adjacent *open strings* will be perceived as ‘optimally harmonious’.

In the present context, what ‘optimally harmonious’ is supposed to mean – both in theory and in practice – is not just that the intervals are tuned to suit the

²⁸⁶ Poulton (1972, p. 454).

²⁸⁷ Robinson (1603/1973, p. 11).

subjective preferences of individual musicians. Rather, what is aimed for is the achievement of a local minimization of the ‘interference beats’ in the overtones, when two notes are played together. Whether or not a musician knows what these ‘beats’ really are, and however a musician chooses to describe them – and whether or not a given musician *likes* them – any musician with a good ear can certainly *hear* them. When two notes hit what might be described as a ‘sweet spot’, then slightly raising or lowering either of those two notes will perceptibly increase the beats in the overtones.

A secondary back-up test of whether two strings have been tuned to the ‘sweet spot’ is to sound the lower string and then *see* or *feel* whether it creates a sympathetic vibration in the other string. The task is not the ‘purely subjective’ one of finding the tuning that suits your own subjective preferences.

Using this method of tuning, it is instructive to imagine the following steps in tuning the open strings for a guitar, harp or lute.

Step 1. (Pythagorean tuning)

Adjust tension on the strings in such a way as to maximize perceived harmony between adjacent open strings. And then tune these open strings, in a ‘cycle of fourths’, to the notes:

E_0 -A-D-G- C^0 - F^0 .

(This chain of fourths would be even more complete if we added an extra-low string for B_0 -*natural* on the left, and an extra-high string for B^{00} -*flat* on the right.)

Both theory and experimentation will demonstrate that, if Step 1 is carried out conscientiously, then all the fourths will approximate the frequency-ratio of 3:4.

It follows that Step 1 will inevitably generate what is called Pythagorean tuning.²⁸⁸

In tuning stringed instruments, this ‘purecycle of fourths’ has historic roots that are both deep and wide. It is registered for instance in a tenth century Encyclopaedia by a group of Muslim scholars called the Brethren of Purity:

The motivation conducting the philosophers to establish the thickness of each string in the proportion of 4:3 with that of the string above it, is explained by the fact that they wished to imitate the science of the Creator – great are His praises – and reproduce the Signs of His art in the natural productions.²⁸⁹

Shakespeare is unlikely to have known about these Islamic ‘Pythagoreans’; but the point here is just that the idea of ‘a cycle of fourths’ has been *widespread* in human history. It sprouts again and again from the fertile soil of the material facts about interference ‘beats’ among ‘overtones’, when two notes are played simultaneously.

One trouble with the Pythagorean tuning that emerges from Step 1 is that all the major thirds (and minor thirds) are seriously discordant.²⁹⁰ One initial step that

²⁸⁸ The arithmetical ratios for ‘Pythagorean tuning’, and for the rival systems of ‘just intonation’, will be given below, when explaining the mathematical theory that Kepler described as a ‘basis’ for ‘the Davidic harp’.

²⁸⁹ Godwin (1993, p. 114).

²⁹⁰ From well before Kepler’s time, the dissonance in the Pythagorean thirds, or ‘ditones’, was readily observable by musicians, and was relatively well understood by Pythagorean theorists. It will be explained more fully below.

could be taken to remedy this defect is to deviate from Pythagorean tuning in the following manner:

Step 2. (Kepler's just intonation)

Maximize perceived harmonies (minimizing detectable 'beats') between adjacent open strings, and tune these strings to the following series of notes:

$$E_o-A-D-G-B^\circ-E^\circ.$$

Note also that this manifestly immediately draws at least one major third, $G-B^\circ$, into harmony. And note that this system lowers just the two note B° and E° against the background of the Pythagorean tuning in Step 1. Closer examination will show, both empirically and arithmetically, that this will in fact maximize harmonies in the triads C-E-G and G-B-D.

Both experience and theory then demonstrate that, if one makes the harmonies between adjacent open strings as 'perfect' as possible, this will inescapably create a dissonance between the lowest and highest strings. Hence it is appropriate to supplement Step 2 with the following auxiliary procedure:

Step 2a.

Return to the lowest string E_o and lower its frequency just enough to maximize its harmony with the highest string E° .

The open E_o string, playing the lowest note, was initially tuned to harmonize with the adjacent open A string. Hence slightly lowering the frequency for E_o will now create a dissonance with A. But all the other strings remain as they were for Pythagorean tuning.

Therefore, if Steps (2+2*a*) are carried out conscientiously then, apart from the fourth E₀-A, all the other fourths will remain at the ratio 3:4, just as they were under Pythagorean tuning. But the major third G-B⁰ will now approximate the ratio 4:5. From this it can be verified (both arithmetically and experimentally) that Steps (2+2*a*) will generate Kepler's version of 'just intonation'.

Steps (2+2*a*) could then be followed by a Step 3, which would rectify the dissonance between the open E₀ and the open A string – by lowering the A string to bring it back into harmony with the E₀ string.

The resultant slight lowering of *both* the E₀ *and* the A strings will result – both practically and mathematically – in an alternative version of just intonation. This alternative system will slightly lower the *three* notes A, B and E, against the background of the Pythagorean tuning in Step 1. That generates the 'Ptolemaic' version of 'just intonation' that was articulated by Zarlino.²⁹¹

But Step 3 would involve slightly lowering the A string *without* changing the D string. Therefore, this would create a dissonance between the A string and the D

²⁹¹ Zarlino (1571/1966).

Zarlino's Ptolemaic version of just intonation is neatly encapsulated by a 'cycle of thirds':

$$F_0 \quad A \quad C \quad E \quad G \quad B^0 \quad D^0 \quad F^0 .$$

In practical terms, interference 'beats' in the overtones are to be reduced to a local minimum in all the thirds in this cycle. In theoretical terms, the frequency-ratio for all the major thirds aims at 4:5, and for all the minor thirds aims at 5:6 – all except for the final minor third D⁰-F⁰. Tuning the F⁰ to be exactly two octaves above the initial F₀ will create a dissonance in the minor third D⁰-F⁰.

string. And yet, it would clearly be futile now to adjust the D string *as well*, because that would just set the D string in dissonance with the G string. The snake is eating its own tail.

Hence it should eventually become reasonably obvious, or at least *tacitly* obvious, to practicing musicians that ‘*near enough is good enough*’. And settling for one or another combination of ‘near enough’ harmonies between adjacent open strings will result in one or another among a number of the many slightly different tuning systems that fall under the label of ‘temperament’ (as in ‘mean temperament’, ‘the well-tempered clavier’, and so on).²⁹²

Nevertheless, for present purposes, it is worth focussing on just the Steps $(2+2a)$, which generate Kepler’s version of just intonation.

²⁹² For early articulations of ‘temperament’, see for instance Schlick (1511/1980) and Galilei (1581/2003)

6.3 KEPLER'S JUST INTONATION

One of about a dozen rival 'tuning systems' in the early seventeenth century was a distinctive species of 'just intonation' that was articulated in great detail by Kepler. Thoroughly reviewing the documentary evidence bearing on Kepler's music theory, Pesic (2012) concludes that it was probably only around 1607 that Kepler first noticed that his own system might have been partially anticipated by Ptolemy and Zarlino, but that 'Kepler essentially reinvented and then rediscovered [his own idiosyncratic version of just intonation] in the course of pursuing his own vision.'²⁹³

²⁹³ Pesic (2012, para. 3.2). One of the few descriptions of Kepler's theory that I have found is a brief description by d'Alembert (1752/1966, p. 35), Book 1, Chapter 6, where he gives the frequency ratios for the scale *ut, re, mi, fa, sol, la, si, UT*, that runs: 1, (9/8), (5/4), (4/3), (3/2), (27/16), (15/8), 2. And d'Alembert notes that this scale differs from the scale of 'the Greeks', because the ratio (27/15) for the sixth note, A, differs by the ratio of (81/80). That is, Kepler's scale sets a large whole-tone (9/8) between G (3/2) and A (27/16), whereas Ptolemaic just intonation sets this interval as a small whole-tone (10/9) and hence sets A at (5/3). A century and a half earlier, Kepler evidently did not understand his own theory as clearly as d'Alembert did. (Witness for instance Kepler (1619/1997, p. 215), footnote 122, where a serious error by Kepler has been picked up by the editors.)

Kepler's version of just intonation can be seen as a variant on Pythagorean tuning. Pythagorean tuning creates a harmonious frequency-ratio of 3:2 for all the 'fifths' in the diatonic scale. Against a background of Pythagorean tuning, Kepler's tuning system slightly lowers the relative frequencies for just two notes: B and E.²⁹⁴ Lowering these two notes has the beneficial effect of improving the perceived harmonies (that is, reducing the interference 'beats' in the overtones)

²⁹⁴ Kepler arrives at his theory by a different route – and *not* by noticing that his system results simply from a slight lowering of the Pythagorean frequencies for E and B.

Like Zarlino (1571/1966), who modelled his theory on Ptolemy (*ca* 150/2000), Kepler identifies the following three species of intervals between adjacent notes in the diatonic scale:

'major tone' = T (frequency-ratio 9:8),

'minor tone' = t (10:9),

'semitone' = s (16:15).

He calls them 'one and an eighth', 'one and a ninth', and 'one and a fifteenth':

Kepler (1619/1997, pp. 137-138). Then in the scale:

G A B C D E F G^o

Kepler sets the major and minor whole tones and the semitones 'T', 't', 's' in the order:

-T-t-s-T-t-s-T-.

See Kepler (1619/1997, pp. 191-192). This demonstrably lowers just the two notes B and E by a factor of 80/81 against a background of Pythagorean tuning.

for the two major thirds G-B and C-E – which are noticeably ‘too wide’ under Pythagorean tuning.

However, this lowering of B and E inescapably creates collateral damage to one of the fifths that were formerly ‘perfect harmonies’ under Pythagorean tuning. In particular, the fifth A-E was perfectly harmonious under Pythagorean tuning. Lowering E (but not A) therefore creates severe dissonance in the fifth A-E (and also in the associated fourth E-A^o). The introduced dissonance in those two intervals was, however, according to Kepler, compensated by improvements in the perceived harmonies in the major thirds G-B and C-E (but, as Kepler acknowledged, *not* in the third F-A).²⁹⁵

All the alternative Renaissance tuning systems, Kepler thought that, on balance, his theory produced the most harmonious system overall. He clearly thought that King James thought so too. And Kepler also set out to give this tuning system the final seal of approval by demonstrating that the mathematical ratios characterizing James’s tuning system were written into the orbital times and distances for the planets.

Kepler explicitly acknowledges that the two dissonant intervals A-E and E-A^o, under his tuning system, are comparable to the dissonances that all the Renaissance tuning systems inescapably create in the intervals B-F (an augmented fourth), and the associated interval F-B^o (the tritone). But Kepler makes no apologies. On the contrary. In Book 3, in the chapter on discords, he explicitly identifies the dissonance of the tritone and augmented fourth – and he then immediately adds: ‘There is the same between *a* and *ee* ... a narrow fifth,

²⁹⁵ Kepler (1619/1973, p. 215).

27:40, that is 81:120'.²⁹⁶ Furthermore, in Book 5, where music theory is applied to astronomy, Kepler explicitly refers back to this very passage from the music theory of Book 3. And then he draws profound astronomical and astrological consequences from this discord A-E. For instance, he concludes for instance that '*Mars is in dissonance with Venus*'.²⁹⁷ The 'retrograde motions' of Mars presented a relatively famous problem for astronomers of the time. Thus, for Kepler, this dissonance in A-E truly does stand out from the pack.

Musically speaking, Kepler's discordant fifth A-E would inescapably create especially severe musical mayhem in the Aeolian modes, in which A is the tonic. On the Initial Table, the scales for the two Aeolian modes fall on either side of sonnet 126. And the twelve-line sonnet 126 is the most obviously anomalous 'sonnet' in the entire sonnet sequence.

Is it credible that Shakespeare could have understood Kepler's idiosyncratic and complicated music theory? Perhaps. Perhaps not. However, even if Shakespeare knew nothing whatever about Kepler's music theory, it is relatively credible that he could nevertheless, independently, have got wind of something else – namely, the 'Davidic harp' that King James had written about in his youthful poetry, and for which Kepler says his mathematical theory provides a theoretical 'basis'.

²⁹⁶ See Kepler (1619/1997, p. 215). The form in which Kepler cites this ratio, 'that is 81:120', is helpful because 81:120 manifestly just misses 80:120 = 2:3, which is a perfect fifth.

²⁹⁷ Kepler (1619/1997, p. 477).

6.4 FOURTH TEST

(KEPLER'S WOLVES)

Any practical tuning systems for which Kepler's mathematical theory furnishes a mathematical 'basis' will be a tuning system that makes the interval A-E a seriously dissonant 'narrow fifth'. And it follows from this that the tetrachord EFGA will span a dissonant 'wide fourth', closely analogous to the defective tetrachord FGAB that spans a dissonant tritone.

On the Initial Table there are *four* defective tetrachords FGAB and they align in appropriate ways with the pattern of distribution of poetic anomalies in the relevant sonnets or stanzas as marked on the Initial Table in Figure 1.

Analogous to these four Pythagorean discords, there Kepler's system generates four tetrachords EFGA on the Initial Table. Do they, too, align in appropriate ways with the pattern of distribution of poetic anomalies in the corresponding sonnets? Yes, they do. They are highlighted in the following re-presentation of the Initial Table:

FIGURE 3: INITIAL TABLE (KEPLER'S WOLVES)

<i>Dorian mode</i>													
D	E	F	G		A	B	C	D ^o	♪	♪	♪	♪	♪
1	2	3	4		5	6	7	8	9	10	11	12	13 14
<i>Hypo-Dorian mode</i>													
	A	B	C	D	E	F	G	A ^o	♪	♪	♪	♪	♪
	15	16	17	18	19	20	21	22	23	24	25	26	27 28
<i>Phrygian mode</i>													
E	F	G	A		B	C	D	E ^o	♪	♪	♪	♪	♪
29	30	31	32		33	34	35	36	37	38	39	40	41 42
<i>Hypo-Phrygian mode</i>													
	B	C	D	E	F	G	A	B ^o	♪	♪	♪	♪	♪
	43	44	45	46	47	48	49	50	51	52	53	54	55 56
<i>Lydian mode</i>													
F	G	A	B		C	D	E	F ^o		♪	♪	♪	♪
57	58	59	60		61	62	63	64	65	66	67	68	69 70
<i>Hypo-Lydian mode</i>													
	C	D	E	F	G	A	B	C ^o	♪	♪	♪	♪	♪
	71	72	73	74	75	76	77	78	79	80	81	82	83 84
<i>Mixolydian mode</i>													
G	A	B	C		D	E	F	G ^o	♪	♪	♪	♪	♪
85	86	87	88		89	90	91	92	93	94	95	96	97 98
<i>Hypo-Mixolydian mode</i>													
	D	E	F	G	A	B	C	D ^o	♪	♪	♪	♪	♪
	99	100	101	102	103	104	105	106	107	108	109	110	111 112
<i>Aeolian mode</i>													
A	B	C	D		E	F	G	A ^o	♪	♪	♪	♪	♪
113	114	115	116		117	118	119	120	121	122	123	124	125 126
<i>Hypo-Aeolian mode</i>													
	E	F	G	A	B	C	D	E ^o	♪	♪	♪	♪	♪
	127	128	129	130	131	132	133	134	135	136	137	138	139 140
<i>Locrian mode</i>													
B	C	D	E		F	G	A	B ^o	♪	♪	♪	♪	♪
141	142	143	144		145	146	147	148	149	150	151	152	153 154
<i>Hypo-Locrian mode</i>													
<i>A Louers complaint [stanza-pairs]:</i>													
	F	G	A	B	C	D	E	F ^o	♪	♪	♪	♪	♪
[11,12][13,14][15,16][17,18] [19,20][21,22][23,24][25,26] [27,28][29,30][31,32][33,34] [35,36][37,38]													

The first tetrachord **EFGA** falls in the second mode, where D is the tonic. Neither E nor A strikes a wolf sixth, fifth, fourth or third *from the tonic*, according to Kepler's tuning system. Hence the theory does not predict a high likelihood of rhyme-anomalies in the corresponding sonnets **19, 20, 21, 22**; and none are found.

The second tetrachord **EFGA** falls in the third mode, where E is the tonic. Hence the theory predicts a lifted likelihood of rhyme anomalies in the corresponding sonnets, particularly **29, 30, 31, 32**; and there is indeed a rhyme anomaly in sonnet 29. There is also an anomaly involving sonnet 36, an octave above, because the closing couplet of sonnet 36 is repeated word for word as the closing couplet of sonnet 96.

Of Kepler's four problematic tetrachords **EFGA** on the Initial Table, the last two fall within the Aeolian modes. And that is where Kepler's 'wolf fifth' will create the greatest musical damage. Kepler's wolves will virtually break the back of the Aeolian modes. In those modes the tonic is A; and Kepler places E a dissonant 'narrow fifth' above the tonic. Hence the theory predicts correspondingly serious poetic anomalies in the corresponding sonnets.

Is there any evidence to suggest that this distinctive musical catastrophe in the Aeolian modes might credibly be mirrored – in the Initial Table – by formal poetic patterns of some kind in the corresponding sonnets? Yes, there is.

1. Sonnet 126

On the Initial Table, the two Aeolian modes lie, respectively, on either side of sonnet 126. This sonnet contains one of the most striking of all the formal anomalies in Shakespeare's sonnet sequence. It is truncated to only twelve lines, and the rhyme-scheme is *aabb ccdd eeff*. The positions on the page, in the

original 1609 publication, at which the thirteenth and fourteenth lines would have stood are each marked by two widely spaced parentheses with nothing between them.

The truncation of the ‘microcosm’ of sonnet 126 then entails the prediction of a significantly lifted likelihood of a *mirroring* pattern in macro-sonnets 9 and 10 on the Initial Table. That is, it is to be predicted that macro-sonnets 9 and 10 should *probably* be truncated by the removal of *two sonnets*. That is what is to be expected (with at least a raised likelihood) as a consequence of the Pythagorean notion that ‘the microcosm mirrors the macrocosm’.

Musically, this would then correspond to the removal of *two notes* from *each* of the musical scales for the Aeolian modes. And there is a musical motive for removing *two notes* from the musical scales for the Aeolian modes: namely, the excision of one dissonant wolf fifth above the tonic in the upward scale, and another in the downward scale. Removing two notes would then produce a ‘gapped scale of six notes’.²⁹⁸

There is a chain of poetic anomalies whose locations corroborate the postulated truncation of macro-sonnets 9 and 10.

2. Sonnets 139, 140, 141, 142

If macro-sonnet 10, corresponding to the HypoAeolian mode, were truncated to comprise just twelve sonnets, then macro-sonnet 11 would open not (as would otherwise have been expected) with sonnet 141, but with sonnet 139 instead.

²⁹⁸ A ‘gapped scale’ is not just my own invention to save the theory: see Blom (1947, p. 242).

Fitting that prediction, sonnets 139, 140, 141, 142 are drawn into a natural macro-quatrain by the *formal* fact that the rhymes in their closing couplets form a macro-pattern analogous to Shakespeare's rhyme-scheme for quatrains, *abab*:

139: 'slaine'	140: 'belied'	141: 'gain'	142: 'hide'
'pain'	'wide'	'pain'	'denied'.

3. The 'Cupid' sonnets: 153, 154

It is therefore also to be predicted that macro-sonnet 11 should be *augmented* by the addition of *two extra* sonnets. Matching that prediction, commentators regularly remark on the distinctiveness of the two 'anacreontic' sonnets 153 and 154 that are tacked on at the very end of the entire sonnet sequence.

4. Sonnet 99

There are fifteen lines in sonnet 99. On the Initial Table, sonnet 99 is flanked by macro-sonnet 7 and macro-sonnet 8. If the under-sized sonnet 126 is flanked by two undersized macro-sonnets, that boosts the expectation that an over-sized sonnet 99 might be flanked by at least one over-sized macro-sonnets.

Consequently, if one extra sonnet were to be analogously added to each of the two macro-sonnets on either side of sonnet 99, then macro-sonnet 9 will open not with sonnet 113 (as on the Initial Table), but with sonnet 115 instead. And that would leave just twelve sonnets, sonnets 115 to 126, in macro-sonnet 9: exactly as predicted above.

5. Sonnets 104, 108, 112

Sonnet 99 opens with an 'announcement' in line 1, and it has the rhyme-scheme *b+abab cdcd efef gg* – with the grouping-pattern (1+4)+4+4+2. If the macro-sonnet 8, which immediately follows sonnet 99, were to stand as a macrocosm

mirroring the microcosm of sonnet 99, then macro-sonnet 8 would be sub-grouped into sonnets (100+101-104), (105-108), (109-112), (113-114).

In that case, it turns out that the three macro-quatrains of macro-sonnet 8 will be neatly marked by repetitions of the rhyme-words in their closing couplets:

104: 'vnbred'	108: 'bred'	112: 'bred'
'dead'	'dead'	'dead'.

6. *Sonnets 113, 114*

Thus, the truncation of macro-sonnet 9 entails that the sonnet-pair 113, 114 will then comprise the closing macro-couplet in macro-sonnet 8. And on inspection, the pair of sonnets 113, 114 is indeed an extremely appropriate candidate for a 'macro-couplet'.

Furthermore, sonnet 115, 'Those lines that I before haue writ doe lie ...' then makes an interesting opening for the 'macro-envoy' of the group comprising the twelve sonnets 115 to 126.

7. *Sonnets 36, 96*

The closing couplet of sonnet 36 is repeated, word for word, as the closing couplet in sonnet 96. This has been noticed by commentators, and they have found it puzzling. No other line in any other sonnet in this entire sequence is ever repeated in any other sonnet.

As commentators note, this closing couplet is not so outstandingly 'poetic' that it invites repetition. Commentators have had difficulty in understanding exactly what is being said in this couplet; and in both sonnet 36 and 96 it is even harder to see how either of these couplets can be intelligibly related to the twelve lines that

come before – especially in the case of sonnet 96.²⁹⁹ Sonnet 96 also contains a rhyme-anomaly (and this anomaly also echoes one of the salient end-rhymes in the preceding sonnet). Furthermore, both these sonnets not only describe ‘dissonance’ in the poet’s personal relations, they also embody formal, poetic ‘dissonances’ of several different kinds.³⁰⁰

On the Initial Table, sonnet 96 does not align with Kepler’s ‘wolf fifth’. But because sonnet 99 contains an extra line, we are warned that there might be reasons for altering the Initial Table, and re-aligning macro-sonnet 7.

Under one possible re-alignment, macro-sonnet 7 could open with the first of what commentators call the ‘Farewell’ grouping, namely sonnet 87. The ‘Farewell’ grouping comes immediately after the ‘Rival Poet’ grouping, which closes with sonnet 86. (Or perhaps these two groupings overlap, with sonnet 86 both closing the first group and introducing the next.)

If the seventh macro-sonnet were displaced in the manner indicated, then it could fall into something like the following pattern:

[F]	G	A	B	C	D	E	F	G ^o	F	E	D	C	♪	♪
Mixolydian														
[86]	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Macro-sonnet 7														

(Here an additional conjecture has also been introduced – concerning one way that the downward scale could commence.)

Under this alternative alignment, both sonnets 36 and 96 are aligned with Kepler’s ‘wolf note’ E.

²⁹⁹ See for instance the comments on this sonnet by Vendler (1997).

³⁰⁰ Especially in sonnet 96, which even includes an apt allusion to a ‘sterne Wolf’.

8. *Sonnets 91, 92, 93, 94*

The above re-alignment of macro-sonnet 7 receives further corroboration from further formal patterns in the sonnets. This re-alignment results in a macro-quatraine, not comprising sonnets 79, 80, 81, 82, as on the Initial Table, but comprising sonnets 91, 92, 93, 94 instead.

Hence it is good news for the theory, that these four sonnets are tightly tied together, formally, by a pattern of ‘anadiplosis’. That is, each of these sonnets opens with a salient word from the close of the preceding sonnet. Thus, for instance, Duncan-Jones begins her commentaries on sonnets 92, 93, 94 with the words, respectively: ‘92 Following from the end of the preceding sonnet ...’; ‘93 The speaker develops from the last line of the previous sonnet ...’; ‘94 Picking up from the conclusion of the previous sonnet ...’. The commentary on the next sonnet opens, ‘95 The speaker alters the angle from which he views ...’.³⁰¹

Poetically, it makes no sense at all to group sonnets 89, 90, 91, 92 in one macro-quatraine, and sonnets 93, 94, 95, 96 in another, as on the Initial Table. But it makes excellent sense to group sonnets 87 to 94 into a macro-octave.

Poetically, it makes no sense at all to place sonnet 98 as the last in one macro-sonnet, and sonnet 99 as the opening sonnet in the next macro-sonnet. But it makes very good sense to close macro-sonnet 7 with sonnet 100, and to open the eighth macro-sonnet with sonnet 101.

³⁰¹ Duncan-Jones (2010, pp. 294, 296, 298, 300).

CHAPTER 7

COROLLARIES AND CONCLUSIONS

7.1 LEADS FOR FURTHER RESEARCH

There is much more evidence to be assessed. For a start, there is a need to augment the Initial Table by making a conjecture about how the downward scales for the sestets should proceed. Should the top note be repeated, before commencing the descent – as is done for instance in singing the scales for the Gam – ‘*ut re mi fa sol la la sol fa mi re ut*’ – according to Morley?³⁰² Should each of the downward scales contrive somehow to end on the same note with which the upward scale began? Or should they close with an anticipation of the opening note for the next scale that is to come in the sequence? Or did the author deliberately leave the downward scales formally unconstrained – free for the reader to play with *ad lib*?

And so on. It is possible in principle that this further investigation might uncover serious errors in the theory that has been teased out so far. This theory is of a kind that will always remain ‘falsifiable *in principle*’, as they say in theories of scientific methodology. And, of course, further evidence is extremely likely to suggest ways of augmenting, extending, and correcting details in the theory.

Nevertheless, the evidence surveyed so far does strongly support the conclusion that Shakespeare’s *Sonnets* contains topomorphic poetic echoes of musical scales that some of his contemporaries believed to underlie the Cosmic Harmonies that

³⁰² Morley (1597/1973, p. 13).

God wrote not only into the orbits of the planets, and into the harmonies and discords within a well-governed State under the Divine Right of an anointed King, but also into the deep courses of each individual human soul.

7.2 SUMMARY OF THE ARGUMENT

The conclusions:

Shakespeare's sequence of 154 sonnets contains evidence of supererogatory patterning that can be successfully explained by the hypothesis that they are sub-divided into eleven macro-sonnets, as in one of Spenser's *Complaints*, 'The Ruines of Time'. Various formal anomalies can be explained if the series of macro-sonnets is also aligned with musical scales for the canonical catalogue of Renaissance modes under a version of just intonation that was described by Kepler in his masterwork on *The Harmony of the World*.

The reasoning:

Shakespeare's sequence of 154 sonnets can be sub-divided into eleven macro-sonnets, each of which embodies apt poetic analogues of Shakespeare's ubiquitous three quatrains and closing couplet. Sonnets 1 to 14 urge a young man to reproduce biologically; sonnet 15 introduces a new theme of *immortality in verse*; sonnets 71 to 74 constitute a strikingly aptly placed 'macro-quatrain' on this theme; the transience of the young man's beauty is a recurring theme up to sonnet 126; and the final 28 sonnets, addressed to a 'femall euill' (sonnet 144), close with a distinctive 'macro-couplet' in sonnets 153, 154. This is just the tip of an iceberg.

These, along with many other apt poetic alignments with a topomorphic pattern of 'macro-sonnets', are sufficiently numerous and striking to support the conclusion that it is highly unlikely for patterns like this to have arisen without any deliberate design by the author.

However, it is also highly unlikely for patterns like this to have been deliberately placed in a sonnet sequence and then not noticed by numerous intelligent, attentive, knowledgeable, curious and industrious commentators over a period of more than two centuries. If so many commentators have failed to notice these patterns, then that boosts the likelihood that Shakespeare and those in any contemporary potential readership did not notice them either.

Counterbalanced against that negative argument, there is abundant evidence that many Tudor and Jacobean poets did weave topomorphic patterns into their literary works, and that many of these patterns have not been uncovered by later commentators. In particular, Spenser's *Amoretti and Epithalamion*³⁰³ contains sophisticated topomorphic patterns that have escaped detection by commentators until at least some of them were disclosed by Hieatt in 1960.

Furthermore, there is abundant historical evidence that Shakespeare's sonnets circulated for many years among his private friends or patrons; and indeed there is no very weighty evidence that their print publication in 1609 was authorized. It is less improbable that the author would have woven topomorphic patterns into a sonnet sequence if the initially intended audience included a small circle of friends or patrons who valued privately circulating poetic manuscripts containing topomorphic patterns.

There is abundant evidence that the Earl of Southampton was closely bound up with a literary circle of precisely that kind; and Shakespeare's only indisputably authorized publications in his lifetime were *Venus and Adonis* (1593) and *Lucrece* (1594), both of which were dedicated to the Earl of Southampton and

³⁰³ Spenser (1595/1912).

were frequently re-published in Shakespeare's lifetime, always with exactly the same dedications.

Nevertheless, there are some formal anomalies in the 1609 text of the *Sonnets* that are not explained by the pattern of macro-sonnets, taken on its own. One of these is the anomaly of the iambic tetrameter in sonnet 145. There are just two other sonnets with comparably extreme formal anomalies: sonnet 99 (fifteen lines), and sonnet 126 (twelve lines). These latter two anomalies align neatly with junctures in the division of this sonnet sequence into eleven macro-sonnets. But the anomaly of sonnet 145 does not.

However, sonnet 145 does receive an extremely apt topomorphic alignment if the series of macro-sonnets is also aligned with musical scales for the canonical catalogue of Renaissance musical modes.

Suppose that the first macro-sonnet is aligned with a musical scale for the Dorian mode, which has tonic D. Suppose, in particular, that the eight notes in the upward scale DEFGABCD^o were to be aligned with sonnets 1, 2, 3, 4, 5, 6, 7, 8 respectively.

Under this hypothesis, the second macro-sonnet should be similarly aligned with the Hypo-Dorian mode, which also has tonic D. The third and fourth macro-sonnets would align with the two modes with tonic E; and the fifth and sixth with modes with tonic F; the seventh and eighth macro-sonnets with modes with tonic G; the ninth and tenth macro-sonnets with modes with tonic A. Then the eleventh macro-sonnet will open with sonnet 141, which will be aligned with the note B as the tonic for the Locrian mode.

Sonnet 145, which is in iambic *tetrameter*, will then be aligned with the note F, which lies a dissonant augmented *fourth* above the tonic. The dissonant interval

B-F (along with the tritone, F-B^o) is sometimes known as ‘the devil’s interval’; and so, it is interesting to find reference to a ‘fiend’ in sonnet 145. The use of the term ‘devil’s interval’ (or *diabolus in musica*) in Shakespeare’s time is not well documented. Nevertheless, a ‘fiend’ is clearly an apt poetic image for the supremely significant musical discord in the diatonic division of the octave. Furthermore, sonnet 145 is ‘discordant’ with the other sonnets around it in many different ways, as has been noted by various commentators.

Under this topomorphic alignment of Shakespeare’s sonnets with musical scales, the first occurrence of the dissonant ‘devil’s interval’ in the series will fall on the alignment of sonnet 3 with the note F, and sonnet 6 with the note B. Hence the topomorphic hypothesis predicts a lifted likelihood that there might be some sort of poetic anomaly linking sonnets 3 and 6. And, as discussed above, there is: both sonnet 3 and sonnet 6 contain the very same word ‘thee’ as an end-rhyme for two distinct lines.

The question then arises whether all the discords in these musical scales aptly align topomorphically with poetic anomalies – and (*vice versa*) whether all the formal poetic anomalies in this sonnet sequence aptly align topomorphically with musical discords.

The answer is, that they do: but only if the discords in these scales are identified according to a version of just intonation that was described by Kepler in 1619 and described as a ‘basis’ for ‘your Davidic harp, glorious King’, in a Dedication to King James I of England.

This evidence cumulatively supports the conclusion that both Shakespeare and Kepler both discovered a tuning system and had reasons to think that King James thought of it as the tuning system of ‘the Davidic harp’. There is a tuning system

whose distribution of harmonies and discords matches the predictions of the mathematical theory Kepler described in 1619. And this distribution of musical harmonies and discords also topomorphically matches the distribution of formal poetic anomalies in Shakespeare's sonnet sequence of 1609.

Consequently, this evidence cumulatively supports the conclusion that Shakespeare compiled his sonnet sequence of 1609 as a poetic microcosm that mirrors the macrocosm of 'the music of the spheres', and that doing this would have afforded one promising way of pleasing his likely patron, the Earl of Southampton, who in turn transparently had abundant reasons for striving to please King James.

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