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Title: Echoes and Energies: Unraveling the Confused Phenomenology of Hopkins' Metre

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Introduction: A Submerged Metre

Hopkins' Poetry, without a doubt, contains some of the 19th century's greatest formal innovations in iambic pentameter.— Left untouched, the preceding sentence would likely come across as an acceptable critical commonplace, but there is something naggingly contradictory in the phrase "formal innovations in iambic pentameter". Surely the extent to which any poem is "in iambic pentameter" is the extent to which it shows no formal innovation? Certainly, if we take iambic pentameter by its encyclopedic definition:

> "iambic pentameter [is] composed of ten syllables arranged in five metrical feet (iambs), each of which consists of an unstressed syllable followed by a stressed syllable."[1]

Hopkins seems to write very little of it. In fact, there is something approaching self-conscious absurdity in Hopkins' calling one of his works "the longest sonnet ever made and no doubt the longest making"[2]. If we apply the logic used to justify his 10.5-line "sonnets":

> "Nos. 13 and 22 are Curtal-Sonnets, that is they are constructed in proportions resembling those of the sonnet proper, namely 6 + 4 instead of 8 + 6"[3]

It becomes clear that, to Hopkins himself, number isn't so important as "proportion[s]" when it comes to defining form. But looking at Hopkins' poems more generally, his treatment of conventional metre is far more confusing than a simple re-proportioning. Despite the immense critical attention which has been levelled at Hopkins' use of metre, no unifying formal approach has arisen to explain the sonnet-ness of underweight "Pied Beauty", and the overweight "Spelt From Sibyl's Leaves", or to explain the sensation of metre which persists in "The Leaden Echo", "That Nature is a Heraclitean Fire [...]", and indeed all of his structurally irregular poems. Part I of this essay will consider some popular approaches to deconstructing Hopkins' metre and expose the inadequacies of each to explain the overwhelming rhythmic effect of the poems themselves. Part II will discuss the greater insight provided by Hopkins' own critical framework and part III apply this insight, proposing the outline of a new system by which to understand and evidence the metrical patterns of Hopkins' verse.

Part I: The Myth of Sprung Rhythm

To begin with perhaps the least effective critical method of expounding Hopkins' metre, there is a widespread tendency to present *sprung rhythm,* in its irregularity, as the defining formal feature of Hopkins' verse. For any prospective critical reader of Hopkins, the first available explanation of his metre is likely given along the following lines:

> "sprung rhythm, an irregular system [...] is based on the number of stressed syllables in a line and permits an indeterminate number of unstressed syllables" (Encyclopedia Britannica)[4]

The popularity of this approach is surprising, not least because the above definition would consider almost any sentence in English a line of sprung rhythm, including the definition itself. The absurdity here stems simply from a lack of specificity – the Brittanica definition does accurately describe Hopkins' lines, as does Hopkins' own quotation from which the definition is adapted:

> "To speak shortly, it consists in scanning by accents or stresses alone, without any account of the number of syllables, so that a foot may be one strong syllable or it may be many light and one strong."[5]

Importantly, though, Hopkins *is* speaking "shortly". It is not this irregularity itself which characterises the effect of Hopkins metre — he goes on to describe the virtues of *sprung rhythm* as being "more natural [...] much more flexible and capable of much greater effects" (Hopkins 1955: 14-15) than non-sprung (even-footed) metres. The idea that the sole virtue of Hopkins' metre is its deviation from regularity — in order to accommodate the patterns of speech — is oversimplified to the point that it fails even to distinguish his verse from prose. In describing *sprung rhythm* as "more natural", but "*much* more flexible" than even-footed verse, Hopkins reveals the distinguishing quality of *sprung rhythm* to be its capacity for metrical effects. It follows, then, that the primary metrical effect of Hopkins' verse is not the irregularity of *sprung rhythm* itself, but some other feature which *sprung rhythm* facilitates. Critics, however, are reluctant to define this *other feature* in any strict terms. Peter McDonald's explanation of Hopkins' metrical effects is typically mystical:

> The texture of his poetry, its aural shapes and arrangements, embody Hopkins's own conclusions about the extent to which the thing a poet is driving at is also that to which he is driven by the energies latent in language[6]

Very little is explained here. A slightly ungenerous gloss of the quotation might read: *whatever is going on in the text* ("texture", "aural shapes") *is related to whatever Hopkins thought about what language is* (indeterminately related to its "latent energies"). In general, this is the level of specificity with which Hopkins' effects beyond *sprung rhythm* are discussed. An entertaining game to play with articles on Hopkins is to look for mentions of rhythm and to follow their logical trail – inevitably it leads either to a quotation from Hopkins' letters or to obscure praise of a non-specific virtue akin to "aural shapes" and "latent energies". Dennis Sansom's article on "Metaphysics and the Poetry of Gerard Manley Hopkins"[7], to take a recent example, points to W. H. Gardner's introduction to *Gerard Manley Hopkins: Poems and Prose* for "a clear explanation of "sprung rhythm"" (Sansom 2021: 54). Gardner's introduction, in turn, defines "sprung rhythms" as follows:

> "in *The Wreck of the Deutschland* [Hopkins] tried out and almost perfected what he called his 'new rhythm'. By this he meant primarily Sprung Rhythm, which is fully explained in the Author's Preface and Letter XIII"[8]

This "explanation" gives the reader no information at all; the final (or indeed, only) explanation on Rhythm is left to Hopkins' letters. When faced with the task of describing for himself the qualities of Hopkins' metre, Gardner is predictably driven to praise its obscure "sound-texture":

> "the sound-texture of the poetry [...] is really an integral part of the rhythm. Partly to give richness to his language, partly to bring out subtle relationships between ideas and images, and partly as a guide to rhythmical stresses, [...] alliteration, assonance, internal full- and half-rhyme [...] are generally employed with taste and control; they give intensity, variety in unity, ;[...] 'starriness', pattern and melody" (Gardner 1954: xxxi-xxxii)

In fairness to Gardner, this quotation isn't saying **nothing**; the idea that the matching of phonemes (*lettering*, to use Hopkins' term) "bring[s] out subtle relationships" is a valid critical point, albeit one generally overused and under-nuanced. In fact, the principle of *lettering* as a "guide to metrical stresses" will later form the basis of this essay's proposed formal methodology. The issue with Gardner's "explanation" is simply that it *doesn't* explain any of its points. A skeptical reader might ask: *what is* "richness" ? *How* does "sound-texture" express "relationships"? *How* does it "guide" and *to what extent* "partly"? What *is* "variety", "intensity", "starriness", "melody", or any one of the impressionistic terms employed here? The text can provide no answer, of course, because it is not written for a reader seeking explanation – critics such as Gardner depend upon a reader with a somatic/intuitive* understanding of Hopkins' metrical effects, who can then experience their criticism as a reverential evocation, rather than an explanation, of these effects. The same is true even when the thesis being proposed is significant and precise, such as the following aside from Meredith Martin's analysis of "The Wreck of the Deutschland":

> "is he attempting to alliterate and allude to the Anglo-Saxon strong-stress meter ("mast" and "me" carry stress)?"[9]

YES! (this critical response to the quotation above is almost an outburst) but *how?* For any reader without an intuitive understanding of how the "Anglo-Saxon" hemistich *feels*, assessing the validity of Martin's point is impossible, since it provides no evidence with which to replace that intuition. Part of the frustration which this critical vaguery (sic.) begets is its complete defiance of Hopkins' own critical intent. By the end of his life, Hopkins had assembled a good deal of the necessary critical apparatus by which to systematise the

*This should be clarified given this essay's objection to obscure and mystical terms: whether the ability to detect these effects is *intuitive*, ie. a product of subconscious mental processes, or *somatic*, ie. a product of sensory experience, is a psychological issue irrelevant to the point, which is that the ability is not a conscious application of logical or systematic methods

properties of metre *in* and *through* his verse, and instead of adjusting and extending this work, critics have insisted upon simplifying and de-systematising it. Whether these critics consider Hopkins' theoretical writings to be impenetrably obscure, or simply out-of-date*, the potential for a highly specialised form of metrical analysis, based on Hopkins' own principles, remains hugely underused.

Two critical approaches which may constitute exceptions to this rule are those of Derek Attridge and Geoffrey Leech. Both Leech's extension of "sprung rhythm"[10] and Attridge's "English Dolnik"[11] are marked advancements of Hopkins' own rhythmic analysis. The two critics similarly deconstruct Hopkins' metre in terms of "musical scansion" (Leech 2015: 75) and *dipodic*† structures. These two terms essentially represent a two-step approach to systematising the apparent irregularities of Hopkins' metre. The first step, "musical" or "dolnik" scansion, involves interpreting verse as strictly stress-timed, such that each "measure" (Leech 2015: 76), containing one stressed beat and any number of offbeats, occupies a set amount of time. The second step, *dipodic* scansion, then involves creating pairs of measures, or *dipodies*. The small-print, as it were, of these techniques is provided only by Attridge — Leech's "musical scansion" seems to be applied *ad hoc* to each example, giving the reader no definable technique by which to reproduce and verify his results. Leech's inconsistencies, however, are less remarkable than the corresponding consistency of Attridge's *dolnik* scansion. Distinguishing between "duple" and "triple" (Attridge 2020: 180) variants, *dolnik* scansion necessarily produces a consistent number and order of stressed and unstressed beats in each measure‡. Though the ratio of beat to syllable is inconsistent, ranging from 1:2 to 2:1 or even 2:0, Attridge provides a consistent method for mapping these beats onto syllables according to stress and caesurae alone. *Dolnik* scansion, therefore, is a prodigious prosodic achievement, and an excellent reference point for Hopkins' rhythmical *ear*. Beyond that, however, its ability to describe his metrical effects is limited. By design, *dolnik* scansion can only be applied in cases of a consistent *tempo* of stress, ie. when each stress is understood, in performance, as equidistant. In Hopkins' poetry, however, this is not always the case. Surprisingly, Gardner's distinction between "sprung" and "counterpoint [...] modes" becomes useful here. Although Hopkins himself never draws a clear distinction between the two (in fact, counterpoint is likely one of the "greater effects" of which he considered sprung rhythm capable), Gardner's slight misappropriation can be applied to the sensation of rhythmic "spring" (Attridge 2020: 188) as classified by Attridge. The cases of

*Hopkins' critical language is clearly and charmingly improvised within the confines of an age before the institution of *Literary Theory* and the *English Literature Degree*. It is no surprise that those with great faith in the modern Lit-Crit institution may be disinclined to believe that this pre-historic improvisation could outperform their own estimable MAs (Oxon)

† Both Leech and Attridge use the term in specific reference to instances of a dipody (set of two feet) taking the structural place of a single foot, not in general reference to two-foot structures. A simple example would be bracketing of the line ABCAD (where A, B, C and D are metrical feet) as [A] [BC] [A] [D], such that the *dipody* [BC] and the single foot [D] occupy the same position in the repeating structure [A][x]).

‡1 and 1 for duple, 1 and 2 for triple

adjacent stress-accents *can* fall under Attridge's definition of *dolnik*, so long as the first accent is *sprung* with the additional beats in the *dolnik* foot. A monosyllabic foot is only metrical in the *sprung* mode, where the syllable is stressed and lengthened to double or triple the duration of a standard beat (in *duple* or *triple dolnik* respectively). The "counterpoint" or *contrapuntal* mode can be treated as the alternative case, in which the monosyllable occupies only the length of a single beat. In imagining a "counterpoint rhythm", made up of *contrapuntal* feet, overlapping the natural or *non-contrapuntal* feet of the line, the monosyllabic foot is reframed as part of a polysyllabic *contrapuntal* foot. *Contrapuntal* scansion eliminates any monosyllabic foot by demoting one or more of the adjacent stresses to form a new *contrapuntal* foot. The main flaw of *contrapuntal* scansion is easy to spot, in fact, Attridge's summary of this flaw, from *The Rhythms of English Poetry*, explains the absence of counterpoint in *dolnik* almost forty years beforehand:

> Hopkins's influential borrowing of the term 'counterpoint' from music, for instance, gives the erroneous impression that the double structure is the equivalent of two voices in a polyphonic composition, each clearly perceptible, and each with a distinct character of its own. But what we are aware of in reading a metrical line is an onward movement [...] constantly arousing and thwarting rhythmic expectations[12]

Attridge is completely correct — the idea of counterpoint is essentially at odds with the experience of reading. Unfortunately, this fact only brings us further from a comprehensive approach to scanning Hopkins' verse; without the option of *contrapuntal* scansion, Attridge's method is unable to systematize any variations of tempo that appear in Hopkins' verse, including the frequent occurrence of successive single-beat stresses.

Part II: The Lecture Notes

A preferable alternative method can be found in Hopkins' own critical writings, particularly his lecture notes. Despite their unique insight, the notes have largely been neglected by critics in favour of the snappier reformulations of theory found in his letters*. Among the notes' many achievements, perhaps most remarkable is the parallel treatment of the different "kinds of resemblance"[13] that may constitute verse. Hopkins' list of features that may be patterned to create verse is as follows:

> (1) "pitch" (2) "quantity" (3) "Stress" (4) "lettering" (5) "Holding"
> (Hopkins 2021: 313, henceforth referenced by page number only, (p.313))

The series is non-hierarchical, every feature is similarly capable of forming patterns of "resemblance".

*I suspect, perhaps cynically, that impatience alone may have driven critics away from Hopkins' most complete critical work — written in dense and obscure prose, the notes existed for decades in a single edition, which remained out of print for decades, until it was republished in the 2021 *Collected Works*[13], this time buried in part 3 of title 1 of section 2 of part 1 of volume 6.

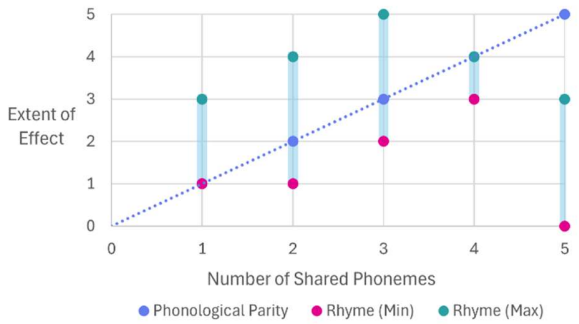
The liberal definition of verse, here, resembles a phenomenological definition of *rhythm,* grounded in the basic human expectation of, and satisfaction by, repeated stimulation.* Hopkins' application of this definition, however, is disappointingly narrow. *Pitch* is described as a "weak" (p.315) feature that, in English, is only an addition to stress accent. *Quantity* is equally underspecified: the effect of vowel length and consonant count is addressed, but quickly overlooked, since the relative *quantity* of syllables in English is never measurably rational†. The following section, (3), on *Stress*, occupies the majority of the lecture, absorbing Hopkins so fully that he seems to forget his own numbering system: in the MS, the "5" initially written before the section on *Lettering*, is struck-through: "~~5~~" (p.337), and corrected with a superscript "4" (p.337). Whether or not Hopkins set out to write a section treating *lettering* as similar, separate and equal to *stress*, his notes had certainly become possessed by *stress* patterns before he could do so. Section 4 of the notes disappointingly refers to *lettering* in a largely conventional way, as subordinate to the *stress-accent*. That is to say, the liberal definition of verse which begins the lecture hints at a system in which *parities* of *lettering* and of *stress* can be treated similarly, but this system is never realised. Instead, the commonplace distinction is made between "rhyme, alliteration [and] assonance" (p.337) as separate possible *parities* of *lettering*. Though Hopkins' ear for each of these is astute, his explanations are somewhat impressionistic, and categorise parities on an unquantified scale from the "soft" (p. 338) to the "best" (p.338), according to their "beauty" (p.339). But while the extent of *lettering* is not codified in the notes, the organization of *lettering* **is**, and presciently so. Hopkins divides the syllable into "initial", "stem" and "final" (p.340), nearly a century before the currently accepted onset/nucleus (peak)/coda syllable model was proposed.‡[18] This three-part approach proves an immense benefit, as will be illustrated Part III, to measuring the interrelation of *stress* and *lettering*. As for Hopkins' description of all *lettering* as "reducible to the principle of rhyme" (p.343), it is largely rhetorical, but it does present one particularly useful insight. While phonemic parity increases proportionally to the quantity of similar components, rhyme, as Hopkins defines it, is most "rich" (p.342) at an ideal distribution of similarity and difference (p.340). This is the issue with any straightforward computation of recurring phonemes: the largest repeated string of phonemes is by no means the best rhyme, or the most "richly lettered" (p.345). In fact, Hopkins considers the exact

*The canon of relevant work within phenomenology is immense, and not necessarily helpful. See Abraham (1952)[14] for a particularly methodical example of this definition, expanded in Abraham (1962)[15]. See also Freer (2015)[16] for a wider-ranging summary and history of the definition.

† in the mathematical sense of the term, ie. two phrases are never measurably equal in *quantity* unless they contain the same number of syllables.

‡The division of a syllable into three parts may seem trivial, but Hopkins' model is a precise forecast of current linguistic understanding. The label "stem" is particularly similar to "nucleus" — framing of the vowel as the major, central, and defining part of the syllable is non-trivial, as is the treatment of the onset and coda as single (regardless of consonant cluster), and distinct (Before the ONC syllable model, *glossematic* theory treated onset and coda as similar, "marginal part[s]"[19])

repetition of syllables "no rhyme" (p.340) at all, though he accepts it as a "substitute[s] for rhyme" (p.343), in the case of heterographs, eg. "eye"/ "I". The level of nuance which is added by this distinction can be visualized as follows:



Each point represents a partial or complete rhyme for example syllable "breathes". For each number of similar phonemes, examples of the weakest and strongest possible rhymes, according to Hopkins' example (p.340-343), are given below. Each is assigned a Y value 1-5, to represent near-partial, partial, imperfect, near-perfect, and perfect rhymes respectively.

1. Min = 1, eg. "flogs", Max = 3, eg. "heaths"
2. Min = 1, eg. "runs", Max = 4, eg. "seethe"
3. Min = 2, eg. "bream", Max = 5, eg. "seethes"
4. Min = 3, eg. "breathe", Max = 4, eg. "wreathes"
5. Min = 0, e. "breathes", Max = 3, eg. "robe-wreathes"

Clearly the relationship between pure phonemic *parity* and Hopkin's evaluation of *rhyme* is not linear. *Rhymes* of the same length are by no means equally "rich", as can be seen in each of the pairs above. Hopkins' evaluation of *richness* is intuitively convincing, but must be defined in clearer terms before it is applied systematically. The relevant terms are defined below:

1. "Letters" (p.313) are defined by Hopkins as "elementary sounds [...] of which syllables are made" (p.313), ie. *phonemes*, as opposed to *phones*.
2. *Syllables* are sets of *phonemes* containing a "stem" vowel (p.340), henceforth termed the *nucleus*, and any number of consonants or semivowels.
3. The set of phonemes (*segment*) before and after the *nucleus*, which Hopkins calls the "initial" (p.340) and "final"(p.340), are both *margins*, henceforth termed the *onset* and *coda* respectively.
4. Verse is divided into syllables such that:
   a. There is exactly one syllable boundary between any two adjacent vowels
   b. Syllables are never spread across two non-enclitic words
   c. Syllables are never spread across two nucleated morphemes, except to avoid the presence of two adjacent occlusives within a syllable*
5. Hopkins defines "the principle of rhyme" (p.343) as the relationship between two non-homophonous *syllables* which contain one or two identical *segments*. To distinguish from the specific definition of *rhyme*, this feature will be termed *parity*. Pairs of syllables which meet this definition are *parities*, while other pairs are *disparities*.

6. "Alliteration" (p.337) refers to *onset parity*, "assonance" to *nucleus parity*, "skothending" (p.338) to *coda parity*, and "perfect rhyme[s]" (p.341) to *nucleus-coda parity* (henceforth, *rhyme*)
7. "Imperfect" (p.341) *parities*, are "soft" (p.338) forms of parity, defined by Hopkins within two categories:
    a. *Subparities*: concessions by which a disparity can be treated as a lesser kind of parity. The following cases constitute *subparities*:
        i. Differing *segments* which contain at least one identical *phoneme*:
            eg. /gz/ and /ðz/ *coda* in "flogs"/ "breathes"
            eg. /e/ and /eɪ/ *nucleus* in "dress" / "lace"
        ii. *Margins* which differ only between:
            1. voiced/unvoiced continuants:
                eg. /θs/ and /ðz/ *coda* in "heaths" / "breathes"
            2. /n/ and /ŋ/:
                eg /nz/ and /ŋz/ *coda* in "bans" / "hangs"
            3. Fricative and stop articulations of the same place
                eg /p/ and /f/ *onset* in "pick" / "fill"
    b. *Defects* : poetic contexts through which a parity can be considered ineffective. The following cases are considered defective:
        i. Parities which differ in stress-accent:
            eg. /ɪŋ/ and /ɪŋ/ *nucleus-coda parity* in "sing" / "soaring"
        ii. Parities within etymologically similar words
            eg. /br/ and /br/ *onset parity* in "breath" / "breathes"
        iii. Syllables identical *phonemes* in each segment:
            eg. "breathes" / "wreathes" (weakly defective)
            or "breathes" / "breathes" (strongly defective)
        iv. Parities within words which end in disparity:
            eg. /i:t/ *rhyme* in "heat" / "greeting"

*Hopkins' morphological preference for syllable divisions, though not directly addressed, can be inferred from a minor manuscript detail. The examples initially given to illustrate the imperfection of "borrow[ing]" (p.341) letters between syllables, "Troy and destroy pair and despair", are struck through, and replaced with "member and di-smember". Hopkins' initial approach was clearly phonological: minimising the number of consonants in each margin, "des-troy"/"des-pair" would be natural, and "de-stroy"/ "de-spair" therefore erroneous *borrowings* to avoid the homophonous "troy"/ "troy", "pair"/ "pair". The correction, though, is morphological. Hopkins, presumably recognising "destroy" and "despair" as cognates of the Latin prefixations "de + struere"[20] and "de + sperare"[21] respectively, must have re-bracketed the words as "de-stroy" and "de-spair", for which no *borrowing* is necessary. "Dismember" is then a logical replacement, since it is bracketed as "dis-member", according to the Latin "dis- + membrare"[22]

Though each of the above is listed as an imperfection, Hopkins seems to distribute his affection unequally between them, as evidenced by brief glance at one of his best-known lines of pentameter:

> "I caught this morning morning's minion, king-[23]

The rich *lettering* conspicuously avoids parity between syllables differing in stress accent; the *onset* and *nucleus* of the first stress "caught" are repeated only in the stressed syllables "morn", and "king" respectively. Similarly, /m/ occurs only in the onset of stressed syllables. The *defect* 7b.i is therefore only apparent in the /ɪn/ and /ɪŋ/ *rhyme,* which spans both the unstressed "this"/ "ing"/ "ing" and the stressed "min" / "king". But just as conspicuously as 7b.i is avoided, 7b.iv is deliberately employed. Hopkins describes rhyme "partly in one line, partly in another" (p.342) as a *defect*, but the split of "king-/dom" to rhyme with "wing"[23] is a conscious engagement with this kind of rhyme. In reality, Hopkins' deconstruction of *parity* is highly effective at categorising effects of *lettering*, but less effective at selecting between these categories. Part III of this essay will therefore propose no new categorisation of Hopkins' rhythmic effects, only a new approach to understanding and mapping these effects, as they appear in Hopkins' rhythmic verse.

Part III: Principles of Echoic Scansion

> "I had long had haunting my ear the echo of a new rhythm" (Hopkins 1855: 14)

As noted by many of the critics cited in Part I, this "new rhythm", is in fact a very old one: the rhythm of "nursery rhymes" (ibid.). Although the letter containing this quotation gives comparatively dry examples from Shakespeare and Campbell (ibid.), it is the idea of a nursery-rhyme rhythm which seems to chime best with Hopkins' own work. If it were truly the case that *sprung rhythm* were the beginning and end of this similarity, critics should be equally willing to use the example of Milton or Shakespeare to explain Hopkins, and yet the nursery rhyme explanation is invariably more convincing. The largely unexplained affinity between Hopkins' verse and the Nursery rhyme is in fact a straightforward one, based on the principle of *lability*. In neurological terms, *lability* is the capacity of a memory to be altered in the process of reconsolidation[24]. The phenomena of Hopkins' nursery-rhyme metre are essentially *labile;* his metre can be understood phenomenologically as the process of recalling and recasting metrical structures based on progressing parities between them. This model depends on the fact that echoic memory, the form of short-term memory which encodes but does not interpret sounds, lasts only a few seconds[25]. The satisfying phenomenon of nursery-rhyme metre is therefore to extend the use of this short-term memory through

labile reconsolidation. It is, essentially, a metrical Shepard tone, which appears in the echoic memory to be a repeating chant – (a phenomenon so overwhelming, in the case of the *mantra*, as to evoke spiritual responses) – but all the while the labile *echo* is gradually mutating. In practical terms, this explains the preference of rhyme over repetition; the simple recurrence of syllables stops this compelling mutation in its tracks. In the nursery rhyme, each stress-initial beat is a call to attention, signifying the start of a new reconsolidation. "Ding" is recalled as "dong", and the *echo* is encoded to memory as "d...ng", but this begins to fade immediately, until the following line, "pussy's in the well", reconsolidates the *echoic* memory of "ding dong bell", creating a new *echo* "X X ...ell" (where X is a stressed beat). Importantly, these *echoes* are not simply repeating patterns of stress, but reiterations of a combined accentual and phonological phenomenon. To put it simply, the abstract *parity* of a rhythmic line is interpreted progressively through a series of *echoes*, each signalled by an initial stress, which are consolidated by repeating phonological figures in the same accentual position ie. by simultaneous parities of stress-accent and phoneme.

This is an ideological explanation behind the patterning of Hopkins' verse, but one must be substantiated through quantitative assessment. If the metrical effect of Hopkins' verse is defined by the combined effect of *phonemic* and *accentual* parities on series of metrical *echoes*, these *echoes* remain traceable when the verse is reduced to these parities alone. The system proposed below is therefore a method of *formal reduction,* representing the verse in terms of phonemic and accentual parities such that the two can be compared directly, making it possible to trace metrical *echoes* in physical, diagrammatic space.

Formal Reduction

Since the intended reduction is concerned only with *parities*, ie. the similarity of each new syllable to those preceding it, a generalised formal reduction is relatively easy to achieve. In order to reflect the process of reading, the only requirement of the system is that each syllable is compared to these preceding syllables, beginning with the most recent. Fortunately, this kind of regressive comparison can be expressed in an existing graphical form, a type of *self-contingency crosstabulation* or *crosstab*:

Ding	Dong,	Bell	Puss-	-y's	in	the	well
1-offset	Ding	Dong,	Bell	Puss-	-y's	in	the
2-offset		Ding	Dong,	Bell	Puss-	-y's	in
3-offset			Ding	Dong,	Bell	Puss-	-y's
4-offset				Ding	Dong,	Bell	Puss-
5-offset					Ding	Dong,	Bell
6-offset						Ding	Dong,
7-offset							Ding

This form includes a cell for every possible comparison of a syllable to a preceding syllable, and it can be used to express any possible parities between syllables. For instance, shading cells which contain the same stress accent as the header cell:

Ding	Dong,	Bell	Puss-	-y's	in	the	well
	Ding	Dong,	Bell	Puss-	-y's	in	the
		Ding	Dong,	Bell	Puss-	-y's	in
			Ding	Dong,	Bell	Puss-	-y's
				Ding	Dong,	Bell	Puss-
					Ding	Dong,	Bell
						Ding	Dong,
							Ding

Makes available all the possible accentual parities in the line. Prioritising parities with more recent syllables, represented by shaded cells higher-up in the crosstab, gives the following pattern:

Ding	Dong,	Bell	Puss-	-y's	in	the	well
	Ding	Dong,	Bell				
					Puss-	-y's	in

This is a revealing accentual representation of the line; the horizontal lines of shaded cells represent "running" (p.313) parities, and despite the apparent asymmetry of syllables in the line, the 0,3,0,3 shaded pattern above reveals a deeper symmetry in the form. The exact relevance of this formal representation becomes clearer when applied to more complex verse lines. The following example is taken from Hopkins' highly asymmetrical poem *The Leaden Echo*:

> How to kéep—is there ány any, is there none such, nowhere known some, bow or brooch or braid or brace, láce, latch or catch or key to keep
> Back beauty, keep it, beauty, beauty, beauty,... from vanishing away?[26]

Applying the same method of crosstabulation to this line's stress-accent gives the following:

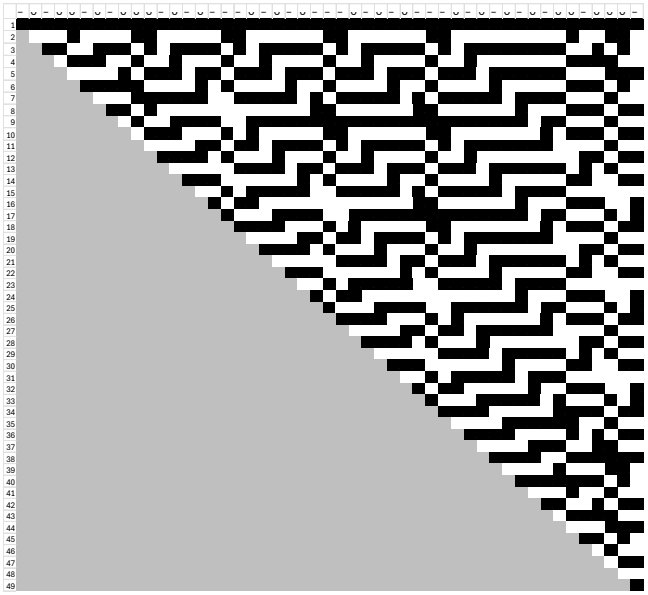


Fig.A: Stress-accent crosstab

Repeating patterns of stress are clearly visible in fig.A, but these patterns are not immediately easy to interpret. Essentially, each horizontal line represents a repeated series of stressed and unstressed beats; the distance of each line from row 1 represents the distance between the *initial* and repeated (*secondary*) iteration of the series. The longest of these horizontal lines is in row 9, and it spans almost half the original verse line, from "or brooch or braid" to "keep it, beauty, beaut-". Since the horizontal line is in row 9, the distance between *initial* and *secondary* is 8, meaning that stress of each syllable in this series matches the stress 8 syllables earlier.

Since *Fig.A* represents all of the possible accentual *parities* in the line, it is necessary to reduce the amount of data, in order to select which of these *parities* are actually experienced as *echoes* in the line. The first step is eliminate any *parities* with too great an *internal distance* (distance between the *initial* and *secondary*); *secondary* terms which appear after the *initial* term has fully decayed in the reader's echoic memory will simply not be recognised as *parities*. Since the duration of echoic memory is generally <4 seconds[27], and the tempo of English speech generally <5 syllables/second[28], the internal distance of a *parity* can conservatively be limited at 20 syllables. Applying this limit to *Fig.A* gives the following crosstab:

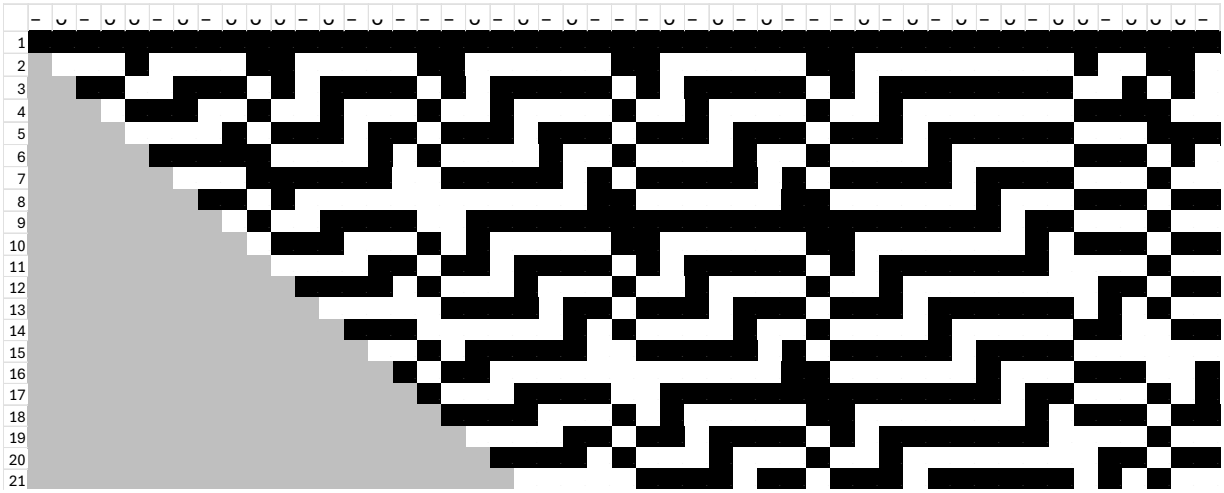


Fig.B; Stress-accent crosstab, limited at an internal distance of 20

This data can further be sorted using the internal components of each parity. Each parity, represented by a horizontal line, contains two components, its length (L), and its *internal distance*, (D). *Parities* can therefore be sorted into cases where $D = L$ (Abraham 1952 defines these as *even*), and those where $D \neq L$ (*odd* terms.) *Even parities* are a generalised form of Hopkins' "running" (p.313) effects, and *odd parities* "intermittent" (p.313) effects. In combinatorics, specifically binary word theory, these *even parities* are referred to as *squares*, the reason for which is conveniently evident when mapped onto *Fig.B:*

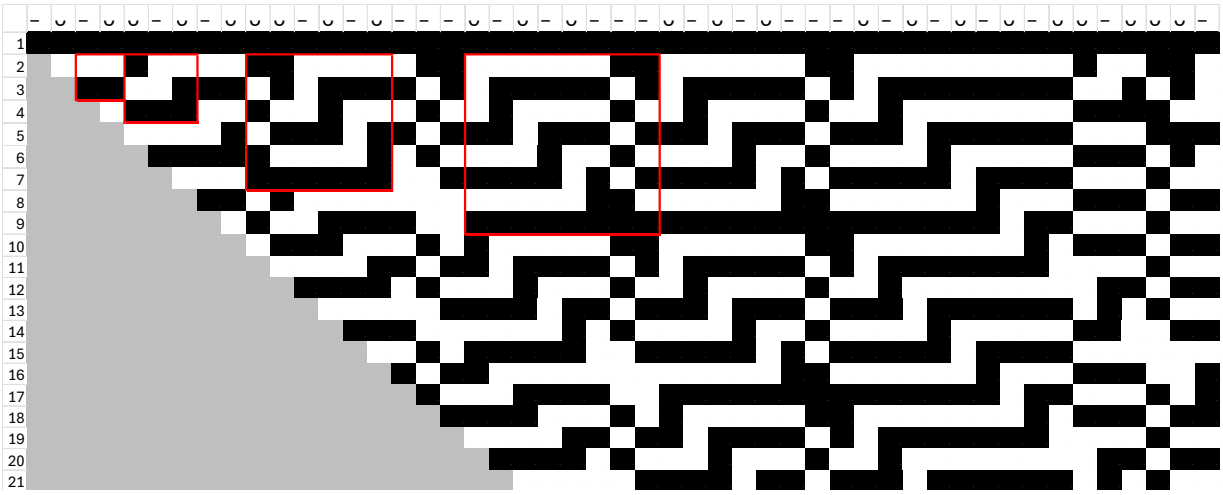


Fig.C: Examples of even parities. The lower edge of the squares follows along the initial term, and the upper edge along the secondary term, forming a quadrangle of width L, Height D, which is therefore "square" for even terms, since D=L

Since *even parities* of accentual stress are preferred to *odd* ones (p.313), the possible parities in *Fig.B* can be further screened so as to remove cells which are not contained within *even parities* (*squares*). Adding to this the earlier stated condition that *echoes* must be begin with a stress-accent, only the following parities remain for consideration as echoes:

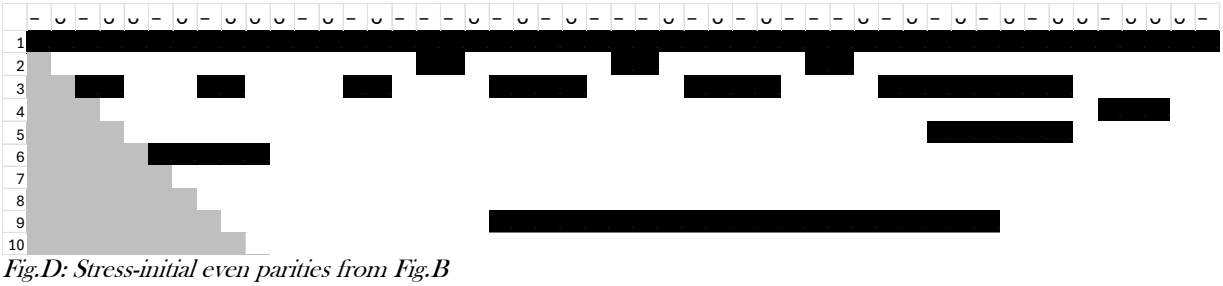


Fig.D: Stress-initial even parities from Fig.B

The full set of *parities* represented in Fig.D, henceforth termed the set of *primary echoes,* is given in *Appendix A.* Despite being constructed from *accentual* data, this set of *primary echoes* contains many of richest *phonemic parities* in the line. Though immediately visible, this fact is not yet entirely justified. In order to test this observation systematically, a *phonemic* crosstab must be constructed.

Owing to the simplicity of the *crosstab form,* a *phonemic* diagram can be constructed almost identically to the *accentual* diagram in *Fig.B*:

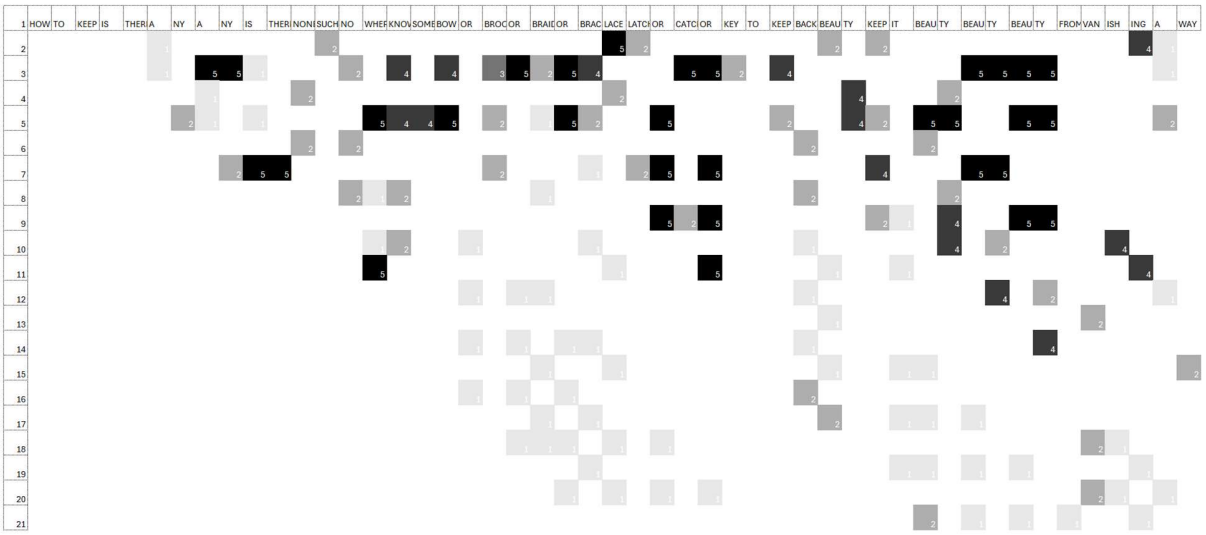


Fig.E: Phonemic crosstab, with parities assigned values 1-5 according to Hopkins' criteria, as described in Part II. Cells are shaded according to this value. An exception is made for exact repetitions, which are valued at 5 despite being excluded in Hopkins notes, since they are so abundantly used for rhythmic effect in Hopkins' poetry itself.

Since Fig.E represents patterns of *phonemic parity* using axes identical to those in Fig.D, the *primary echoes* can therefore be directly overlaid from Fig.D onto Fig.E, as follows:

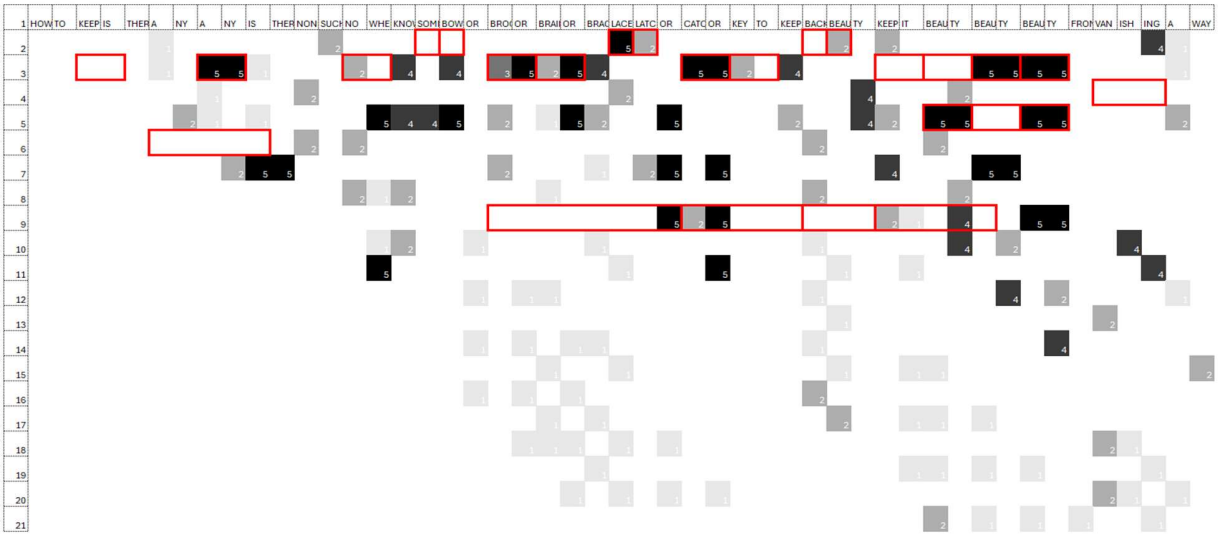


Fig.F: Red bars marking stress-initial even parities of accent (Fig.D), overlaid on phonemic crosstab (Fig.B)

Each red bar in *Fig.F* represents a *primary echo* from the set defined in *Fig D*, and the extent of its internal shading represents the extent *phonemic parities* contained within it. Comparing the average *phonemic parity*

inside and outside of these bars provides statistically compelling evidence that the line's *phonemic parities* are highly aligned with these *primary echoes*, as initially predicted. The data extracted from *Fig F,* (listed fully in in *Appendix B*) constitutes statistical proof that the *primary echoes*, are significantly rich in *phonemic parity*, both when compared to the line in general (at a statistical confidence level of >99.999999%), and to other *accentual parities* (at a confidence level of 99.999944%). The presentation of this data as a *crosstab* is by no means definitive, since the findings here are purely computational, but without a diagrammatic framework, these findings would be neither intuitive to reach, nor intuitive to explain. The incredibly high level of concord between the *primary echoes* of the line and its *phonemic parities* is, primarily, evidence that the set of *primary echoes* is not arbitrarily defined. Of course, this is no complete proof of a more generalised *echoic* understanding of verse, as earlier proposed. The single example presented above is only intended as a methodological blueprint, to demonstrate that the principles of *echoic scansion* can be practically applied, in order to generate quantitative evidence. The sheer amount of computation required to even approach an exhaustive application of *echoic* principles to Hopkins' verse is far beyond the scope of this proposal. However, each of the processes outlined above is systematic and reproducible, allowing for analysis of Hopkins' verse which is not only verifiable but grounded in Hopkins' own approach to prosody.

Conclusion

The system proposed in Part III is, from a critical perspective, difficult. It abandons the natural inclinations of a critical reader to deal with each formal flourish individually, according to its effect, and leaves the verse-line stripped of content and context. It is neither an approach which has appealed to critics of Hopkins, nor one which deals well with poets other than Hopkins, but it is, nonetheless, necessary. In teaching that

> "Some matter and meaning is essential to [poetry] but only as an element necessary to support and employ the shape which is contemplated for its own sake." (p.307),

Hopkins invites critics to adopt these strictly formal methods. There is perhaps a slight absurdity to the employment of rigorous statistical methods to prove a relationship between *phonetic* and *accentual echoes*, in a single phrase from a poem itself called *The Leaden Echo;* this relationship, to the average reader, is self-evident. The intention of the proof, therefore, is not to prove anything about the quotation itself, but to prove that such a proof is possible, to demonstrate that Hopkins' mythical "sound-texture" can survive formal deconstruction — to define *echoes* not as mystical "latent energies", but as detectable, traceable, provable features of Hopkins' verse.

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Appendix A: Parities Represented in Fig.D, by row.

Row 2 (D = L = 1): [“known” / “some” / “bow”], [“Brace”/ “Lace” / “Latch”], [“Keep / Back / Beau-”]

Row 3 (D = L = 2): [“How to” / “kéep—is”], [“ány” / “any”], [“None such”, “nowhere”], [“Bow or” / “brooch or” / “braid or”], [“latch or” / “catch or” / “key to”], [“Beauty” / “keep it” / “beauty” / “beauty” / “beauty”]

Row 4 (D = L = 3): [“beauty,... from” / “vanishing”]

Row 5 (D = L = 4): [“beauty, keep it” / “beauty, beauty”] , [“keep it, beauty” / “beauty, beauty”]

Row 6 (D = L = 5): [“How to kéep—is there” / “ány any, is”]

Row 9 (D = L = 8): [“none such, nowhere known some, bow or” / “brooch or braid or brace, láce, latch or” / “catch or key to keep Back beauty”], [“nowhere known some, bow or brooch or” / “braid or brace, láce, latch or catch or” / “key to keep Back beauty, keep it”], [“known some, bow or brooch or braid or” / “brace, láce, latch or catch or key to”], [“some, bow or brooch or braid or brace” / “láce, latch or catch or key to keep”] , [“bow or brooch or braid or brace, láce” / “latch or catch or key to keep back”]

Appendix B: Statistical Tests

	Number of *phonemic parities* contained within *accentual parities*						
	None	Near-Partial (1)	Partial (2)	Imperfect (3)	Near-perfect (4)	Perfect (5)	Mean
All possible *parities* (*Set* α)	618	65	39	1	16	31	0.474
All *accentual parities* (Fig.B) (Set β)	269	42	24	1	12	30	0.770
Selected *accentual parities,* (Fig.D) (Set γ)	36	1	7	1	1	17	1.698

Test 1:

$H_0: \gamma \subset \alpha$ (γ is a random sample of α)

$H_1: \gamma \not\subset \alpha$ (γ is not a random sample of α)

Under $H_0: \gamma \sim N\left(\overline{\alpha}, \frac{\sigma_\alpha}{\sqrt{n}}\right)$, by the Central Limit Theorem, where n is the size of sample γ .

$$\therefore \gamma \sim N\left(0.474, \frac{1.1887}{\sqrt{63}}\right)$$

Since $P(\gamma > 1.3726) = 0.00000001$, $P(\gamma > 1.698) < 0.00000001$

$\therefore$ Reject H_0 at a 0.000001% significance level, or 99.999999% confidence level.

There is sufficient evidence at a 99.999999% confidence level to suggest that γ is **not** a random sample of α

Test 2:

$H_0: \gamma \subset \beta$ (γ is a random sample of β)

$H_1: \gamma \not\subset \beta$ (γ is not a random sample of β)

Under $H_0: \gamma \sim N\left(\overline{\beta}, \frac{\sigma_\beta}{\sqrt{n}}\right)$, by the Central Limit Theorem, where n is the size of sample .

$$\therefore \gamma \sim N\left(0.770, \frac{1.5127}{\sqrt{63}}\right)$$

$P(\gamma > 1.698) = 0.00000056$

Reject H_0 at a 0.000056% significance level

There is sufficient evidence at a 99.999944% confidence level to suggest that γ is **not** a random sample of β