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# THE CASE OF THE MISSING LINE: NABOKOV'S MATHEMATICS IN *PALE FIRE*

In his seminal work on the Latin tradition in European literature Ernst Robert Curtius (1948) propagated the term *Zahlenkomposition* (Exkurs XV) to cover those cases where a literary work follows certain mathematical rules regarding, above all, the amount of poetical entities. Unfortunately his term has not won general acceptance regardless of its adaptable translation, for instance into Danish (*talkomposition*). In English one sometimes comes across the expression *number symbolism*, which is directly misleading. Numerical composition has nothing whatsoever to do with symbolic values of various numbers (the 'study' of which belongs to the realm of *numerology* along with flying saucers, black cats, and other examples of superstition). The term *number poetry* is more serviceable as it is more neutral, though perhaps not quite precise as it overlooks a crucial point – namely that the arithmetical entities belong to the *signifiant*, rather than the *signifié,* and may also direct the shape of prose texts (for instance the writings of Nabokov).

"Pale Fire" (i.e. John Francis Shade's poem) is a case in point. Already in the very first pages of the Foreword Charles Kinbote asserts that right from the start the text was intended to cover 1,000 lines, of which only 999 have been preserved. The loss, however,

is not very great: "Nay, I shall even assert (as our shadows still walk with us) that there remained to be written only *one* line of the poem (namely verse 1000) which would have been identical to line 1 and would have completed the symmetry of the structure".

Number composition was already known in pre-Roman antiquity, indicated by the autobiography of Darius the First, the Persian emperor (522-486 BC). The text, inscribed on a limestone cliff near the present-day village of Behistun (originally Old Persian Bagastana, 'the place of the gods'), is divided into five columns containing the following quantities of lines:

| Column | *1* | *2* | *3* | *4* | *5* | | | |
|---|---|---|---|---|---|---|---|---|
| Lines | 96 | 98 | 92 | 92 | 36 | | | |
| Even | + | + | + | + | + | | | |
| Odd | - | - | - | - | - | | | |
| Sum | | | 92 | 92 | | 184 | | |
| Sum | 96 | 98 | | | 36 | 230 | | |
| Proportion | 184 : 230 = 4:5 = $x$: ($x$+1) | | | | | | | |

A proportion of the type $a$:$b$ = $x$::($x$+1) was called *epimorion* by Archytas (428-37 BC). For the Greek (Pythagorean) influence upon the Old Persian script and the Behistun inscription, see Jensen (1966, 1970, 1986, 2002).

Some very basic similarities in regards to the sense of strict mathematical harmony occur in "Pale Fire" (the poem). That fact in no way implies that Nabokov had any knowledge of Persian literature, although he might easily have had. Ronald G. King's edition (1950) had been reprinted several times. Rather it goes to demonstrate that, normally, mathematical composition tends to utilize some very general, almost trivial arithmetical phenomena: the opposition of even/odd, prime numbers, or squares and so on.

On the other hand Nabokov was undoubtedly well acquainted with another early example of numerical composition: the division of the Psalms of the Hebrew Bible into groups of 41, 31, 17, 17, 43 (the so called nr. 150 being a later addition). All five

numbers are primes, and so is their sum (149). Moreover, pursuit for symmetry is obvious, although generally overlooked.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 41 | 31 | 17 | 17 | 43 | | | |
| 41 | 31 | | 17 | 43 | 72:60 = 6:5 | | |
| 41 | | | | 43 | 84:48 = 7:4 | | |
| | 31 | | 17 | | | | |

After the addition of Psalm 150, the pattern looked like this:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 41 | 31 | 17 | 17 | 44 | | | |
| 41 | | | | 44 | 85:65 = 17:13<br>5*p*:5*p* | | |
| | 31 | 17 | 17 | | | | |

The difference is most likely due to the psychological fact that the first 'redactor' had an arithmetical approach to numerical phenomena, whereas his colleague saw them from a geometrical point of view. That is, they were both highly intelligent and observant people, but belonged to different *psychologische Typen*, as C. G. Jung (1921) would have put it. Nabokov, it seems, possessed the ability to create a bridge between these two attitudes, as shall be demonstrated below.

The five Books are connected by means of an acrostic:

| 5. | 4. | 3. | 2. | 1. | |
|---|---|---|---|---|---|
| ה | ת | ם | ל | א | to a dead (woman) |

So the notion of acrostic, which plays an important role in *Pale Fire*, was known already two millennia before his time.

There can hardly be any doubt that Nabokov knew his Vergil, in whose poetry one likewise finds evident traces of mathematical composition; the fact that the name of Maecenas occurs in symmetrical positions (verse 1.2, 2.41, 3.41, 4.2) has been well known for centuries. No classical philologist, however, has been able to interpret this

arrangement correctly. What characterizes the figures 2 and 41 is that both of them are prime numbers. Moreover, the only even prime number existing (2) is combined with an arbitrary odd prime number out of an infinite multitude in determining the exact amount of hexameters found in each Book and choosing them on a symmetrical basis:

| Book | | *1* | *2* | *3* | | *4* | | |
|---|---|---|---|---|---|---|---|---|
| Hexameters | | 514 | 542 | 566 | | 566 | | |
| Divided by 2 | | 257 | 271 | 283 | | 283 | | |
| Squares | $16^2$ | | | | | | | $17^2$ |
| Primes | | first | middle | last | | | | |

The notion of 'doubled prime' is found in Nabokov in such an evident way that it has often been overlooked:

| Canto | *1* | *2* | *3* | *4* | Formula |
|---|---|---|---|---|---|
| Lines | 166 | 334 | 334 | *166 | |
| Divided by 2 | 83 | 167 | 167 | 83 | *p* |
| Place in prime list | 24 | 40 | 40 | 24 | 8*p* |
| *p* = | 3 | 5 | 5 | 3 | |

As in the *Georgics*, the position in the line of primes has also thus been taken into consideration.

The omission of line 1,000 similarly has a parallel in Vergil's composition of the *Georgics*. If a hexameter is defined as a specific metrical unit, then the *Georgics* contain 2,188. If, however, its definition is based on semantics, then there are only 2,187, as the wording of two verses is identical.

Since $2187 = 3^7$, i.e. a prime elevated to a potency which is also a prime, it may be considered an 'elegant' number. In Nabokov's case the outcome is 999, which is what in German is called a *Schnappszahl*. This phenomenon, as is well known, was mentioned by the author of the Apocalypse (666), although it would be rash to assume that he had any first-hand acquaintance with Bavarian Bierstuben.

Vergil's youthful poetry marked the starting point of European mathematical composition. His elaborate system inspired Horace to an apparently very simple, but in reality extremely complicated construction in Book I of his Odes, written in hexameters – the most conspicuous features are described here:

| Ode | *1* | | *2* | *3* | *4* | | *5* | *6* | *7* | | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hexameters | 121 | | 134 | 142 | 143 | | 104 | 131 | 35 | | 50 | 78 | 92 |
| Relative size | first<sec. | | | do. | do. | | | do. | do. | | | | |
| Combined | 255 | | | 285 | 235 | | | 85 | 170 | | | | |
| Divisible by 5 | + | | | + | + | | | + | + | | | | |

"Pale Fire" Canto IV has a clear numerical structure based on the fundamental distinction between even and odd numbers, cf. the following chart.

| | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* | *15* | *16* | *17* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| lines | 12 | 6 | 8 | 12 | 14 | 8 | 12 | 8 | 8 | 8 | 8 | 2 | 8 | 8 | 6 | 22 | *16 | | |
| even | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| odd | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | 8 | | | 8 | | 8 | 8 | 8 | 8 | | 8 | 8 | | | | **64** | = 16·4 |
| | 12 | 6 | | 12 | | | 12 | | | | | | | | 6 | | | **48** | = 16·3 |
| | | | | | 14 | | | | | | | 2 | | | | | 16 | **32** | = 16·2 |
| | | | | | | | | | | | | | | | | 22 | | **22** | |
| total | | | | | | | | | | | | | | | | | | **166** | |

Compare Canto I:

| Sect. | *1* | *2* | *3* | | *4* | | *5* | *6* | | *7* | *8* | *9* | *10* | *11* | *12* | *13* | *14* | *15* | *16* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Line | 12 | 16 | 12 | | 8 | | 9 | 13 | | 8 | 7 | 13 | 6 | 10 | 10 | 6 | 16 | 10 | 10 |
| Even | 12 | 16 | 12 | | 8 | | | | | 8 | | 13 | 6 | 10 | 10 | 6 | 16 | 10 | 10 |
| | 48 | | | | | | | 8 + 32 = 40 | | | | | 36 | | | | | | |
| Odd | | | | | | | 9 | 13 | | | 7 | 13 | | | | | | | |
| | | | | | | | 22 | | | | 20 | | | | | | | | |

The composition of this text, not to say construction, abounds in epimorion proportions: 36:48 = 3:4; 36:40 = 9:10; 40:48 = 5:6; 20:22 = 10:11.

Moreover, the first ten lines of Canto I are, presumably, bound together by an embedded message, written in Latin:

| Line | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| Initials | I | B | I | L | A | M | U | H | A | C |
| Encoding | acrostic | | anagram | | | acrostic | | | | |
| Decoding | *ibi* | | *luam mula* | | | *hac* | | | | |

The central constellation of letters allows for a double decoding: *luam* (subj. or future of the verb *luo*) and *mula* (vocative of *mula* 'mule'). While the literal meaning of the message is 'There I shall wash, you mule, in this manner,' the implication may be something more along the lines of 'there I shall atone, you silly cow, in this manner'. Further light on this question must be postponed until the whole of the poem has been submitted to a computer analysis. Where one hidden message has been unearthed, others might very well turn up.

The insertion of a personal message into a poetical text could equally have been inspired by Vergil's *Georgics* – its first few lines run as such:

> Quid faciat laetas segetes, quo sidere terram
> uertere, Maecenas, ulmisque adiungere uitis
> conueniat, quae cura boum, qui cultus habendo
> sit pecori, apibus quanta experientia parcis,
> hinc canere incipiam. uos, o clarissima mundi
> lumina, labentem caelo quae ducitis annum;
> Liber et alma Ceres, uestro si munere tellus

The message embedded on the position 'second word from the end' is an anagram stating: *caces d(eos) m(anes)*, 'fuck the gods'. This youthful, defiant blasphemy might in itself have caused the poet to be sentenced to death. Worse was to come, however, in the

preface of the Aeneid. On the intriguing topic of Vergil's death see www.virgilmurder.org.

Nabokov mastered the technique of mathematical composition already at the age of 25, as demonstrated by his Shakespearean poem, written in Russian (for text and translation see Grayson (2002: 1.216-219)). However, it is equally clear that he never passed on that knowledge to his son, Dmitri. Otherwise, the translation would have looked radically different.

The Shakespeare poem:

| **Sections** | I | II | III | IV | | | | *p* = | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lines | 6 | 16 | 8 | 12 | | | | | | | | |
| Even | + | + | + | + | | | | | | | | |
| Odd | - | - | - | - | | | | | | | | |
| | 6 | | 18 | | 24 | 8*p* | | 3 | | | | |
| | | 16 | | 8 | 24 | 8*p* | | 3 | | | | |
| Words | 31 | 85 | 89 | 43 | 248 | 8*p* | | 31 | | | | |
| Even | - | - | - | - | | | | | | | | |
| Odd | + | + | + | + | | | | | | | | |
| | 31 | | 89 | | 120 | 120:128 = 15:16 | | | | | | |
| | | 85 | | 43 | 128 | | | | | | | |

A forerunner of Nabokov's was the prolific writer who around 100 BC composed two major texts of the New Testament, the Gospel according to Luke and Acts. A few embedded messages chosen (almost) at random (from Acts ch. 18) may suffice to illustrate her use of Latin messages to describe certain very private situations.

18.2

καὶ εὑρών τινα Ἰουδαῖον

ὀνόματι Ἀκύλαν, Ποντικὸν τῷ γένει, προσφάτως ἐληλυθότα

ἀπὸ τῆς Ἰταλίας καὶ Πρίσκιλλαν γυναῖκα

αὐτοῦ διὰ τὸ διατεταχέναι Κλαύδιον χωρίζεσθαι πάντας τοὺς Ἰουδαίους

ἀπὸ τῆς Ῥώμης, προσῆλθεν αὐτοῖς

*Translation*: There he found a Jew named Aquila, a native of Pontus, who had recently come from Italy with his wife Priscilla, because Claudius had ordered all the Jews to depart from Rome. Paul approached them…

Decoding:

| | |
|---|---|
| CETI | CETI cite |
| OAPT GPE | OAPT apto |
| ATICP G | ATICP capti |
| AD TDCCPTI | AD da |
| ATRPA | ATRPA parta(m) |

Decoding: *Cite apto capti da parta(m*), 'Quickly give the slave's daughter to the intelligent man'. The accusative ending *–m* is regularly omitted in contemporary inscriptions, cf. below. The slave's daughter was Luke herself. She was a Jewish girl, whose real name was Eva. The name Luca derives from the garrison city in Northern Italy (nowadays Lucca), where her boyfriend Titus was a Roman officer. She bore him a son, also called Titus, but her father refused to marry them (which would have meant granting her Roman citizenship). The accusative ending *–m* is regularly omitted in contemporary inscriptions, cf. below.

**18 Ὁ δὲ Παῦλος ἔτι**

**προσμείνας ἡμέρας ἱκανὰς τοῖς**

**ἀδελφοῖς ἀποταξάμενος ἐξέπλει εἰς τὴν** Συρίαν,

**καὶ σὺν αὐτῷ Πρίσκιλλα**

**καὶ Ἀκύλας, κειράμενος ἐν**

Κεγχρεαῖς τὴν *κεφαλήν, εἶχεν γὰρ εὐχήν***.**

| **Acts 18.**18 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Word init. | O | D | P | | E | | P | | E | | T | I |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acrostic | | | | | *peti* | | | | | | | |
| Anagram | *pedo* | | | | | | | | | | | |

| **Acts** 18.18 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Word init. | (A) | A | E | E | T | K | S | A | P |
| Acrostic | | | | | | | | | *cace* |
| Anagram | | *ăete* | | | *pacs = pax* | | | | |

**18.18**

**Ὁ δὲ Παῦλος ἔτι** **ODPE pedo**

**προσμείνας ἡμέρας ἱκανὰς τοῖς** **PEIT peti**

**ἀδελφοῖς ἀποταξάμενος ἐξέπλει εἰς τὴν** **AAEET âete**

Συρίαν**, καὶ *σὺν αὐτῷ Πρίσκιλλα*** **CSAP pax**

***καὶ Ἀκύλας* κειράμενος ἐν** **CACE cace**

Κεγχρεαῖς τὴν κεφαλήν, εἶχεν γὰρ εὐχήν.

*Translation*: And Paul after this tarried there yet a good while, and then took his leave of the brethren, and sailed thence into Syria, and with him Priscilla and Aquila. He had his hair cut off at Cenchrea because he had made a vow.

*Decoding*: ‘I (don’t give a) fart. I asked (you), (my) Eagle’ (from Gk. αετός), ‘peace (= let’s be friends again), bad (boy)’. There is a vague possibility that the final initials CEGE stand for a misunderstood imperative of the verb cogo, the perfect of which *coegi* was probably monophthongized in Luke’s time: ‘force (me)’

**[26]οὗτός τε ἤρξατο παρρησιάζεσθαι** ἐν

**τῇ συναγωγῇ: ἀκούσαντες**

**δὲ αὐτοῦ**

**Πρίσκιλλα καὶ Ἀκύλας προσελάβοντο αὐτὸν** καὶ

**ἀκριβέστερον αὐτῷ ἐξέθεντο τὴν ὁδὸν**

| | |
|---|---|
| CETI | CETI cite |
| OAPT GPE | OAPT apto |
| ATICP G | ATICP capti |
| AD TDCCPTI | AD da |
| ATRPA | ATRPA parta(m) |

18.26

| | |
|---|---|
| **[26]οὗτός τε ἤρξατο παρρησιάζεσθαι** | OTEP peto |
| ἐν **τῇ συναγωγῇ: ἀκούσαντες** | SAT sat |
| **δὲ αὐτοῦ** | DA da |
| **Πρίσκιλλα καὶ Ἀκύλας προσελάβοντο αὐτὸν** | PCAPA cappa(m) |
| καὶ **ἀκριβέστερον αὐτῷ ἐξέθεντο τὴν ὁδὸν** | AAETO âeto |

Decoding: *peto, sat, da cappam aeto (= αετωι).* 'I pray, enough, give the clothes back to (me), (your) Eagle'.

Luke was eager to include a memorial to her lover, the 'bad' boy, who evidently helped her in editing the last of the above quotations. As her pet name for him was Aetos, or 'Eagle', she invented a totally fictitious man calling him Aquila (Latin for eagle). To symbolize herself as the epitome of 'das Ewig Weibliche, das zieht uns hinan,' she similarly coined a diminutive of the Latin word *priscus* meaning 'ancient'. Hence, the English name Priscilla.

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