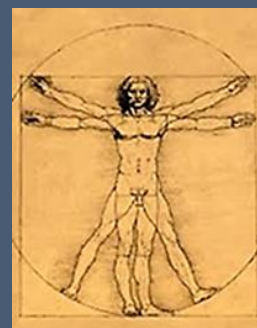


Lidia Vianu

The “Quark”...



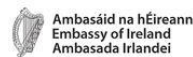
Joyce Lexicography
Volume 121

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Director
Lidia Vianu
Executive Advisor
George Sandulescu



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**A Manual for the Advanced Study
of *Finnegans Wake* in 121 Volumes**
Totalling 35,000 pages
by C. George Sandulescu and Lidia Vianu



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Holograph
list of the
40
languages
used by
James Joyce
in writing
*Finnegans
Wake*

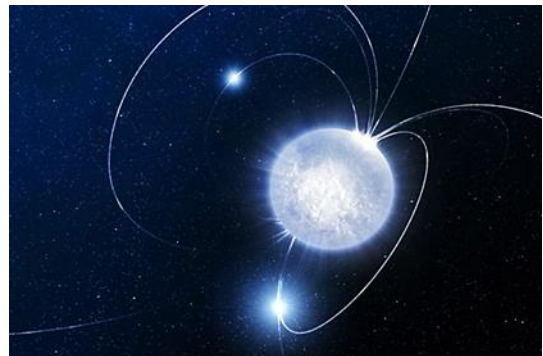
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The “Quark”...



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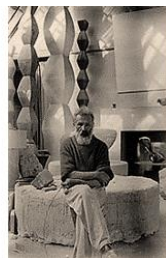


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Contents

| | |
|---|-------|
| The Quark – Thought-Syllable-Sound | p. 6 |
| I. | |
| Blaise Pascal – La Pensée. 'Travaillons donc à bien penser.' (1670) | p. 13 |
| Max Richter – The Mind. '...în fiecare atom al naturii se găsește o inteligență.' (1939) | p. 14 |
| Ioan Iovitz Popescu – The Etheron. (1982) | p. 15 |
| James Joyce – The Quark. (1939/1964) | p. 16 |
| Egbert K. Duursma – The bridge between Matter and Mind. (2013) | p. 17 |
| Emanuel Swedenborg – The Angels in Conversation with Man. (1758) | p. 20 |
| Ferdinand de Saussure – Le Signe. Le Signifiant. Le Signifié. (1916) | p. 25 |
| Roman Jakobson – 'Le signe est un renvoi.' (Milan, 1972) | p. 27 |
| George Sandulescu – The Multi-Sign. | p. 28 |
| II. | |
| Circle, Axis, and Sphere: Joyce and Brancusi. (1929) | p. 31 |
| <i>Le sens du pousser: Brancusi's Portraits of Joyce...</i> | p. 32 |
| Brancusi's Signs – Used to portray James Joyce. | p. 33 |
| Joyce and Brancusi. | p. 34 |
| The Sphere – W.B. Yeats. (1933) | p. 44 |
| Charles Ogden – <i>The Meaning of Meaning</i> . (1923) | p. 47 |
| C. George Sandulescu and Lidia Vianu: The Letter G from Joyce's 'Words' in <i>Finnegans Wake</i> . | p. 48 |



III.

C. George Sandulescu – Cartouching

p. 94

Appendices

p. 110

C. George Sandulescu – Only Connect...

p. 111

Quantifying Joyce's *Finnegans Wake*

p. 132

A Manual for the Advanced Study of James Joyce's *Finnegans Wake*
in 121 Volumes...

p. 169



PRECIS OF FW BY JAMES JOYCE IN STRAIGHT SHAPE.

REVISED VERSION

For 17 years solid James Joyce worked hard at his borogoves.

There were also mimsies, and last but not least, a vast amount of slithy toves. Most were hierarchically organized, but the borogoves had the upper hand. We should not forget the wabes and blades, but right at the top were the mome raths.

It would take another hundred volumes or so to analyse each of these categories in great detail, and which indeed did not at all carry the upper hand.

But I personally am fascinated between the relations between the borogoves on the one hand, and all the rest taken together on the other hand.

The wabes form a fascinating colony of words, but they are far too difficult for the man in the street.

A discussion of wombats is another matter altogether.

ends



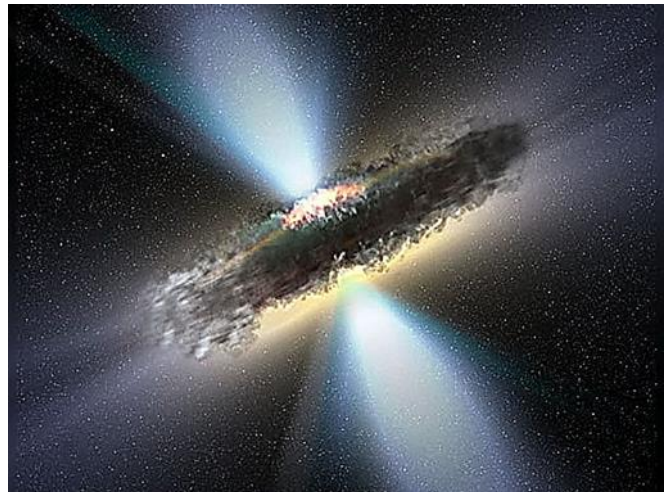
The "Quark"...



4

**We may come, touch and go, from atoms and ifs but
we're presurely destined to be odd's without ends.**

(FW455.16:5)



Lidia Vianu
Joyce Lexicography Volume 121
The "Quark"...



5

(Stoop) if you are abcedminded, to this claybook, what **curios of signs** (please stoop), in this allaphbed! Can you rede (since We and Thou had it out already) its world? It is **the same told of all**. Many. Miscegenations on miscegenations. Tieckle. They lived und laughed ant loved end left. Forsin.

FW 018.17

seeker of the nest of evil in the bosom of a good word

FW189.28:6

And wordloosed over seven seas crowdblast in
celtelleneteutoslavzendlatinoundsript.

FW219.16:6

Lets hear in remember

FW338.32:8





The Quark – Thought-Syllable-Sound

As a child I only had one favourite toy. No other toy meant anything to me at all. I despised their make-believe. But this one toy – if a toy it was – showed me the secret of my world. Its name was *kaleidoscope*.

When Ioan-Iovitz Popescu was visited by the idea of the *Etheron*, he thought of a Kaleidoscope which builds shapes – innumerable shapes – out of smallest units of matter.

While working on Joyce's *Finnegans Wake* for a long time, George Sandulescu was the first to notice that, when faced with language, Joyce was like a child with a kaleidoscope. His Etherons were the Thought-Syllable-Sounds. Joyce's own name for them was **Quarks**.

'The Universe is filled almost exclusively with particles of tiny mass,

$$m = hH/2c^2 \approx 1,3494 \times 10^{-69} \text{ kg},$$

moving at random at light speed, c , where h is the reduced Planck's constant and H is Hubble's constant.'

These tiny particles were named Etherons by Ioan-Iovitz Popescu. The cosmic Etherons are always free: they can go right through the most rarefied matter, through all temporary structures. Nothing can stop or capture them, except highly dense etheron concentrations such as found within atomic nuclei.

Brancusi's view of the universe is built on a very simple idea: circles revolving round an axis suggest space, an endless spiral – the Column of the Infinite.

Joyce's books suggest a similar spiral: they are built on one very simple thought. That thought is the axis. The circles revolving around it are ...words?... syllables?... Syllable-Sounds.

Joyce found his own Etheron: it was the Thought-Syllable-Sound (TSS). He

The "Quark"...



7

himself called it the Quark. This tiniest particle of Joycean craft transits freely languages, stories, minds, history, geography, music, and so much more. It is faster, and infinitely simpler than all the forms of communication that we know.

While using it, Joyce's message to us is:

I think in your mind: your language is in the way.

With an addition, though:

Language is so much fun if you make it your own. So is everything: history, literature, geography, music... Find me out. Continue what I have begun. Lisant au livre de lui même.

Meaning

A meaningful story—with its necessary fixed structure, suspense and clear ending—is a statement of mortality. Joyce calls it 'sotisfiction' (FW452.06:9)—a suggestion that fiction makes us 'sots' (stupid readers).

Eliot stated that the 'meaning' of a poem was a 'habit' of the reader's mind:

The chief use of the 'meaning' of a poem, in the ordinary sense, may be (for here again I am speaking of some kinds of poetry and not all) to satisfy one habit of the reader, to keep his mind diverted and quiet, while the poem does its work upon him: much as the imaginary burglar is always provided with a bit of nice meat for the house-dog.

(*'Reflections on Vers Libre'*, 1919)

Meanings, eventually, end up as clear explanations. In spite of the fact that Eliot claimed that he did not trust meanings, he did add Notes to his *Waste Land*. Those Notes were meant to clarify the Signs in his lines, to help the reader figure out what the poet had meant to say.

James Joyce left us a vortex of particles: words, letters suggestive of a name, a place, a song, fragments of one language or another. It is a captivating adventure—better than any story ever—to trace all the suggestions enclosed in one single word.





On the other hand, as Joyce once put it, mistaken readings of signs are welcome 'portals of discovery'.

The Sign, however, is not enough for James Joyce: it leads to more of the same. Consequently, he chooses to guide his readers towards his Quarks by means of the **Fragestellung Method**. Brancusi declared that his portraits of Joyce expressed a feature which he had detected in the writer: *le sens du pousser*. Going in that direction, what a question conveys is precisely *le sens du pousser*: unlike the sign, it opens an unpredictable road. Between writer and reader, it grows into a vortex, a world of its own. The only way to read Joyce is to find his questions, his Quarks, in every word.

On the surface, at least, *Finnegans Wake* is a huge quiz. It has a number of possible answers, some of which are thoroughly enjoyable. They are, in fact, fairly simple, sometimes obsessive answers.

On the other hand, *Finnegans Wake* comes fairly close to Swedenborg's 'speech of angels'. It shortcircuits any exchange of words, of signs. While reading it it, minds connect without need for explanation:

'Angels can express in a single word what a man cannot express in a thousand words. Again, a single angelic word contains innumerable things that cannot be expressed in the words of human language; for in each of the things uttered by angels there are arcana of wisdom **in continuous connection** that human knowledges never reach.'

[Emanuel Swedenborg, *Heaven and Hell*, 269]

'Meaningful' literature is short-term literature: it stops once we have found an answer, once we have explained the writer's signs. There is a huge difference between one-meaning-signs and multiple-question-mark-Quarks. Joyce's 'Bygmester Finnegan' (FW004.18:1) – who was a *meșter*, like Brancusi himself – starts from a word, expanding it from circle to spiral, until it grows into a vortex. Joyce wrote books based on an idea as simple as Brancusi's 'Coloana Infinitului'. His story is the simplest story of them all: it is his own biography. To that, he adds a few more recurring stories, whose meaning, unlike Eliot, he practically hides under the carpet.



According to Egbert Duursma, by travelling so easily from shape to shape, from man to man, from what we call 'past' to 'present' or 'future', Etherons are the bridge between matter and mind. The Etheron, the tiniest particle in the universe, connects what to us is palpable—bodies, concrete signs—to what we think is impalpable—our own questions about feelings, thoughts, souls. Joyce's Quarks, which are, basically, Thought-Syllable-Sounds, connect them all. They say without saying.

The Earworm

'But the whacker his word the weaker our
ears for auracles who paroles parses orileys.'

(FW467.28:3)

The Earworm is a habit of one's memory. It is a musical term, for a phenomenon which the BBC and Goldsmiths University of London are jointly studying now:

'The term earworm originally comes from a translation of the German word 'Ohrwurm'. It refers to the experience of having a tune or a part of a tune stuck in your head. Often a person experiencing an earworm has no idea why a tune has popped into their head and has little control over how long it continues.

Earworms are a really common phenomenon: A recent poll suggested over 90% of the population experience them at least once a week, so it seems like having the odd earworm is perfectly normal. Now Goldsmiths University have launched some serious research into our little wriggly friends...'

(Music, Mind and Brain, Goldsmiths University of London,
<http://www.gold.ac.uk/music-mind-brain/earworm-project/>)

In most of his poems, Eliot uses literary Earworms as signs of texts which the



reader has already seen, and which the poet does not quote in full.

James Joyce, mainly in *Finnegans Wake*, defamiliarizes the Earworm. What exactly a word can be pointing at is the reader's private discovery. Reading *Finnegans Wake* requires almost as much curiosity and inspiration as writing it did. Joyce never meant to help the reader in his Sherlock Holmesing. Decoding – biographical, literary, broadly cultural – signs may be useful with Eliot. Joyce's Earworms are questions: the thought, the syllable, the sounds in a Quark are beginnings in the reader's mind – they never end.

Eliot's Earworms point to clear, coherent language, and his languages were: English, German, and French, with bits of Italian, Latin, Greek, and Sanskrit. Even though Joyce handled more than forty languages in *Finnegans Wake*, he used his Earworms as signals that **language was not enough**.

T.S. Eliot once wrote: 'Genuine poetry can communicate before it is understood.' Joyce never said it in as many words, but his texts had one aim alone: to short-circuit the very idea of communication as explanation, and think directly in the mind of his readers. He did that by subverting all the verbal habits that he was aware of.

A language that we know is likely to brainwash us, so Joyce tried to wake us up. He destabilized words: spelling, pronunciation, word-formation, morphology, syntax, meanings, and collocations. He contradicted our expectations of regularity: verbal, stylistic, structural rules were deliberately and systematically reshuffled. **Opposition to verbal habits** draws our attention to what is being said. In his own words, 'Andoring the games, induring the studies, undaring the stories, end all.' (FW368.34:12)

This being the obvious case, a question arises: why did James Joyce avoid the word 'Epiphany', after he had used it only once, in *Stephen Hero*, his discarded manuscript?



Quark-Connecting

Lexicon 121 sums up the intention of this first part of Joyce Lexicography Series.

The tiniest particle in any universe is the one responsible for the life of that universe. It is the very substance of life, actually. Ioan-Iovitz Popescu called it the Etheron. In James Joyce's books, the tiniest particle is the Thought-Syllable-Sound (TSS) – The Quark.

The Etherons travel freely across all shapes matter can take. They carry information from object to object, from body to body, from mind to mind. They make up a collective soul. They are both freedom and structure in one.

In this *Finnegans Wake* series, we have identified Joyce's tool: the Etheron which can build. We have drawn up a body of Joyce's 'Words', which were all painstakingly built out of Thought-Syllable-Sounds. It took Joyce 17 long years to create them all.

The logical next step is the question: on the basis of what intuition of the universe at large did Joyce start this vortex? WHY did he methodically change all the words he had ever learnt, in all the languages that he was aware of?

There is only one answer, which opens the way for a – possibly – second series of Joyce Lexicography: Connecting the Quarks.

Lidia Vianu
Joyce Lexicography Volume 121
The "Quark"...



12

Dear Lidia,

I find the association of Etherons as building blocks of all possible structures occurring in Nature very useful and productive. Similarly, your TSS (Thought-Syllable-Sounds) can be viewed as building blocks of all possible structures in literary creation, being both meaningful and productive for other fields, too. Thus, for instance, musical theory will certainly confirm there is an Etheron in music as well, the TPS (Thought-Pitch-Sound).

Furthermore, a certain periodicity – which enables them to close and regroup – makes structures/constructions built with Etherons more stable. Such is the case of circular, spiral, vortex, or – the most general of them all – toroid structures.

The Endless Coulmn itself is a mere segment of a torus, which comes from the infinite, crosses Earth, and goes on towards the infinite. It consists of building blocks (bricks) which are repeated again an again, in an etheronic chain.

Iovitz Popescu





13

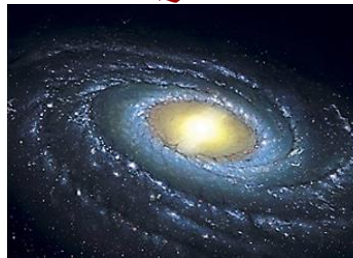
I.

Blaise Pascal – La Pensée. 1670

'L'homme n'est qu'un roseau, le plus faible de la nature ; mais c'est un roseau pensant. ... Toute notre dignité consiste donc en la pensée. ... **Travaillons donc à bien penser** : voilà le principe de la morale.'

[Pascal, *Pensées*, 1670, fragments 347 et 348
dans l'édition L. Brunschvicg]





Max Richter – The Mind. 1939

‘Perceperea și gândirea noastră sunt mărginite mai ales prin ideile de spațiu și de timp înnăscute în noi. Suntem incapabili de a ne închipui ceva fără timp (eternitate) sau fără spațiu (nemărginit, infinit). Fiecare efect trebuie să aibă pentru noi o cauză, legea de cauzalitate ne stăpânește. Spațiul, timpul și cauzalitatea pe cari le atribuim, fără șovăire lumii exterioare, nu sunt decât forme înnăscute ale facultăților noastre de cunoaștere.’

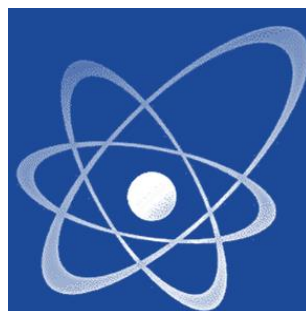
[Max Richter: *Filozofie. Științe moderne. Poezie*,
Inst. de arte grafice „Tiparul Universitar”,
București, 1939, p.4]

‘Noi nu cunoaștem aproape de loc aparatul nostru de gândire, creierul. Acesta este un aparat complicat cu 9.000 de milioane de celule de ganglioni și nici până azi nu știm cum se naște un gând.’

[Id. p. 8]

‘...în fiecare atom al naturii se găsește o inteligență ... tot universul este în sufletit.’

[Id. p. 14]





Ioan-Iovitz Popescu – The Etheron. 1982

'The Universe is filled almost exclusively with particles of tiny mass, m_E , moving at random at light speed, c . The aggregated mass, stored in stars and galaxies, can be formally considered as constructed of such particles of mass m_E – called here **etherons** – whose number is proportional to the ratio between the inertial mass of the body and the mass of etherons.'

(...)

'A new explanation of the Newtonian law of gravitation is given, proceeding from the following statements: a) the Universe is finite and filled with some **particles of exceedingly small mass, travelling chaotically at the speed of light**; b) all the material bodies in the Universe are made up of such particles called 'etherons'; c) **the matter in the Universe is prevailingly under the form of etherons**; d) the hydrodynamic mechanism of Lesage for the gravitational interaction is valid, the cosmic background being the ether made up of etherons.'

(...)

'Generally, we expect the etherons to have extraordinary, hardly conceivable properties. This is basically caused by the fact that the **etherons carry almost 100 % of the mass of the entire Universe**, ... while their proper volume is about 61 orders of magnitude smaller than the total Universe volume, a number derived from the given radius of the etheron of 10^{-35} m and of the Universe radius of 10^{26} m. In simple words, our observable Universe, excepting the volume occupied by the composing 10^{122} etherons, is void of mass, though, actually, it contains the huge overall mass of 10^{53} kg carried solely by etherons with negligible volume.'

[The Romanian Academy journal of physics *Studii și Cercetări de Fizică*, vol. 34, Editura Academiei, 1982, pp451-468]



James Joyce – The Quark. 1939 / 1964

Three quarks for Muster Mark!

*Sure he hasn't got much of a bark
And sure any he has it's all beside the mark.
But O, Wreneagle Almighty, wouldn't un be a sky of a lark
To see that old buzzard whooping about for uns shirt in the dark
And he hunting round for uns speckled trousers around by Palmer-
stown Park?
Hohohoho, moulty Mark!
You're the rummest old rooster ever flopped out of a Noah's ark
And you think you're cock of the wark.
Fowls, up! Tristy's the spry young spark
That'll tread her and wed her and bed her and red her
Without ever winking the tail of a feather
And that's how that chap's going to make his money and mark!*

Quarks are one type of matter particle. Most of the matter we see around us is made from protons and neutrons, which are composed of quarks.

Quarks and Leptons are the building blocks which build up matter, i.e., they are seen as the “**elementary particles**”. In the present standard model, there are six “flavors” of quarks. They can successfully account for all known mesons and baryons (over 200). The most familiar baryons are the proton and neutron, which are each constructed from up and down quarks.

(<http://hyperphysics.phy-astr.gsu.edu/hbase/particles/quark.html>)

The naming of quarks: in 1964, **Murray Gell-Mann** and George Zweig suggested that hundreds of the particles known at the time could be explained as combinations of just three fundamental particles. Gell-Mann chose the name ‘quarks’ for these three particles, a word created by James Joyce in *Finnegan's Wake*:

‘Three quarks for Muster Mark!’

(FW383.01:1)

Gell-Mann received the 1969 Nobel Prize for his work in classifying elementary particles.



**Egbert K. Duursma –
The bridge between Matter and Mind. 2013**

Albert Einstein, in an address delivered on 5 may 1920, at the University of Leyden:

‘According to the general theory of relativity, space is endowed with physical qualities; in this sense, therefore, there exists an **ether**. [Additionally,] space without ether is unthinkable; for in such space there would not only be no propagation of light, but also no possibility of existence for standards of space and time (measuring-rods and clocks), nor therefore any space-time intervals in the physical sense. But this ether may not be thought of as endowed with the quality characteristic of ponderable media, as consisting of parts which may be tracked through time. The idea of motion may not be applied to it. The ether does have electromagnetic properties (permeability and permittivity), from which Maxwell deduced the speed of light.’

‘All material in the universe, except that in the neutron stars and black holes and that of cosmic ray particles (90% protons and 9% alpha particles) are **atoms or molecules** of the elements of the periodic system, and are for more than **99% empty**. This emptiness we call **atomic ether**.’

‘For any electromagnetic transfer in the universe and within atoms, a medium is requested that passes on radiation, but also “handles” forces such as magnetic forces and gravitation. (...) This brings us to the theory of the existence of **hypothetical particles (units), which the cosmic and atomic ethers contain**. Ioan-Iovitz Popescu gave them the name of etherons.’

‘Prof. Ioan-Iovitz Popescu... predicted in 1982 **the smallest particles in our ether, the so-called etherons**.’



'The bridge between matter and mind should be located in the "not really empty" spheres (atomic ether) around the atomic nuclei and their etherons.

The human mind, alive or from deceased persons, may react in the emptiness of the universe with the 'help' of etherons.

As long as science has no more insight in the "behaviour" of the mind in the vast "vivid" emptiness of the atomic ether of our brain molecules, it will be difficult to evaluate many of the above described phenomena and theories.'

[Egbert K. Duursma: *Einstein's Cosmic Ether, the Atomic Ether, Their Etherons and Our Mind*, 2013, pp12-19]

Prof. Dr. Egbert Duursma, a Member of Academia Europaea, is Professor Emeritus of the University of Groningen (Netherlands), and retired director of the Netherlands Institute of Sea Research, Texel (NL). Before that, he was director of the Delta Institute of Hydrobiology at Yerseke (NL) of the Royal Netherlands Academy of Sciences, and chemist at the IAEA laboratory of marine Radioactivity in Monaco, with one year leave in Jepara, Indonesia at the FAO Shrimp Culture Research Centre. After retirement, he published many articles and books on environmental problems (some available with Createspace) and received the silver medal of merit from the Vatican for his service as voluntary organist. Having followed 1400 sermons in this period he was inspired to write this booklet on the ether and mind.



Lidia Vianu
Joyce Lexicography Volume 121
The "Quark"...



19

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The hundredlettered
name again, last word
of perfect language.

FW424.23:1



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and
Lidia Vianu**

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Joyce's "Words"
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Photograph List of the 40 Languages used by James Joyce
in writing Finnegans Wake.



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Emanuel Swedenborg – The Angels in Conversation with Man. 1758

234. XXVII. The Speech of Angels.

237. Angelic language has nothing in common with human languages except certain words that are the sounds of a specific affection; yet this is true **not of the words themselves but of their sounds**; on which subject something will be said in what follows That angelic language has nothing in common with human languages is evident from the fact that angels are unable to utter a single word of human language. This was tried but they could not do it, because they can utter nothing except what is **in entire agreement with their affections**; whatever is not in agreement is repugnant to their very life, for life belongs to affection, and their speech is from their life. I have been told that the first language of men on our earth coincided with angelic language because they had it from heaven; and that the Hebrew language coincides with it in some respects.

238. As the speech of angels corresponds to their affection, and their affection belongs to their love, and as the love of heaven is love to the Lord and love towards the neighbor (see above, n. 13-19), it is evident how choice and delightful their talk must be, affecting not the ears only but also the interiors of the mind of those who listen to it. There was a certain hard-hearted spirit with whom an angel spoke. At length he was so affected by what was said that he shed tears, saying that he had never wept before, but he could not refrain, for it was love speaking.
(...)

239. The speech of angels is likewise full of wisdom because it proceeds from their interior thoughts, and their interior thought is wisdom, as their interior affection is love, and **in their speech their love and wisdom unite**. For this reason their speech is so full of wisdom that **they can express in a single word what man cannot express in a thousand words also the ideas of their thought include things that are beyond man's comprehension, and still more his power of expression**. This is why the things



that have been heard and seen in heaven are said to be ineffable, and such as ear hath never heard nor eye seen. [2] That this is true I have also been permitted to learn by experience. At times I have entered into the state in which angels are, and in that state have talked with them, and I then understood everything. But when I was brought back into my former state, and thus into the natural thought proper to man, and wished to recall what I had heard I could not; for there were thousands of things unadapted to the ideas of natural thought, and therefore inexpressible except by variegations of heavenly light, and thus not at all by human words. [3] Also the ideas of thought of the angels from which their words spring are modifications of the light of heaven, and the affections from which the tones of the words spring are variations of the heat of heaven, the light of heaven being Divine truth or wisdom, and the heat of heaven the Divine good or love (see above, n. 126-140); and the angels have their affection from the Divine love, and their thought from the Divine wisdom.

(...)

246. XXVIII. The Speech of Angels with Man.

Angels who talk with man do not talk in their own language, nor in any language unknown to man, but in the man's own language, or in some other language with which he is acquainted. This is so because when angels speak with man they turn themselves to him and conjoin themselves with him; and this conjunction of angel with man causes the two **to be in like thought**; and as man's thought coheres to his memory, and this is the source of his speech, the two have the same language. Moreover, when an angel or a spirit comes to a man, and by turning to him is conjoined to him, **he so enters into the entire memory of the man** that he is scarcely conscious that he does not himself know whatever the man knows, including his languages. [2] I have talked with angels about this, and have said that perhaps they thought that they were addressing me in my mother tongue, since it is so perceived; and yet it was I and not they that spoke; and that this is evident from the fact that angels cannot utter a single word of human language (see n. 237); furthermore, human language is natural and they are spiritual, and spiritual beings cannot give expression to any thing in a natural way. To this they replied that they are aware that their conjunction with the man with whom they are speaking is with his spiritual thought;

The "Quark"...



but because his spiritual thought flows into his natural thought, and his natural thought coheres to his memory, the language of the man and all his knowledge appear to them to be their own; and that this is so for this reason, that while it is the Lord's pleasure that there should be such a conjunction with and sort of insertion of man into heaven, yet the state of man is now such that there can no longer be such conjunction with angels, but only with spirits who are not in heaven. [3] When I talked about this with spirits also they were unwilling to believe that it is the man that speaks, insisting that they spoke in man, also that man's knowledge is their knowledge and not the man's knowledge, consequently that everything that man knows is from them. I tried to convince them by many proofs that this is not true, but in vain. Who are meant by spirits and who are meant by angels will be told further on when the world of spirits is treated of.

(...)

255. That the nature of the conjunction of angels and spirits with man may be understood I am permitted to mention some notable things by which it may be elucidated and verified. When angels and spirits turn themselves to man they do not know otherwise than that the man's language is their own and that they have no other language; and for the reason that they are there in the man's language, and not in their own, which they have forgotten. But as soon as they turn themselves away from the man they are in their own angelic and spiritual language, and know nothing about the man's language. I have had a like experience when in company with angels and in a state like theirs. **I then talked with them in their language and knew nothing of my own, having forgotten it; but as soon as I ceased to be present with them I was in my own language.**

(...)

269. The wisdom of the angels is indescribable in words; it can only be illustrated by some general things. **Angels can express in a single word what a man cannot express in a thousand words. Again, a single angelic word contains innumerable things that cannot be expressed in the words of human language; for in each of the things uttered by angels there are arcana of wisdom in continuous connection that human knowledges never reach.** Again, what the angels fail to express in the words of their



speech they make up by the tone, in which there is an affection for the things in their order; for (as has been said above, n. 236, 241) tones express affections, as words express ideas of thought from the affections; and for this reason the things heard in heaven are said to be ineffable. So, too, the angels are able to express in a few words every least thing written in an entire volume, and give to every word meanings that elevate the mind to interior wisdom; for their speech is such as to be in accord with their affections, and each word is in accord with their ideas; and their words are varied in infinite ways in accord with the series of things which in complex are in the thought. (...)

461.

After death man is possessed of every sense, and of all the memory, thought, and affection, that he had in the world, leaving nothing behind except his earthly body.

(...)

464. Although **the external or natural memory remains in man after death**, the merely natural things in it are not reproduced in the other life, but only the spiritual things adjoined to the natural by correspondences; but when these are present to the sight they appear in exactly the same form as they had in the natural world; for all things seen in the heavens have just the same appearance as in the world, although in their essence they are not natural but spiritual (as may be seen in the chapter on Representatives and Appearances in Heaven, n. 170-176). [2] But the external or natural memory in respect to the things in it that are derived from the material, and from time and space, and from other properties of nature, is not serviceable to the spirit in the way that it was serviceable to it in the world, for whenever man thinks in the world from his external sensual, and not at the same time from his internal or intellectual sensual, he thinks naturally and not spiritually; but in the other life when he is a spirit in the spiritual world he does not think naturally but spiritually, and to think spiritually is to think intellectually or rationally. For this reason the external or natural memory in respect to its material contents is then quiescent, and only those things that man has imbibed in the world by means of material things, and has made rational, come into use. The external memory becomes quiescent in respect to material things because these cannot then be brought forth, since spirits and angels speak from





those affections and thoughts that are proper to their minds; and are therefore unable to give expression to any thing that is not in accord with their affections and thoughts as can be seen in what is said about the speech of angels in heaven and their speech with man (n. 234-257).

(...)

[6] **The rational faculty of man is like a garden or shrubbery, or like fresh ground; the memory is the soil, truths known and knowledges are the seeds, the light and heat of heaven cause them to grow; without light and heat there is no germination;** so is it with the mind when the light of heaven, which is Divine truth, and the heat of heaven, which is Divine love, are not admitted; rationality is solely from these. It is a great grief to the angels that learned men for the most part ascribe all things to nature, and have thereby so closed up the interiors of their minds as to be unable to see any thing of truth from the light of truth, which is the light of heaven. In consequence of this such in the other life are deprived of their ability to reason that they may not disseminate falsities among the simple good and lead them astray; and are sent away into desert places.

[Heaven and its Wonders and Hell, from Things Heard and Seen [De Caelo et eius Mirabilibus et de Inferno, ex auditis et visis, translated by John Ager, 1758.]





Ferdinand de Saussure. 1916

Le Signe

Le Signifiant

Le Signifié.

'Nous appelons **signe** la combinaison du concept et de l'image acoustique : mais dans l'usage courant ce terme désigne généralement l'image acoustique seule, par exemple un mot (*arbor*, etc.). On oublie que si *arbor* est appelé signe, ce n'est qu'en tant qu'il porte le concept 'arbre', de telle sorte que l'idée de la partie sensorielle implique celle du total.

L'ambiguïté disparaîtrait si l'on désignait les trois notions ici en présence par des noms qui s'appellent les uns les autres tout en s'opposant. Nous proposons de conserver **le mot signe pour désigner le total**, et de **remplacer concept et image acoustique respectivement par signifié et signifiant (...)**

Le lien unifiant le signifiant et le signifié est arbitraire, ou encore, puisque nous entendons par signe le total résultant de l'association d'un signifiant à un signifié, nous pouvons dire plus simplement : **le signe linguistique est arbitraire.**

Ainsi l'idée de "soeur" n'est liée par aucun rapport intérieur avec la suite de sons s-ö-r qui lui sert de signifiant ; il pourrait être aussi bien représenté par n'importe quel autre : à preuve les différences entre les langues et l'existence même de langues différentes (...)

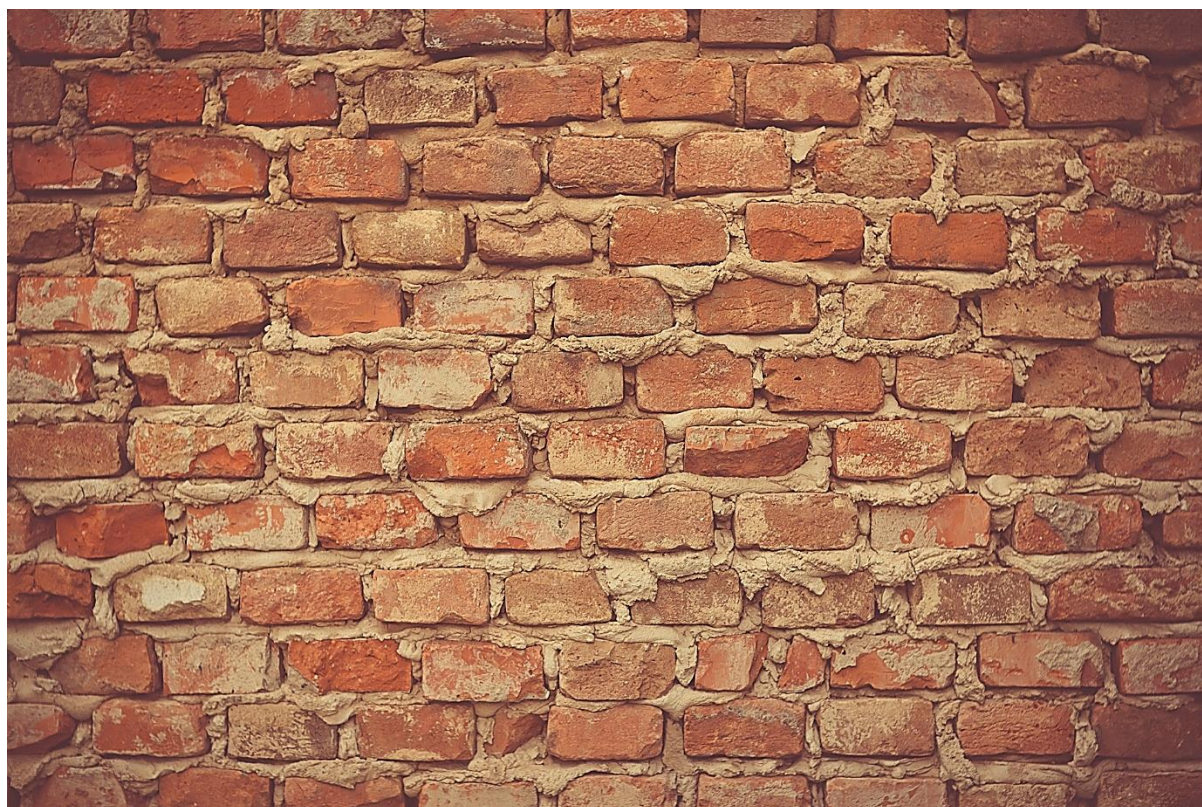
Le mot arbitraire appelle aussi une remarque. Il ne doit pas donner l'idée que le signifiant dépend du libre choix du sujet parlant (on verra plus bas qu'il n'est pas au pouvoir de l'individu de rien changer à un signe une fois établi





dans un groupe linguistique) ; nous voulons dire qu'il est immotivé, c'est-à-dire arbitraire par rapport au signifié, avec lequel il n'a aucune attache naturelle dans la réalité.'

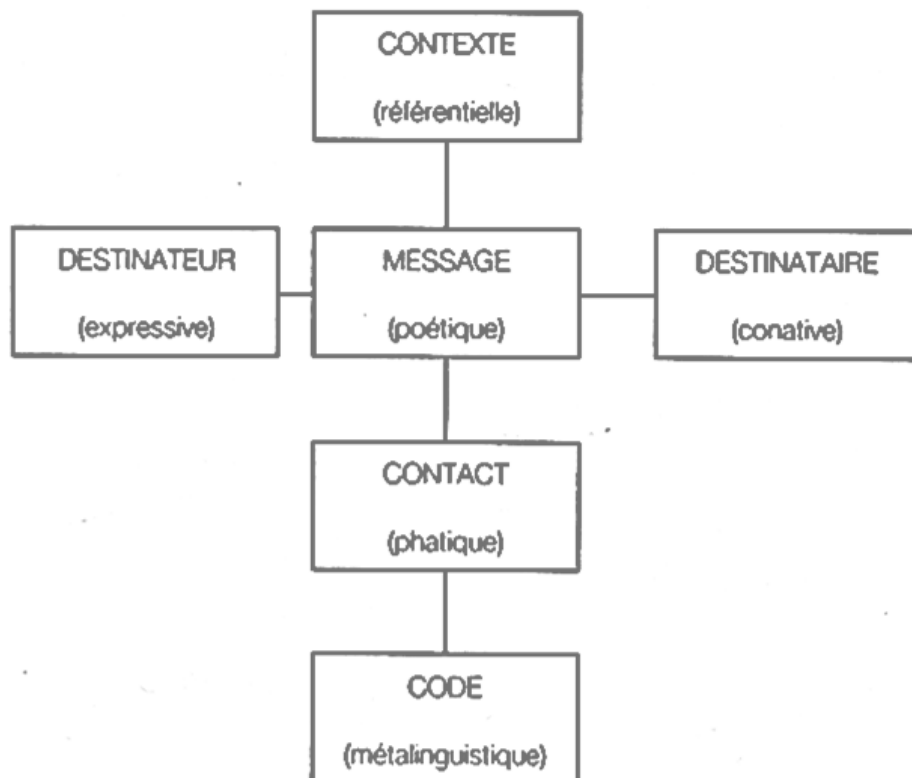
[Ferdinand de Saussure: *Cours de linguistique générale*,
Ed. Payot, 1916, pp. 98-101]





Roman Jakobson. Milan. 1972

'Le signe est un renvoi'





George Sandulescu – The Multi-Sign.

There is a well-known definition of the Sign, given by Roman Jakobson almost half a century ago. And when he gave that definition at *The First Congress of Semiotics*, which took place in Milan, organized by Umberto Eco in 1974, the first thing I asked him was: 'Why did you give the talk and the definition in the French language, instead of the English language? Very few here at this Congress do understand French...' And Roman Jakobson candidly replied: 'Simply because **the English language does not possess an exact equivalent for the word *Renvoi***. Several other languages do!'

And it is very true that other languages, in addition to French, do have an equivalent. That is the case, for instance, with the Scandinavian languages, where the word in Swedish is *hänvisning*, and the Romanian language as well, where the exact equivalent of the French word *Renvoi* is the word *trimitere*. (Which in English literally means 'sending'!) This is what poor Jim Atherton meant in his book about *Literary Allusions*, but he only had the English word *reference* at his disposal... which is not at all the same thing, for subtler researchers.)

That *en effet* is the Sign! It sends something to something else. It sends somebody to somebody else. It establishes a connection between one thing and another. Between one item and another. **The word** is a sign, for instance, because it establishes a connection between the sounds of a word, or the lettering of a word, on the one hand, and the meaning of that particular word, on the other hand. Read Ferdinand de Saussure (1907/1916) for further details...

As Roman Jakobson had so rightly pointed out, it is only the phoneme that is not a sign within the frame of reference of his own theory.

Mais revenons à nos moutons. Dans ce cas, nos moutons sont *Hodgart and Worthington*!

And in this case we have a formidable instance of what I prefer to call a **multi-sign, or a complex sign**: certain groups of words send you to music in the first place. They send you further to the title of a piece of music, in the second place. The title of that piece of music sends you further again, to the music itself.



And the music is of various kinds. In the first place, the sending is the visualizing of the musical notation. In the second place, that musical notation sends you further to the singing of it, and to the playing of it on one instrument or another. So, a few words in *Finnegans Wake* may send you to a famous song, and any famous song is a multi-text, and as such it is *a multi-sign*.

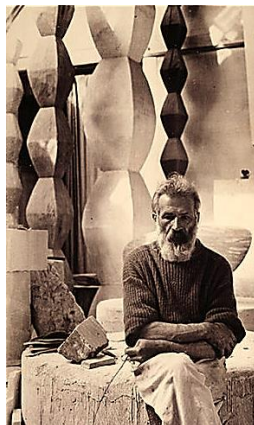


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30

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31

II.

Circle Axis and Sphere

Joyce and Brancusi. 1929



Lidia Vianu
Joyce Lexicography Volume 121
The "Quark"...

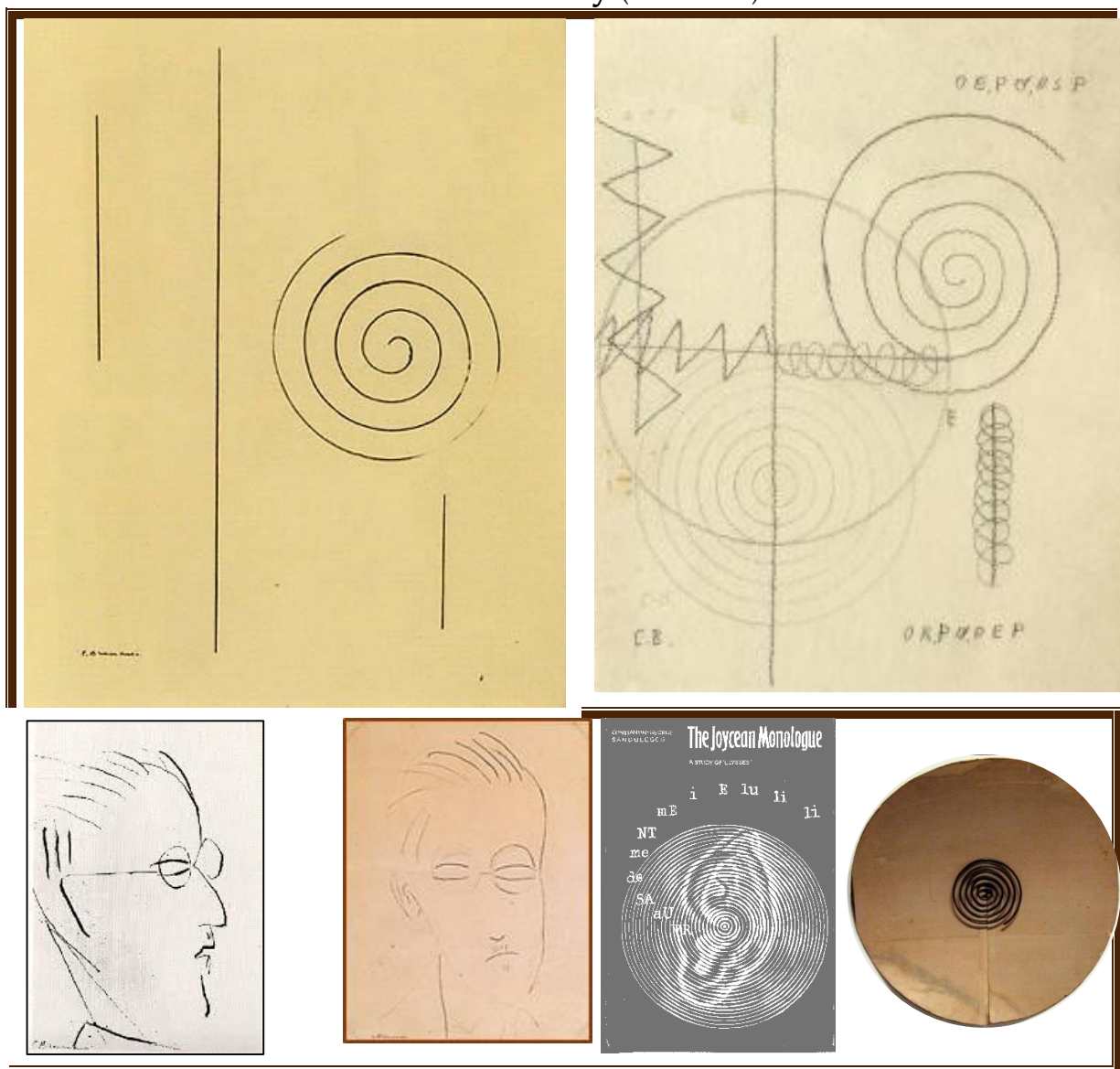


32

Le sens du pousser

Brancusi's Portraits of Joyce...

constantinently (FW155.09:1)



The "Quark"...



Brancusi's Signs – Used to portray James Joyce.

Vertical and Horizontal Axis

Circles

Spiral=
axis and
circles
coloana
infinitului

| | | | | | | | | |
|--------|-------------|---------------|------------------|--|--|---------------------------|--|--|
| | | | | | | | | |
| circle | semi circle | vertical axis | circle plus axis | The Spiral is built out of circles (O), in the shape of an S, by means of an axis that pierces the circles (P)→OSP | | | axis [vertical and oblique] + semicircle | at the intersection of circles with the spiral |
| O, O | P, R, C, B | P, R, E, B, N | B, P, R | OEP: circle (O)+ axis (E)= circle cut into halves by axis (P) | OSP: circle (O)+ spiral (S)+ circle cut into halves by axis | E, S→ tools of the spiral | R, P | E (the tool) |

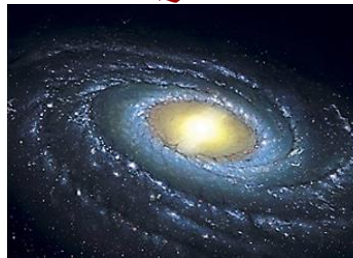
Conclusion to Brancusi's Signs in Joyce's Portraits – 'Coloana Infinitului'.

The **Circle** is a Sign: it is a plane, two-dimensional surface.

The **Axis** brings the third dimension to the circle: it makes us see it as an infinite spiral.

Brancusi creates the **Endless Column** out of mere circles and an axis. He also uses the oval as a sphere with a vertical axis, making it a soaring sphere ('**Măiastra**').

Brancusi's portraits of James Joyce indicate that he saw in Joyce *le sens du pousser*, the same aspiration to defy the finite world of Signs, the same need that he himself felt to make his creation the Signal that draws attention to what we have never seen and may never understand.



Joyce and Brancusi.

The American John Quinn, who collected Constantin Brancusi's work, also bought the manuscript of *Ulysses* from James Joyce, and that of *The Waste Land* from T.S. Eliot. Both Joyce and Brancusi were in Paris in the early 1920's. They may have met around that time. It seems their paths crossed in the summer of 1923. In his diary, Harry Crosby – an American expatriate living in Paris – mentioned seeing Joyce and Brancusi at the Théâtre des Champs Élysées on 29 June 1926¹.

It all started, in our view, from the portraits of Joyce that Brancusi made. As owners of *The Black Sun Press* in Paris, Harry Crosby and his wife decided to publish a part of Joyce's *Work in Progress*, which Joyce entitled *Tales Told of Shem and Shaun*. The book appeared on 9 August 1929, with an abstract portrait of Joyce by Brancusi in it.

In a memoir published in 1953, Crosby's wife, Caresse, remembered Joyce sitting for Brancusi while he was doing the portraits, which were five in all: 'Brancusi agreed to do it, Joyce agreed to sit, but it was hard to get them together and harder to get them apart!'²

In a letter to Harriet Shaw Weaver – advocate of James Joyce, and editor of *The Egoist* – Joyce wrote: 'I got on well with Brancusi (who is something of a fogey like myself, deploring modern feminine fashions, the speed of modern trains, etc., etc.).'³

Joyce was 47, and Brancusi was 53.

Joyce himself said little about the portraits. He is reported to have stated: 'His design of me will attract certain buyers.'⁴ Besides that, in a letter to Valery Larbaud, Joyce mentioned 'Brancusi's whirlgig.'⁵ In another letter to Miss Weaver, sent on 17 January 1932, he wrote: 'When he [Joyce's father] got the copy I sent him of *Tales Told* etc. (so they write me) he looked a long time at Brancusi's Portrait of J.J. and finally remarked: Jim has changed more than I thought.'⁶

Of the five portraits made by Brancusi, one was entitled by the Romanian artist 'Symbole de James Joyce'. Brancusi himself said it expressed *le sens du pousser* that he



had felt in Joyce⁷. James Joyce, on the other hand, coined in *Finnegans Wake* (FW155.09:1) a word suggestive of Brancusi's first name: 'constantinently'. That word occurs in a context which reveals that Joyce identified with Brancusi just as Brancusi identified with Joyce: 'a constantineal namesuch of my very own.' (FW442.05:1)

Three out of the five portraits of Joyce that Brancusi made have the 'whirl' in the centre. The key to the connection between Joyce and this whirl (*le sens du pousser*) is suggested by the cover to *The Joycean Monologue*, by George Sandulescu. The book was, as the title says, *A Study of Ulysses*, and it was published by the Department of Literature, University of Essex, in 1979⁸. The cover of this book on *Ulysses* had on it a whirl, which vaguely pointed to an ear in its middle, and which was surrounded by an anagram of *Lisant au livre de lui-même*, which points to Hamlet through Mallarmé. Joyce himself translated these words in *Ulysses* as 'reading the book of himself.'⁹

Finnegans Wake is a book of himself, indeed: it is an ideal definition of the interior monologue. Here is Mallarmé again, present in the epigraph of the site that hosts the whole series of FW Lexicons (<http://sandulescu.perso.monaco.mc/>): *Tout, au monde, existe pour aboutir à un livre*. Everything Joyce thought and heard and felt ended up in the book: that one book was *Dubliners – Ulysses – Stephen Hero – Portrait of the Artist as a Young Man – Finnegans Wake*.

We have absolutely no idea so far when, how, where Joyce and Brancusi met, and what they did on those occasions. We can imagine Joyce in a Parisian café with Brancusi, drinking or talking, but mainly listening. The almost blind man who had chosen writing over singing certainly used his musical ear to record in his memory every sound he overheard in cafés, pubs, inns – since he spent his afternoons there more than once.

James Joyce's connections with Brancusi and Romania have not been examined so far. Our first Romanian Lexicon was published by *Contemporary Literature Press* on 11.11.2011. We enlarged it in 2012. We are enlarging it again. The fascination comes from the fact that whenever one has a fresh look at the text, one finds more Romanian words. Looking for Romanian words while reading the whole of FW does not help much. You only notice them when they strike you: sometimes the letters, many times the sounds.



The first time Joyce alluded to Romania was in *Ulysses*, where Plevna was mentioned four times: 4.63, 15.1529, 17.1425, 18.690. Plevna is closely associated with Romania's becoming an independent state in 1877.

- 4.63 Pity. All the way from Gibraltar. Forgotten any little Spanish she knew Wonder what her father gave for it. Old Style. Ah yes! of course. Bought it at the Governor's auction. Got a short knock. Hard as nails at a bargain, old Tweedy. Yes, sir. At **Plevna** that was. I rose from the ranks, sir, and I'm proud of it. Still he had brains enough to make that corner in stamps. Now that was far seeing.
- 15.1529 Lo! We charge! Deploying to the left our light horse swept across the heights of **Plevna** and, uttering their warcry Bonafide Sabaoth, sabred the Saracen gunners to a man.
- 17.1425 Why, firstly and secondly, did he not consult the work in question? Firstly, in order to exercise mnemotechnic: secondly, because after an interval of amnesia, when, seated at the central table, about to consult the work in question, he remembered by mnemotechnic the name of the military engagement, **Plevna**.
- 18.690 and only captain Groves and father talking about Rorkes drift and **Plevna** and sir Garnet Wolseley and Gordon at Kharthoum lighting their pipes for them everytime they went out

Plevna is a meaningful word in *Ulysses*:

'Leopold Bloom knew about Plevna, as he had among his books *The History of the Russian-Turkish War*, published in London, and bearing the stamp 'The Garrison Library' at Gibraltar. In consequence, it could only have belonged to Major Tweedy himself, Molly Bloom's father. As to the Battle of Plevna (a city in Northern Bulgaria), which lasted for 143 days, from 20 July to 10 December 1877, the English maintained an attitude of strict neutrality, though the British Navy had an ample presence in the area.'

George Sandulescu¹⁰



In *Finnegans Wake*, Joyce shows us in several ways that he was acquainted with the Romanian language, with its basic grammar, some of its peculiarities, with Romanian folk beliefs, with some places in Romania, and some proper names. More often than not, when he uses an approximation of a Romanian word, he builds around it a context which supports the association with Romanian. We have chosen here those Romanian words which Joyce placed in his book for a Romanian to find – those words which are Romanian beyond the shadow of a doubt. In an undemonstrated way, or undemonstrated yet, these words suggest the presence of Brancusi in Joyce's mind. We must add that, in enlarging the Romanian Lexicon with some of the following words, we were greatly helped by the Index to Alexandru Rosetti's *Histoire de la langue roumaine des origines au XVII^e siècle*¹¹. It includes words which are unmistakably Romanian, and it was a welcome confirmation of what we had found in Joyce's text.

The list of words below will prove that Joyce knew exactly what he was doing. If those interested will take the time to use the *Finnegans Wake* addresses we give (page, line, position on the line) and read the context, they will understand the full extent of our finding. Joyce made it crystal clear that he knew what he was talking about.

'...Rumanian tends to be, with Joyce, almost as important as Irish! For Irish was used for local colour. The Rumanian language, together with a few others, have been resorted to for more obscure, and more cryptic, reasons. It is the honest and sincere researcher's job to find that out.'

George Sandulescu¹²

We have grouped the few examples chosen to illustrate the statements above under the following headings, which support the lines of our argument:

1. Words presumably mentioned in conversations with Brancusi, or which refer to Brancusi
2. Words accompanied by specific markers of the Romanian language, such as enclitic definite articles, suffixes in proper family names, vocatives, diminutives



3. Names connected with Romanian topography
4. Romanian proper names
5. Common Romanian phrases
6. Random words

Joyce's punctuation before and after these words has been preserved.

1. Words presumably mentioned in Joyce's conversations with **Brancusi**, or which refer to Brancusi:

038.25:1 vinars [brandy]

054.16:6 .Ismeme de bumbac [men's underwear, made of cotton]

158.19:7 Vallee Maraia

→ Valea Mare: place in Romania, not far from Târgu Jiu, where Constantin Brancusi accepted the commission for three major sculptures in 1935; well known for its wines.

222.08:9 Mester [master, craftsman]

386.30:3 barrancos → Brancusi?

397.11:9 Mamalujo [polenta]

420.28:2 O'Domnally [Sir!]

518.28:2 mujic [peasant]

518.30:1 — Da Domnuley. [Yes, Sir]

549.14:7, coloumba mea, frimosa mea, → Măiastra? (cca 1911) [My dove, my beauty]

599.08:6 fattafottafutt. [girl. skirt. fuck]

2. Words accompanied by **specific markers of the Romanian language**, such as enclitic definite articles, suffixes in proper family names, vocatives, diminutives:

049.15:8 Paul Horan,

053.02:2.3 Wildu Picturescu. → [Rad]u [Lup]escu, Oscar Wilde + Picture

064.25:3 Pamintul. [the Earth]

064.32:2 Duzinascu (imaginary typical surname)



- 241.08:1 Collosul [the colossus]
 244.05:9 ,Neomenie! [inhumanity]
 255.15:3 , procul abeat! [drunken pig]
 230.07:7 omulette → omule!, omuleț, omletă [littel man. omlette]
 404.14:9 , O romence, [Romanian women]
 484.29:7 rumanescu [Romanian]
 505.25:3 The form masculine. The gender feminine.
 → This is the best definition of the Neuter Gender in Romanian
 518.22:10 sorowbrate → soro + frate [sister. brother]
 518.23:9 , scusascmerul? [excuse]
 518.24:9 , Limba romena [the Romanian language]
 518.22:8 Ruman [Romanian]
 621.34:4 in the timpul [during]

3. Names connected with Romanian **topography**:

- 105.26:8 Galasia like his Milchcow
 → Milcov (Romanian river, the border between former Moldova and Muntenia);
 (Galiția included Bucovina between 1786-1849 and 1860-1861) (Bucovina: 'Țara
 Fagilor', 'Buchenland')
 114.04:5 Bukarahast [Buhcarest]
 136.08:4 Ostrov [island]
 158.19:7 Vallee Maraia
 → place in Romania, not far from Târgu Jiu, where Constantin Brancusi accepted the
 commision for three major sculptures in 1935; well known for its wines.
 209.17:6 pruth [the river Prut]
 403.09:3 Tegmine — sub — Fagi [mine. birch trees]
 554.01:2 , buckarestive

4. Romanian **proper names**:

The "Quark"...



40

| | |
|------------|------------------------------------|
| 049.15:8 | Paul Horan, |
| 053.02:2.3 | Wildu Picturescu. |
| 064.32:2 | Duzinascu |
| 145.32:12 | Dracula's |
| 192.21:3 | Paraskivee |
| 343.02:2 | Draco |
| 358.12:8 | corvinophobe |
| 360.13:1-6 | Carmen Sylvae, my quest, my queen. |
| 540.21:2 | ! Redu Negru may be black |

5. Common Romanian **phrases**:

| | |
|-----------|--|
| 198.19:5 | spate a spate. → spate la spate [back to back] |
| 212.26:6 | Merced multe! → Mersi mult! [thanks a lot] |
| 215.25:5 | howmulty → cât de mulți [how many] |
| 338.13:13 | But da. But dada, → Ba da, ba da! [yes, yes] |
| 340.23:11 | drumbume → drum bun [safe journey!] |
| 343.11:2 | . Attent! [attentive] |
| 355.30:8 | Misto |
| 439.16:12 | ! As broad as its lung → Romanian fairy-tale hero: Păsări-lăți-lungilă |
| 464.07:7 | omportent man! → om + important man. important] |
| 466.01:5 | Babau and Momie! → baubau + momîie [fee-faw-fum. scarecrow] |
| 555.01:7 | ? Too mult sleepth. [much] |
| 578.03:2 | . Oom Godd → Om bun! [good man] |
| 583.03:8 | , her dinties are chattering, → îi clănțâne dinții [teeth] |
| 598.18:3 | . Panpan and vinvin → pâine și vin [bread and wine] |
| 619.27:3 | from cape to pede. → din cap (până) în picioare [from head to foot] |
| 621.34:4 | in the timpul [during] |

6. Random words



- 010.17:1 : Ap Pukkaru! [catch hold]
117.12:1 jambebatiste → batistă(+ jambe) [handkerchief]
176.36:6 somnbomnet [sleep]
180.35:10 boer constructor [boyard. builder]
184.29:11 his uoves, oves and uves à la Sulphate de Soude, his ochiuri [fried eggs]
213.30:4 ? Deataceas! → dată + ceas [date. hour]
219.05:2 Somndoze → somn (+ doze) [sleep]
241.02:4 summan, [long, thick peasant coat]
360.27:2 , Salam! [salami]
365.17:5 tarafs [folk music band]
370.13:3 , oooom oooom! [man]
397.11:9 Mamalujo [polenta]
406.07:5 , Margaretar → mărgăritar; Margareta [pearl. Margaret]
455.08:10 Iereny [winters]
493.31:7 , Nu-Men, → nu (+ men) [no]
577.01:2 , mandragon mor → mătrăgună + mor [mandrake. die]

This list of possibly Romanian words is indirectly explained by Joyce himself in the following collage of statements – all chosen from page 83, lines 10-25 of the book: 'Marx my word: this is nat language at any sinse of the world. One might as fairly go and kish his sprogues as fail to certify. Remarxing in languidoily. Much more highly pleased than tongue could tell. The lexinction of life.'

One interpretation of these sentences could be: 'Mark my words: this is not language in any sense [+ sin] of the word. One might fairly put it aside, ignorant as we are, since it fails to certify. Remake it as language. Much more highly pleased than tongue could tell. The language of life.'

These sentences explain, maybe, why Romanian is present in *Finnegans Wake* – a book whose translation into just one language or one meaning at a time stands no chance at all. This book emerges from the simultaneity of languages and meanings. One does not 'read' Joyce's book. By means of idiosyncratic words, this book breeds

Lidia Vianu
Joyce Lexicography Volume 121
The "Quark"...



42

thoughts that propagate at light speed.

References

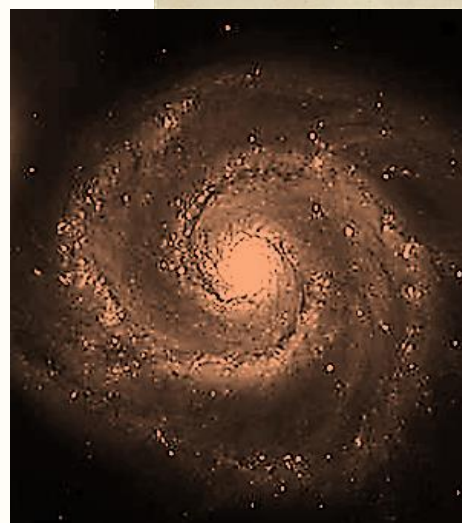
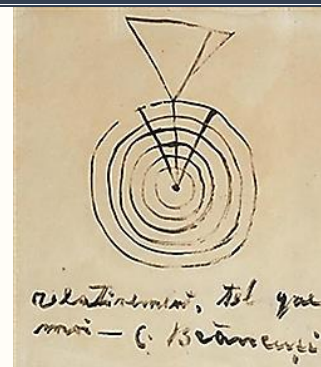
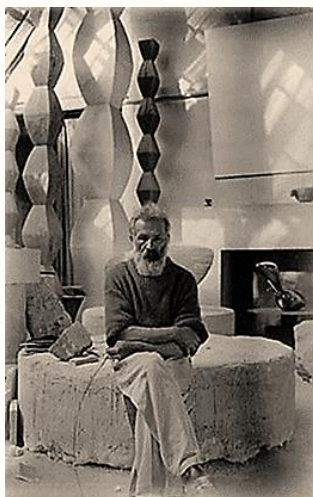
- ¹ Harry Crosby, *Shadows of the Sun*, Paris, Black Sun Press, 1928.
- ² Caresse Crosby, *The Passionate Years*, New York: Dial Press, 1953.
- ³ Sturat Gilbert (ed.), *Letters of James Joyce*, Viking Press, 1957.
- ⁴ Sidney Geist, *Brancusi and His Contemporaries*, The WriteDeal, 2011.
- ⁵ Quoted in J. Aubert and M. Jolas (eds.): *Joyce & Paris. 1902.....1920-1940....1975*, Papers from the Fifth International James Joyce Symposium, Paris 16-20 June 1975, p. 70.
- ⁶ Sturat Gilbert (ed.), *Letters of James Joyce*, Viking Press, 1957.
- ⁷ Quoted in J. Aubert and M. Jolas (eds.): *Joyce & Paris. 1902.....1920-1940....1975*, Papers from the Fifth International James Joyce Symposium, Paris 16-20 June 1975, p. 77.
- ⁸ A Wake Newslitter Press.
- ⁹ James Joyce, *Ulysses*. The corrected text, Penguin Books, 1986, Episode 9, line 115.
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- ¹¹ Published by *Clusium*, Cluj-Napoca, in 2001.
- ¹² George Sandulescu, *A Lexicon of Romanian in Finnegans Wake*, Contemporary Literature Press, 2011, p. 9, <http://editura.mttlc.ro/sandulescu.lexicon-of-romanian-in-FW.html>

[Lidia Vianu and C. George Sandulescu: The Romanian Language in James Joyce, *The European English Messenger*, volume 23.2, winter 2014, pp56-66]

Lidia Vianu
Joyce Lexicography Volume 121
The "Quark"...



43



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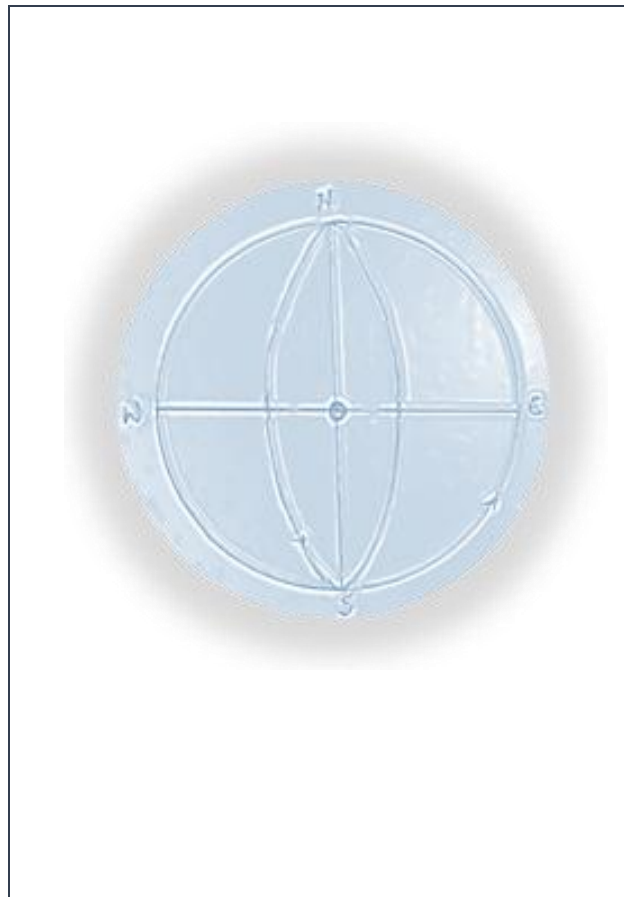
The Sphere – W.B. Yeats.

'Chosen' [from *A Woman Young and Old*, 1933]

A poetic approximation of Brancusi's Endless Column is the Sphere as imagined by William Butler Yeats in the very short poem 'Chosen' – a poem in which a woman speaks:

The lot of love is chosen. I learnt that much
Struggling for an image on the track
Of the whirling Zodiac.
Scarce did he my body touch,
Scarce sank he from the west
Or found a subterranean rest
On the maternal midnight of my breast
Before I had marked him on his northern way,
And seemed to stand although in bed I lay.

I struggled with the horror of daybreak,
I chose it for my lot! If questioned on
My utmost pleasure with a man
By some new-married bride, I take
That stillness for a theme
Where his heart my heart did seem
And both adrift on the miraculous stream
Where – wrote a learned astrologer –
The Zodiac is changed into a sphere.



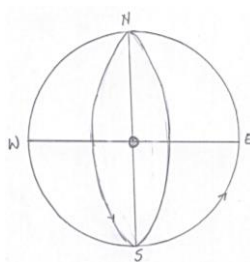
In this poem, the Zodiac, which means one year in the woman's life, must be



geometrically represented as a circle – the twelve months of a year. Since she is talking about love, we can infer that there is a man in the poem as well, which implies the existence of a second Circle, a second Zodiac. The two only meet if they are lucky enough to start the race for life at the same time and in the same place, and if they go ahead at the same speed.

Once they have been granted these lucky coincidences, they will be allowed to meet twice on the 'track of the whirling Zodiac'. For Yeats, those two points are North and South. In between them, the two protagonists race alone. The woman is 'Struggling for an image on the track/Of the whirling zodiac,' she struggles with 'the horror of daybreak'. The man's passage is maddeningly brief: 'Scarce did he my body touch,/Scarce sank he from the west/Or found a subterranean rest/On the maternal midnight of my breast/Before I had marked him on his northern way...'

The woman's refuge from the pain of the Circle, the brevity of the Balcony-and-Nightingale scene, is her mind. When the man reaches her, she thinks: I 'seemed to stand although in bed I lay.' This is not a poetic image. It is pure geometry. If we think of a Circle and try to picture 'stand' and 'lie' – verbs which hardly make any sense otherwise – , we get the two lines that cut a circle into two, and mark its centre when they meet:



The centre is not as real as 'west', 'daybreak', or the 'northern way'. It only 'seems': it is a creation of the woman's mind. The woman finds rest from racing when she thinks of the centre. She sees in it the essence of love. It is the ability to stop thinking of the physical body racing round the circle again and again, and focus on its invisible centre, 'that stillness ... Where his heart my heart did seem.'

The poet has moved now from obviously physical images of love to that part

The "Quark"...



46

which is impalpable: the soul. The soul only 'seems', it is true, but, once the man and the woman realize that the centre of the circle *is* there, they find temsleves 'adrift on the miraculous stream/Where ... The Zodiac is changed into a sphere.'

What is the difference between circlce and sphere? It is the difference between the circle and the endless column, probably. Brancusi's 'Coloana Infinitului' was born out of circles and an axis. In its turn, this endless column points to the Vortex, which is essential to the existence of the entire universe. Ezra Pound gave it a name in literature: Vorticism.

A sphere is an infinty of circles that run around the same centre. Once Yeats's protagonists are in the centre of the same sphere, age and mortality can no longer touch them. The Zodiac becomes meaningless.

This poem was written sometime around the year 1933. *Finnegans Wake* was written between 1922 and 1939. Yeats and Joyce had this in common: they wanted to open the minds of their readers to the sphere, to the endless column of the universe – to make them think the unthinkable – and read what can at first seem to be unreadable.





Charles Ogden – *The Meaning of Meaning*. 1923

Charles Ogden was stating in his preface to *The Meaning of Meaning* (1923):

‘The following pages, some of which were written as long ago as 1910, have appeared for the most part in periodical form during 1920-22, and arise out of an attempt to deal directly with difficulties raised by the influence of Language upon Thought.’

The subtitle of that book actually was ‘A Study of the Influence of Language upon Thought and of the Science of Symbolism.’

~~~~~  
**Ludwig Josef Johann Wittgenstein** (1889-1951) *Tractatus Logico-Philosophicus* (**1921**), translated into English by Charles K. Ogden in 1922

~~~~~  
Charles Kay Ogden (1889-1957) *The Meaning of Meaning* (**1923**)

~~~~~  
**James Joyce** (1882-1941) *Finnegans Wake* (**1922-1939**)

~~~~~  
The only recording of James Joyce reading a part of “Anna Livia Plurabelle”, lasting eight and a half minutes, was made by Charles K. Ogden in London, in August **1929**.
~~~~~

If Joyce knew a great British linguist personally and knew him well, that was Charles Ogden, who was actually the only professional British linguist who succeeded to provide a recording of the voice of James Joyce. Charles Ogden is the distinguished London linguist who recorded Joyce’s voice, while being at the same time the very first to translate Ludwig Wittgenstein into English. If Joyce knew Ogden, he must have been acquainted with Wittgenstein’s *Tractatus*, too.

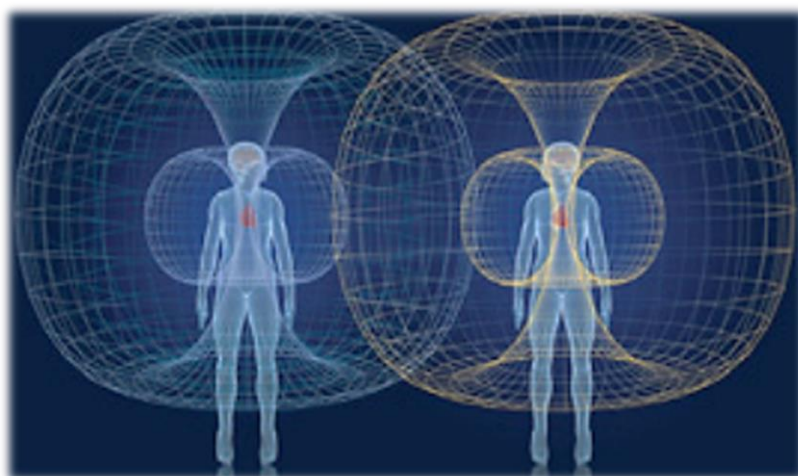
The question “Did Joyce know Wittgenstein?” has an answer, then: Charles Ogden is the key to it.

G.S.



C. George Sandulescu and Lidia Vianu

The Letter G from  
Joyce's 'Words' In *Finnegans Wake*



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Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



49

**FW Address**

|                                                       |                       |
|-------------------------------------------------------|-----------------------|
| 369.07:10                                             | G. B. W.              |
| 603.12:4                                              | G.M.P.'s              |
| 025.23:10                                             | G.O.G.                |
| 256.29:8                                              | G.P.O.                |
| 212.34:12, 212.35:11, 212.36:4,<br>270.31:6, 270.31:7 | ga                    |
| 514.33:1                                              | Gaa                   |
| 332.26:6                                              | gaames                |
| 140.36:7                                              | gaarden               |
| 323.13:11                                             | Gaascooker            |
| 175.31:5                                              | gaasy                 |
| 332.14:1                                              | gaauspices            |
| 324.14:8                                              | gabbalots             |
| 197.28:6                                              | gabbard               |
| 342.13:6                                              | Gabbarnaur-Jaggarnath |
| 150.28:8                                              | gabbercoat            |
| 424.10:9                                              | Gabbiano's            |
| 209.28:8                                              | gabe                  |
| 490.14:3                                              | gabgut                |
| 276.12:4                                              | gabhard               |
| 422.03:10                                             | Gach                  |
| 511.11:10                                             | gackles               |
| 202.04:7                                              | gadabout              |
| 354.22:7                                              | gadden                |
| 155.26:10                                             | gaddered              |
| 034.27:6                                              | gaddeth               |
| 275.F2                                                | gaddy                 |
| 260.13:2                                              | Gadeway               |
| 246.05:9                                              | Gadolmagtog           |



Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



50

|                              |                |
|------------------------------|----------------|
| 063.06:2                     | gaeilish       |
| 267.07:2, 321.12:3, 515.07:2 | gael           |
| 510.15:12                    | Gaelers'       |
| 549.36:8                     | gaelic         |
| 514.33:7                     | Gaelicise      |
| 011.05:4                     | gaels          |
| 043.27:13                    | gaels          |
| 339.13:6                     | gaelstorms     |
| 087.14:5                     | Gaeltact       |
| 560.27:2                     | gaffneysaffron |
| 330.01:4                     | gafr           |
| 093.20:2                     | gaft           |
| 482.20:1                     | gagag          |
| 389.22:3                     | gagagniagnian  |
| 178.01:6                     | gagainst       |
| 102.08:7                     | gagar's        |
| 272.29:1                     | gageure        |
| 004.01:9                     | gaggin         |
| 565.11:1                     | Gaij           |
| 321.23:6                     | gail           |
| 312.30:5                     | gailydhe       |
| 540.24:3                     | gaingangers    |
| 093.20:10                    | gaingridando   |
| 325.04:3                     | gainous        |
| 366.11:7                     | gainst         |
| 321.06:2                     | gainsts        |
| 389.23:6                     | galahat        |
| 492.26:2                     | galandhar      |
| 256.09:8                     | galantifloures |
| 105.26:5                     | Galasia        |
| 547.32:1, 547.32:2           | Galata         |





|                     |                |
|---------------------|----------------|
| 032.12:4            | Galathee       |
| 206.31:2            | galawater      |
| 203.28:1            | galbs          |
| 294.16:7            | galehus        |
| 251.25:6            | Galilleotto    |
| 622.06:6            | Galla          |
| 008.25:1            | Gallawghurs    |
| 604.15:6            | gallaxion      |
| 583.08:10           | galleonman     |
| 321.11:9            | galler         |
| 489.07:1            | gallews        |
| 540.23:5            | galleyliers    |
| 185.33:1, 315.36:10 | gallic         |
| 143.17:6            | gallicry       |
| 208.13:3            | galligo        |
| 620.13:8            | Galliver       |
| 524.29:4            | gallockers     |
| 256.36:10           | Gallocks       |
| 187.13:1            | gallonts       |
| 288.24:2            | galloroman     |
| 118.13:6            | Gallotaurus    |
| 031.17:7, 387.06:2  | gallowglasses  |
| 388.25:9            | gallowsbirds   |
| 566.03:7            | gallpitch      |
| 393.18:2            | Gallstonebelly |
| 377.21:6            | gallus         |
| 089.07:4            | Gallwegian     |
| 557.04:9            | galohery       |
| 219.12:2            | Galorius       |
| 141.30:3            | Galory         |
| 557.03:1            | galorybit      |



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|------------------------------|----------------|
| 502.10:2                     | galumphantes   |
| 458.09:10                    | galways        |
| 343.10:4                     | Galwegian      |
| 344.06:8                     | Gambanman      |
| 009.35:10                    | Gambariste     |
| 414.28:1                     | gambills       |
| 541.13:3                     | Gambleden      |
| 134.06:8                     | Gambrinus      |
| 615.06:6                     | gamebold       |
| 451.27:8                     | gameboy        |
| 234.17:3                     | gamecox        |
| 191.19:10                    | gamefellow     |
| 350.35:7                     | gamefellow     |
| 034.03:1                     | Gamellaxarksky |
| 389.32:2                     | gamen          |
| 606.33:3                     | gamesy         |
| 427.31:1, 461.12:7           | gamings        |
| 568.32:5                     | gamman         |
| 492.04:10                    | gammat         |
| 275.05:4                     | gammel         |
| 096.09:10                    | gammeldags     |
| 046.21:3                     | gammelhole     |
| 046.22:6                     | gammelhore     |
| 215.14:7                     | Gammer         |
| 268.L4                       | Gamper         |
| 057.23:5                     | gamps          |
| 318.22:10                    | Gamuels        |
| 246.21:9, 503.23:6, 129.10:5 | gan            |
| 389.32:1                     | gandered       |
| 423.09:4                     | ganderpan      |
| 378.25:8                     | gandfarder     |



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| 552.11:6            | Gandon        |
| 487.30:1            | Gangang       |
| 479.35:11           | ganghorn      |
| 487.29:11           | ganguin       |
| 196.18:9            | gangres       |
| 576.31:10           | gangrung      |
| 373.09:2            | gangstairs    |
| 330.29:2            | ganna         |
| 452.27:5            | gannies       |
| 287.02:9            | ganswer       |
| 531.07:5            | gansyfet      |
| 583.11:4            | ganymede      |
| 098.28:10, 407.06:5 | ganz          |
| 427.09:1            | Gaogaogaone   |
| 413.29:6            | gaon          |
| 425.23:2            | Gaoy          |
| 136.20:3            | gapman        |
| 019.16:5            | garbagecans   |
| 509.30:12           | garce         |
| 423.02:2            | garcielasso   |
| 471.30:8            | garde         |
| 564.35:10           | gardeenen     |
| 475.11:7            | gardenfillers |
| 133.23:2            | gardiner      |
| 552.19:4            | garding       |
| 252.32:1            | Gardoun       |
| 596.22:1            | gards         |
| 350.02:10           | garerden      |
| 319.26:5            | gargantast    |
| 550.10:12           | garleeks      |
| 622.36:8            | garlens       |





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| 339.21:7  | garmentguy   |
| 146.35:2  | Garnd        |
| 574.34:9  | garnishee    |
| 205.15:4  | garonne      |
| 467.13:2  | garotted     |
| 352.31:7  | garou        |
| 055.35:1  | garrickson's |
| 471.20:12 | garron       |
| 583.11:5  | garrymore    |
| 089.19:4  | gart         |
| 336.21:7  | gartener     |
| 423.35:3  | Garterd      |
| 471.09:7  | gartergazer  |
| 034.27:5  | garthen      |
| 069.10:2  | garthen      |
| 362.16:6  | garzelle     |
| 403.08:10 | Gascon       |
| 426.21:9  | gaseytotum   |
| 349.16:3  | gaspel       |
| 485.03:6  | Gaspey       |
| 521.24:6  | gaspower     |
| 485.09:11 | gasp         |
| 058.18:3  | gassies      |
| 437.01:11 | gastricks    |
| 393.35:2  | gastspiels   |
| 346.20:8  | Gasty        |
| 281.F2    | gaswind      |
| 288.F7    | gatch        |
| 063.28:4  | gatestone    |
| 345.18:4  | gatherumed   |
| 051.17:2  | gathery      |



|                                |              |
|--------------------------------|--------------|
| 339.04:4                       | gatovit      |
| 424.10:7                       | Gattabuia    |
| 246.21:8, 377.06:1             | gattling     |
| 233.27:4                       | Gau          |
| 134.06:7                       | Gaudio       |
| 294.29:2                       | Gaudyanna    |
| 208.07:8                       | gaudyquiviry |
| 313.29:11                      | gauger       |
| 321.23:9                       | gaul         |
| 281.05:8                       | Gaules       |
| 291.23:8                       | gaulish      |
| 604.22:8                       | Gaulls       |
| 406.06:3                       | gaulusch     |
| 381.13:9                       | gaunts       |
| 531.19:8                       | gause        |
| 277.L5                         | Gautamed     |
| 056.34:11, 365.31:10, 423.10:5 | gav          |
| 175.02:2                       | gaving       |
| 208.25:7                       | gawan        |
| 257.34:3                       | gawds        |
| 398.06:1                       | Gawin        |
| 297.18:5                       | gayatsee     |
| 179.08:12                      | gayboys      |
| 020.33:5                       | gaye         |
| 239.36:5                       | gayed        |
| 300.09:2                       | gayet        |
| 352.31:9                       | gayl         |
| 006.23:8                       | gaylabouring |
| 442.24:10                      | Gaylad       |
| 378.28:8                       | gayleague    |
| 256.36:5                       | Gaylegs      |



|           |                |
|-----------|----------------|
| 614.28:2  | gazebocroticon |
| 293.09:4  | gazet          |
| 224.26:8  | gazework       |
| 369.10:9  | Gazey          |
| 227.25:8  | gazious        |
| 089.17:13 | gcourts        |
| 302.25:7  | gd             |
| 502.14:3  | geallachers    |
| 257.05:1  | Geamatron      |
| 599.18:7  | Gearge         |
| 392.24:3  | geasa          |
| 199.34:6  | gebroren       |
| 150.11:5  | Gedankje       |
| 548.24:3  | geegaws        |
| 120.21:2  | geegees        |
| 606.36:5  | geen           |
| 552.02:3  | Geenar         |
| 454.16:9  | geepy          |
| 065.05:9  | geeser         |
| 233.12:3  | geeses         |
| 527.08:7  | geesing        |
| 464.32:2  | Geesyhus       |
| 180.06:4  | geewhiz        |
| 308.14:1  | Geg            |
| 249.36:9  | gegging        |
| 246.28:10 | gegifting      |
| 379.19:11 | gegs           |
| 378.21:4  | Geh            |
| 127.31:9  | gehamerat      |
| 078.09:4  | Gehinnon       |
| 321.23:7  | geil           |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



57

|                    |            |
|--------------------|------------|
| 296.11:5           | geing      |
| 597.27:10          | geip       |
| 071.11:3           | Geit       |
| 141.09:6           | geit       |
| 411.15:1           | Geity's    |
| 233.36:3           | Gelagala   |
| 143.25:5           | gelb       |
| 228.14:2           | Gelchasser |
| 375.12:1, 445.09:6 | gell       |
| 255.19:9           | Gellius    |
| 620.14:1           | Gellover   |
| 283.17:3, 354.31:7 | gells      |
| 182.09:1           | gember     |
| 090.18:10          | Gemellus   |
| 352.01:6           | gemenal    |
| 185.17:3           | gemens     |
| 220.14:2           | geminally  |
| 505.12:7           | gemination |
| 185.20:8           | geminorum  |
| 290.27:7           | Gemiti     |
| 202.20:9           | gemman's   |
| 498.13:7           | gemmynosed |
| 116.06:5           | Gemral     |
| 358.32:8           | Gemuas     |
| 251.36:8           | gemurmal   |
| 530.17:10          | gendarm    |
| 268.25:3           | genderous  |
| 510.31:7           | genderymen |
| 351.22:4           | generales  |
| 325.16:4           | generalman |
| 335.20:9           | generand   |







|           |                |
|-----------|----------------|
| 281.11:2  | générations    |
| 362.16:1  | generose       |
| 112.16:2  | genesic        |
| 219.09:2  | Genesius       |
| 523.04:4  | genewality     |
| 593.17:8  | genghis        |
| 350.09:1  | gangstermen    |
| 228.07:7  | Genik          |
| 569.31:7  | genitalmen     |
| 230.29:5  | genitricksling |
| 371.26:1  | genmen         |
| 113.21:3  | Genoaman       |
| 501.20:1  | Genral         |
| 531.28:2  | genral         |
| 423.33:1  | genrously      |
| 609.03:5  | genstries      |
| 546.05:4  | genteelician   |
| 552.14:7  | gentes         |
| 152.16:1  | Gentes         |
| 092.25:8  | Gentia         |
| 150.26:8  | Gentleman      |
| 573.35:5  | gentlemen      |
| 365.04:10 | gentilhomme    |
| 089.27:6  | gentium        |
| 106.12:9  | Gentlehomme's  |
| 617.25:7  | gentlemale     |
| 318.26:12 | gentlemeants   |
| 325.16:2  | gentlemens     |
| 301.11:1  | gentlemine     |
| 561.31:10 | gentlenest     |
| 177.08:8  | gentlenuns     |



|           |              |
|-----------|--------------|
| 120.09:6  | gentlerman   |
| 462.02:3  | gentlemen    |
| 063.10:2  | gentlewriter |
| 524.07:6  | gentlman     |
| 322.17:3  | gentryman    |
| 236.12:10 | gentrymen    |
| 269.06:5  | genua        |
| 053.19:1  | genuane      |
| 274.F2    | Genuas       |
| 595.07:4  | Geoglyphy's  |
| 242.06:6  | geolgian     |
| 297.01:1  | geomater     |
| 303.17:4  | Georgeous    |
| 388.34:2  | gerachknell  |
| 269.10:3  | gerandiums   |
| 337.34:4  | Gereland     |
| 434.07:2  | gerils       |
| 338.03:1  | Germanon     |
| 127.13:2  | germhuns     |
| 176.20:6  | germogall    |
| 115.12:4  | gerontophils |
| 287.19:3  | gert         |
| 618.03:1  | gertles      |
| 245.17:6  | ges          |
| 352.31:10 | geselles     |
| 093.11:4  | geshing      |
| 420.35:6  | geshotten    |
| 332.07:8  | Gestapose    |
| 361.32:6  | gestare      |
| 227.27:6  | geste        |
| 407.25:11 | gested       |



|           |                  |
|-----------|------------------|
| 431.33:10 | gesweest         |
| 169.02:4  | getatable        |
| 434.07:8  | gethobbyhorsical |
| 370.17:10 | Getobodoff       |
| 228.24:2  | getrennty        |
| 337.01:8  | getrunner        |
| 312.18:10 | getsome          |
| 500.35:3  | gettin           |
| 104.24:7  | Gettle           |
| 380.08:8  | gettogether      |
| 136.13:3  | geulant          |
| 369.04:9  | geust            |
| 394.27:7  | gev              |
| 221.09:3  | geyswerks        |
| 278.F1    | gezumpher        |
| 609.33:7  | ghariwallahs     |
| 008.19:9  | gharters         |
| 349.19:5  | ghast            |
| 265.03:2  | ghastcold        |
| 598.10:8  | ghastern         |
| 551.35:8  | ghates           |
| 559.24:2  | ghazometron      |
| 299.14:9  | gheist           |
| 193.09:10 | ghem             |
| 318.05:6  | ghem's           |
| 381.13:8  | Ghenter's        |
| 010.18:1  | ghentleman       |
| 228.33:2  | gheol            |
| 392.15:7  | gherman          |
| 182.13:1  | ghets            |
| 071.26:8  | Ghibeline        |



|                     |                |
|---------------------|----------------|
| 504.30:2            | ghiberring     |
| 567.36:7            | ghimbelling    |
| 120.26:8            | ghimel         |
| 182.12:10           | ghinee         |
| 016.31:8            | Ghinees        |
| 272.27:6            | Ghinis         |
| 228.32:3            | ghiornal       |
| 182.12:12           | ghirk          |
| 551.03:2            | ghoasts        |
| 051.15:8, 081.30:11 | ghoats         |
| 051.13:8            | ghoatstory     |
| 377.34:4            | ghools         |
| 318.06:1            | ghoom          |
| 593.18:3            | ghoon          |
| 397.22:9            | ghosses        |
| 219.08:5            | ghosters       |
| 473.09:1            | ghostmark      |
| 329.25:1            | Ghoststown     |
| 532.04:4            | ghostus        |
| 214.15:7            | ghostwhite     |
| 057.06:5            | ghouly         |
| 414.08:9            | ghuest         |
| 471.02:4            | Ghugugoothoyou |
| 323.35:11           | ghustorily     |
| 518.09:4            | Ghyllygully    |
| 615.03:3            | Giacinta       |
| 102.25:9            | Giallia        |
| 391.18:11           | giamond's      |
| 006.18:9            | gianed         |
| 368.08:7            | gianerant      |
| 243.15:8            | giantar        |





|           |                   |
|-----------|-------------------|
| 509.19:7  | giantle           |
| 616.30:10 | giantstand        |
| 355.22:2  | Giaourmany        |
| 107.22:6  | giaours           |
| 108.17:8  | giardarner        |
| 184.02:5  | gias              |
| 568.22:6  | gibbetmeade       |
| 504.29:6  | gibbonses         |
| 148.20:8  | gibos             |
| 170.26:11 | Gibsen's          |
| 511.11:6  | gickling          |
| 284.29:9  | giddy             |
| 617.12:6  | giddersh          |
| 347.27:9  | Gidding           |
| 508.30:3  | giddle            |
| 448.25:9  | giddles           |
| 195.03:10 | giddygaddy        |
| 418.32:3  | gidflirts         |
| 202.05:10 | gidgad            |
| 367.13:2  | gie               |
| 321.23:4  | giel              |
| 326.08:9  | gielgaulgalls     |
| 241.17:13 | gients            |
| 062.10:6  | giftake           |
| 358.07:12 | giftname          |
| 126.12:5  | giganteous        |
| 253.29:10 | gigantesquesque   |
| 055.27:5  | gigantig's        |
| 363.36:7  | giggag            |
| 377.19:5  | giggle-for-giggle |
| 289.18:4  | gigglehouse       |



|                    |                  |
|--------------------|------------------|
| 008.04:4           | gigglesomes      |
| 078.18:3           | gigglibly        |
| 532.22:4           | Gigglotte's      |
| 206.14:8           | gigguels         |
| 532.20:7           | gigirl           |
| 305.F3             | Giglamps         |
| 341.07:4           | gigls            |
| 523.31:2           | gigscrew         |
| 213.08:6           | gihon            |
| 558.02:1           | Gilbey's         |
| 037.08:7           | gildthegap       |
| 391.21:6           | Gillette         |
| 450.06:9           | Gillaroo         |
| 370.22:7           | Gilligan-Goll    |
| 178.16:4           | Gillooly         |
| 524.28:6           | gillybrighteners |
| 440.15:7           | Gillydehooly's   |
| 254.36:3           | gillyflowrets    |
| 550.25:2           | giltedged        |
| 344.01:6           | giming           |
| 456.08:1           | gimme            |
| 334.21:6           | gimmy            |
| 095.07:1           | ginabawdy        |
| 444.32:4           | ging             |
| 052.26:5           | gingerine        |
| 116.19:5, 116.19:6 | gingin           |
| 081.22:3           | ginkus           |
| 014.16:5           | ginnandgo        |
| 540.23:2           | gints            |
| 276.17:2           | Gipoo            |
| 261.01:1           | gipsylike        |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



64

|                              |               |
|------------------------------|---------------|
| 571.31:3                     | gir           |
| 075.20:7                     | Girahash      |
| 437.01:9                     | girde         |
| 245.14:9                     | giregargoh    |
| 112.30:4                     | Girilis       |
| 288.10:7                     | girlalove     |
| 496.03:9                     | girlcutted    |
| 397.05:1, 398.34:9           | girleen       |
| 493.21:5                     | girlery       |
| 051.15:9                     | Girles        |
| 182.08:12                    | girlglee      |
| 260.F1                       | girlic        |
| 174.15:7                     | girlic-on-you |
| 034.28:4                     | girling       |
| 430.22:2                     | girlsfluss    |
| 234.34:8                     | girlycums     |
| 143.20:8                     | girlyhead     |
| 346.20:4                     | girnirilles   |
| 129.30:4                     | Giroflaa      |
| 129.30:3                     | Giroflee      |
| 349.21:9                     | girtel        |
| 144.27:8                     | girters       |
| 130.27:3, 130.27:4, 130.27:6 | girther       |
| 211.01:12                    | girton        |
| 080.33:8                     | gish          |
| 350.10:4                     | gisture       |
| 320.14:5                     | gitter        |
| 031.20:7                     | Giubilei      |
| 056.34:9                     | Giv           |
| 345.21:2                     | giveme        |
| 133.31:3                     | giveth        |





|           |               |
|-----------|---------------|
| 223.11:10 | givin         |
| 243.10:7  | givnergenral  |
| 451.30:4  | Gizzygay      |
| 238.36:10 | Gizzygazelle  |
| 601.27:3  | Glacianivia's |
| 232.32:1  | glaciator     |
| 470.17:4  | Gladdays      |
| 555.15:8  | gladdied      |
| 387.35:7  | Gladeys       |
| 524.26:8  | gladful       |
| 276.02:5  | gladhander    |
| 267.10:5  | gladrags      |
| 507.16:12 | gladrolleries |
| 428.08:9  | Gladshouse    |
| 537.01:3  | gladshouses   |
| 600.13:2  | gladsighted   |
| 373.28:2  | Gladstools    |
| 365.11:2  | gladyst       |
| 493.36:3  | glamourie     |
| 250.16:10 | Glamours      |
| 512.09:2  | glancefull    |
| 038.10:9  | glaned        |
| 226.28:6  | glants        |
| 404.12:4  | glaow         |
| 209.30:10 | glashaboys    |
| 027.01:4  | Glassarse     |
| 113.02:3  | glasseries    |
| 529.23:8  | Glassthure    |
| 041.35:6  | Glasstone     |
| 077.34:5  | glasstone     |
| 321.08:4  | Glasthule     |





|           |                         |
|-----------|-------------------------|
| 327.13:12 | glatsch                 |
| 072.27:4  | glatt                   |
| 261.16:1  | Glattstoneburg          |
| 157.11:4  | glaubering              |
| 012.08:12 | glaubrous               |
| 179.26:3  | glaucous                |
| 600.36:10 | glaum                   |
| 010.35:9  | glav                    |
| 621.24:10 | glave                   |
| 232.07:3  | gleamens                |
| 477.12:5  | gleamy                  |
| 553.23:7  | gleanermonth            |
| 264.28:4  | Gleannaulinn            |
| 145.25:2  | gleechoreal             |
| 533.22:2  | gleeglom                |
| 169.18:4  | gleetsteen              |
| 146.16:11 | gleison                 |
| 529.26:3  | glenagearries           |
| 223.17:3  | Glenasmole              |
| 248.30:5  | Glendalough             |
| 605.11:5  | Glendalough-le-vert     |
| 380.09:4  | Glenfinnisk-en-la-Valle |
| 183.36:2  | glete                   |
| 063.24:2  | Glibt                   |
| 158.08:3  | glidder                 |
| 318.35:3  | gliddinyss              |
| 325.27:1  | Glideon                 |
| 284.10:7  | glike                   |
| 585.05:8  | Glinglow                |
| 130.03:6  | glimse                  |
| 049.29:6  | glimt                   |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



67

|                     |                      |
|---------------------|----------------------|
| 623.28:6            | Glinaduna            |
| 059.18:3            | Glintalook           |
| 130.33:7            | Glintylook           |
| 403.24:9            | glistery             |
| 349.12:1            | glitteraglatteaglutt |
| 249.07:6            | glittergates         |
| 054.29:4            | gllll                |
| 014.31:2            | gloamering           |
| 433.06:2            | Gloamy               |
| 438.14:4            | Gloatsdane's         |
| 229.18:6            | globbtrottell        |
| 131.35:8            | globeful             |
| 532.30:10           | globelettes          |
| 435.12:6            | globetopper          |
| 455.26:9            | globoes              |
| 198.29:4            | glommen              |
| 089.33:10           | glomsk               |
| 493.36:1            | gloomerie            |
| 112.24:4            | gloompourers         |
| 434.06:2            | glooves              |
| 439.16:3            | Glor                 |
| 213.31:11, 611.23:5 | gloria               |
| 454.29:10           | gloria's             |
| 418.04:11           | gloriam              |
| 388.28:9            | gloriaspanquost      |
| 553.15:3            | glorietta's          |
| 304.22:1            | glorifires           |
| 108.27:1            | glorisol             |
| 282.06:4            | gloryaims            |
| 230.33:1            | glos                 |
| 083.11:1            | glossery             |





|                                                                             |             |
|-----------------------------------------------------------------------------|-------------|
| 165.02:6                                                                    | glottide    |
| 252.21:6                                                                    | glouch      |
| 345.19:10                                                                   | glouglou    |
| 540.31:9                                                                    | glovars'    |
| 338.28:2                                                                    | glowrings   |
| 327.17:1                                                                    | glowru      |
| 372.29:2                                                                    | glowry      |
| 144.01:7                                                                    | glowstop    |
| 318.14:1                                                                    | glowworld's |
| 099.01:5                                                                    | glowworm    |
| 339.24:10                                                                   | glozery     |
| 360.09:9                                                                    | gluckglucky |
| 569.04:8                                                                    | gluckspeels |
| 537.13:8                                                                    | glucose     |
| 537.13:7                                                                    | glueglue    |
| 219.22:1                                                                    | GLUGG       |
| 220.10:7, 220.14:1, 223.05:7,<br>224.09:5, 224.16:11, 225.29:4,<br>225.29:9 | Glugg       |
| 226.20:3                                                                    | Glugg's     |
| 222.25:7, 240.03:8                                                          | Glugger     |
| 301.14:4                                                                    | glumsome    |
| 340.10:1                                                                    | glunn       |
| 370.36:7                                                                    | glutany     |
| 358.10:10                                                                   | gluttened   |
| 482.13:4                                                                    | Gwlwd       |
| 236.02:1                                                                    | glycering   |
| 242.13:5                                                                    | glycorawman |
| 122.01:6                                                                    | glypse      |
| 342.02:3                                                                    | Gmax        |
| 243.05:4                                                                    | gmere       |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



69

|                      |                                |
|----------------------|--------------------------------|
| 243.05:7             | gmountains                     |
| 344.29:8             | gnaas                          |
| 159.28:1             | Gnaccus                        |
| 345.30:10            | gnarld                         |
| 010.32:1, 010.34:3   | gnarlybird                     |
| 556.29:2             | gnasty                         |
| 274.F2               | gnatives                       |
| 222.27:4             | gnatsching                     |
| 170.11:10            | gnawstick                      |
| 231.22:1             | gnawthing                      |
| 274.F2               | gneesgnobs                     |
| 605.01:6             | gnewgnawns                     |
| 607.18:9             | gnid                           |
| 607.18:7             | Gnig                           |
| 319.07:8             | gnir                           |
| 416.15:12            | gnit                           |
| 159.28:2             | Gnoccovitch                    |
| 333.33:1             | gnockmeggs                     |
| 596.14:4             | gnomeosulphidosalamermauderman |
| 182.04:13            | gnose's                        |
| 612.24:8             | gnosegates                     |
| 157.25:1             | gnoses                         |
| 060.10:3, 140.02:1   | gnot                           |
| 274.F2               | gnows                          |
| 607.18:4             | Gnug                           |
| 349.27:2             | gnwrng                         |
| 083.27:1             | Goalball                       |
| 093.18:9             | goalbind                       |
| 129.31:8             | goaldkeeper                    |
| 147.15:8, 602.11:3   | goaling                        |
| 008.09:10, 010.22:10 | goan                           |





|                    |               |
|--------------------|---------------|
| 298.03:6           | goaneggbetter |
| 585.14:7           | goatfathers   |
| 344.05:7           | goathey       |
| 464.12:9           | goatsbeard    |
| 097.34:2           | goatservant   |
| 370.01:7           | goatsman      |
| 015.01:6           | Goatstown's   |
| 558.02:2           | goatswhey     |
| 441.33:8           | goattanned    |
| 372.13:9           | goatweigh     |
| 504.29:8           | gobbenses     |
| 061.19:12          | gobbit        |
| 071.18:6           | Gobblasst     |
| 087.03:3           | gobbless      |
| 118.22:5           | gobblydumped  |
| 319.20:7           | gobbos        |
| 441.29:4           | gobed         |
| 437.07:5           | go-be-dee     |
| 357.29:4           | gobelimned    |
| 552.13:8           | gobelins      |
| 277.12:1           | gobleeege     |
| 095.18:2           | Goborro       |
| 338.03:5           | gobrawl       |
| 242.09:2           | gobstick      |
| 095.18:6           | Gobugga       |
| 251.26:3           | goche         |
| 503.17:1           | Godamedy      |
| 185.21:3           | Godardi       |
| 254.28:7, 578.03:3 | Godd          |
| 560.15:1           | Godde         |
| 593.07:9           | godden        |



|                     |                |
|---------------------|----------------|
| 476.04:3            | goddestfar     |
| 059.12:1            | goddinpotty    |
| 076.10:2            | gode           |
| 313.05:6            | Godeown        |
| 490.24:7            | godforgiven    |
| 091.35:13           | Godhelic       |
| 326.16:7            | godhsbattaring |
| 347.06:3            | godinats       |
| 078.20:12, 446.05:3 | godkin         |
| 534.01:4            | Godnotch       |
| 300.28:3            | godolphing     |
| 555.20:3            | Godolphing     |
| 563.26:10           | godolphinglad  |
| 361.23:11           | godoms         |
| 565.21:4, 456.05:5  | godown         |
| 449.35:4            | godrolling     |
| 071.14:8            | Godsoilman     |
| 117.04:7            | godsun         |
| 312.19:4            | godthaab       |
| 584.11:7            | Goeasyosey     |
| 256.16:2            | goed           |
| 296.F3              | goeligum       |
| 577.22:1            | Goerz          |
| 270.F2              | goesbelly      |
| 347.03:9            | goest          |
| 334.18:5, 375.17:9  | goff           |
| 126.24:2            | goflooded      |
| 343.03:9            | gogemblem      |
| 451.04:7            | gogetter       |
| 292.29:9            | gogoin         |
| 102.08:4            | gogor's        |



|           |                      |
|-----------|----------------------|
| 361.07:6  | goh                  |
| 080.26:2  | goharksome           |
| 538.29:7  | goheerd              |
| 077.27:1  | gohellt              |
| 234.36:3  | goholden             |
| 371.26:5  | goin                 |
| 028.23:7  | goingaways           |
| 360.07:5  | Golazy               |
| 567.19:1  | Goldarskiel          |
| 448.14:5  | goldcapped           |
| 099.01:2  | golddawn             |
| 148.08:1  | golded               |
| 234.10:1  | goldenest            |
| 211.34:6  | goldeny              |
| 276.F2    | goldfashioned        |
| 384.31:9  | goldies              |
| 366.11:6  | goldrush             |
| 613.01:7  | Goldselforelump      |
| 008.18:7  | goldtin              |
| 595.14:6  | goldways             |
| 569.19:5  | goldwhite            |
| 071.11:2  | Goldy                |
| 615.23:8  | goldylocks           |
| 167.08:8  | golfchild's          |
| 312.09:6  | Golfe                |
| 060.11:3  | Golforgilhisjyrylegs |
| 008.20:6  | goliar's             |
| 354.13:6  | Goll's               |
| 294.18:6  | Gollovar's           |
| 240.13:9  | golls                |
| 089.35:15 | gololy               |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



73

|                              |                        |
|------------------------------|------------------------|
| 008.20:7                     | goloshes               |
| 225.16:7                     | golten                 |
| 054.19:2                     | Gomagh                 |
| 317.15:2                     | gombolier              |
| 259.06:4                     | gomeet                 |
| 116.33:2                     | gomenon                |
| 374.10:6                     | gommas                 |
| 068.27:3, 546.32:4, 141.06:3 | gon                    |
| 104.23:10                    | Gonder                 |
| 066.32:9                     | gonemost               |
| 306.F2                       | Goney                  |
| 306.F2                       | goney                  |
| 345.20:2                     | gongos                 |
| 598.09:9                     | goning                 |
| 181.22:1                     | gonk                   |
| 370.28:2                     | gonlannludder          |
| 009.08:8                     | gonn                   |
| 072.25:6, 257.34:1           | Gonn                   |
| 271.18:4                     | Gonna                  |
| 292.12:5                     | gonna                  |
| 508.28:2                     | gonning                |
| 349.02:8                     | gonorrhal              |
| 245.02:5                     | gonz                   |
| 442.27:9                     | gooandfrighthisdualman |
| 603.25:3                     | goobes                 |
| 609.04:6                     | goochlipped            |
| 382.28:9                     | Goodbark               |
| 262.F7                       | Goodbeg                |
| 595.07:9                     | goodbett               |
| 453.16:8                     | Goodboy                |
| 471.32:1                     | goodboy's              |







|                                |                 |
|--------------------------------|-----------------|
| 600.33:4                       | goodbroomirish  |
| 077.29:1, 537.23:6             | goodbuy         |
| 073.16:8                       | goodbyte        |
| 406.36:3                       | goodcheap       |
| 224.02:6                       | goodda          |
| 025.05:3, 113.03:6, 326.17:5   | gooden          |
| 326.17:9, 625.35:5             | gooder          |
| 242.09:11                      | goodess         |
| 463.36:9                       | goodfilips      |
| 209.17:3                       | goodfor         |
| 292.14:1                       | goodfornobody   |
| 360.11:2                       | Goodfox         |
| 622.10:5                       | goodiest        |
| 111.08:11                      | goodishsized    |
| 460.06:5                       | goodless        |
| 191.25:6                       | goodlooker      |
| 014.11:12, 492.01:10, 515.02:7 | goodman         |
| 511.09:2                       | Good-man        |
| 403.22:5                       | goodmantrue     |
| 557.13:8                       | goodmen         |
| 545.10:8                       | Goodmen's       |
| 621.35:5                       | Goodmens        |
| 237.07:7                       | goodmiss        |
| 568.24:6                       | goodmorrow      |
| 149.23:1                       | goodmother      |
| 262.F3                         | goodrid         |
| 007.19:1                       | goodridhirring  |
| 140.34:1                       | goodself        |
| 327.02:5                       | goodsend        |
| 586.30:4                       | goodsforetombd  |
| 346.31:8                       | goodsforseeking |



|                     |                |
|---------------------|----------------|
| 428.19:11           | goodship       |
| 600.14:7            | Goodspeed      |
| 539.25:9            | goodwalldabout |
| 265.F4              | Googlaa        |
| 584.09:8            | googlie        |
| 557.07:8            | googoo         |
| 472.02:3            | googoos        |
| 381.06:4            | googs          |
| 405.34:3            | googs          |
| 390.35:4            | Goold          |
| 602.11:4            | goold          |
| 619.24:11, 619.29:8 | goolden        |
| 619.30:7            | goolden        |
| 414.12:6            | Goonness's     |
| 142.02:14           | goosebellies   |
| 170.35:9            | goosebosom     |
| 548.03:8            | goosegaze      |
| 399.23:2            | goosegreasing  |
| 242.25:7            | goosemother    |
| 449.36:10           | goosemother    |
| 287.02:8            | goosey's       |
| 233.12:4            | goosling       |
| 533.19:1            | Goosna         |
| 227.25:7            | goosseys       |
| 557.07:9            | goosth         |
| 425.01:11           | goosybone      |
| 155.19:7            | goot           |
| 197.01:2            | Gootch         |
| 394.27:5            | gooth          |
| 624.09:8            | gopeep         |
| 325.26:8            | Gophar         |



|           |                      |
|-----------|----------------------|
| 125.17:13 | Gopheph              |
| 323.16:7  | goragorridgorballyed |
| 031.12:7  | gorban               |
| 069.36:1  | Gorbotipacco         |
| 438.36:6  | gordons              |
| 246.04:3  | Gorey                |
| 011.15:8  | gorgeups             |
| 102.07:10 | gorggony             |
| 003.08:4  | gorgios              |
| 458.25:1  | gorgiose             |
| 219.11:3  | Gorias               |
| 132.35:1  | gorky                |
| 376.18:5  | Gormagareen          |
| 348.18:11 | Gormleyson           |
| 294.18:5  | Gorotsky             |
| 403.08:7  | gorsecone            |
| 338.35:6  | gorsecopper's        |
| 361.23:8  | gorsedd              |
| 128.20:10 | gorsegrowth          |
| 053.30:2  | Gort                 |
| 602.18:9  | gortan               |
| 379.28:6  | Gorteen              |
| 565.12:5  | Gortigern            |
| 278.F1    | Gosem                |
| 152.09:5  | goslingnecked        |
| 343.32:2  | gospeds              |
| 112.06:12 | gospellers           |
| 552.27:11 | gospelly             |
| 325.18:8  | gospfather           |
| 345.02:3  | Gospolis             |
| 253.23:10 | gossan               |



|           |                 |
|-----------|-----------------|
| 325.16:6  | gosse           |
| 195.04:2  | gossipaceous    |
| 038.23:2  | gossiple        |
| 476.04:6  | gossipocracy    |
| 377.25:2  | gosson          |
| 390.03:9  | Gosterstown     |
| 198.13:3  | Gota            |
| 339.04:7  | gotafit         |
| 262.F1    | Gotahelv        |
| 527.01:8  | Gotellus        |
| 276.12:1  | Goteshoppard    |
| 332.10:6  | goth            |
| 352.11:6  | Gothabobus      |
| 550.11:4  | gothakrauts     |
| 538.33:7  | Gothamm         |
| 394.27:9  | gotheny         |
| 148.20:1  | Gothewishegoths |
| 565.21:2  | Gothgorod       |
| 568.08:5  | Gothius         |
| 415.27:1  | goths           |
| 053.27:3  | gothsprogue     |
| 378.04:5  | gotliness       |
| 386.31:2  | Gotopoxy        |
| 487.17:13 | gots            |
| 114.25:6  | gotsquantity    |
| 326.17:1  | gott            |
| 551.29:4  | gottalike       |
| 490.08:6  | Gottgab         |
| 501.09:2  | gotye           |
| 498.17:4  | gougerotty      |
| 438.08:9  | gougouzoug      |



Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



78

|                                                                                      |               |
|--------------------------------------------------------------------------------------|---------------|
| 165.14:1                                                                             | goulache      |
| 327.28:7, 140.15:8                                                                   | gould         |
| 531.14:6                                                                             | goulewed      |
| 369.34:5                                                                             | goumeral's    |
| 170.35:2                                                                             | goupons       |
| 088.31:2                                                                             | gourgling     |
| 407.02:2                                                                             | gourmeteering |
| 480.33:3                                                                             | gouspils      |
| 596.36:2                                                                             | Goute         |
| 194.07:6                                                                             | gouttelette   |
| 301.20:2                                                                             | gouvernement  |
| 375.23:6                                                                             | Gouverneur    |
| 258.28:8                                                                             | Gov           |
| 345.11:3                                                                             | govalise      |
| 346.21:8, 599.06:3                                                                   | gow           |
| 356.03:3                                                                             | Gow           |
| 398.05:9                                                                             | Gowan         |
| 624.08:4                                                                             | Gowans        |
| 552.11:3                                                                             | gowgow        |
| 057.25:7                                                                             | gowndabout    |
| 182.22:8                                                                             | goyls         |
| 199.22:4                                                                             | goyt          |
| 018.13:5                                                                             | graab         |
| 541.17:2                                                                             | graatched     |
| 113.03:5                                                                             | Grabar        |
| 492.11:1                                                                             | Grabashag     |
| 545.34:5                                                                             | graben        |
| 221.34:6                                                                             | Grabstone     |
| 414.21:2, 414.22:2, 416.08:7,<br>417.03:2, 417.22:8, 417.33:1,<br>418.11:2, 418.12:8 | Gracehoper    |



|                               |                 |
|-------------------------------|-----------------|
| 257.05:5                      | gracehoppers    |
| 512.28:4                      | gracer          |
| 337.01:7                      | gracesold       |
| 387.34:6                      | gracest         |
| 607.34:5                      | Gracest         |
| 291.09:4                      | gracewindow'd   |
| 623.11:10                     | graciast        |
| 095.04:1, 242.09:9, 273.19:1, | gracies         |
| 356.07:6                      |                 |
| 361.12:7                      | Gracius         |
| 611.17:3                      | gradationes     |
| 353.10:6                      | grafe           |
| 300.25:4                      | grafficking     |
| 317.36:8                      | gragh           |
| 353.03:4                      | Gragious        |
| 140.04:4                      | Grahot          |
| 587.32:5                      | grainpopaw      |
| 203.03:8                      | grainwaster     |
| 113.01:11                     | graith          |
| 366.20:5                      | grakeshoots     |
| 457.09:8                      | grame           |
| 613.18:4                      | graminopalmular |
| 268.24:1                      | gramma          |
| 268.17:1                      | gramma's        |
| 256.20:3                      | Grammaires      |
| 007.08:8                      | Grampupus       |
| 362.08:6                      | grampurpoise    |
| 570.01:7                      | Grandbeyond     |
| 498.14:8                      | granddaucher    |
| 268.12:4                      | grandegaffe     |
| 029.07:1                      | grandfallar     |



|           |                       |
|-----------|-----------------------|
| 202.02:10 | Grandfarthring        |
| 027.03:11 | grandfer              |
| 250.12:1  | Grandicellies         |
| 256.20:1  | Grandmère             |
| 448.14:4  | grandnational         |
| 343.23:6  | grandoper             |
| 527.07:13 | grandpassia           |
| 464.13:7  | grandsourd            |
| 152.21:6  | grandsumer            |
| 343.25:7  | grandthiked           |
| 113.03:7  | grandy                |
| 439.13:2  | grandydad's           |
| 375.29:5  | graneen               |
| 070.28:7  | granfather's          |
| 236.24:4  | Grangegorman          |
| 306.28:7  | Grania                |
| 329.29:11 | Granjook              |
| 022.12:2  | grannewwail           |
| 450.04:7  | grannom               |
| 299.10:7  | grannyamother         |
| 195.04:1  | grannyma              |
| 495.18:9  | Granny-stream-Auborne |
| 553.26:6  | granvilled            |
| 292.01:1  | granyou               |
| 457.28:5  | grapbed               |
| 432.35:1  | grapce                |
| 568.11:5  | grapcias              |
| 171.18:2  | grapefruce            |
| 261.F3    | grapejuice            |
| 456.15:9  | grapeling             |
| 284.07:1  | graphplot             |



|                     |                 |
|---------------------|-----------------|
| 360.25:7            | grappes         |
| 561.26:7            | graps           |
| 405.26:5            | graspis         |
| 611.33:9            | grassbelonghead |
| 132.13:13           | grasscircle     |
| 556.25:5            | grassgross      |
| 197.27:7            | grasshoop       |
| 024.10:9, 360.30:3  | grassies        |
| 209.05:8            | grasswinter's   |
| 174.15:1            | grassyass       |
| 158.19:10           | Grasyaplaina    |
| 174.12:12, 584.35:3 | gratias         |
| 093.15:6            | gratiasagam     |
| 415.20:7            | gratiis         |
| 580.32:8            | grattaned       |
| 496.06:1            | gratuitouses    |
| 624.12:7            | graundplotting  |
| 513.28:2            | graunt          |
| 605.07:5            | graunted        |
| 068.10:5            | Graunya         |
| 058.11:2            | Graunya's       |
| 417.01:4, 417.02:1  | Grausssssss     |
| 506.13:7            | grauws          |
| 568.27:10           | graveleek       |
| 202.24:2            | graveller       |
| 013.10:7            | gravemure       |
| 364.23:6            | gravesobbers    |
| 102.21:7            | gravespoil      |
| 572.05:7            | gravetrench     |
| 146.34:8            | gravestone      |
| 329.08:11           | gravydock       |





|                     |                         |
|---------------------|-------------------------|
| 030.07:1            | Gravys                  |
| 200.20:8, 488.36:8  | Graw                    |
| 503.33:5            | grawndest               |
| 567.18:8            | graycloak               |
| 322.14:6            | graye                   |
| 614.01:1            | grazeheifer             |
| 186.31:7            | grazious                |
| 161.16:5            | greace                  |
| 343.17:9            | greak                   |
| 212.10:3            | Greaney                 |
| 603.28:1            | Greanteavvents          |
| 464.29:5            | greas                   |
| 136.09:11, 136.10:4 | greasefulness           |
| 339.36:5            | greaseshaper            |
| 140.20:6            | greaseways              |
| 170.34:9            | greasilygristly         |
| 552.02:5            | Greasouwea              |
| 031.16:6            | greataunt               |
| 403.23:4            | greatbritish            |
| 569.15:1            | Greatchrist             |
| 343.21:1            | Creates                 |
| 191.34:5            | greatgrand              |
| 368.04:5            | greatgrandgosterfosters |
| 017.33:7            | greatgrandhotelled      |
| 237.07:10           | greatmess               |
| 068.11:3            | greatsire               |
| 058.03:12           | Greatwheel              |
| 407.12:3            | gred                    |
| 267.04:6            | greeces                 |
| 362.16:4            | greediguss              |
| 377.01:1            | greeding                |



|                     |                    |
|---------------------|--------------------|
| 308.21:5            | greedings          |
| 037.03:9            | greedly            |
| 411.21:2            | Greedo             |
| 445.23:9            | greedypuss         |
| 241.31:4            | greeft             |
| 043.13:4            | greek              |
| 171.01:6            | greekenhearted     |
| 143.25:7            | greem              |
| 563.31:7            | greenafang         |
| 068.06:4            | greenawn           |
| 289.06:1            | greendgold         |
| 360.30:2            | greendy            |
| 094.01:3            | greene             |
| 226.31:13           | greeneriN          |
| 088.15:10, 249.03:5 | greeneyed          |
| 556.15:5            | greengageflavoured |
| 446.19:2            | greengeese         |
| 522.16:9            | greengoaters       |
| 407.13:1            | greengrown         |
| 532.23:7            | greenily           |
| 378.11:5            | Greenislender      |
| 074.02:11           | Greenman's         |
| 582.10:7            | greenmould         |
| 411.24:8            | greenridinghued    |
| 161.30:4            | greensleeves       |
| 553.20:9            | greenwished        |
| 467.10:9            | greeping           |
| 158.08:7, 158.08:8  | greepsing          |
| 549.02:1            | greese             |
| 206.32:7            | greesed            |
| 379.29:9            | greesiously        |



|           |                   |
|-----------|-------------------|
| 535.11:1  | greethims         |
| 375.03:5  | Greevy            |
| 278.F1    | greeze            |
| 156.21:7  | gregary           |
| 167.16:11 | gregational       |
| 553.16:10 | gregoromaio       |
| 368.33:2  | Gregorovitch      |
| 551.31:4  | gregos            |
| 564.09:7  | grekish           |
| 596.21:4  | gren              |
| 349.13:9  | grenadite         |
| 267.13:4  | grene             |
| 449.33:3  | grenoulls         |
| 450.05:1  | greppies          |
| 155.27:8  | gresk             |
| 344.27:4  | Greste            |
| 538.24:10 | gretched          |
| 553.14:4  | Gretecloke        |
| 094.01:6  | gretnass          |
| 212.10:2  | Grettna           |
| 041.23:1  | grevey            |
| 170.34:5  | Grex's            |
| 190.31:2  | greybounding      |
| 602.15:2  | Greyglens         |
| 478.35:3  | greyleg           |
| 503.23:7  | greyne            |
| 611.09:5  | greysfriaryfamily |
| 601.05:3  | greyt             |
| 016.34:2  | greytcloak        |
| 158.17:1  | Gri               |
| 503.23:3  | grianblachk       |



|                                |                  |
|--------------------------------|------------------|
| 331.17:1                       | gribes           |
| 332.15:2                       | gribgrobgrab     |
| 158.17:11                      | grice            |
| 011.35:12                      | Gricks           |
| 620.30:9                       | gricks           |
| 058.09:4                       | grida            |
| 531.21:9                       | Griddle-the-Sink |
| 269.25:1                       | griefer          |
| 169.23:3                       | Griefotrofio     |
| 207.03:10                      | griefs           |
| 393.12:4                       | griesouper       |
| 370.04:7                       | grievingfrue     |
| 450.14:2                       | griffeen         |
| 279.F14:11, 139.19:9           | grig             |
| 113.02:9                       | grigs            |
| 416.29:1                       | grillies         |
| 016.35:8                       | grilsy           |
| 055.35:3                       | grimaldism       |
| 480.24:10                      | Grimbarb         |
| 335.05:10, 335.05:11, 414.17:5 | grimm            |
| 388.31:8                       | grimmacticals    |
| 330.06:8                       | grimmed          |
| 206.02:9                       | Grimmfather      |
| 132.10:6                       | Grimshaw         |
| 602.35:1                       | Grimstad         |
| 579.08:8                       | grinden          |
| 272.30:4                       | Gringrin         |
| 272.30:5                       | gringrin         |
| 007.09:2                       | grinny           |
| 517.25:7                       | Grinwicker       |
| 193.08:1                       | gripins          |





|                               |                |
|-------------------------------|----------------|
| 156.10:5                      | Gripos         |
| 234.02:9                      | griposly       |
| 619.04:5                      | Grippiths'     |
| 220.19:5                      | Grischun       |
| 353.22:8                      | grisning       |
| 410.09:2                      | grizzild       |
| 302.25:8                      | grl            |
| 585.14:9                      | groanmothers   |
| 291.24:3                      | Groany         |
| 137.04:6                      | groany         |
| 589.13:5                      | groat          |
| 360.36:3                      | groatsupper    |
| 356.05:3                      | grobbling      |
| 357.01:5                      | grobsmid       |
| 619.04:1                      | grocerest      |
| 469.16:8                      | Groenmund's    |
| 177.17:9                      | grognt         |
| 154.21:1                      | grogory        |
| 550.19:9                      | groinscrubbers |
| 130.02:7                      | grommelants    |
| 116.32:3                      | gromwelled     |
| 332.20:3                      | gronde         |
| 418.12:4                      | grondt         |
| 492.11:2                      | groogy         |
| 365.06:5                      | groont         |
| 268.11:3                      | grooser's      |
| 013.33:12, 102.33:3, 317.30:4 | groot          |
| 361.21:3                      | grootvatter    |
| 167.12:10                     | gropesarching  |
| 353.22:11                     | grosning       |
| 367.02:8                      | grossery       |



|           |               |
|-----------|---------------|
| 478.14:9  | grossgrown    |
| 598.33:7  | Grossguy      |
| 078.05:4  | grosskopp     |
| 331.16:4  | grosskropper  |
| 565.22:9  | grossman's    |
| 268.12:3  | grossopper's  |
| 541.08:7  | grossscruple  |
| 500.01:9  | groun         |
| 262.22:8  | groundloftfan |
| 072.34:6  | groundould    |
| 338.18:2  | groundsapper  |
| 076.18:4  | groundwet     |
| 477.35:10 | grouns        |
| 261.F3    | Groupname     |
| 476.33:8  | groupography  |
| 147.16:8  | groupsuppers  |
| 167.04:2  | grouptriad    |
| 415.25:1  | Grouscious    |
| 449.27:7  | Grouseus      |
| 087.23:2  | grousuppers   |
| 556.02:8  | growed        |
| 197.07:3  | Growley       |
| 016.35:9  | growlsy       |
| 369.31:3  | grownian      |
| 223.32:4  | growing       |
| 339.21:4  | Grozarktic    |
| 054.17:7  | guarso        |
| 056.35:3  | grube         |
| 023.01:8  | gruebleen     |
| 117.07:3  | gruen         |
| 065.20:4  | grum          |



|           |                    |
|-----------|--------------------|
| 065.23:2  | grum               |
| 065.23:10 | Grum               |
| 273.01:3  | Grumbledum's       |
| 413.21:2  | Grumby             |
| 006.17:6  | grumes             |
| 057.14:10 | grummelung         |
| 065.12:6  | grumpapar          |
| 065.19:3  | grumpapar          |
| 072.33:2  | grumus             |
| 353.23:6  | grunder            |
| 423.18:5  | Grundtsagar        |
| 301.F5    | Grunny             |
| 078.24:3  | gruntens           |
| 376.11:5  | Grusham            |
| 229.36:8  | grusomehed's       |
| 482.13:8  | Grwpp              |
| 358.22:9  | gryffygryffygryffs |
| 258.02:1  | gttrdmmrng         |
| 287.12:4  | Gu                 |
| 366.01:9  | guage              |
| 172.22:11 | Guardacosta        |
| 570.35:2  | guardafew          |
| 258.33:6  | guardiance         |
| 187.02:5  | guardiant          |
| 538.24:2  | guardient          |
| 324.07:7  | guardin            |
| 525.15:1  | Gubernathor        |
| 558.15:1  | Gubbs              |
| 306.R1    | GUBERNANT          |
| 338.19:3  | gubernier-gerenal  |
| 551.02:8  | Gudd               |



|                    |               |
|--------------------|---------------|
| 326.24:4           | Gudfodren     |
| 102.33:4           | gudgeon       |
| 356.18:3           | gudhe         |
| 613.12:7           | Gudstruce     |
| 241.28:1           | gudth         |
| 332.18:4, 332.18:6 | gué           |
| 272.29:3           | guegerre      |
| 504.29:9           | guelfing      |
| 567.36:9           | guelflinks    |
| 006.27:10          | guenesis      |
| 004.24:7           | guenneses     |
| 340.10:8           | guerillaman   |
| 256.36:1           | gueroligue    |
| 137.10:8           | guesse        |
| 603.03:2           | guessmasque   |
| 624.17:5           | guessp        |
| 536.12:6           | Guestermed    |
| 076.04:7           | guestfriendly |
| 470.13:8           | Guesturn's    |
| 614.16:11          | guett         |
| 570.28:8           | guey          |
| 341.30:1           | guffalawd     |
| 149.04:6           | guffalled     |
| 078.18:6           | guffawably    |
| 229.19:5           | guffer        |
| 031.11:10          | gugglet       |
| 363.36:6           | Guggy's       |
| 553.14:5           | Guglielmus    |
| 221.09:1           | Gugnir        |
| 403.12:8           | Gugurtha      |
| 403.13:1           | Gugurtha      |



Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



90

|                     |               |
|---------------------|---------------|
| 360.26:11, 360.27:1 | gui           |
| 519.16:4, 520.35:3  | guid          |
| 521.31:1            | Guid          |
| 621.08:2            | guiddus       |
| 345.22:10           | guidness      |
| 464.36:1            | guidneys      |
| 406.33:5            | guilbey       |
| 208.09:5            | guildered     |
| 567.28:4            | guillotened   |
| 072.29:2            | guilphy       |
| 072.14:6            | Guilteypig's  |
| 355.12:2            | guiltfeather  |
| 356.06:4            | guiltshouters |
| 105.15:5            | Guimea        |
| 204.29:6            | guimpes       |
| 179.34:2            | guineagold    |
| 479.05:3            | guineagould   |
| 361.05:3            | guineases     |
| 071.04:10           | guineese      |
| 565.10:11           | guineeser     |
| 382.03:8            | Guinness's    |
| 420.22:5            | Guineys       |
| 549.34:7            | Guinnass      |
| 009.18:5            | guinness      |
| 099.03:3, 309.01:11 | Guinnesses    |
| 090.13:12           | Guinney's     |
| 024.35:5            | Guinnghis     |
| 340.01:5            | guld          |
| 593.09:3            | Guld          |
| 028.11:11           | guldensilver  |
| 462.15:2            | gullaby       |





|                                           |              |
|-------------------------------------------|--------------|
| 197.06:3                                  | gullaway     |
| 057.21:8                                  | gullery      |
| 171.14:3                                  | gulletburn   |
| 173.03:8                                  | gullible's   |
| 426.17:5                                  | gulpa        |
| 396.23:7                                  | gulpable     |
| 406.33:7                                  | gulpable     |
| 319.27:2                                  | gulpstroom   |
| 493.13:5                                  | gulughurutty |
| 470.29:4                                  | gummalicked  |
| 066.13:4                                  | gummibacks   |
| 410.25:10                                 | gumpower     |
| 208.27:8                                  | gumptyum     |
| 444.15:4                                  | gunbarrel    |
| 596.15:10                                 | Gund         |
| 351.32:7                                  | Gundhur      |
| 316.33:12                                 | gundy        |
| 368.02:10                                 | gundy        |
| 220.15:3                                  | gunerally    |
| 387.35:5                                  | gunfree      |
| 443.21:5                                  | Gunger       |
| 008.11:2, 130.26:2                        | gunn         |
| 177.18:1                                  | gunnard      |
| 025.22:1, 044.12:6, 104.08:9,<br>271.17:8 | Gunne        |
| 531.05:1, 590.24:12, 625.32:8             | gunne        |
| 263.18:3                                  | Gunne's      |
| 379.10:1                                  | gunnell      |
| 242.10:11                                 | gunnfodder   |
| 567.11:3                                  | gunnings     |
| 596.15:9                                  | Gunnings     |



|           |                  |
|-----------|------------------|
| 343.23:11 | gunnong          |
| 192.03:1  | gunorrhal        |
| 035.27:10 | gunpocket        |
| 190.01:3  | gunpowdered      |
| 136.20:4  | gunrun           |
| 338.24:8  | gunshop          |
| 376.18:8  | Gunting          |
| 067.16:3  | guntinued        |
| 056.11:9  | gunwielder       |
| 529.14:8  | gup              |
| 349.09:3  | guranium         |
| 354.14:9  | gurdly           |
| 341.02:2  | gurg             |
| 365.25:1  | Gurk             |
| 378.26:1  | gurk             |
| 342.17:2  | Gurragrunch      |
| 342.17:3  | gurragrunch      |
| 258.01:6  | gurs             |
| 568.07:10 | gushgasps        |
| 394.35:4  | gushious         |
| 534.02:4  | gustoms          |
| 621.06:3  | Gustsofairy      |
| 257.34:5  | gustspells       |
| 020.07:3  | Gutenmorg        |
| 328.26:5  | Gutmann          |
| 617.18:10 | gutmurdherers    |
| 394.21:3  | gutterful        |
| 565.02:8  | guttergloomering |
| 116.29:2  | gutterhowls      |
| 518.25:5  | gutterish        |
| 091.11:6  | gutthroat        |



|           |                 |
|-----------|-----------------|
| 494.23:13 | Guygas          |
| 258.01:4  | Gwds            |
| 061.07:3  | gweatness       |
| 406.11:3  | gwen            |
| 609.04:7  | gwendolenes     |
| 406.11:5  | gwistel         |
| 418.27:3  | Gwyfyn          |
| 018.11:3  | gyant           |
| 069.06:4  | Gyant           |
| 596.23:7  | gygantogyres    |
| 036.13:8  | Gygas           |
| 099.09:3  | Gygasta         |
| 271.F4    | gymnufleshed    |
| 389.09:7  | gynecollege     |
| 014.25:4  | gynecure        |
| 444.16:4  | gypseyeyed      |
| 586.34:11 | gypsing         |
| 553.17:2  | gypsyjuliennes  |
| 298.16:8  | gyribouts       |
| 292.28:8  | gyrographically |
| 239.27:2  | gyrogyrorondo   |
| 295.24:3  | gyrotundo       |





C. George Sandulescu

Cartouching<sup>1</sup>

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<sup>1</sup> First conceived during the Spring of 1977, this section represents my contribution to the panel I chaired at the James Joyce Symposium (Dublin, June 1977). On that occasion, it was all delivered in ten minutes, which also included questions and comments from the floor.



Joyce finds a close parallel between the discovery of the source of the Nile and the writing – and perhaps the reading – of *Finnegans Wake*.

Jim Atherton (1959: 281)

I call cartouching a convenient heuristic procedure for *decoding* already encoded meaning in difficult poetic discourse in prose, especially of the FW type.

Cartouching was an interesting ancient Egyptian device for *encoding* in writing royal names, such as Ptolemy V Epiphanes, king of all Egypt, as these names were supposed to possess magic qualities. It was on this very name, and Cleopatra's, that Thomas Young in 1814, and Jean-François Champollion in 1822 and afterwards, managed to unravel the intricacies of the ancient Egyptian script. And it was on the four or five cartouches of the Rosetta Stone – repeats of the same name of Epiphanes – that both Young and Champollion had the separate revelation of the way this script was functioning. This is one of those Joycean coincidences that the name incapsulated in the cartouche of the Rosetta Stone, so central to Champollion's major discovery, is strangely reminiscent of the word that Joyce himself shunned and eliminated carefully from any theorizing after the incomplete completion of *Stephen Hero*. On top of it all, the Rosetta Stone was the very first Interlinear of human civilization, and, by coincidence again perhaps, it is a cartouche-based *Interlinear* that I propose in the subsequent Lexicon.

But to return now to the very essence of the cartouche. It is supposed, by my definition at least, to flash meaning in the way a bleep flashes sound signals. For it is a sort of bleep that calls doctors to an emergency hospital, signalling to them from somewhere in their breast pocket that they must report to headquarters at once. And it is a similar bleep too which transmits to earth the whereabouts of a satellite thrown into orbit. Well, a cartouche does bleep, or it does not. If it does not, it either is not a cartouche (for one should not forget that a cartouche is a decoder's entity only), or the reader in question is not a suitable decoder. What the encoder had done is quite

The "Quark"...



another matter, and that is, I am inclined to think, entirely his own private concern. Genetic research is, and should be, quite different in methodology and goals from the consistently structural approach to the printed text. As Paul Ricoeur (1970: 182-3) says, a text truly comes to life only upon the physical death of its author.

The eerie cartouche-bleep is epiphany-like: if it does not flash sound or meaning or whatever, it is not *it*. In other words, it does not fulfil its inherent function. Leo Spitzer was very fond of this device, though he simply called it a 'click'. The reader, he used to state, should go through a text on and on and over and over until he hears, or perceives a 'click', and then, starting from there, he should proceed to make an assessment of the whole text and thoroughly explicate his click:

(SPITZER (1948/1967: 6-7)) What seemed an agglomeration of mere sounds now appears motivated. We feel the same 'inner click' accompanying our comprehension.

Leo Spitzer himself was hearing the click when he was supposed to be hearing it; that was enough for him: he did not much bother about the underlying formal gadget, that was instrumental in producing it. Or, if he did, he took that particular thing to be the whole work of literature itself. As such, his click was a structural click, as it provided panoramic insight, leading to an overall assessment of *Don Quixote*, or any other piece of literature that might become a prey to his scrutiny. A cartouche is different, for it is a textural device only. It is far too early to try and assess its structural implications. It is a certainty that it is closely associated with a methodology for reading *Finnegans Wake*: it is perhaps the indispensable tool the average reader has to have in order to delve his own tunnel through a man-made mountain of meaning. As John Austin says somewhere, echoing Wittgenstein, the good craftsman should take good care of his tools, and keep them clean and tidy:

(AUSTIN (1955/1970: 181-2)) Words are our tools, and, as a minimum, we should use clean tools: we should know what we mean and what we do not.

One essential operation the perceptive reader is asked to do when seehearing –



a blend of Tindall's 'wifedaughter' brand! – this semantic bleep is to stay his progress, stop the videorecorder, as it were, and then try to slow-motion for his own benefit the semantic event he has gone through; he must ask himself:

What happened, and when, which led me to the revelation (the choice of this word here is deliberate!) of the fact that x is y?

It is very important for the reader to try and single out the exact boundaries of a cartouche. In order to facilitate this operation of lifting the cartouche from its highly intricate surrounding discourse, he is bound to some marked extent to adopt a to-hell-with-context frame of mind, and relax. This twin stance is FW-specific, and for lack of space here, it will be relegated for discussion elsewhere. The reason for neatly lifting the cartouche from surrounding FW discourse is quite simple: once lifted and properly identified, it is sure to function in one capacity or another – as hidden reminder, at the least – in order to carry the story. The lifting trigger is solely and exclusively its own semantic brilliancy, traceable back and quite analogous to –

(JJ (SH: 215)) a sudden spiritual manifestation whether in the vulgarity of speech /.../ or in a memorable phase of the mind itself.

That is what Hodgart & Worthington (1959) did when they lifted all cartouches from FW discourse containing a *renvoi*, or pointer, meant to turn the reader's mind's eye towards one particular Song or another. This is what Clive Hart (1962) did too, when he lifted all twice or more occurring cartouches of FW discourse on the strength of their intrinsic leitmotivistic capabilities, i.e. by virtue more or less of their very at-least-twice occurring. This too is what Adaline Glasheen (1956/1963/1977) did, when she exclaimed, 'Aha!', spectralizing in loud writing strong presuppositions of personal identity. They all had seenheard the Spitzerian semantic 'click', at the textural level of course, and whenever they were not absolutely sure they had seenheard it – the bleep that is – loud and clear, they carefully marked the fact with a question-mark or a pair of braces. All this is accounted for by the fact that saying 'x is y' in a difficult situation



is a revelation of meaning, which is ultimately grounded upon some sort of semantic coming-forth. That in its turn may receive a wide range of possible verbalizations in one's own interior monologue, in retrospective formulas such as —

- (a) It struck me that x was y.
- (b) It dawned upon me that x was y.

or, in the drier tone of understatement —

- (c) I suddenly realized that x was y.

and even the still lower key of —

- (d) I suddenly noticed that x was y.

The listing may go on, of course. But the word *sudden* is important in all the entries. It is perhaps essential to the definition of a cartouche, and as I was saying earlier, it is unpremeditatedly traceable to 'a sudden spiritual manifestation' in the decoder-reader. In short, the cartouche is the textural, or materially linguistic outcome of a very sudden and very fragile moment of revelation in ourselves. Once identified, and the ephemeral pleasure of identification gone, the cartouche as such is bound to go into cold storage, awaiting happier days—its potential recurrence. By way of illustration, and fully aware that dissection kills the revelation part of anything, be it God or love or sex, I am going to have a closer look, all the same, at one particular segment of FW discourse, chosen more or less at random. Here it is:

- (1) 020.07: and Gutenmorg with his cromagnom charter,

The cartouche that I am suggesting that we should borrow from the ancient Egyptians looks like this when it is empty:



The "Quark"...



(2)

It functions as a slot into which the ancient Egyptians used to insert the filler 'name of a great ruler', which was indeed Champollion's clue to the decipherment of the hieroglyphs. Into this cartouche, the above segment from *Finnegans Wake* is now being inserted, obtaining –

(3)  : and Gutenmorg with his cromagnom charter,

In addition to this cartouche containing the given segment (which, I would like to advance here, has a special kind of semantic glow about it!), there must be an indication as to where it is to be found exactly in the body of the book. Conventional Joyce scholarship would call this 'page and line reference'; personally, I would like to adopt a more refined approach to it here and call it, making use of current technology, 'address'. This address contains in my suggestion three elements instead of two, as I am adding *item reference* to the already existing page and line references; this is done expressly for purposes of absolutely accurate identification. These three elements of the address would in themselves form another entity, which merely for the sake of methodological convenience, may be looked upon as another cartouche-like unit, thus –

(4) (020.07 : 2. (::5))

This should be simply taken to mean that the FW segment encapsulated in the cartouche under (3) is located on page 20, line 7, and its first item is the second item in the line, which, for the purposes of this analysis, should be bracketed together with the subsequent five items, bringing the total up to six items. It is again 'context' which forces us to have two cartouches instead of merely one, as the latter gives the discourse placement of the segment under scrutiny. For typographic reasons, I propose that the



boundaries of the two cartouches be rendered by normal parentheses in concentric bracketing (as the address is subordinated to the FW segment). On the printed page, it would form one single cartouche. It is up to the reader to visualize the two parallel lines, linking the other parentheses together, and in this way forming the perfect cartouche.

(5) (020.07 : 2. (::5) (: and Gutenmorg with his cromagnom charter,))

And for the sake of clarity too, it must be emphatically pointed out once again that both the address and the boundary punctuation are part and parcel of the 'context' and should be viewed as intrusions of a context-sensitive approach into an otherwise context-free analysis.

Once the question of the formal and graphic representation of the cartouche is more or less satisfactorily expounded, it is time to have a closer look at the words themselves, and start the analysis. In order to have any claim to at least attempted exhaustiveness, to say nothing of the achieved one, simplifications in the manner of presentation are imperative, as the analysis is far more complex than might be expected at first sight. For purposes of space-saving straightforwardness, I would like to let it fall into at least six stages, and present them in a form which is as close to a diagrammatic approach as possible. The purpose of the first stage is to emphasize the degree of relevance of the material by singling out what is more relevant from what is less relevant (in relation to the very restricted goals of the analysis), so that cleaner relevant information is passed on to the next stage. Then, the second stage is there merely to make explicit the conclusions of the first one and state them from another angle. The third stage is at first sight trivial, but in point of actual fact very important, as it is there in order to detach a very relevant significant detail, namely capitalization. The fourth stage can be taken to be a new beginning, for it is here that the semantic conventions are introduced, largely as a result of matching. The purpose of the fifth stage is to anticipate the conclusions by continuing the matching operation of the elements obtained in the previous stage, and all constitutive elements begin to radiate analogous meaning. Finally, the last stage makes the point that the cartouche holds



together on account of the fact that its major semantic constituents shine in unison, exhibiting brilliancy of meaning on account of the very fact that they essentially embody the same semantic primitive.

*STAGE ONE: Function Word Analysis*

(6) : and ( NP<sub>1</sub> ) with his ( NP<sub>2</sub> ), )

*STAGE TWO: Content Word Analysis*

(7.a) ( (Gutenmorg) ( (cromagnom) (charter)))

NP<sub>1</sub>      NP<sub>1</sub> NP<sub>2</sub>                      NP<sub>2</sub>

(7.b) ((NOUN common) (NOUN common)))

(ADJ function)

*STAGE THREE: Graphemic Analysis*

STATEMENT 1: Initial grapheme of NP<sub>1</sub> is capitalized, whereas NP<sub>2</sub> contains no capitalization.

PROPOSITION 2: The general convention is that one name of one Person is usually marked by one single capital.

COROLLARY 1: Only one capital, i.e. G, in a six-word segment, in conjunction with function-word *his*, is meant to mark PERSON.

COROLLARY 2: Reinforcing punctuation, capitalization, and *his* fuse the segment into one single entity and converge in pointing to a PERSON.

*STAGE FOUR: Semantic Analysis : Type/Token Correlation*

(8. 1) ((To) (Gutenmorg) (cromagnom) (charter))

(8. 2) ((To) (Gutenmorg) ((Ty<sub>1</sub>) (G (Gutenberg))))

(8. 3) ((To) (Gutenmorg) ((Ty<sub>2</sub>) (g (guten (M) Morgen))))

(8. 4) ((To) (cromagnom) ((Ty<sub>3</sub>) (C (Cro- (M) Magnon) n)))

(8. 5) ((To) (cromagnom) ((Ty<sub>4</sub>) (O (M (Magna) a))))

(8. 6) ((To) (charter) ((Ty<sub>5</sub>) (C (Carta) a)))

(8. 7) ((To) (charter) ((Ty<sub>6</sub>) (C (Charta) a)))

(8. 8) ((Ty) (Gutenberg) (guten Morgen) (Cro-Magnon) (Magna-Carta)



PROPOSITION 1: Capitalization provides an important link between the lower graphemic level and the higher semantic level.

STATEMENT 2: The diagraph *gn* remains stable throughout, even when permitting phonological variation (two pronunciations possible); the diagraph *ch* allows for two graphemic variants (*cha-*) (*ca-*), and two phonological variants. Both diagraphs are major semantic triggers.

STATEMENT 3: Conventional hyphenation in (8. 4) facilitates identification of LAT *magnus*, -*a*, -*um* in (8. 5).

STATEMENT 4: ((8. 7) Charta) is current misspelling for ((8. 6) Carta).

*STAGE FIVE: Prototypal and Archetypal Analysis*

STATEMENT OF FACT 1: Johann Gutenberg (1397?-1468) was a GERMAN printer, the reputed INVENTOR of movable type, whose name is associated with *The Gutenberg Bible* that he had been instrumental in printing.

STATEMENT OF FACT 2: Cro-Magnon is (1) a cave in the Dordogne department, FRANCE, where (2) was found. Cro-Magnon is (2) a member of prehistoric race of tall, erect men; the Cro-Magnons are considered to be the FIRST to belong to the same species (*Homo Sapiens*) as modern man.

STATEMENT OF FACT 3: *Morgen* is GERMAN for (1) morning, daybreak, dawn, sunrise, and for (2) ARCAHIC & POETIC) the east. *Guten Morgen!* is GERMAN for the FIRST greeting of the day, very common in a German-speaking environment.

STATEMENT OF FACT 4: The LATIN phrase *Magna Carta* (often translated by the U.S. Establishment as The Great Charter) is (1) the Great Charter of English liberties, delivered on 19<sup>th</sup> June 1215 by King John at Runnymede, on the demand of the English barons: it is the FIRST document of the English constitution and (2) any fundamental constitution that secures personal liberty and civil rights.

*STAGE SIX: Semantic Feature Analysis*

NOTE: Roman Jakobson's DISTINCTIVE FEATURES are here exclusively used to cover SEMANTIC aspects. For the limited purpose of this study, they could roughly be interpreted as Semantic Primitives. They are mainly used in their marked values [+ FEATURE] to point to the existence of *common denominators*.

STATEMENT OF FACT 1: Johann Gutenberg was the FIRST printer (civilization ever had; i.e. he embodied the dawn of the world of books).





STATEMENT OF FACT 2: Cro-Magnon was the FIRST modern man (he, again, meant in a way the dawn of human civilization).

STATEMENT OF FACT 3: *Guten Morgen!* is the FIRST greeting of the day (metaphorically, the dawn—in the cyclic sense of 'start again' of daily communication by language, and perhaps the only very common greeting of the day in German (and English) among members of the same family, meeting at breakfast).

STATEMENT OF FACT 4: *Magna Carta* is the FIRST legal document securing personal liberty and human rights, the dawn, as it were, of law and order in the sense given it by pan-Western civilization.

Returning now to the initial FW cartouche, bearing in mind this semantic feature which is [+ FIRST], we notice that it occurs four times, once in each of the major lexical items. The capitalized lexical item, however, receives a double semantic load. This semantic feature would make the initial segment evince the following underlying pattern, as given in (9), and the punctuation marks become now even more important as boundary markers. Here first is what we had under (3) earlier on:

(9) (: and Gutenmorg with his cromagnom charter,) (Gutenberg) (guten Morgen!) (Cro-Magnon) (magna) (Carta) (Charter) (Magna Carta)

|          |          |          |          |
|----------|----------|----------|----------|
| [+FIRST] | [+FIRST] | [+FIRST] | [+FIRST] |
| (1)      | (2)      | (3)      | (4)      |

These four occurrences of this specific distinctive feature should be grouped, or bracketed, together in the following way, in order to reflect the *grammatical* reality of the FW text. This time, for methodological reasons, I choose to place myself not at the level of (3), but at the level of (7.a), which was—to repeat it here for facility of reference—

(7.a) ( (Gutenmorg) ( (cromagnom) (charter)))  
NP<sub>1</sub> NP<sub>1</sub> NP<sub>2</sub> NP<sub>2</sub>

The corresponding pattern of the semantic features would then be something like —





(10) (  $\begin{smallmatrix} [+ \text{ FIRST}] \\ \text{NP}_1 \end{smallmatrix}$   $\begin{smallmatrix} [+ \text{ FIRST}] \\ \text{NP}_1 \end{smallmatrix}$  ) (  $\begin{smallmatrix} [+ \text{ FIRST}] \\ \text{NP}_2 \end{smallmatrix}$   $\begin{smallmatrix} [+ \text{ FIRST}] \\ \text{NP}_2 \end{smallmatrix}$  ) )

The factual symmetry of this feature structure of the FW segment is indeed astonishing. But I was also saying at the beginning of this analysis that there is intra-segment evidence that NP<sub>1</sub> is a PERSON: this is provided by the function-word *his*, which in terms of a similar semantic-feature analysis tells that NP<sub>1</sub> stands for SOMEBODY, not only on the semantic evidence provided by the Statement of Fact, which is to a large extent extrinsic and extraneous, but also, and more importantly, on the strength of grammatical evidence to be discovered within the very boundaries of the cartouche. But this 'some man' (to discard for a few seconds his feature attributes as analysed above) is endowed with something, holds something, perhaps in his hand, possesses something, etc. This is again very clearly indicated grammatically by the outline of grammatical structure as appearing under (6), which I repeat here for convenience –

(6) : and ( NP<sub>1</sub> ) with his ( NP<sub>2</sub> ), )

which becomes –

(11) ( : and (SOME PERSON) with his (SOME OBJECT), )

It may be 'Peeping Tom with his binoculars', or 'Bishop Berkeley with his solipsistic crosier', or even—why not?—'Roman Jakobson with his theory of Distinctive Features'... But it is not. And it is not simply because the semantic-feature analysis points in a different direction. Incidentally, the Object that the man is endowed with, possesses, holds in his hand, etc. turns out to be in the undercurrent of meaning elementals too, whether we want it or not, some kind of *charter*. For *charta* is obsolete, and alien, not naturalized, the Shorter Oxford Dictionary states, and stands for 'paper', 'letter', 'deed', 'record'. Which by logical extension leads one to the gloss



'book'. For according to Thomas Hobbes, 'Charters are donations of the sovereign; and not laws, but exemptions from law'. This latter gloss would move it further away from legal connotations. The meaning of *charter*, therefore, particularly in a pan-historic pan-European approach is very fluid, very slippery, and eludes the operation of pinning it down to tangible lexicographic butterflies. Thomas Hobbes himself is reluctant to accept the meaning of 'law', which tends to become less central to the word than one might like to remember it from one's history classes of long ago. I personally prefer a gloss along the line of PAPER—DEED (in the two senses)—LETTER—BOOK. My Romance-language exposure over time might account for certain imperceptible shifts of connotational-denotational emphasis. The segment thus becomes —

(12) ( : and (SOME MAN) with his (SOME BOOK),)

It is now high time to append the feature attributes to each of the NP's:

(13) ( : and ([+FIRST] [+FIRST] MAN) with his ([+FIRST] [+FIRST] BOOK),)

It is at this stage—and not *before*—that scientific rigour leaves off, and the individual's imaginative capabilities take over. It is at this stage, too, that we must reread our Leo Spitzers, and William Empsons, and the other brilliant exponents of close textual analysis. And even reading Albert Einstein might not be so harmful and repelling an experience, for he too believed in imagination and clear-sighted intuition as the tool *par excellence*, which must necessarily take over when all the other tools are failing or have already failed.

Going back to cartouche, I should like to add that without the flash of lightning emerging from the cloudy heaven of intuited language experience, there is no way in which we could have the peal of thunder descend upon us with its rumbling meaning. (The ten hundredletterthunderwords in *Finnegans Wake* are sure to be extreme instances of highly intricate cartouching, still awaiting analogous analyses.) It is at this stage, therefore, that one is allowed to leave aside the more rigorous tools of the



language analyst, and start to improvise semantically with the more imaginative and equally useful tools of the literary critic and historian, of the teacher of literature, and of the text explicator. If we were to take a few steps along that tortuous path, I would perhaps like to improvise in a New Orleans style tradition, and, coming closer to the vast implications of *Here Comes EVERYBODY*, the man I would point out by identikit that Joyce was trying among others to put across to us, would be something like –

(14) ( : and the Dawn Man with his Dawn Book , )

That would be poetic enough for me, and sufficiently rigorous too in order to comply with the constraints that I myself had imposed upon my analysis. To me, therefore, the four 'First-First' flashes are picked up semantically and more elegantly by 'Dawn-Dawn' – of the Dawn of human civilization, and the Dawn of the Libraries of the World includingexcluding Alexandria.

Some cartouches, after they are perceived as such, do not bob up again, and allow me to assume just for the sake of argument, without further ado, that this is the case with the example we have just scrutinized at considerable length, and thus avail ourselves of this pretext to drop the example. In other cases, however, certain segments are bound to bob up again and again; every time the reader spots an eitch, a sea and a eh anywhere in the text or the subtext – see Stanislavsky for the notion – he is as a matter of course bound to develop Spitzer's 'click', and exclaim 'Aha!' This is indeed a question of 'Who is Who When Everybody Is Somebody Else'. The same is true about *The Lord's Prayer*, any small chunk of which any prayer-conscious person should be able to identify. It functions as one of the major archetypes (q.v.), and is actualized in the FW text in the shape of about forty-four cartouches. The material occurrence of any of these cartouches is instrumental in generating the archetype.

There are substantial differences between *cartouche*, *archetype* and *motif*. A cartouche may not so much be relatable to a cultural archetype as, via a prototype (q.v.), go direct to a semantic primitive, such as [± FIRST] in the Gutenmorg-cromagnom example above discussed, or [± FIRE], as in the first two lines of page 594.



Further, both cartouche and archetype may be nonce occurrences, with no minimal two-occurrence requirement as is the case with the Clive Hart leitmotiv. In this connection, it might perhaps be profitable at times to distinguish between nonce-cartouches, and motif-cartouches (the subject most certainly deserves minute investigation), but the distinction is tenuous, as it is always bound to depend on the 'present state of the art' in FW research at any moment in time—past, present or foreseeable future.

To summarize the differences between cartouche, archetype and motif: a cartouche is eminently bracketable and detachable, a leitmotiv is inherently recurrent, and an archetype is a blanket term covering a strong Token/Type relation, generally aimed at conveying explicit cultural information.

As the present discussion is slightly getting out of hand both in point of level of abstraction and in point of ambiguity of status of border-line instances, it would be far wiser for the time being to leave the field of cartouching with a practical thought—namely, with the following Rule of the Thumb: a cartouche is more often than not the material embodiment of an archetype, e.g. the highbrow quote ((502.29:2) Miss Somer's nice dream) on the corresponding lowbrow (journalese) one ((301.06:5) Christ's Church varses Bellail). A cartouche, in other words, is a heuristic tool. As a tool, it must always be clean and ready for use. If items cannot be bracketed together neatly to form a cartouche, thus—

(15) ((417.04:4), his good smetterling of entymology)

then it may mean that there is something wrong with it. It should also be noted that, cartouches are not often interrupted by 'lexical noise' (i.e. irrelevant and redundantly digressive 'foreign bodies'). If there is something within their bounds that does not really belong there, it means that something is out of order in our decoding algorithms and we had better start the process afresh. Furthermore, cartouches are easily memorized. For they are a memorable mini-phase of the mind itself: they are internally pasted together by a sort of semantic glue that has a very high mnemonic quotient, which in the following instances resides in their deictic feature [+ PERSON]:





(16.a) ((230.04:4) Bill C. Babby) and ((441.11:11) Mavis Toffeelips)  
((Beelzebub)) and ((Mephistopheles))  
((395.23:9) Nema Knatut) and ((385.04:12) Twotongue Common)  
((Tutankhamen)) and ((Tutankhamen))

So much for the analysis of the cartouche in itself. It has been, it is true, very largely a context-free analysis. But it has also been a watertight analysis both in point of Statements of Historical Fact (Gutenberg, Cro-Magnon, Magna Carta) and in point of Statements of Language Information (guten Morgen!) and of Grammatical Information (X with his Y). It is up to the reader to take the cartouche, with its semantic thunder now paradoxically exploded but not defused, and make the most of it. He should approach it the way I approached it when I lifted it from the text – almost at random, and solely on the strength of its boundaries being signalled by punctuation marks. After the context-free analysis, he should then go back to the FW text with it, and fit it back into place, taking good care not to lose any of the six stages of the analysis on the way. In this way, he is well-equipped to ride the high seas of a context-sensitive analysis on the next leg of his perilous voyage to Meaning. In other words, and in more technical phraseology this time, the reader is asked to perform, in my opinion, an operation of *discourse placement* (some might prefer to call it recontextualization), and see whether the analysis proposed fits the larger meaning provided by the Environment. I do not think that for the segment which has just been under scrutiny it is my job here to do it: I save it for later, and for my more environmentalist moods. My job here has been to illustrate cartouching as the working and fact-finding tool that I see it to be within the frame of reference of a methodology for reading *Finnegans Wake*.

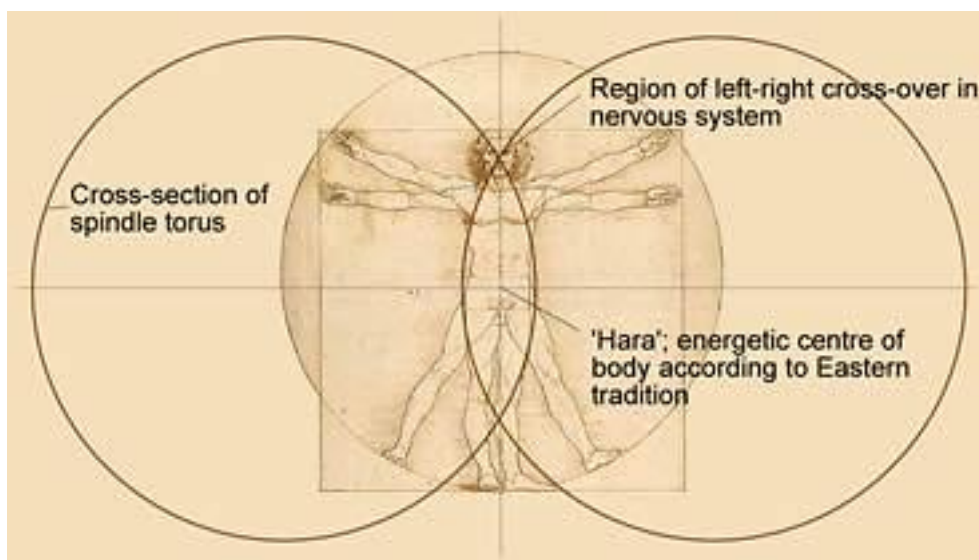
This is the flash-flash device that performs the douche-douche upon the reader, giving the tauf-tauf to the ones who have the eyes to see it farfar, as it comes down to us from Great Taufel-Teufel Jim Himself. An exercise in cartouching should be taken as an exercise in epiphanic understanding in the Age of the Minuteman and the Swing-Wing. Hence the computer-like Semantic-Feature analysis. One should keep





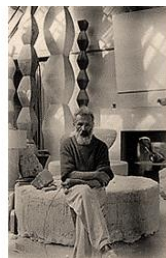
remembering in ((628.14:6) mememoremee) fashion that Jean-François Champollion succeeded in decartouching the cartouche not only on the strength of the detachability of its formal boundaries (SEE my context-free approach), but also on the strength of his thorough knowledge of Coptic, which Thomas Young unfortunately did not possess: the average reader of *Finnegans Wake's* success, too, ultimately depends on the extent of his Europe-centred knowledge—language-wise and otherwise.

[C. George Sandulescu, *The Language of the Devil, Texture and Archetype in Finnegans Wake*, Collin Smythe Ltd of London and Dufour Editions of Chester Springs, Pennsylvania, 1987, 'Cartouching', pp81-94]





## Appendices



**C. George Sandulescu**

**ONLY CONNECT...**

I have often compared language to a tool chest, containing a hammer, chisel, matches, nails, screws, glue. It is not a chance that these things have been put together—but there are important differences between the different tools—they are used in a family of ways—though nothing can be more different than glue and a chisel.

(Ludwig Wittgenstein, 1938)



**1.1 Outline of the problem.** The present study is devoted to the discussion of the following relations –

$$\begin{array}{ll} (1) & C_n \quad \{ p, q \} \\ (2) & C [+s] / (n, 0) \rightarrow K (0, c) \end{array}$$

where  $p$  and  $q$  are current hypermorphemes in sequentialization.  $C_n$  is a standard or non-standard conjoiner (**fn 1**) actualized in the linear manifestation of discourse, whereas  $K$  is an abstract connector with its overt and covert matrices, as defined in Sandulescu (Texas, April 1976). The main theoretical problem under discussion is that of the possible correlation between an actualized conjoiner  $C$  – with its whole range of lexicalizations in a given natural language – on the one hand, and the complex bundle of features going into the making of  $K_o$  and  $K_c$  structures in the process of monitoring discourse in both production and perception. It is advanced that conjoiner status in discourse, particularly within a frame of reference of a consistent real-discourse model which should meet tight requirements of descriptive adequacy, is by no means identical with 'propositional connective' status in symbolic logic, or 'conjunction' status in conventional grammar, and should in no way be confused with them.

**1.2 Connectedness.** The itemizable category of conjoiner, as viewed in the present model of discourse, is highly dependent on the theoretical construct of connectedness, circulated in topology and algebraic linguistics (cf. Saloni et al. 1974). It is superordinated to the less satisfying notions of cohesion (Halliday & Hasan 1976), coherence (as differentiated from cohesion by H. Widdowson), and connexivity as employed by language statisticians and quantitativists. Ongoing research into discourse structure shows that conjoiners tend to form open sets, analysable in terms of set theory, rather than closed inventories, as hypothesized by conventional (including transformational) grammars.

1.3 The symbols  $p$  and  $q$  in symbolic logic. Taking  $p$  and  $q$  to stand for atomic



propositions, more complex statements can be formed by connecting them in order to obtain molecular propositions. This is done via connectives: propositional connectives in modern logic derive from the conjunctions existing in natural language, but are defined explicitly by means of truth tables, logic having originally emerged as a purely normative discipline (fundamentally connected with truth-values in effective argumentation). The exact sense of logical connectives thus rests on their truth-functional definition:

(3)

| p | C | q |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 0 | 1 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

If C is ascribed the lexicalization 'and', then the truth table is correct, and the conjunction  $p \& q$  is true provided p is true and q is true. Assuming that –

- (4)
- |   |                        |
|---|------------------------|
| p | ( Aristotle is Greek ) |
| q | ( the table is brown ) |

the connection thus obtained –

- (5)                    (  $p \& q$  )    ( Aristotle is Greek and the table is brown )

is acceptable in logic on the strength of its truth-value function exclusively. But this, it must be pointed out, is an excessively narrow theoretical foundation to base a discourse model on. Here is what an outstanding logician has to say regarding the goals of logic:

(CHURCH 1956 : 1)    Our subject is [ ... ] formal logic. Traditionally,





formal logic is concerned with the analysis of sentences or of propositions and of proof with attention to the *form* in abstraction from the *matter*.

Imposing, however, even minimal requirements of descriptive adequacy on a real-discourse model, p & q as conjoined in (5) hardly meets connectedness conditions in any possible communicative situation. The same holds good if we delete the conjoiner and/or play with tense:

- (6) Aristotle was Greek, the table is brown.

This does not meet connectedness conditions for the reason that *matter* (i. e. the semantic interpretation) – in the sense given it by Alonso Church – becomes in a real-discourse model as important as *form*, and perhaps, even more so. Within such a model, it is the function of the twin K matrices to fuse matter and form in a unified descriptive procedure, not only by extending conjoiner range to cover all non-standard items, but also by providing a **subtheory of discourse heads** – as sketchily outlined in Sandulescu (New York, March 1976) – to take care of matter. An overt or covert sharing of identical or related discourse heads is a fundamental connectedness constraint, imposed on any p q sequence in order to build appropriate discourse.

- (7) (Aristotle was Greek. His writing table was always brown.)

In (7), the two items *his* and *was* are to be represented as 'sustained Person' and 'sustained Tense' respectively within the overt K matrix, whereas *writing* is only assigned a place as a connectedness marker within the covert matrix of the same K connector on the basis of the speech-act participants' mutual factual knowledge of a certain possible world (which incidentally also accounts in part for the use of Past Tense in the latter hypermorpheme: the proper name *Aristotle* certainly functions as a covert tense marker). Lastly, *always* occupies an even more remotely covert position in the K hierarchy, fulfilling multiple functions (mainly 'diachronic' in implication) at



the levels both of the given possible worlds and of a certain universe of discourse. The 'atmospheric' impact on discourse of such items is so far uninvestigated, having only been analysed impressionistically in stylistics. Worth an analysis in the above manner are also discourses such as –

(8) Aristotle was Greek. He never had a writing table and it was always brown.

(9a) Aristotle was Greek. His writing table will have been brown.

(9b) Aristotle was Greek. His gestures will have been Mediterranean.

In these oversimple examples, which come nowhere near the complexity of an actual text, the obvious methodological restrictions imposed upon the data are that we have confined our remarks to two-hypermorpheme discourse only: the precedent (i. e. the first hypermorpheme) was kept constant, and only one central discourse head (viz. Aristotle) was resorted to.

**1.4 Connectives as the 'glue' of language.** Turning again to fairly elementary symbolic logic for a statement of phenomena from the formal viewpoint, several types of propositional connectives can clearly be distinguished. Generally speaking, logical connectors are symbols which may be used together with one or more propositions to form or produce a new proposition. They in fact play such an outstandingly important role in the language, be it natural or formal, that it is next to inconceivable to have them eliminated from it. But connectors not only 'glue' propositions together, they 'control' propositions. It is on the basis of this control rather than 'conjoining' function that there are three distinct types of truth-functional connectives TFC in mathematical logic:

(a) **unary**, or singular, or one-place TFC's, controlling one single proposition;

(b) **binary**, or two-place TFC's, controlling two propositions (the *precedent* and the *subsequent* in the terminology of our discourse model),



and finally,

- (c) **n-ary**, or n-place TFC's, controlling more than two propositions.

In point of fact, there is no upper limit to their conjoining capabilities, as TFC's can logically be defined for any number of constituent propositions. However, natural language lexicalizations of propositional connectives only evince a two-place pattern of the standard formula –

$$C_n \{ p, q \}.$$

In consequence, conventional linguistics and all descriptive grammars deal with the middle type only in the above sub-categorization of logical connectives – that of the standard conjunction.

The problem we are faced with at this stage is expressible in terms of what should be given conjoiner status in a real-discourse model in order to meet connectedness constraints which are at least remotely analogous with those in symbolic logic.

**1.5 Objections to connective sub-categorization in logic.** Contemplating the threefold conjoiner typology, however, the important remark must be made that modern symbolic logic has concentrated to such an overwhelming extent on two-place connectives – conjunction, disjunction, implication, and equivalence – primarily because they represent the outstandingly common type of connective that is lexicalized in natural language. The three-fold classification also points to the equally important fact that there can be no question of a 'zero-place connective' even remotely analogous to Montague's zero-place operation symbol (cf. 1974 : 99) (**fn 3**). And this simply because, in Wittgenstein's terms, a connective should be 'the glue of language', fundamentally presupposing at least one item to be organically tagged to at least one other item via 'this very thing', which may be variously called *connective* in



mathematical logic, *conjunction* in conventional linguistics, and (*standard vs. non-standard*) *conjoiner* in our own model of discourse structure. But if a zero-place ‘*connector*’—to use Lord Quirk’s (1972 : 661ff) new-fangled spelling—is a misnomer in all these disciplines, so is a one-place connector in at least some of them.

(CHURCH 1956 : 36) The chief singular sentence connective we shall need is one for negation. In this role we shall use, in formalized languages, the single symbol  $\sim$ , which when prefixed to a sentence, forms a new sentence that is the negation of the first one. The associated function of this connective is the function from truth-values to truth-values whose value for the argument *falsehood* is *truth*, and whose value for the argument *truth* is *falsehood*.

It is very hard to conceive of connectedness constraints on discourse structure allowing for a ‘one-place’ conjoiner, analogous to negation, the singular connective of symbolic logic. This is indeed a major point of divergence as regards connector theory between the two disciplines. Negation does not in any way have a connective function, worth that name, in discourse. No possible interpretation of negation in discourse can assign it a higher status as a connectedness marker, be it syntactic, semantic, or pragmatic, than that which may be accidentally assumed by any other non-conjoiner (fn 4).

**1.6 More than two place connectives.** In a very recent and interesting paper, Gazdar & Pullum (1976) point to the fact that natural languages lexicalize only an extremely small range of TFC’s. And the authors go on to demonstrate by using truth-value tables and other arguments that “the number of logically definable TFC’s turns out to be literally greater than infinity”. The real-discourse model that we are operating in requires that TF constraints on conjoiners be dropped are replaced by the pragmatics-oriented category of connectedness constraints, which take into account not only form but also matter (cf. the subtheory of discourse heads) and the attitudes of speech-act participants. Within this entirely different frame of reference, it still remains a very interesting suggestion to hypothesize the existence of -ary conjoiners





(cf. Section 3.5 of the present paper).

**2.1 The zero conjoiner.** There is then the issue, by no means clear in interpreting discourse structure, of the zero conjoiner, which is quite different from the non-existent zero-place connective mentioned above. Such a conjoiner either does not emerge very often in the linear manifestation of discourse (the restricted approach), or it does emerge, literally, all the time (the comprehensive approach). Adopting the narrow approach, we may say that whenever such a conjoiner does emerge, it disturbs both intonation patterns and conventional punctuation (i. e. graphemic) systems; here it is, provisionally illustrated by two sets of data, one in Swedish, the other one in Rumanian:

- (10) Man ska inte bara bo – man ska trivas. (current Stockholm housing advert)
- (11) Nu mergem acasă, (ci) mergem la cinema.

In the Rumanian example, the insertion is possible of an optional conjoiner *ci*, but the fairly low frequency of occurrence of this standard conjoiner in most discourse types makes its reinsertion rather improbable. Something somewhat similar may perhaps be said of the Swedish example (cf. *utan*, perhaps correlated with *också*). But in English sentences of the type –

- (12) We are not going home, we are going to the cinema.

no standard conjoiner is conceivably insertable; in writing, the linear manifestation takes the shape of two hypermorphemes not separated by period, but united by a comma. Even the semi-colon would be inappropriate.

**2.2 Insertability vs. deletability.** In Sandulescu (Oslo, April 1975) the complicated issue was discussed of the following principles: (a) the conjoiner insertability principle, as suggested by Katz & Fodor in 1963, and by virtue of which





any text could become a sentence by infinite and indefinite *and* insertion; this is nowadays widely rejected by most linguists. There is at the other end of the scale, (b) the conjoiner deletability principle, suggested for the first time by Sandulescu (in the same paper) as a primary means of discourse formation, and as a cardinal communicative operation in monitoring discourse in reception. Hypothesizing such a principle also throws new light on the theory of paraphrase. The question is, particularly in the light of the conjoiner deletability principle, whether all instances of deleted conjoiner should or should not be regarded as instantiations of the 'zero conjoiner'. In this way, however, any two sentences separated by period, but united by a common semantic interpretation should indeed be connected by means of a zero conjoiner! And to facilitate it, a symbolic-logic approach even discards, as we have seen earlier in the present study, the requirement of an inter-related or mutually connected semantic interpretation, ascribing all truth-value to the conjunction  $p \ \& \ q$ , provided the two hypermorphemes are true, when taken separately. As the issue of the zero conjoiner is an extremely complex one, the solution of which depends on the completion in greater detail of other areas of the discourse model that we have adopted, we would like to leave the question open for further discussion, restricting, however, the use of the zero conjoiner to the instances in which the language under investigation does have a fully lexicalized standard item, which is optionally insertable in order to fulfil a standard-conjoiner function in the linear manifestation of the discourse, as illustrated by the Swedish and Rumanian examples // DATA // in (10) and (11).

**2.3 Deep structure status ?** At a time when certain generativists (cf. Chomsky 1976, *Reflections on Language*, Fontana, as reviewed by J. Searle, TLS, September 1976) seem to be dropping the notion of deep structure in favour of a modified version of surface structure, it would be preposterous on our part to postulate and hypothesize abstract levels and even more abstract levels of investigation, the 'existence' may be disproved within the short span of only a few years. There has been far too little investigation of discourse to justify positing the issues of both 'deep structure' and 'generation' of discourse. However, hypothesizing a zero conjoiner remains an



interesting suggestion, particularly for at least some of the cases that D. Wilson (1975: 33, 78, 84) presents as single sentences, but which Sandulescu (Åbo/Turku, November 1975) interprets as discourse, such as –

- (13) I just knew I'd win – I can't see how I lost.
- (14a) Mary didn't clean the room: it wasn't dirty.
- (14b) I didn't clean the bathroom: I cleaned the kitchen.
- (15) Harry didn't criticize Bill for being the last man out of the room: he criticized Charley.

The postulation of a zero conjoiner is, we repeat, fraught with dangers, and it is only a correlation between the linear manifestation of discourse and its corresponding semantic interpretation (far more exact and accurate than any researcher can produce at the moment) that can give an answer to this question. We wish to suggest by way of conclusion that it is only by providing a rigorous binary (overt vs. covert) structuring of K matrices that many of the current impressionistic conclusions about discourse can become scientific data.

**3.1 Role of C in text structure.** In order to ensure an empirical basis for the discussion of standard and non-standard conjoiners, let us start from a text which belongs to a discourse type by definition cancelling the pragmatic boundaries of written vs. spoken transmission. Any text can be broken down into (a) an ordered set of hypermorphemes –

- (16) p q r ... x y z ,

defined as minimal clauses functioning as independent communicative entities in discourse, particularly given their propositional content, and (b) a set of conjoiners C of various types and categories. One important step in providing an explicit description of a text to contribute to its assignation to a discourse type is reducing it to a structure which can in logical terms be described as –



121

$$(17) \quad ((p \text{ ---} q) \& (q \text{ ---} r)) \text{ ---} (p \text{ ---} r).$$

Assuming that all joiners are C in the linear manifestation, any text is of the shape –

$$(18) \quad p \ C \ q \ C \ r \ C \ \dots \ x \ C \ y \ C \ z \ ,$$

where **p** is the initial hypermorpheme of any discourse, and **z** is the final hypermorpheme of the same discourse, no matter whether the given discourse is in pragmatic or syntactic terms defined as a partial sequence **pQ** or as a total sequence **tQ**; such a notation makes unnecessary and redundant the use of any end-of-discourse marker. It may happen, however, that no lexicalized joiner C occurs in the linear manifestation of discourse and the text may take the hypothetical shape –

$$(19) \quad p \ q \ r \ \dots \ x \ y \ z \ ,$$

but the discourse model presupposes the existence of relations of connectedness between the hypermorphemes sequentialized in the linear manifestation of discourse.

**3.2 Three fundamental types of hypermorpheme sequentialization.** Such connectedness relations can be explicitly described within the matrices and with the formal devices of K, which concurrently functions as an overall symbolic marker of propositional connectedness. One obtains in this way three possible sequences of hypermorphemes in discourse:

$$(20) \quad (\text{alpha}) \ ( \ p \ C \ q \ C \ r \ \dots \ C \ x \ C \ y \ C \ z \ )$$

$$(21) \quad (\text{beta}) \ ( \ p \ K \ q \ K \ r \ \dots \ K \ x \ K \ y \ k \ z \ )$$

The (beta) formula shows that the relations between hypermorphemes are



abstract relations of connectedness, not realized in the linear manifestation of the discourse by means of any lexicalized conjoiner. Finally, a formula of the type –

$$(22) \quad (\text{gamma}) \quad \{ x ; p ; y ; q ; z ; r \}$$

would simply denote a set of hypermorphemes with no relations of connectedness whatever established between them. Certain researchers may label a sequence of hypermorphemes patterned on the last formula a '**non-text**', or even a '**pseudo-text**' ! But as any 'pseudo-text' may become a text provided certain pragmatic constraints are in force (**fn 5 !**), we prefer to call it '**an unordered set of hypermorphemes**'. Such an unordered set of hypermorphemes may accidentally meet appropriateness constraints: putting together two sentences which are seemingly unrelated, a new semantic relation may emerge from discourse head association.

(23a)            I met Enkvist on the corridor a few minutes ago. There's going to be majority rule in Rhodesia in two years' time.

The 'accidental' connectedness relationship between the two discourse heads –

(23b)            Enkvist        vs.        Rhodesia

conveys the presupposed meaning in the underlying structure that –

(23c)            It was Enkvist who communicated to me that this was so.

The unordered nature of (22) is marked by the bracketing { } rather than in the conjoining system alone, as there is more to connectedness than just conjoining. This means that neither C nor K are insertable between the hypermorphemes, though relations of connectedness may accidentally occur.

The text to be outlined below is, like any real text, a complex combination of an (alpha) with a (beta) formula of discourse structure: it is submitted to the





fundamental formal constraint of discourse in accordance with which **the emergence of a C in the linear manifestation of discourse is optional, whereas the existence of a K is compulsory between all hypermorphemes, be they adjacent or remote.**

**3.3 A partial sequence.** As we are less interested at the moment in the semantic substance of the hypermorphemes, let us simply replace them by bracketed lower-case Latin letters (for reasons of convenience, we start the listing with a; and the occurrence of z is no longer an end-of-discourse marker, as was the case in the hypothetical formalization). We thus obtain the following text structure, itemizing only the lexemes outside hypermorphemes. **(A)** and **(B)** mark participant boundaries:

(24)

**(A)** ((but) (my dear fellow) (excuse me for interrupting you) (you seem to be X-ing (a))) # (for) (after all) (even you must admit (that (b) (than (c)))) #

**(B)** (b') (than (c')) # (d) # (e) # (f) than (g)) # (h) # (i) # (j) (k(l(that m)))) # (it is (n) (or (o)) # (p(q) # (indeed (r) (and when (s)))) (because (t) (which (u(v(who w)))))) # (no) (Avoc)) (x) # (y(and z(of whose (aa)))) # (bb(because (cc(and(dd(ee)))))) # (ff) # (gg(who(hh (how(ii))))))

**(A)** (Bvoc)(jj(as if(kk))) # (ll(and(mm))) # (nn(but(oo))) #

(The actual semantic interpretation of this whole text is left to the reader's literary imagination. Have a try!)

**3.4 Discussion.** This way of representing a text, any text, singles out three major sets of joiners. First, there is the comprehensive group of standard joiners—the 'conjunctions' of conventional linguistics. They materialize two distinct types of grammatical relations—co-ordination vs. subordination. It is only the 'logical connectors' (*and, but, or, for*; cf Lord Quirk et al. 1972 : 661f) that approximate the function of propositional connectives in symbolic logic. The subordinators (*who, when, how, that, than*), the next set of joiners, pose major problems in the methodological process of disengaging hypermorphemes. Disengagement





procedures have yet to be studied in discourse. Clearly, it is the subordinators that distinguish between discourse types: written discourse evinces highly elaborate subordinator patterns, this being one of the formal features on the basis of which it can be defined. Finally, it is the subordinators that are to an overwhelming extent compulsory in the linearization of a given discourse; their co-ordinative counterparts are to a large extent deletable from the linearization without affecting sentential well-formedness, and quite often, without substantially modifying the overall semantic interpretation of discourse. Subordinators should be given great attention as part of a discourse theory of paraphrase.

Non-standard joiners – the next most important set – are not generally assigned joiner status in conventional linguistics. Traditional, structural, and even transformational grammars have treated them as adverbs or particles deprived of any considerable syntactic significance. They were never viewed as conjunctions for they are 'parenthetical' to various degrees, and it is the semantic interpretation alone that ascribes them a connector function. More recently (Halliday & Hasan 1976 : 267ff) has led to the study of **continuatives** (*after all, of course* etc). The set of **attitudinal disjuncts** (*indeed, possibly, apparently, actually*; cf. Lord Quirk et al 1972 : 511ff) is a controversial subcategorization balancing repudiated against sustained information in discourse structure. **Response markers** *yes* and *no* presuppose two distinct linguistic phenomena: first, the existence of a foregoing question in relation to which they function both as answer and as '**reduplicative dummy**'; secondly, the existence of a participant boundary between the question and the answer (**Footnote 7**). **Parentheticals** are a subset of non-standard joiners with a difference: they are syntactically even more disengaged than the continuatives or the response markers for the very fact that they are often linearized at the level of the sentence, clause or phrase. This essentially marginal syntactic character has made them be closely associated with **performance phenomena** and dismissed as such. But parentheticals fulfil a definite connector function: all discourse types (cf. partial sequence pQ above) evince the use of one type of parentheticals or another. They clearly affect discourse structure in a most immediate way, and considerably modify semantic interpretation over longer stretches of linearized language. It is only a discourse model that can begin



to accommodate parentheticals; their occurrence in discourse is culture-specific.

To conclude this section, here is a conjoiner chart for the standard and non-standard conjoiners so far discussed:

|            |                                                                    |
|------------|--------------------------------------------------------------------|
| <b>1.0</b> | <b>Standard Conjoiners:</b>                                        |
| 1.1        | Co-ordinative (logical connectors): and, but, or; for.             |
| 1.2        | Subordinative: that, than, how, who, of whose, when, which, as if. |
| <b>2.0</b> | <b>Non-standard Conjoiners:</b>                                    |
| 2.1        | Continuatives: after all, of course.                               |
| 2.2        | Attitudinal Disjuncts: indeed, possibly.                           |
| 2.3        | Response Markers: yes, no.                                         |
| <b>3.0</b> | <b>Parentheticals:</b>                                             |
| 3.1        | (sentence) excuse me for interrupting you                          |
| 3.2        | (clause) you must admit                                            |
| 3.3        | (phrase) my dear fellow, in my opinion                             |
| 3.4        | (word) NAME (in vocative function)                                 |
| 3.5        | (morpheme) well.                                                   |

These were the subsets of conjoiners to be almost exclusively derived from the very short text in 3.3. More extensive text is sure to reveal more complex conjoining systems. Some are language-specific, thus correlating with differentials, others have communicative value correlating with universals. Whichever the case is, all such subsets require unified treatment in discourse.

**3.5 n-ary conjoiners.** A case should perhaps be made that at least some conjoiners function on an n-place basis, i. e. more-than-two-place-structure:

$$(25) \quad C [-s] \{ p \ q \ r \ s \ \dots \}$$

Certain parentheticals may be particularly well suited for this function. Such an n-place non-standard discourse conjoiner is analogous in function with the logical connective –



(26) It is not the case that { p q r s }

However, given their clearly nominal character, a discussion of n-place conjoiners in discourse goes far beyond the bounds of the present paper; we have therefore merely limited ourselves to stating the issue.

#### 4.0 CONCLUSIONS.

4.1 A text, any text, is made up of **two distinct configurations** superimposed one upon the other: a configuration of sequentially ordered hypermorphemes pqr...xyz, coupled with a configuration of conjoiners Cn's, insertable between the hypermorphemes on the basis of optional constraints. This twin configuration gives the essence of **textuality**.

4.2 The set of C's plays a cardinal role in structuring discourse, quite analogical—though by no means identical—with that played by propositional connectives in modern logic. The fundamental distinction lies in the fact that lexicalizations of C form two distinct subsets, subjected to different internal constraints.

4.3 In addition to closed subsets of **standard conjoiners** C[+s], also belonging to the set C is the open subset of **non-standard conjoiners** C[-s], including parentheticals.

4.4 Non-standard conjoiners, as defined in the body of the paper, can only emerge from a consistent correlation of the semantic interpretation of the discourse with the corresponding linear manifestation, as mirrored in K structures at various levels of operationalization in the hierarchy.

4.5 Hypothesizing the existence of a zero conjoiner in the discourse model



to be adopted requires further investigation. Such a zero element, to be duly interpreted formally only within the Kc matrix could emerge in the linear manifestation as either **C[+s]** or as **C[-s]**, depending on the alternative realizations to be adopted in the process of monitoring discourse in production. This issue is closely related to a pragmatic theory of paraphrase at hypermorpheme level.

4.6 How to operationalize **C[-s]** in a formal model of discourse without reducing it to the status of a mere logical connective, ranging over more than two hypermorphemes, could be considered n-place connectors, analysable in terms of Montague's concept of satisfaction.

#### NOTES:

(1) In the talk given at the Helsinki Meeting of Linguists, **C[+s]** and **C[-s]**, were called 'conventional' and 'non-conventional' respectively, but labels have since been changed largely on account of a remark by Einar Haugen during the discussions, pertaining to conventionality in language. We wish to express gratitude for insistence on terminological accuracy.

(2) For a plethora of similar examples, see any elementary textbook, e. g. Suppes 1964, First Course in Mathematical Logic; Suppes 1957, Introduction to Logic; Stebbing, passim, etc. Furthermore, any descriptive analysis of any partial sequence  $p\ q$  is impeded by the very fact that it is 'partial'. This is not at all a question of disambiguation by context, but rather an issue of overall discourse structure, which is an altogether different matter.

(3) Montague's (1974 : 99) zero-place operator symbol *The American President* is, in the last analysis, a one-place symbol. This culture-specific place assignment to the expression is perhaps most obvious in British English or in 'Swedish English' (The American President Gerald Ford, den amerikanske presidenten Jimmy Carter) than it is in a purely 'American' 'context of use'. One should perhaps mention that Carter had difficulty during the 1976 TV-debates in finding the right term of address in spoken discourse: he rejected both *Mr President* and *Mr Ford* and was only left with the rather questionable vocative *President Ford*. (A similar problem surfaced years later in the TV-debates in French between President Mitterand and Mayor of Paris Jacques Chirac: it surfaced quite dramatically in the actual quite spontaneous exchanges in spoken discourse...) In other words, within the given discourse structure *president* clearly became a one-place symbol.

(4) Negation does have a disturbing effect on connectedness in data of the type—I have no brown table but it is square, or the exchange (A) What time is it ? (B) Not yet which still, in very specific





situations, may make very appropriate discourse. These and other data may point to the fact that negation could function as a very strong 'disconnecter'. It may increase connectedness in dialogue but that in itself does not justify an analogy with logic.

(5) Nobody in quest of a novel to read would take up a telephone directory, though the latter is subjected to a clear set of textual constraints too, which make it either appropriate or inappropriate according to the year of publication.

A telephone directory is a discourse ranging over a set of individuals existing in a given possible world, analogous to a novel. All propositions, however, are invariably of the same shape: an implied existential operator, accompanied by the deictic markers of coded location and coded tele-channel. This is adducible to rigorous, but trivial, formalization. Such a description does not of course cover 'secret' telephone numbers, which require additional constraints related to the interpretation of silence.

(6) This particular partial sequence has been selected from **Oscar Wilde**, 'The Critic as Artist', in: *Complete Works of Oscar Wilde*, edited, with an Introduction by Vyvyan Holland, Collins, London and Glasgow, 1948/1969, pages 1022-1023:

Ernest: But, my dear fellow--excuse me for interrupting you --you seem to me to be allowing your passion for criticism to lead you a great deal too far. For, after all, even you must admit that it is more difficult to do a thing than to talk about it.

Gilbert: More difficult to do a thing than to talk about it ? Not at all. That is a gross popular error. It is very much more difficult to talk about a thing than to do it. In the sphere of actual life that is of course obvious. Anybody can make history. Only a great man can write it. There is no mode of action, no form of emotion, that we do not share with the lower animals. It is only by language that we rise above them, or above each other --by **language, which is the parent, and not the child, of thought**. Action, indeed, is always easy and when presented to us in its most aggravated, because most continuous form, which I take to be that of real industry, becomes simply the refuge of people who have nothing whatsoever to do. No, Ernest, don't talk about action. It is a blind thing dependent on external influences, and moved by an impulse of whose nature it is unconscious. It is a thing incomplete in its essence, because limited by accident, and ignorant of its direction, being always at variance with its aim. Its basis is the lack of imagination. It is the last resource of those who know not how to dream.

Ernest: Gilbert, you treat the world as if it were a crystal ball. You hold it in your hand, and reverse it to please a wilful fancy. You do nothing but re-write history.

(7) It is true that in the case of rhetorical questions there is no participant boundary; this very phenomenon is marked by the fact that certain languages possess specific or quasi-specific lexicalized response markers, which are, among others, used in conjunction with such questions: jo in Swedish, si in French, ba da in Rumanian, depending, of course, on the structure of the question itself.



Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



129

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Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



130

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Ernest: But, my dear fellow--excuse me for interrupting you--you seem to me to be allowing your passion for criticism to lead you a great deal too far. For, after all, even you must admit that it is more difficult to do a thing than to talk about it.

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Ernest: Gilbert, you treat the world as if it were a crystal ball. You hold it in your hand, and reverse it to please a wilful fancy. You do nothing but re-write history.

(24)



(A) ((but) (my dear fellow) (excuse me for interrupting you) (you seem to be X-ing (a))) # (for (after all) (even you must admit (that (b) (than (c))))) #

(B) (b') (than (c')) # (d) # (e) # (f) than (g)) # (h) # (i) # (j) (k(l(that m)))) # (it is (n) (or (o)) # (p(q) # (indeed (r) (and when (s)))) (because (t) (which (u(v(who w)))))) # (no) (Avoc)) (x) # (y(and z(of whose (aa)))) # (bb(because (cc(and(dd(ee)))))) # (ff) # (gg(who(hh (how(ii))))))

(A) (Bvoc)(jj(as if(kk))) # (ll(and(mm))) # (nn(but(oo))) #

Paper given by C. George SANDULESCU in 1976, at the **Third Scandinavian Conference of Linguistics**, which took place at Hanasaari, near Helsinki, in Finland, between 1 and 3 October 1976; the Proceedings, edited by Fred Karlsson were issued by the Text Linguistics Research Group of the Academy of Finland, Turku/Åbo, 1976, 404+16 pages.

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## Quantifying Joyce's *Finnegans Wake*

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For if the lingo gasped between kicksheets, however **basically English**, were to be preached from the mouths of wickerchurchwardens and metaphysicians in the row and advokaatoes, allvoyous, demivoyelles, languoaths, lesbiels, dentelles, gutterhowls and furtz, where would their practice be or where the human race itself were the Pythagorean sesquipedalia of the panepistemion, however apically Volapucky, grunted and gromwelled, ichabod, habakuk, opanoff, uggamyg, **hapaxle**, **gomenon**, ppppfff, over country stiles, behind slated dwellinghouses, down blind lanes, or, when all fruit fails, under some sacking left on a coarse cart?

**FW117.25**







**Abstract.** The aim of the article is to show that the quantitative indicators already applied to many texts are useful also for characterizing a special text containing many artificial components created by J. Joyce.

*Keywords:* James Joyce, *Finnegans Wake*, English, quantitative properties

## 1. Introduction

(...)

The large majority of previous literary criticism of *Finnegans Wake* has taken a qualitative approach and focused on specific stylistic aspects of the work (see Campbell and Robinson, 1947; Benstock 1969; DiBernard, 1980). Some works could be considered to have taken a slightly more quantitative approach, by systematically considering the text and attempting to capture the size of it. For example, Glasheen (1956) created a census of biographical information of the characters in *Finnegans Wake* and Hart (1962) created a primary index of the 63,924 words in the vocabulary, an alphabetical list of syllables in the compound words and also listed some 10,000 English words suggested by Joyce's puns and distortions. However such analyses are still heavily qualitative in their methodology. This paper, the first in a series of articles, will offer a new perspective to the study of *Finnegans Wake* through taking a quantitative approach in order to consider the relationship between the author's creativity and language laws.

Whilst writing is a creative process, there is evidence to suggest it is constrained by language laws (see Zipf, 1935). These language laws can be seen as comparable to those in physics; however, whilst there are thousands of physicists trying to find laws in their field, there are a small number of linguists attempting to do the same for language laws. Fortunately, there are already several steps made by Köhler (2012) into the depth of syntax, and statistical evaluations from different domains (cf. Bybee, Hopper 2001, cf. also Janda 2013). In this study, our main aim is to state whether, in a text of this sort, linguistic laws are strong enough to soften the exuberant self-organization in the vocabulary, to establish whether the usual mathematical models used to analyse texts are still valid.





## 2. Methodology

The Joycean texts and word frequencies used in the present article are provided by Sandulescu and Vianu (James Joyce: *Finnegans Wake*. Full Text. Contemporary Literature Press, posted on Internet at the addresses given in References). Most word frequency data in the present article were obtained with

[http://www.writewords.org.uk/word\\_count.asp](http://www.writewords.org.uk/word_count.asp),

after removing apostrophes, hyphens, and accents from the text. We shall call these words "mechanical words".

To explore stratification (see sections 2.3 and 3.3) it was necessary to consider the proportion of standard English words in the text. Therefore, for episode one, "original words" were used and classified as "standard English" or "Joycean word". This classification was agreed, out of context, with the joint judgements of two native speakers with backgrounds in English linguistics.

Through this paper, we analyse some of the quantitative properties of *Finnegans Wake*, using methods that have been used in similar studies previously. Through this, we enable the reader to perform comparisons of these texts. Below, we give a theoretical description of the steps of our analysis. Please note, this is not intended to be an exhaustive analysis; it is a beginning of a complete quantitative description of Joyce's work.

### 2.1 Rank-frequency distribution

There are several laws that attempt to capture the regularities that seem to exist in the frequency structure of texts, by expressing the relationship between frequency and rank of words in a text. Zipf (1935) carried out a systematic investigation of several languages and found a stable relationship between rank and frequency, which he expressed through a power law function. Researchers have since built on Zipf's work (see Popescu, Altmann and Köhler, 2010), attempting to explain it further and find an equation that better expresses the relationship. It is now common practice for the rank-frequency distribution of a text to be modeled by the Zipf-Mandelbrot distribution, which is a normalized extended Zipf-distribution (cf. Wimmer, Altmann 1999a: 666). We will therefore use this to present the rank-frequency distributions of words in the 17 episodes of *Finnegans Wake*.



## 2.2 The Lambda indicator

The Lambda indicator is derived from the sum of Euclidean distances between the neighboring frequencies of the rank-frequency distribution, i.e. as

$$(1) \quad L = \sum_{r=1}^{V-1} [(f_r - f_{r+1})^2 + 1]^{1/2}$$

where  $L$  is the arc length of the word frequency distribution,  $V$  is the vocabulary (= highest rank) and  $f_r$  are the individual frequencies. Since this indicator increases with increasing text size  $N$ , it can be standardized by taking the ratio

$$(2) \quad \Lambda = \frac{L}{N} \text{Log}_{10}(N)$$

yielding a relatively stable value independent of  $N$ .

Unfortunately, the variance of the Euclidian distance is a very lengthy expression containing the covariances, and it requires complex computing especially for text comparisons (cf. Popescu, Mačutek, Altmann 2010). In order to alleviate the use of Lambda, one found a simple approximation which minimally deviates from the Euclidean arc length and called it *simplified arc length* (Popescu, Altmann 2014)

$$(3) \quad L^* = V + f_1 - (h + 1)$$

where  $h$  is the currently used h-point defined as

$$(4) \quad h = \begin{cases} r, & \text{if there is an } r = f(r) \\ \frac{f(i)r_j - f(j)r_i}{r_j - r_i + f(i) - f(j)}, & \text{if there is no } r = f(r) \end{cases}$$

This point can be found and computed easily. Hence the standard *simplified Lambda* is defined as



136

$$(5) \quad \Lambda^* = \frac{L^*}{N} \text{Log}_{10}(N) = \frac{(V + f_1 - (h+1))\text{Log}_{10}(N)}{N}.$$

Since in (5) the only variable is  $f_1$  ( $V$  is given for the text and  $h$  is a fixed point), the variance of the simplified Lambda can easily be derived by expansion as

$$(6) \quad \text{Var}(\Lambda^*) = \frac{f_1(N - f_1)(\text{Log}_{10}N)^2}{N^3}$$

For comparing two texts, one can use the asymptotic normal test defined as

$$(7) \quad u = \frac{|\Lambda_1^* - \Lambda_2^*|}{\sqrt{\text{Var}(\Lambda_1^*) + \text{Var}(\Lambda_2^*)}}$$

The formulas are sufficient for characterizing the vocabulary richness in individual episodes of *Finnegans Wake*, identifying stylistic change within a text and performing comparisons between different texts. Needless to say, a work like the studied one does not arise spontaneously, so to say, in one go, but is steadily corrected, improved, parts are added or omitted, etc. Thus we obtain merely only a *grosso modo* image of the development, nevertheless, the whole is a true image of the vocabulary.

### 2.3 Stratification

Texts, partly due to characteristics of individual languages and partly due to language variability, are composed of a number of components. It is possible to confirm the existence of this stratification in a text through calculating the number of strata present at the word form level. Usually, this is done using the stratification formula (cf. Popescu, Altmann, Köhler 2010) defined as

$$(8) \quad y = 1 + A_1 \exp(-x/r_1) + A_2 \exp(-x/r_2) + \dots$$

in which the number of exponential components signals the number of strata. If two coefficients are equal, or if a coefficient presents a nonsense number, or if the determination coefficient  $R^2$  attains a value greater than 0.9, the last component may



be eliminated as redundant.

However, the stating of the number of strata does not mean the recognition and identification of strata, merely their existence and number (Knight 2013, p.36). However we will still carry out this analysis with *Finnegans Wake* as, firstly, the findings can still be compared with previous attempts and, secondly, the more texts that are analysed in this way, the more likely it is that we will be able to recognise and identify specific strata.

#### 2.4 Ord's criterion

The aim of Ord's criterion (cf. Ord 1972) is to show that there is a unique structure if the values lie in a certain domain. The criterion has the form

$$(9) \quad I = \frac{m_2}{m'_1}, \quad S = \frac{m_3}{m_2},$$

where  $m'_1$  is the mean and  $m_r$  are the central moments of  $r$ -th order.

#### 2.5 Pearson's excess

Pearson's excess is used as the indicator of excess of the distribution. Using simply

$$(10) \quad \beta_2 = \frac{m_4}{m_2^2},$$

without -3 which compares it with the normal distribution (cf. Kapur, Saxena 1970: 38).

#### 2.6 Entropy and Repeat Rate

There are many definitions of entropy (cf. Esteban, Morales 1995). In our analysis, we use the best known measure, proposed by C. Shannon and applied currently in linguistics to show the diversity/uncertainty and the concentration of the distribution. This is defined as





$$(11) \quad H = -\sum_{i=1}^V p_i \log_2 p_i$$

Here  $p_i = f_i/N$ , i.e. the relative frequencies of each word in the text. The variance of entropy can be obtained by expansion as

$$(12) \quad \text{Var}(H) = \frac{1}{N} \left( \sum_{i=1}^V p_i \log_2^2 p_i - H^2 \right)$$

It is possible to also use the natural logarithm. The entropy can be relativized dividing the value of  $H$  by its maximum which is simply  $H_0 = \log_2 V$ , hence

$$(13) \quad H_{rel} = H/H_0$$

and its variance is

$$(14) \quad \text{Var}(H_{rel}) = \frac{\text{Var}(H)}{(\log_2 V)^2}.$$

Now, the greater is the diversity, the greater is vocabulary richness.

The Repeat Rate says asymptotically the same as the Entropy, but it is interpreted in reverse sense. If all frequencies are concentrated to one word, then the text is maximally concentrated. The smallest concentration is given if all words have the same frequency. The Repeat Rate is defined as

$$(15) \quad RR = \sum_{i=1}^V p_i^2 = \frac{1}{N^2} \sum_{i=1}^V f_i^2.$$

The maximum is 1, the minimum is  $1/V$ , the relative Repeat Rate is

$$(16) \quad RR_{rel} = \frac{1 - RR}{1 - 1/V},$$



and the variance is

$$(17) \quad \text{Var}(RR) = \frac{4}{N} \left( \sum_{i=1}^V p_i^3 - RR^2 \right).$$

### 2.7 Writer's view

Other aspects of this methodology section have highlighted that authors shape their texts both consciously and sub-consciously. Some aspects of the writing process are subconscious because they take their course according to laws (not rules). Laws cannot be learned but they can be captured conceptually. One of such laws is the abiding by the “golden section” which can be defined as

$$(18) \quad \varphi = \frac{1 + \sqrt{5}}{2} = 1.6180...$$

and in frequency analysis of texts it is represented by the so-called “writer's view” (cf. Popescu, Altmann 2007). One can imagine the writer sitting at a fixed point of the rank-frequency distribution and looking at the same time at the most frequent word ( $f_1$ ) and at his vocabulary ( $V$ ), i.e. the last word of the distribution. That means, his view encompasses an angle between his position - let us call it  $P(h,h)$  - and the extreme points  $P(1,f_1)$  and  $P(V,1)$ . ...

### 2.8 Vocabulary richness

In section 2.2, we outlined how we intend to analyse *Finnegans Wake* using the Lambda indicator. This will give us an indication of the vocabulary richness of the novel, however we wish to also use other methods to analyse this in more depth.

The number of indicators characterizing vocabulary richness is enormous. The concept itself can be interpreted in different ways, as can be seen in the history of its application (cf. e.g. Wimmer, Altmann 1999). Vocabulary richness may be considered as a function of any of the following: the number of different lemmas in text; the number of hapax legomena and the number of different tokemes (word form types). Alternatively, it is possible to study its evolution in text and perform several transformations. Regardless, text size  $N$  is always involved and this circumstance caused problems in the developing of indicators of richness (cf. Wimmer, Altmann



1999).

Popescu and Altmann (2006) introduced Gini's coefficient as a method of measuring vocabulary richness, as it takes into account all frequencies. However, frequencies play different roles. Fortunately, it is not necessary to revert and cumulate the distribution and the compute the sum of trapezoids to obtain the area above the Lorenz curve. Instead, one simply computes

$$(20) \quad G = \frac{1}{V} \left( V + 1 - \frac{2}{N} \sum_{r=1}^V r f_r \right)$$

where  $V$  is the vocabulary (= highest rank),  $N$  is the text size,  $r$  is the rank and  $f_r$  the frequency of rank  $r$ . The authors defined a richness indicator as the complement to  $G$ , i.e.

$$(21) \quad R_4 = 1 - G.$$

Since in (20) there are some constants ( $V$  and  $2$ ) and the mean, it is easy to define the variance as

$$(22) \quad \text{Var}(G) = \text{Var}(R_4) = \frac{4\sigma^2}{V^2 N}$$

where  $\sigma^2$  is the variance of the distribution.

A quite different approach to vocabulary richness is considering the  $h$ -point. Words with ranks smaller than  $h$  are mostly auxiliaries, synsemantics and those (thematic) words which occur quite frequently but do not contribute to the richness. Richness is produced rather by words that occur seldom; in the history of this research one separated hapax legomena and considered them as unique indicators of richness. This is, of course, a slightly restricted view. But one can add also dis legomena or even tris legomena, but which of the approaches leads to “better” results? Where is the boundary?

Popescu et al. (2009: 29ff.) took into account the fixed point  $h$  and considered all words whose frequency is smaller than  $h$  (that is, the tail of the distribution) as contributors to richness. In order to obtain a comparable indicator we first define the cumulative probabilities up to  $h$  as



$$(23) \quad F([h]) = F(r \leq h) = \frac{1}{N} \sum_{r=1}^{[h]} f_r$$

That is,  $F([h])$  is the sum of relative frequencies of words whose ranks are smaller or equal to  $h$ . A slight correction to  $F([h])$  is the subtraction of the quantity  $h^2/(2N)$ , the half of the square of the  $h$ -point (cf. Popescu et al. 2009: 17). Using these conditions, one can define the indicator

$$(24) \quad R_1 = 1 - \left( F([h]) - \frac{h^2}{2N} \right)$$

Since in (24) the only variable is  $F([h])$  which can be considered a probability, one easily obtains the variance of  $R_1$  as

$$(25) \quad \text{Var}(R_1) = F([h])[1 - F([h])]/N.$$

This study will consider both of these approaches to vocabulary richness.

### 3. Results and analysis

#### 3.1 Rank-frequency distribution

Unfortunately, the results of fitting the Zipf-Mandelbrot distribution are statistically not satisfactory. This may be due to some boundary conditions that has not been taken into account but also to the fact that the chi-square fitting has different weak points. However, considering the resulting formula as a simple function, we obtain a good result yielding  $R^2 = 0.9964$ .

Alternatively, it is possible to perform the fitting by means of a function known as Zipf-Alekseev function. One can obtain it from the differential equation

$$(26) \quad \frac{dy}{y} = \frac{A + B \ln x}{Dx} dx$$





which solved and reparametrized yields the function

$$(27) \quad y = cx^{a+b \ln x}.$$

In (26),  $A$  is the language/text-sort/style/... constant,  $B$  is the force of the speaker/writer and  $D$  is the equilibrating force of the community (cf. Wimmer, Altmann 2005). The check of sufficiency can be done again with the determination coefficient  $R^2$ .

Applying (27) to all episodes separately, we obtain the results presented in Table 1.

Table 1  
Zipf-Alekseev Fitting (mechanical words)

| Text          | $a$     | $b$     | $c$       | $R^2$  |
|---------------|---------|---------|-----------|--------|
| FW Episode 01 | -0.6487 | -0.0605 | 657.9873  | 0.9939 |
| FW Episode 02 | -0.5609 | -0.0878 | 385.0283  | 0.9841 |
| FW Episode 03 | -0.5791 | -0.0711 | 577.5572  | 0.9886 |
| FW Episode 04 | -0.6179 | -0.0685 | 671.2932  | 0.9905 |
| FW Episode 05 | -0.6424 | -0.0524 | 499.2077  | 0.9906 |
| FW Episode 06 | -0.4927 | -0.0879 | 909.1371  | 0.9945 |
| FW Episode 07 | -0.5171 | -0.0862 | 543.3030  | 0.9880 |
| FW Episode 08 | -0.3843 | -0.1132 | 438.6174  | 0.9880 |
| FW Episode 09 | -0.4304 | -0.0976 | 710.6777  | 0.9903 |
| FW Episode 10 | -0.5039 | -0.0851 | 801.7924  | 0.9918 |
| FW Episode 11 | -0.6105 | -0.0716 | 1674.9200 | 0.9945 |
| FW Episode 12 | -0.6983 | -0.0575 | 487.0949  | 0.9595 |
| FW Episode 13 | -0.4000 | -0.1034 | 490.0503  | 0.9876 |
| FW Episode 14 | -0.4322 | -0.0902 | 902.7356  | 0.9959 |
| FW Episode 15 | -0.3987 | -0.1032 | 1317.1361 | 0.9905 |
| FW Episode 16 | -0.4376 | -0.0851 | 595.9386  | 0.9895 |
| FW Episode 17 | -0.5676 | -0.0594 | 696.8380  | 0.9912 |



As can be seen, the parameters  $a$  and  $b$  are smaller than 0, and parameter  $b$  linearly depends on parameter  $a$ , namely  $b = -0.1683 - 0.1659a$  with  $R^2 = 0.85$ . This shows that even in such a non-standard text such as *Finnegans Wake*, the background law is followed subconsciously by the writer. It may be possible to insert the parameter  $a$  and its relation to parameter  $b$  in a more general theory encompassing language levels. However, it must further be scrutinized whether the negative values of  $a$  are characteristic only to the given text or are a general feature of rank-frequency distributions of words. Since this is possible only with a great number of other texts, we must, for now, renounce this task.

The results show that, in the example of this unusual text, the Zipf-Alekseev function yields a better fit than Zipf-Mandelbrot. The text, due to its use of non-standard words, has a large number of hapax legomena (words that occur only one time). The result suggests that modeling a rank-frequency distribution, especially in cases having very long tail, may be done more adequately with a simple function.

### 3.2 The Lambda indicator

In Table 2, the computed values are presented.

Table 2

Simplified Lambdas for individual episodes of *Finnegans Wake* (mechanical words)  
(Note: the difference between the actual  $\Lambda$  and the simplified  $\Lambda^*$  is a few per-mille)

| Text          | N     | V    | f(1) | h       | L*        | $\Lambda^*$ | Var ( $\Lambda^*$ ) |
|---------------|-------|------|------|---------|-----------|-------------|---------------------|
| FW Episode 01 | 9850  | 4107 | 642  | 32.0000 | 4716.0000 | 1.9120      | 0.00009865          |
| FW Episode 02 | 6025  | 2798 | 375  | 24.0000 | 3148.0000 | 1.9750      | 0.00013841          |
| FW Episode 03 | 9830  | 4363 | 580  | 32.5000 | 4909.5000 | 1.9940      | 0.00009003          |
| FW Episode 04 | 10389 | 4443 | 659  | 31.0000 | 5070.0000 | 1.9602      | 0.00009225          |
| FW Episode 05 | 8150  | 3419 | 491  | 28.6000 | 3880.4000 | 1.8622      | 0.00010627          |
| FW Episode 06 | 16137 | 6243 | 898  | 42.0000 | 7098.0000 | 1.8508      | 0.00005766          |
| FW Episode 07 | 9524  | 4153 | 535  | 29.8571 | 4657.1429 | 1.9456      | 0.00008813          |
| FW Episode 08 | 8044  | 3477 | 419  | 28.5000 | 3866.5000 | 1.8772      | 0.00009362          |
| FW Episode 09 | 14348 | 6166 | 692  | 39.6667 | 6817.3333 | 1.9751      | 0.00005528          |
| FW Episode 10 | 15309 | 6619 | 777  | 41.2500 | 7353.7500 | 2.0103      | 0.00005512          |



|               |       |      |      |         |            |        |            |
|---------------|-------|------|------|---------|------------|--------|------------|
| FW Episode 11 | 25952 | 9986 | 1672 | 51.0000 | 11606.0000 | 1.9741 | 0.00004526 |
| FW Episode 12 | 6176  | 2402 | 452  | 27.5000 | 2825.5000  | 1.7342 | 0.00015782 |
| FW Episode 13 | 9551  | 3961 | 474  | 33.8000 | 4400.2000  | 1.8336 | 0.00007823 |
| FW Episode 14 | 17658 | 6237 | 898  | 44.2500 | 7089.7500  | 1.7052 | 0.00004930 |
| FW Episode 15 | 26921 | 9986 | 1262 | 52.0000 | 11195.0000 | 1.8422 | 0.00003257 |
| FW Episode 16 | 12870 | 5307 | 577  | 39.5000 | 5843.5000  | 1.8659 | 0.00005619 |
| FW Episode 17 | 12994 | 5271 | 709  | 39.0000 | 5940.0000  | 1.8805 | 0.00006718 |

For the sake of illustration we show the computation for Episode 1 and compare it with Episode 2. We obtain

$$\Lambda_{E1}^* = \frac{[4107 + 642 - (32.00 + 1)] \log_{10}(9850)}{9850} = 1.9120,$$

and

$$u = \frac{|1.9120 - 1.9759|}{\sqrt{0.00009865 + 0.0001381}} = 4.15,$$

a highly significant value, which suggests there is a stylistic difference between the two episodes. This could be the effect of multiple factors, for example a long pause in writing.

Comparing all episodes with one another, we obtain the results presented in Table 3 below. Instead of presenting all numbers, we mark (X) those pairs of texts whose  $u$  is smaller than 1.96, as this indicates that there is no significant difference of Lambdas and that the texts share similarity.

Table 3  
Similarities of simplified Lambdas in 17 episodes of *Finnegans Wake*

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



145

|    |  |   |   |   |   |   |  |   |   |  |  |  |   |  |  |   |  |
|----|--|---|---|---|---|---|--|---|---|--|--|--|---|--|--|---|--|
| 5  |  |   |   |   |   |   |  |   |   |  |  |  |   |  |  |   |  |
| 6  |  |   |   |   | X |   |  |   |   |  |  |  |   |  |  |   |  |
| 7  |  | X |   | X |   |   |  |   |   |  |  |  |   |  |  |   |  |
| 8  |  |   |   |   | X |   |  |   |   |  |  |  |   |  |  |   |  |
| 9  |  | X | X | X |   |   |  |   |   |  |  |  |   |  |  |   |  |
| 10 |  |   |   | X |   |   |  |   |   |  |  |  |   |  |  |   |  |
| 11 |  | X | X | X |   |   |  |   | X |  |  |  |   |  |  |   |  |
| 12 |  |   |   |   |   |   |  |   |   |  |  |  |   |  |  |   |  |
| 13 |  |   |   |   |   | X |  |   |   |  |  |  |   |  |  |   |  |
| 14 |  |   |   |   |   |   |  |   |   |  |  |  |   |  |  |   |  |
| 15 |  |   |   |   | X | X |  |   |   |  |  |  | X |  |  |   |  |
| 16 |  |   |   |   | X | X |  | X |   |  |  |  |   |  |  |   |  |
| 17 |  |   |   |   | X |   |  | X |   |  |  |  |   |  |  | X |  |

Table 4 expresses this information in a different form, highlighting, for each episode, the number of other episodes it shares similarity with.

Table 4  
Number of Lambda-similarities found for each episode of *Finnegans Wake*

| Episode                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|
| Number of similarities | 0 | 5 | 4 | 4 | 5 | 4 | 2 | 3 | 4 | 1  | 4  | 0  | 2  | 0  | 3  | 4  | 3  |

The centrality (the stylistic gravitation of an episode) is the greater the more episodes are similar to it. Hence the sets of episodes according to decreasing centrality are

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

It is clear that the episodes with the greatest centrality are 2 and 5, whereas the





most divergent are episodes 1, 12 and 14. These results provide a new insight into the stylistic patterns found within *Finnegans Wake* and offer increased focus for a future qualitative study of the text.

Tables 5 and 6, below, show the mean and maximum lambdas calculated in previous studies for a range of text types.

Table 5  
Mean lambdas of the rank-frequency distributions of some English writers  
(taken from Popescu, Čech, Altmann 2011, Appendix, pp. 120 – 127)

| Text sort                                  | # texts | mean $\Lambda$ |
|--------------------------------------------|---------|----------------|
| Table 6a: English poetry                   | 18      | 1.4450         |
| Table 6b: English prose                    | 56      | 1.2922         |
| Table 6c: English Nobel lectures           | 21      | 1.3079         |
| Table 6d: English scientific texts         | 10      | 1.0528         |
| Table 6e. English stories told by children | 39      | 1.2651         |

Table 6  
Maximal Lambdas in some works by English writers  
(taken from Popescu, Čech, Altmann 2011, Appendix, pp. 120 – 127)

| Text sort | Genre    | Text containing maximum $\Lambda$       | Text author         | maximum $\Lambda$ |
|-----------|----------|-----------------------------------------|---------------------|-------------------|
| Table 6a  | Poetry   | Howl (1956)                             | Ginsberg, A.        | 1.7905            |
| Table 6b  | Prose    | Rosinante to the road again. XIV        | Dos Passos, J       | 1.7679            |
| Table 6c  | Nobel    | Literature (banquet speech) (1953)      | Churchill, W.       | 1.6126            |
| Table 6d  | Science  | Rorty's Inspirational Liberalism (2003) | Bernstein, R.J.     | 1.2412            |
| Table 6e  | Children | The Rift                                | Toni, boy, 11 years | 1.5024            |

If we consider the maximum Lambdas for other texts, we see that the values



seem to differ for different genres. Poetry has the highest value, followed by prose. Nobel and science have lower values. It seems reasonable to question whether the more a text deviates from realism in its content and the stronger is its creative component the greater its Lambda is. Our analysis of *Finnegans Wake* seems to fit with this hypothesis. Due to its play with words it is arguably the most creative text so far analyzed, and it has the highest scoring mean of  $\Lambda^*$  (1.8940) and highest scoring maximum of  $\Lambda^*$  (2.0103). Of course, a number of different texts in different languages would be necessary to test this further. The interested reader can perform further analyses concerning languages, text sorts, styles, development, etc. in order to obtain an overall image of this indicator (cf. Popescu, Čech, Altmann 2011).

Finally, Table 2 and Table 7 allow a comparison between Joyce's novels *Finnegans Wake* (1939) and *Ulysses* (1922), the latter written in standard English. The difference is enormous when one compares the  $\Lambda^*$  columns, the corresponding lambda averages being 1.8940 for *Finnegans Wake* versus 1,3671 for *Ulysses*.

Table 7  
Simplified Lambdas for individual episodes of *Ulysses* (mechanical words)  
(Note: the difference between the actual  $\Lambda$  and the simplified  $\Lambda^*$  is a few per-mille)

| Text               | N     | V    | f(1) | h       | $L^*$     | $\Lambda^*$ | Var ( $\Lambda^*$ ) |
|--------------------|-------|------|------|---------|-----------|-------------|---------------------|
| Ulysses Episode 01 | 7189  | 2043 | 399  | 30.3333 | 2410.6667 | 1.2932      | 0.00010846          |
| Ulysses Episode 02 | 4394  | 1508 | 265  | 24.0000 | 1748.0000 | 1.4492      | 0.00017116          |
| Ulysses Episode 03 | 5697  | 2320 | 284  | 25.0000 | 2578.0000 | 1.6995      | 0.00011727          |
| Ulysses Episode 04 | 5874  | 2026 | 395  | 25.4000 | 2394.6000 | 1.5364      | 0.00015168          |
| Ulysses Episode 05 | 6390  | 2026 | 353  | 27.7500 | 2350.2500 | 1.3997      | 0.00011828          |
| Ulysses Episode 06 | 10903 | 2817 | 630  | 37.5000 | 3408.5000 | 1.2622      | 0.00008140          |
| Ulysses Episode 07 | 10151 | 2840 | 638  | 34.0000 | 3443.0000 | 1.3589      | 0.00009314          |
| Ulysses Episode 08 | 12903 | 3529 | 565  | 40.5000 | 4052.5000 | 1.2911      | 0.00005483          |
| Ulysses Episode 09 | 11968 | 3491 | 626  | 39.0000 | 4077.0000 | 1.3892      | 0.00006888          |
| Ulysses Episode 10 | 12442 | 3429 | 626  | 36.0000 | 4018.0000 | 1.3224      | 0.00006440          |
| Ulysses Episode 11 | 12153 | 3205 | 432  | 38.0000 | 3598.0000 | 1.2093      | 0.00004707          |
| Ulysses Episode 12 | 21274 | 5660 | 1608 | 49.5000 | 7217.5000 | 1.4683      | 0.00006152          |



|                    |       |      |     |         |           |        |            |
|--------------------|-------|------|-----|---------|-----------|--------|------------|
| Ulysses Episode 13 | 16755 | 3571 | 811 | 48.4000 | 4332.6000 | 1.0923 | 0.00004905 |
|--------------------|-------|------|-----|---------|-----------|--------|------------|

In order to state the significance of the difference we compute the asymptotic normal test between the means of the two simplified lambdas in the two tests according to

$$u = \frac{\bar{\Lambda}_1 - \bar{\Lambda}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

and obtain

$$u = \frac{1.8940 - 1.3671}{\sqrt{\frac{0.00763}{17} + \frac{0.02353}{13}}} = 11.0863$$

which is highly significant. Hence, *Finnegans Wake* strongly differs from a “normal” text.

### 3.3 Stratification

The results of the computation of strata in *Finnegans Wake* are presented in Table 8.

Table 8

The two-strata structure of rank-frequency distributions of words in all episodes  
(mechanical words)

| Text          | N     | A <sub>1</sub> | r <sub>1</sub> | A <sub>2</sub> | r <sub>2</sub> | R <sup>2</sup> |
|---------------|-------|----------------|----------------|----------------|----------------|----------------|
| FW Episode 01 | 9850  | 800.5245       | 2.4216         | 105.2927       | 31.3232        | 0.9956         |
| FW Episode 02 | 6025  | 438.3131       | 2.9998         | 51.4478        | 33.2732        | 0.9910         |
| FW Episode 03 | 9830  | 620.5005       | 3.0397         | 90.4213        | 33.5005        | 0.9848         |
| FW Episode 04 | 10389 | 800.7309       | 2.3973         | 122.1213       | 27.2785        | 0.9906         |
| FW Episode 05 | 8150  | 566.8180       | 2.8675         | 67.8039        | 39.9975        | 0.9897         |



|               |       |           |        |          |         |        |
|---------------|-------|-----------|--------|----------|---------|--------|
| FW Episode 06 | 16137 | 975.8178  | 3.0202 | 169.7285 | 32.5279 | 0.9920 |
| FW Episode 07 | 9524  | 589.3728  | 3.2088 | 82.4540  | 35.7731 | 0.9900 |
| FW Episode 08 | 8044  | 457.4715  | 3.1030 | 99.9073  | 28.2512 | 0.9911 |
| FW Episode 09 | 14348 | 741.8399  | 3.3278 | 134.5352 | 35.0325 | 0.9917 |
| FW Episode 10 | 15309 | 889.3433  | 2.9443 | 142.0732 | 34.7241 | 0.9951 |
| FW Episode 11 | 25952 | 1973.5895 | 2.4524 | 297.9667 | 29.1142 | 0.9894 |
| FW Episode 12 | 6176  | 664.7541  | 2.1508 | 67.7475  | 31.9517 | 0.9774 |
| FW Episode 13 | 9551  | 503.3348  | 3.2776 | 105.1176 | 31.3593 | 0.9895 |
| FW Episode 14 | 17658 | 903.1733  | 3.1081 | 211.5357 | 30.9411 | 0.9888 |
| FW Episode 15 | 26921 | 1380.8318 | 3.1462 | 287.4493 | 32.8846 | 0.9900 |
| FW Episode 16 | 12870 | 619.4422  | 3.2579 | 120.6342 | 37.8397 | 0.9931 |
| FW Episode 17 | 12994 | 772.4971  | 2.4798 | 152.8376 | 31.4530 | 0.9846 |

As can be seen, the second coefficient  $r_2$  is always greater than  $r_1$ , signaling the weak expression of the second stratum. The fitting is very adequate in all cases. Hence we can conjecture that there are two word strata in all texts.

To explore this further, we shall consider strata of original words (as defined in section 2). If we consider separately the frequencies of English words (eliminating all the others), we obtain again a two strata relation

$$y = 1 + 803.6911 \cdot \exp(-x/2.4385) + 102.3272 \cdot \exp(-x/30.6489)$$

with  $R^2 = 0.9960$ . Since the parameters are quite different, we have again two strata and may continue the procedure. But here, there are as many possibilities as we are able to define. Separating autosemantics and synsemantics would not finish the work. From the linguistic point of view, this would be a fertile way into the depth but from the textological view its relevance is not yet known.

Consider the non-English words, such as the most frequent ones: *willingdone*, *jinnies*, *lipoleums*, *prankquean*, *hootheer*,... it is not easy to find a linguistic or textological criterion which would enable us to perform a classification. If we fit the stratification formula to this data, we obtain again two strata

$$y = 1 + 36.2053 \cdot \exp(-x/1.6548) + 3.4349 \cdot \exp(-x/39.7718)$$





with  $R^2 = 0.9783$ . Even a tri-stratal function yields non-equal parameters. Therefore much philological work would still be necessary to find the exact nature of the strata.

Since the difference of parameters may be caused also by the different size of data, we compute the lambda indicator for both and compare them. We obtain the results presented in Table 9.

Table 9  
Simplified lambda for the three variants of Episode 1  
(words separated by blanks)

| All words (standard English and invented) |          |              |          |            |             |                     |
|-------------------------------------------|----------|--------------|----------|------------|-------------|---------------------|
| <i>N</i>                                  | <i>V</i> | <i>f</i> (1) | <i>h</i> | <i>L</i> * | $\Lambda^*$ | Var ( $\Lambda^*$ ) |
| 9767                                      | 4146     | 642          | 31.6667  | 4755.3333  | 1.9425      | 0.00010009          |
|                                           |          |              |          |            |             |                     |
| Standard English words                    |          |              |          |            |             |                     |
| <i>N</i>                                  | <i>V</i> | <i>f</i> (1) | <i>h</i> | <i>L</i> * | $\Lambda^*$ | Var ( $\Lambda^*$ ) |
| 7562                                      | 2116     | 642          | 31.6667  | 2725.3333  | 1.3979      | 0.00015456          |
|                                           |          |              |          |            |             |                     |
| Joyce's invented words                    |          |              |          |            |             |                     |
| <i>N</i>                                  | <i>V</i> | <i>f</i> (1) | <i>h</i> | <i>L</i> * | $\Lambda^*$ | Var ( $\Lambda^*$ ) |
| 2205                                      | 2030     | 25           | 6.0000   | 2048.0000  | 3.1054      | 0.00005683          |

One can see that the frequency distribution of Joyce's invented words has a much greater simplified lambda than the one of standard English words only. Performing the asymptotic normal test between the latter two distributions, we obtain

$$u = |1.3979 - 3.1054| / [0.00015456 + 0.00005683]^{1/2} = 117.44.$$

an extremely significant value whose probability is very small.

The above example supports the findings of section 3.2, through suggesting that lambda can be drastically increased by enriching the vocabulary with enough  $x$  unique words (actual or invented). The general formula results directly from the definition (5), namely



$$(28) \quad \Lambda^*(x) = \frac{L^* + x}{N + x} \text{Log}_{10}(N + x)$$

To explore this further, we will draw on the example of the poem *Jabberwocky* by Lewis Carroll. Like *Finnegans Wake*, this text contains many words originally made up by the author. We used the values of  $N$  and  $L^*$ , given below in Table 10.

Table 10  
Lambda for *Jabberwocky*

| Lewis Carroll, <i>Jabberwocky</i> (1871) |     |        |        |          |             |                         |
|------------------------------------------|-----|--------|--------|----------|-------------|-------------------------|
| $N$                                      | $V$ | $f(1)$ | $h$    | $L^*$    | $\Lambda^*$ | $\text{Var}(\Lambda^*)$ |
| 168                                      | 92  | 19     | 4.5000 | 105.5000 | 1.3974      | 0.00295660              |

We get

$$\Lambda^*(x) = \frac{105,5 + x}{168 + x} \text{Log}_{10}(168 + x)$$

in terms of  $x$  additional unique words as shown in Figure 2.

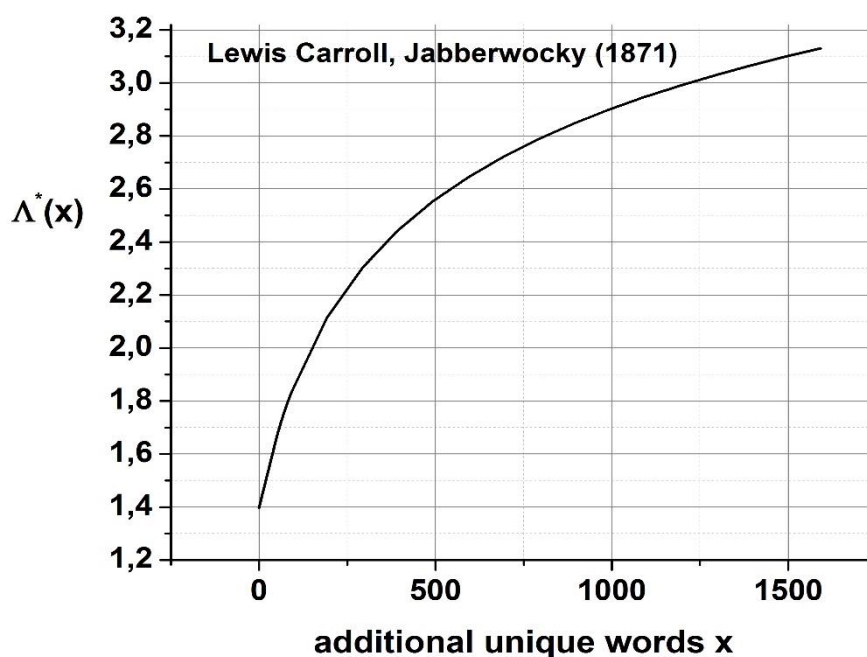


Figure 2. Lambda amplification by additional unique words

As it can be seen, a middle lambda text of about  $\Lambda^* = 1.4$  can be increased to a lambda of about 3.1 by inserting about 1500 new unique words (hapax legomena). However, this freedom is given only to the text author, not to the researcher who must adhere to the state of affairs.

### 3.4 Ord's criterion

In Table 11 the values of Ord's criterion for each individual episode of *Finnegans Wake* are shown.



Table 11  
Ord's criterion for individual episodes of  
*Finnegans Wake* (mechanical words)

| Episode | N     | V     | $m_1'$  | $m_2$ | $m_3$  | $I$     | $S$      |
|---------|-------|-------|---------|-------|--------|---------|----------|
| 1       | 9850  | 4107  | 18.3284 | 1403  | 142294 | 76.5266 | 101.4493 |
| 2       | 6025  | 2798  | 17.8944 | 1445  | 152210 | 80.7499 | 105.3374 |
| 3       | 9830  | 4363  | 17.4356 | 1358  | 140841 | 77.9017 | 103.6918 |
| 4       | 10389 | 4443  | 17.6995 | 1365  | 139515 | 77.1060 | 102.2289 |
| 5       | 8150  | 3419  | 20.1931 | 1586  | 158093 | 78.5312 | 99.6933  |
| 6       | 16137 | 6243  | 18.5976 | 1417  | 143401 | 76.1719 | 101.2280 |
| 7       | 9524  | 4153  | 18.4012 | 1450  | 148444 | 78.7856 | 102.3927 |
| 8       | 8044  | 3477  | 18.3802 | 1348  | 134480 | 73.3131 | 99.7993  |
| 9       | 14348 | 6166  | 17.6029 | 1334  | 135979 | 75.8000 | 101.9106 |
| 10      | 15309 | 6619  | 16.9289 | 1282  | 130904 | 75.7198 | 102.1209 |
| 11      | 26642 | 10676 | 16.0859 | 1193  | 121971 | 74.1423 | 102.2692 |
| 12      | 6176  | 2402  | 20.3339 | 1580  | 159757 | 77.6954 | 101.1219 |
| 13      | 9551  | 3961  | 18.9060 | 1429  | 144060 | 75.5798 | 100.8178 |
| 14      | 17658 | 6237  | 20.1035 | 1515  | 149985 | 75.3757 | 98.9796  |
| 15      | 27373 | 10438 | 17.6353 | 1320  | 133823 | 74.8546 | 101.3749 |
| 16      | 12870 | 5307  | 18.8625 | 1411  | 140567 | 74.7842 | 99.6493  |
| 17      | 12994 | 5271  | 19.7454 | 1482  | 145483 | 75.0404 | 98.1860  |

The relationship between  $I$  and  $S$  is visualized in Figure 3.



The "Quark"...



154

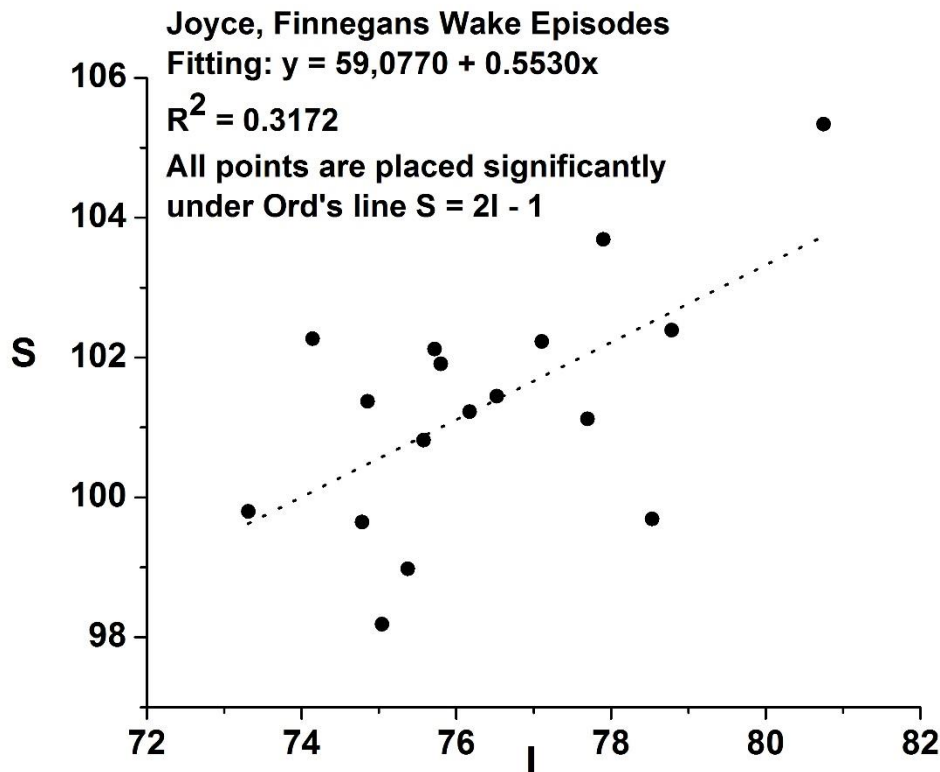


Figure 3. Ord's criterion  $\langle I, S \rangle$  for the individual episodes

Ord's criterion displays a certain tendency but this tendency cannot be captured by a straight line. As can be seen in Figure 3, a very weak tendency exists.

The aim of Ord's criterion is to show that there is a unique structure if the values lie in a certain domain. The separator of the domains is the line  $I = 2S - 1$ , separating the negative hypergeometric domain under the line from several other ones. Since the  $\langle I, S \rangle$  points are under the line, it would be interesting to substantiate linguistically its position. This is surely a task for the future; if one joined the neighboring points, one would obtain a strong oscillation which could be captured merely using some polynomials.

The aim of any indicator in text analysis is to identify some property of the given text, show its location in the two dimensional space, find its links to other indicators and show the inner mechanism controlling the self-regulation. Here, we



must dispense with this aim because we analyze merely one text.

### 3.5 Pearson's excess

We obtained the results presented in Table 12.

Table 12  
Pearson's excess

| Episode | N     | V     | $m_2$ | $m_4$    | $\beta_2$ |
|---------|-------|-------|-------|----------|-----------|
| 1       | 9850  | 4107  | 1403  | 19979792 | 10.1558   |
| 2       | 6025  | 2798  | 1445  | 21787444 | 10.4348   |
| 3       | 9830  | 4363  | 1358  | 19952925 | 10.8153   |
| 4       | 10389 | 4443  | 1365  | 19586475 | 10.5162   |
| 5       | 8150  | 3419  | 1586  | 22281134 | 8.8602    |
| 6       | 16137 | 6243  | 1417  | 20189479 | 10.0606   |
| 7       | 9524  | 4153  | 1450  | 20913274 | 9.9503    |
| 8       | 8044  | 3477  | 1348  | 18761611 | 10.3326   |
| 9       | 14348 | 6166  | 1334  | 19122332 | 10.7408   |
| 10      | 15309 | 6619  | 1282  | 18367567 | 11.1783   |
| 11      | 26642 | 10676 | 1193  | 17101986 | 12.0233   |
| 12      | 6176  | 2402  | 1580  | 22624458 | 9.0646    |
| 13      | 9551  | 3961  | 1429  | 20271044 | 9.9281    |
| 14      | 17658 | 6237  | 1515  | 21035004 | 9.1608    |
| 15      | 27373 | 10438 | 1320  | 18773335 | 10.7731   |
| 16      | 12870 | 5307  | 1411  | 19705541 | 9.9030    |
| 17      | 12994 | 5271  | 1482  | 20287021 | 9.2405    |

As can be seen,  $\beta_2$  is almost constant. It does not bring any possibility of classification or modeling a development trend. A thorough comparison with other texts would show whether this property is constant also for "normal" texts.

### 3.6 Entropy and Repeat Rate

All values necessary for evaluation and comparison of Entropy and Repeat Rate for all individual episodes of *Finnegans Wake* are presented in Table 13 below.



Table 13  
Entropy and Repeat Rate of individual episodes of *Finnegans Wake*

| Text          | N     | V     | H       | Var(H)   | RR       | Var(RR)   |
|---------------|-------|-------|---------|----------|----------|-----------|
| FW Episode 01 | 9850  | 4107  | 9.7437  | 0.001166 | 0.010183 | 1.362E-07 |
| FW Episode 02 | 6025  | 2798  | 9.5711  | 0.001619 | 0.009937 | 2.077E-07 |
| FW Episode 03 | 9830  | 4363  | 9.9722  | 0.001123 | 0.008632 | 1.005E-07 |
| FW Episode 04 | 10389 | 4443  | 9.8648  | 0.001124 | 0.009796 | 1.206E-07 |
| FW Episode 05 | 8150  | 3419  | 9.7025  | 0.001236 | 0.008983 | 1.302E-07 |
| FW Episode 06 | 16137 | 6243  | 10.0712 | 0.000793 | 0.008725 | 5.710E-08 |
| FW Episode 07 | 9524  | 4153  | 9.9052  | 0.001138 | 0.008628 | 9.940E-08 |
| FW Episode 08 | 8044  | 3477  | 9.5949  | 0.001324 | 0.009236 | 1.152E-07 |
| FW Episode 09 | 14348 | 6166  | 10.2781 | 0.000837 | 0.007399 | 4.790E-08 |
| FW Episode 10 | 15309 | 6619  | 10.3844 | 0.000801 | 0.007482 | 4.930E-08 |
| FW Episode 11 | 26642 | 10676 | 10.5383 | 0.000585 | 0.009250 | 4.380E-08 |
| FW Episode 12 | 6176  | 2402  | 9.0835  | 0.001678 | 0.013649 | 3.645E-07 |
| FW Episode 13 | 9551  | 3961  | 9.7812  | 0.001114 | 0.008287 | 8.140E-08 |
| FW Episode 14 | 17658 | 6237  | 9.9978  | 0.000706 | 0.008113 | 4.180E-08 |
| FW Episode 15 | 27373 | 10438 | 10.5862 | 0.000526 | 0.007297 | 2.410E-08 |
| FW Episode 16 | 12870 | 5307  | 10.1697 | 0.000851 | 0.006801 | 4.430E-08 |
| FW Episode 17 | 12994 | 5271  | 10.0400 | 0.000882 | 0.007762 | 6.000E-08 |

As can be seen in Table 13, the richness of all episodes is relatively stable. That means, Entropy and Repeat Rate are effects of some laws working in the background; the writer abides by them unconsciously and creates them in spite of his originality. Though, in theory, there is a clear relationship between Entropy and Repeat Rate (cf. e.g. Altmann 1988: 45), in practice we obtain at least a power relationship as visualized in Figure 4.



157

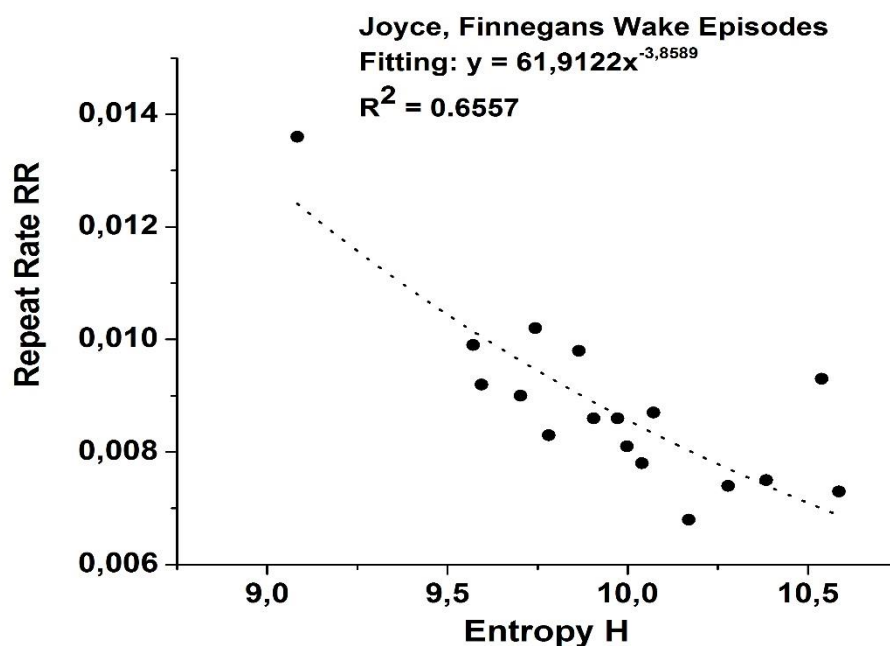


Figure 4. Entropy and Repeat Rate for *Finnegans Wake* episodes

This analysis will allow the mean Entropies or Repeat Rates of other works to be compared with *Finnegans Wake* using the variances, enabling new insights into these texts.

### 3.7 Writer's view

The computation of this value for the individual episodes of *Finnegans Wake* yielded values presented in Table 14.

Table 14  
Writer's view of individual episodes of *Finnegans Wake*

| Text | N | V | $f(1)$ | $h$ | $\cos a$ | $a \text{ rad}$ |
|------|---|---|--------|-----|----------|-----------------|
|      |   |   |        |     |          |                 |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



158

|               |       |      |      |         |         |        |
|---------------|-------|------|------|---------|---------|--------|
| FW Episode 01 | 9850  | 4107 | 642  | 32.0000 | -0.0584 | 1.6292 |
| FW Episode 02 | 6025  | 2798 | 375  | 24.0000 | -0.0737 | 1.6445 |
| FW Episode 03 | 9830  | 4363 | 580  | 32.5000 | -0.0647 | 1.6355 |
| FW Episode 04 | 10389 | 4443 | 659  | 31.0000 | -0.0545 | 1.6253 |
| FW Episode 05 | 8150  | 3419 | 491  | 28.6000 | -0.0677 | 1.6386 |
| FW Episode 06 | 16137 | 6243 | 898  | 42.0000 | -0.0544 | 1.6253 |
| FW Episode 07 | 9524  | 4153 | 535  | 29.8571 | -0.0640 | 1.6349 |
| FW Episode 08 | 8044  | 3477 | 419  | 28.5000 | -0.0782 | 1.6491 |
| FW Episode 09 | 14348 | 6166 | 692  | 39.6667 | -0.0655 | 1.6363 |
| FW Episode 10 | 15309 | 6619 | 777  | 41.2500 | -0.0607 | 1.6316 |
| FW Episode 11 | 25952 | 9986 | 1672 | 51.0000 | -0.0359 | 1.6067 |
| FW Episode 12 | 6176  | 2402 | 452  | 27.5000 | -0.0734 | 1.6443 |
| FW Episode 13 | 9551  | 3961 | 474  | 33.8000 | -0.0826 | 1.6535 |
| FW Episode 14 | 17658 | 6237 | 898  | 44.2500 | -0.0576 | 1.6284 |
| FW Episode 15 | 26921 | 9986 | 1262 | 52.0000 | -0.0472 | 1.6181 |
| FW Episode 16 | 12870 | 5307 | 577  | 39.5000 | -0.0787 | 1.6496 |
| FW Episode 17 | 12994 | 5271 | 709  | 39.0000 | -0.0639 | 1.6347 |

Ordering the episodes according to increasing  $N$ , we obtain the course visualized in Figure 5.



The "Quark"...



159

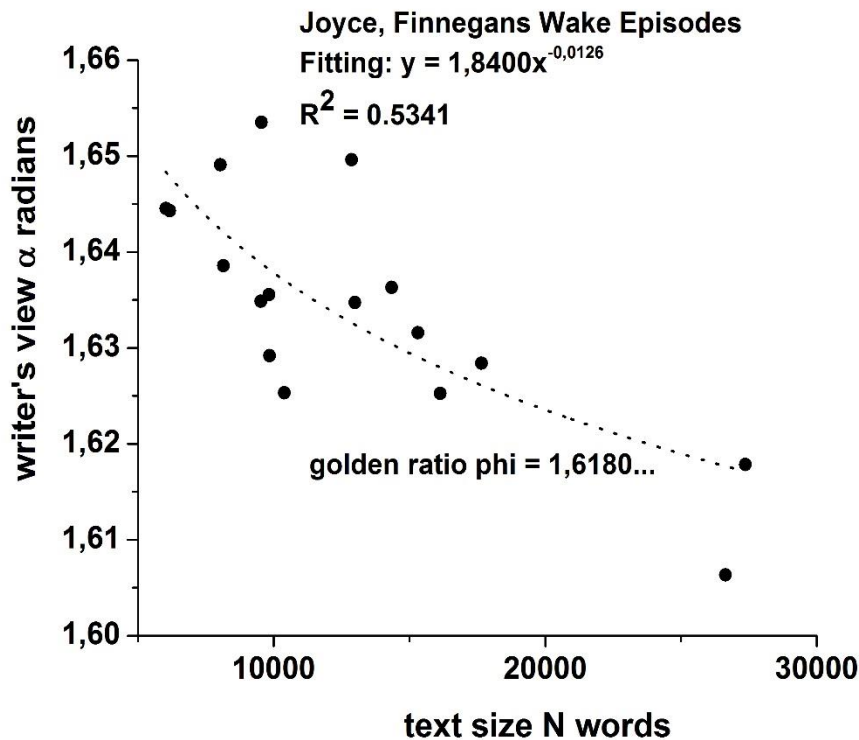


Figure 5. Writer's view for *Finnegans Wake* episodes

It has been shown in 20 languages and 176 texts that with increase of text size  $\alpha$  rad converges to the value  $\phi = 1.6180...$  that is, to the golden section (cf. Popescu, Altmann 2007). In all of the examined texts,  $\alpha$  rad was situated in the neighborhood of this value. One cannot consider it a random event but rather a law concealed in some human senses and thinking.

The power function fitted to the data displays irregular oscillation but the direction is unmistakable. In the longest text (episode 15)  $\alpha$  rad is almost identical with the golden section. Since the golden section exists also in other domains of human activity, it is not a purely linguistic phenomenon. Its origin should be sought somewhere in our evolution or in our physical and mental constitution. Nevertheless, comparisons of texts are possible because the parts of a text display different  $\alpha$  rad, hence a textual whole has a mean and the individual parts have a spread which can be captured e.g. by the variance. The theoretical golden section is a constant having no spread.



When comparing *Finnegans Wake* with other texts, we may consider *Finnegans Wake* as expected values and use them for comparison in an asymptotic normal test. The mean “writer’s view” of *Finnegans Wake* is  $\overline{WW}$  (FW) = 1.6344 and the variance is  $\text{Var}(WW) = 0.00014401$ , hence  $\text{Var}(\overline{WW}) = 0.0001441/17 = 0.000008476$ . Comparing *Finnegans Wake* with *Ulysses*, also by Joyce, we obtained  $\alpha \text{ rad} = 1.5880$ , we obtain  $u = 15.94$  which is, in spite of the small optical difference highly significant. However, *Ulysses* has been evaluated as a whole, not in parts.

### 3.8 Vocabulary richness

When considering vocabulary richness of each individual episode of *Finnegans Wake* using Gini’s coefficient, we obtained the results presented in Table 15.

Table 15  
Vocabulary richness of individual episodes  
of *Finnegans Wake* using Gini’s coefficient

| Text          | N     | V     | G      | $R_4$  | Var(G)   |
|---------------|-------|-------|--------|--------|----------|
| FW Episode 01 | 9850  | 4107  | 0.5643 | 0.4357 | 0.000034 |
| FW Episode 02 | 6025  | 2798  | 0.5153 | 0.4847 | 0.000055 |
| FW Episode 03 | 9830  | 4363  | 0.5383 | 0.4617 | 0.000034 |
| FW Episode 04 | 10389 | 4443  | 0.5546 | 0.4454 | 0.000032 |
| FW Episode 05 | 8150  | 3419  | 0.5575 | 0.4425 | 0.000041 |
| FW Episode 06 | 16137 | 6243  | 0.5940 | 0.4060 | 0.000021 |
| FW Episode 07 | 9524  | 4153  | 0.5453 | 0.4547 | 0.000035 |
| FW Episode 08 | 8044  | 3477  | 0.5522 | 0.4478 | 0.000041 |
| FW Episode 09 | 14348 | 6166  | 0.5544 | 0.4456 | 0.000023 |
| FW Episode 10 | 15309 | 6619  | 0.5504 | 0.4496 | 0.000022 |
| FW Episode 11 | 26642 | 10676 | 0.5850 | 0.4150 | 0.000013 |
| FW Episode 12 | 6176  | 2402  | 0.5841 | 0.4159 | 0.000054 |
| FW Episode 13 | 9551  | 3961  | 0.5653 | 0.4347 | 0.000035 |
| FW Episode 14 | 17658 | 6237  | 0.6240 | 0.3760 | 0.000019 |



|               |       |       |        |        |          |
|---------------|-------|-------|--------|--------|----------|
| FW Episode 15 | 27373 | 10438 | 0.6009 | 0.3991 | 0.000012 |
| FW Episode 16 | 12870 | 5307  | 0.5666 | 0.4334 | 0.000026 |
| FW Episode 17 | 12994 | 5271  | 0.5764 | 0.4236 | 0.000026 |

Though one may see the slow linear decrease of  $R_4$  and the F-test yields a significant result, fitting a straight line to the number in column  $R_4$  yields merely  $R^2 = 0.36$  and ordering according to increasing  $N$  improves slightly the linear tendency.

Popescu et al. (2009) analyzed and evaluated 173 texts in 20 languages using the same method. In other English texts, all Nobel lectures,  $R_4$  was in the interval of 0.2640 and 0.4605. The mean the Nobel lectures was 0.3478. In comparison, the mean of *Finnegans Wake* is 0.4336. The difference seems to be quite great, but we shall not perform any further test here until it can be compared to a wider range of English texts.

Moving on, when we analyse vocabulary richness using formula (25) we achieve the results shown below in Table 16.

Table 16  
Vocabulary richness in individual episodes of *Finnegans Wake*

| Text          | $N$   | $V$  | $h$     | $F([h])$ | $R_1$  | $\text{Var}(R_1)$ |
|---------------|-------|------|---------|----------|--------|-------------------|
| FW Episode 01 | 9850  | 4107 | 32.0000 | 0.3709   | 0.6811 | 2.3689E-05        |
| FW Episode 02 | 6025  | 2798 | 24.0000 | 0.3349   | 0.7129 | 3.6970E-05        |
| FW Episode 03 | 9830  | 4363 | 32.5000 | 0.3517   | 0.7020 | 2.3195E-05        |
| FW Episode 04 | 10389 | 4443 | 31.0000 | 0.3646   | 0.6817 | 2.2299E-05        |
| FW Episode 05 | 8150  | 3419 | 28.6000 | 0.3401   | 0.7101 | 2.7538E-05        |
| FW Episode 06 | 16137 | 6243 | 42.0000 | 0.3956   | 0.6591 | 1.4817E-05        |
| FW Episode 07 | 9524  | 4153 | 29.8571 | 0.3464   | 0.7004 | 2.3772E-05        |
| FW Episode 08 | 8044  | 3477 | 28.5000 | 0.3717   | 0.6788 | 2.9033E-05        |
| FW Episode 09 | 14348 | 6166 | 39.6667 | 0.3671   | 0.6877 | 1.6193E-05        |
| FW Episode 10 | 15309 | 6619 | 42.0000 | 0.3624   | 0.6952 | 1.5093E-05        |
| FW Episode 11 | 25952 | 9986 | 51.0000 | 0.4054   | 0.6447 | 9.2883E-06        |
| FW Episode 12 | 6176  | 2402 | 27.5000 | 0.3873   | 0.6739 | 3.8423E-05        |



|               |       |      |         |        |        |            |
|---------------|-------|------|---------|--------|--------|------------|
| FW Episode 13 | 9551  | 3961 | 33.8000 | 0.3729 | 0.6869 | 2.4484E-05 |
| FW Episode 14 | 17658 | 6237 | 44.2500 | 0.4055 | 0.6499 | 1.3652E-05 |
| FW Episode 15 | 26921 | 9986 | 52.0000 | 0.4004 | 0.6498 | 8.9179E-06 |
| FW Episode 16 | 12870 | 5307 | 39.5000 | 0.3625 | 0.6981 | 1.7956E-05 |
| FW Episode 17 | 12994 | 5271 | 39.0000 | 0.3773 | 0.6812 | 1.8081E-05 |

This method has previously been applied to 176 texts in 20 languages and yielded values for  $R_1$  in the interval of 0.4308 and 0.9369 (cf. Popescu et al. 2009: Table 3.6). If we consider only the texts in English, they were in the interval of 0.6290 and 0.7545 with a mean of 0.6767. All of the episodes of *Finnegans Wake* are within the interval previously found for texts of English, yet have a little bit higher mean of 0.6829. This is to be expected since Joyce created many new words which were used only once, thus leading to a slight increase of the vocabulary richness  $R_1$ . This effect appears much more visible when the vocabulary richness is measured by lambda, as it results from the comparison of Table 2 for *Finnegans Wake* with Tables 5 and 6 for other English texts. Nevertheless, the almost infinite task to analyze all English texts remains an enterprise for the future.

Though the differences between  $R_1$  of individual chapters are optically very small, it can be shown that some neighbouring episodes are significantly different. In Table 17 the  $R_1$  of the neighbouring episodes are compared. The resulting value is the asymptotic  $u$  of the normal distribution.

Table 17  
Normal tests for the differences of  $R_1$  of the neighbouring episodes

| Episodes | $u$  |
|----------|------|
|          |      |
| 1-2      | 4.08 |
| 2-3      | 1.40 |
| 3-4      | 3.01 |
| 4-5      | 4.02 |
| 5-6      | 7.84 |

The "Quark"...



163

|       |         |
|-------|---------|
| 6-7   | 6.65    |
| 7-8   | 2.97    |
| 8-9   | 1.32    |
| 9-10  | 1.34    |
| 10-11 | 10.20   |
| 11-12 | 4.23    |
| 12-13 | 1.64    |
| 13-14 | 5.99    |
| 14-15 | 0.00986 |
| 15-16 | 9.31    |
| 16-17 | 2.81    |

All values greater than 1.96 signal a significant difference. As we saw in section 3.2, there is a significant difference between episodes 1 and 2. However, if one draws a figure of  $R_1$  for the episodes, one can observe a very strong oscillation, hence significant differences are not exceptional in this case.

If we compare all episodes with all other ones, we obtain a matrix displaying the similarities as shown in Table 18.

Table 18  
Similarities of vocabulary richness as expressed by  $R_1$

| Id # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|
| 1    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |
| 2    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |
| 3    |   | X |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |
| 4    | X |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |
| 5    |   | X | X |   |   |   |   |   |   |    |    |    |    |    |    |    |    |
| 6    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |
| 7    |   | X | X |   | X |   |   |   |   |    |    |    |    |    |    |    |    |
| 8    | X |   |   | X |   |   |   |   |   |    |    |    |    |    |    |    |    |
| 9    | X |   |   | X |   |   |   | X |   |    |    |    |    |    |    |    |    |
| 10   |   |   | X |   |   |   | X |   | X |    |    |    |    |    |    |    |    |





164

|    |   |  |   |   |   |   |   |   |   |   |  |   |   |  |   |  |  |
|----|---|--|---|---|---|---|---|---|---|---|--|---|---|--|---|--|--|
| 11 |   |  |   |   |   |   |   |   |   |   |  |   |   |  |   |  |  |
| 12 | X |  |   | X |   |   |   | X | X |   |  |   |   |  |   |  |  |
| 13 | X |  |   | X |   |   | X | X | X | X |  | X |   |  |   |  |  |
| 14 |   |  |   |   |   | X |   |   |   |   |  | X |   |  |   |  |  |
| 15 |   |  |   |   |   | X |   |   |   |   |  | X |   |  | X |  |  |
| 16 |   |  | X |   | X |   | X |   | X | X |  |   | X |  |   |  |  |
| 17 | X |  |   | X |   |   |   | X | X |   |  | X | X |  |   |  |  |

Table 19 expresses this information in a different form, highlighting, for each episode, the number of other episodes it shares similarity with.

Table 19  
Number of similarities found for each episode of *Finnegans Wake*

| Episode                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|
| Number of similarities | 6 | 3 | 5 | 6 | 4 | 2 | 6 | 6 | 8 | 5  | 2  | 6  | 9  | 3  | 3  | 6  | 6  |

As can be seen, there is quite a difference in the number of similarities shown by individual episodes. Episode 13 shares similarities with 9 other episodes, the highest scoring example, and is therefore the episode with the highest centrality in this instance. As can be seen, there is a great difference between the similarity in vocabulary richness computed in this way and using other indicators /cf. section 3.2).

A logical continuation of this study of centrality would be the comparison of concrete entities of Episode 13 with those of other ones. Unfortunately, the number of entities that could be compared is infinite and one would never know whether one found the pertinent ones.

The fact that  $R_1$  and  $R_4$  express the same property can be documented by their power relationship as visualized in Figure 6 below. It is worth noting that the Lorenz-curve is based on cumulative probabilities, too, but computed by an equivalent procedure. One can, of course, propose different other indicators (e.g. omitting synsemantics) but all must at least positively correlate with the above ones.



165

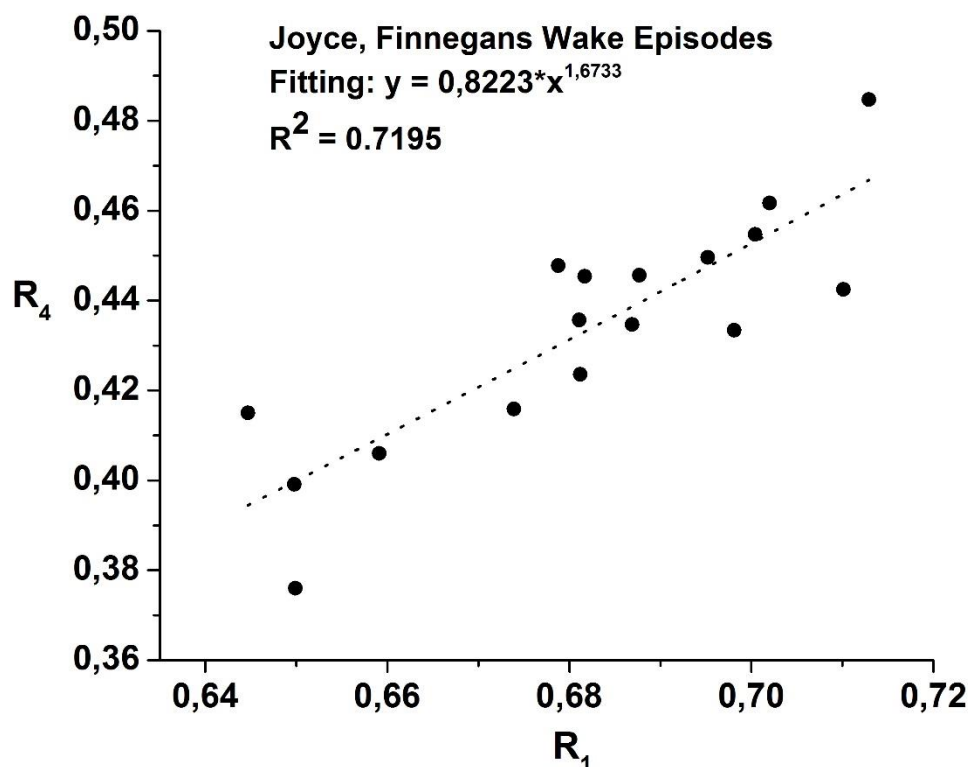


Figure 6. The relationship between  $R_1$  and  $R_4$

If there is at least a positive correlation between two indicators, one of them is sufficient for characterizing the text. But in that case one can show that the indicators merely show various aspects of the text and one can incorporate both in a synergetic control cycle. In special texts like FW, the dependence may be expressed by the difference between the parameters.

In order to obtain a wider perspective, we will also consider the link between  $R_1$  and  $R_4$  based on the data of Popescu et al. (2009), where 176 texts in 20 languages<sup>2</sup> were considered. The results are shown in figure 7.

<sup>2</sup> The 20 languages included were Bulgarian, Czech, English, German, Hungarian, Hawaii, Italian, Indonesian, Kannada, Lakota, Latin, Maori, Marathi, Marquesan, Rarotongan, Romanian, Russian, Samoan, Slovene and Tagalog.

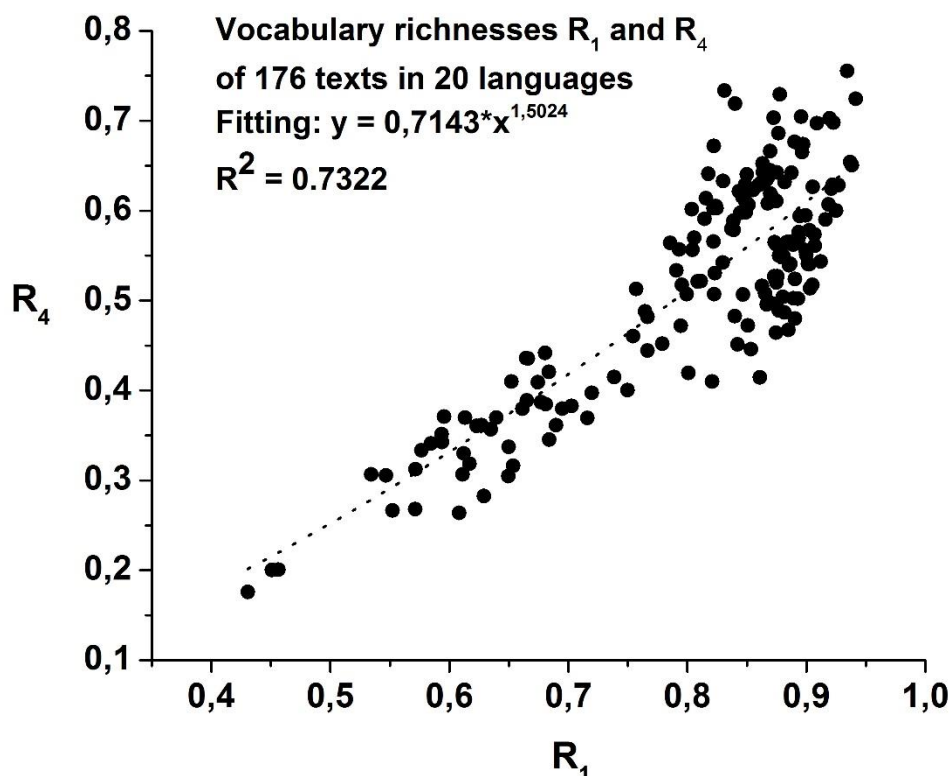


Figure 7. The link between  $R_1$  and  $R_4$  in 176 texts in 20 languages.

Richness cannot come into existence without influencing other properties. Finding those which are related with it may lead to a discovery of a law. To this end, a synthesis of all the computed above indicators of individual episodes of *Finnegans Wake* is presented in Table 20.

Table 20  
Synthesis of all the above indicators  
of individual episodes of *Finnegans Wake*

| Text | $N$ | $V$ | $\Lambda^*$ | $I$ | $S$ | $H$ | $RR$ | $R_1$ | $R_4$ | $\alpha$ rad | $\beta_2$ |
|------|-----|-----|-------------|-----|-----|-----|------|-------|-------|--------------|-----------|
|      |     |     |             |     |     |     |      |       |       |              |           |



|       |       |       |        |         |          |         |        |        |        |        |         |
|-------|-------|-------|--------|---------|----------|---------|--------|--------|--------|--------|---------|
| FW 01 | 9850  | 4107  | 1.9120 | 76.5266 | 101.4493 | 9.7437  | 0.0102 | 0.6811 | 0.4357 | 1.6292 | 10.1558 |
| FW 02 | 6025  | 2798  | 1.9750 | 80.7499 | 105.3374 | 9.5711  | 0.0099 | 0.7129 | 0.4847 | 1.6445 | 10.4348 |
| FW 03 | 9830  | 4363  | 1.9940 | 77.9017 | 103.6918 | 9.9722  | 0.0086 | 0.7020 | 0.4617 | 1.6355 | 10.8153 |
| FW 04 | 10389 | 4443  | 1.9602 | 77.1060 | 102.2289 | 9.8648  | 0.0098 | 0.6817 | 0.4454 | 1.6253 | 10.5162 |
| FW 05 | 8150  | 3419  | 1.8622 | 78.5312 | 99.6933  | 9.7025  | 0.0090 | 0.7101 | 0.4425 | 1.6386 | 8.8602  |
| FW 06 | 16137 | 6243  | 1.8508 | 76.1719 | 101.2280 | 10.0712 | 0.0087 | 0.6591 | 0.4060 | 1.6253 | 10.0606 |
| FW 07 | 9524  | 4153  | 1.9456 | 78.7856 | 102.3927 | 9.9052  | 0.0086 | 0.7004 | 0.4547 | 1.6349 | 9.9503  |
| FW 08 | 8044  | 3477  | 1.8772 | 73.3131 | 99.7993  | 9.5949  | 0.0092 | 0.6788 | 0.4478 | 1.6491 | 10.3326 |
| FW 09 | 14348 | 6166  | 1.9751 | 75.8000 | 101.9106 | 10.2781 | 0.0074 | 0.6877 | 0.4456 | 1.6363 | 10.7408 |
| FW 10 | 15309 | 6619  | 2.0103 | 75.7198 | 102.1209 | 10.3844 | 0.0075 | 0.6952 | 0.4496 | 1.6316 | 11.1783 |
| FW 11 | 26642 | 10676 | 1.9741 | 74.1423 | 102.2692 | 10.5383 | 0.0093 | 0.6447 | 0.4150 | 1.6067 | 12.0233 |
| FW 12 | 6176  | 2402  | 1.7342 | 77.6954 | 101.1219 | 9.0835  | 0.0136 | 0.6739 | 0.4159 | 1.6443 | 9.0646  |
| FW 13 | 9551  | 3961  | 1.8336 | 75.5798 | 100.8178 | 9.7812  | 0.0083 | 0.6869 | 0.4347 | 1.6535 | 9.9281  |
| FW 14 | 17658 | 6237  | 1.7052 | 75.3757 | 98.9796  | 9.9978  | 0.0081 | 0.6499 | 0.3760 | 1.6284 | 9.1608  |
| FW 15 | 27373 | 10438 | 1.8422 | 74.8546 | 101.3749 | 10.5862 | 0.0073 | 0.6498 | 0.3991 | 1.6181 | 10.7731 |
| FW 16 | 12870 | 5307  | 1.8659 | 74.7842 | 99.6493  | 10.1697 | 0.0068 | 0.6981 | 0.4334 | 1.6496 | 9.9030  |
| FW 17 | 12994 | 5271  | 1.8805 | 75.0404 | 98.1860  | 10.0400 | 0.0078 | 0.6812 | 0.4236 | 1.6347 | 9.2405  |

#### 4. Conclusion

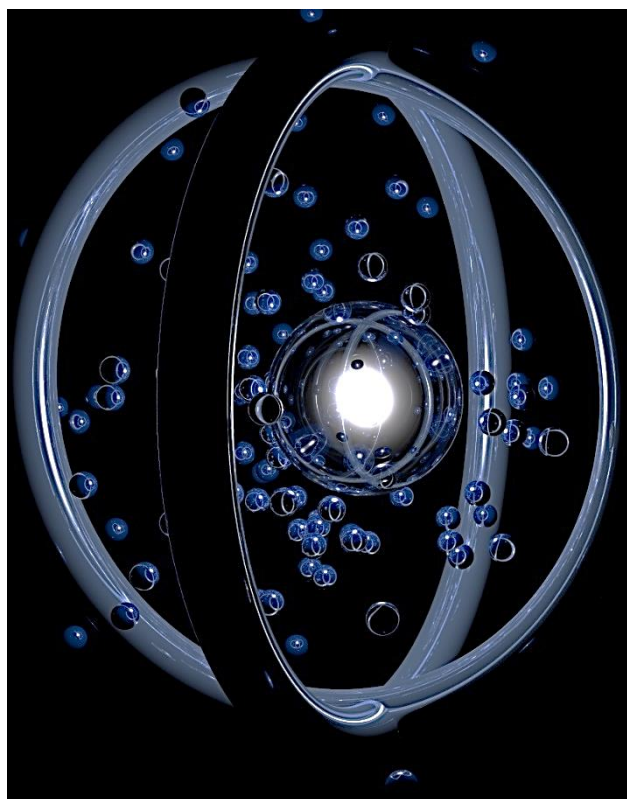
In this study, our main aim was to state whether, in a text of this sort, linguistic laws are strong enough to soften the exuberant self-organization in the vocabulary, to establish whether the usual mathematical models used to analyse texts are still valid. **Our analysis highlights that clearly even extraordinary texts, where the writer tries to deviate from the standard, follow some subconscious laws. We showed that it is possible to trace these laws by computing different indicators** representing the degrees of some properties and searching for their links to other properties. In some cases, for example sections 3.2, 3.3, 3.4, 3.6 and 3.7, standard mathematical models could be used to achieve this. In such instances, it was possible to characterize the text as a whole, compare episodes and perform comparisons between different texts. This provided new insights into the structure and vocabulary of *Finnegans Wake* and





presents opportunities for further analysis to be carried out. In others, the mathematical models needed to be adjusted or did not provide results consistent with any previously found data, limiting further analysis. This point highlights that the interpretation of all of our findings is limited by the amount of comparable data and, as summarised in section 1, few linguists are perusing the study of language laws. **In every language there are some boundaries that cannot be surpassed; *Finnegans Wake* may represent such a boundary**, but this can be stated once we can compare the results with thousands of texts in English and other languages.

[C. George Sandulescu, Monaco; Lidia Vianu, Bucharest; Ioan-Iovitz Popescu, Bucharest; Andrew Wilson, Lancaster; Rosie Knight, Lancaster; Gabriel Altmann, Lüdenscheid: 'Quatifying Joyce's *Finnegans Wake*', *Glottometrics* 30/2015, RAM-Verlag, pp19-44]







**A Manual for the Advanced Study  
of James Joyce's *Finnegans Wake*  
in 121 Volumes**

by C. George Sandulescu and Lidia Vianu

**FW 167.28**

My unchanging Word is sacred. The word is my Wife, to  
exponse and expound, to vend and to velnerate, and may the  
curlews crown our nuptias! Till Breath us depart! Wamen.  
Beware would you change with my years. Be as young as  
your grandmother! The ring man in the rong shop but the  
rite words by the rote order! *Ubi lingua nuncupassit, ibi fas!*  
*Adversus hostem semper sac!*

**FW 219.16**

And wordloosed over seven seas crowdblast in  
celtelleneteutoslavzendlatinsoundscript.

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



170

|                    | Title                                                                                                                                                                                                                                                         |       | Launched<br>on         |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------|
| <b>Vol.<br/>1.</b> | The <b>Romanian</b> Lexicon of <i>Finnegans Wake</i> .<br><br><a href="http://editura.mttlc.ro/sandulescu.lexicon-of-romanian-in-FW.html">http://editura.mttlc.ro/sandulescu.lexicon-of-romanian-in-FW.html</a>                                               | 455pp | 11<br>November<br>2011 |
| <b>Vol.<br/>2.</b> | Helmut Bonheim's <b>German</b> Lexicon of <i>Finnegans Wake</i> .<br><br><a href="http://editura.mttlc.ro/Helmut.Bonheim-Lexicon-of-the-German-in-FW.html">http://editura.mttlc.ro/Helmut.Bonheim-Lexicon-of-the-German-in-FW.html</a>                        | 217pp | 7 December<br>2011     |
| <b>Vol.<br/>3.</b> | A Lexicon of <b>Common Scandinavian</b> in <i>Finnegans Wake</i> .<br><br><a href="http://editura.mttlc.ro/C-G.Sandulescu-A-Lexicon-of-Common-Scandinavian-in-FW.html">http://editura.mttlc.ro/C-G.Sandulescu-A-Lexicon-of-Common-Scandinavian-in-FW.html</a> | 195pp | 13 January<br>2012     |
| <b>Vol.<br/>4.</b> | A Lexicon of <b>Allusions and Motifs</b> in <i>Finnegans Wake</i> .<br><br><a href="http://editura.mttlc.ro/G.Sandulescu-Lexicon-of-Allusions-and-Motifs-in-FW.html">http://editura.mttlc.ro/G.Sandulescu-Lexicon-of-Allusions-and-Motifs-in-FW.html</a>      | 263pp | 11 February<br>2012    |
| <b>Vol.<br/>5.</b> | A Lexicon of ' <b>Small</b> ' Languages in <i>Finnegans Wake</i> .<br><br>Dedicated to Stephen J. Joyce.<br><a href="http://editura.mttlc.ro/sandulescu-small-languages-fw.html">http://editura.mttlc.ro/sandulescu-small-languages-fw.html</a>               | 237pp | 7 March<br>2012        |
| <b>Vol.</b>        | A <b>Total</b> Lexicon of Part Four of <i>Finnegans Wake</i> .                                                                                                                                                                                                | 411pp | 31 March               |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



171

6.

2012

<http://editura.mttlc.ro/sandulescu-total-lexicon-fw.html>

**Vol.**  
7.

**UnEnglish English** in *Finnegans Wake*. The First Hundred Pages. Pages 003 to 103.  
**Dedicated to Clive Hart.**

453pp 27 April  
2012

<http://editura.mttlc.ro/sandulescu-unenglish-fw-volume-one.html>

**Vol.**  
8.

**UnEnglish English** in *Finnegans Wake*. The Second Hundred Pages. Pages 104 to 216.

280pp 14 May 2012

<http://editura.mttlc.ro/sandulescu-unenglish-fw-volume-two.html>

**Vol.**  
9.

**UnEnglish English** in *Finnegans Wake*. Part Two of the Book. Pages 219 to 399.

516pp 7 June 2012

<http://editura.mttlc.ro/sandulescu-unenglish-fw-volume-three.html>

**Vol.**  
10.

**UnEnglish English** in *Finnegans Wake*. The Last Two Hundred Pages. Parts Three and Four of *Finnegans Wake*. From FW page 403 to FW page 628.

563pp 7 July 2012

<http://editura.mttlc.ro/sandulescu-unenglish-fw-volume-four.html>

**Vol.**  
11.

**Literary Allusions** in *Finnegans Wake*.

327pp 23 July 2012

**Dedicated to the Memory of Anthony Burgess.**

<http://editura.mttlc.ro/sandulescu-literary-allusions.html>

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



172

- |                     |                                                                                                                                                                                                                                                     |       |                        |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------|
| <b>Vol.<br/>12.</b> | <i>Finnegans Wake</i> <b>Motifs</b> I. The First 186 Motifs from Letter A to Letter F.<br><a href="http://editura.mttlc.ro/sandulescu-finnegans-wake-motifs.html">http://editura.mttlc.ro/sandulescu-finnegans-wake-motifs.html</a>                 | 348pp | 7 September<br>2012    |
| <b>Vol.<br/>13.</b> | <i>Finnegans Wake</i> <b>Motifs</b> II. The Middle 286 Motifs from Letter F to Letter P.<br><a href="http://editura.mttlc.ro/sandulescu-finnegans-wake-motifs.html">http://editura.mttlc.ro/sandulescu-finnegans-wake-motifs.html</a>               | 458pp | 7 September<br>2012    |
| <b>Vol.<br/>14.</b> | <i>Finnegans Wake</i> <b>Motifs</b> III. The Last 151 Motifs. from Letter Q to the end.<br><a href="http://editura.mttlc.ro/sandulescu-finnegans-wake-motifs.html">http://editura.mttlc.ro/sandulescu-finnegans-wake-motifs.html</a>                | 310pp | 7 September<br>2012    |
| <b>Vol.<br/>15.</b> | <i>Finnegans Wake</i> without Tears. <b>The Honuphrius</b> & A Few other Interludes, paraphrased for the UnEducated.<br><a href="http://editura.mttlc.ro/sandulescu-the-honuphrius.html">http://editura.mttlc.ro/sandulescu-the-honuphrius.html</a> | 248pp | 7 November<br>2012     |
| <b>Vol.<br/>16.</b> | <i>Joyce's Dublin English in the Wake.</i><br><a href="http://editura.mttlc.ro/sandulescu-dublin-english-in-the-wake.html">http://editura.mttlc.ro/sandulescu-dublin-english-in-the-wake.html</a>                                                   | 255pp | 29<br>November<br>2012 |
| <b>Vol.<br/>17.</b> | <i>Adaline Glasheen's Third Census</i> Linearized: A Grid. FW Part One A.<br><a href="http://editura.mttlc.ro/sandulescu-third-">http://editura.mttlc.ro/sandulescu-third-</a>                                                                      | 269pp | 15 April<br>2013       |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



173

[census.html](http://editura.mttlc.ro/sandulescu-third-census.html)

- Vol. 18.** Adaline Glasheen's **Third Census** Linearized: A Grid. 241pp 15 April 2013  
FW Part One B.  
<http://editura.mttlc.ro/sandulescu-third-census.html>
- Vol. 19.** Adaline Glasheen's **Third Census** Linearized: A Grid. 466pp 15 April 2013  
FW Part Two.  
<http://editura.mttlc.ro/sandulescu-third-census.html>
- Vol. 20.** Adaline Glasheen's **Third Census** Linearized: A Grid. 522pp 15 April 2013  
FW Parts Three and Four.  
<http://editura.mttlc.ro/sandulescu-third-census.html>
- Vol. 21.** **Musical Allusions** in *Finnegans Wake*. FW Part One. 333pp 10 May 2013  
All Exemplified.  
<http://editura.mttlc.ro/sandulescu-musical-allusions.html>
- Vol. 22.** **Musical Allusions** in *Finnegans Wake*. FW Part Two. 295pp 10 May 2013  
All Exemplified.  
<http://editura.mttlc.ro/sandulescu-musical-allusions.html>
- Vol. 23.** **Musical Allusions** in *Finnegans Wake*. FW Parts 305pp 10 May 2013  
Three and Four. All Exemplified.  
<http://editura.mttlc.ro/sandulescu-musical-allusions.html>



Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



174

- Vol. 24.** **Geographical Allusions** in Context. Louis Mink's *Gazetteer of Finnegans Wake* in Grid Format only. FW Episodes One to Four. 281pp 7 June 2013  
<http://editura.mttlc.ro/sandulescu-geographical-allusions.html>
- Vol. 25.** **Geographical Allusions** in Context. Louis Mink's *Gazetteer of Finnegans Wake* in Grid Format only. FW Episodes Five to Eight. 340pp 7 June 2013  
<http://editura.mttlc.ro/sandulescu-geographical-allusions.html>
- Vol. 26.** **Geographical Allusions** in Context. Louis Mink's *Gazetteer of Finnegans Wake* in Grid Format only. FW Episodes Nine to Eleven. 438pp 7 June 2013  
<http://editura.mttlc.ro/sandulescu-geographical-allusions.html>
- Vol. 27.** **Geographical Allusions** in Context. Louis Mink's *Gazetteer of Finnegans Wake* in Grid Format only. FW Episodes Twelve to Fourteen. 238pp 7 June 2013  
<http://editura.mttlc.ro/sandulescu-geographical-allusions.html>
- Vol. 28.** **Geographical Allusions** in Context. Louis Mink's *Gazetteer of Finnegans Wake* in Grid Format only. FW Episode Fifteen. 235pp 7 June 2013  
<http://editura.mttlc.ro/sandulescu-geographical-allusions.html>

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



175

- Vol. 29. Geographical Allusions** in Context. Louis Mink's *Gazetteer of Finnegans Wake* in Grid Format only. FW Episodes Sixteen and Seventeen. 216pp 7 June 2013  
<http://editura.mttlc.ro/sandulescu-geographical-allusions.html>
- Vol. 30. German** in *Finnegans Wake* Contextualized. FW Episodes One to Four. 314pp 18 June 2013  
<http://editura.mttlc.ro/sandulescu-german-contextualized.html>
- Vol. 31. German** in *Finnegans Wake* Contextualized. FW Episodes Five to Eight. 339pp 18 June 2013  
<http://editura.mttlc.ro/sandulescu-german-contextualized.html>
- Vol. 32. German** in *Finnegans Wake* Contextualized. FW Episodes Nine to Eleven. 413pp 18 June 2013  
<http://editura.mttlc.ro/sandulescu-german-contextualized.html>
- Vol. 33. German** in *Finnegans Wake* Contextualized. FW Episodes Twelve to Fourteen. 228pp 18 June 2013  
<http://editura.mttlc.ro/sandulescu-german-contextualized.html>
- Vol. 34. German** in *Finnegans Wake* Contextualized. FW Episodes Fifteen. 222pp 18 June 2013  
<http://editura.mttlc.ro/sandulescu-german-contextualized.html>

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



176

- Vol. 35.** **German** in *Finnegans Wake* Contextualized. FW Episodes Sixteen and Seventeen. 199pp 18 June 2013  
<http://editura.mttlc.ro/sandulescu-german-contextualized.html>
- Vol. 36.** A Lexicon of **Selective Segmentation** of *Finnegans Wake* (The 'Syllabifications'). FW Episode One. 205 pp 9 September 2013  
<http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html>
- Vol. 37.** A Lexicon of **Selective Segmentation** of *Finnegans Wake* (The 'Syllabifications'). FW Episode Two. 127 pp 9 September 2013  
<http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html>
- Vol. 38.** A Lexicon of **Selective Segmentation** of *Finnegans Wake* (The 'Syllabifications'). FW Episode Three. 193 pp 9 September 2013  
<http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html>
- Vol. 39.** A Lexicon of **Selective Segmentation** of *Finnegans Wake* (The 'Syllabifications'). FW Episode Four. 208pp 9 September 2013  
<http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html>
- Vol. 40.** A Lexicon of **Selective Segmentation** of *Finnegans Wake* (The 'Syllabifications'). FW Episode Five. 136pp 9 September 2013  
<http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html>

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



177

[fw.html](#)

- |                     |                                                                                                                                     |       |                        |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------|
| <b>Vol.<br/>41.</b> | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Six.                       | 266pp | 9<br>September<br>2013 |
|                     | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |       |                        |
| <b>Vol.<br/>42.</b> | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Seven.                     | 173pp | 9<br>September<br>2013 |
|                     | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |       |                        |
| <b>Vol.<br/>43.</b> | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Eight.                     | 146pp | 9<br>September<br>2013 |
|                     | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |       |                        |
| <b>Vol.<br/>44.</b> | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Nine.                      | 280pp | 9<br>September<br>2013 |
|                     | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |       |                        |
| <b>Vol.<br/>45.</b> | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Ten.                       | 290pp | 9<br>September<br>2013 |
|                     | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |       |                        |
| <b>Vol.</b>         | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans</i>                                                                      | 271pp | 9                      |



|          |                                                                                                                                     |        |   |                |
|----------|-------------------------------------------------------------------------------------------------------------------------------------|--------|---|----------------|
| 46.      | Wake (The 'Syllabifications'). FW Episode Eleven. Part One.                                                                         |        |   | September 2013 |
|          | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |        |   |                |
| Vol. 47. | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Eleven. Part Two.          | 266pp  | 9 | September 2013 |
|          | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |        |   |                |
| Vol. 48. | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Twelve.                    | 116pp  | 9 | September 2013 |
|          | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |        |   |                |
| Vol. 49. | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Thirteen.                  | 169 pp | 9 | September 2013 |
|          | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |        |   |                |
| Vol. 50. | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Fourteen.                  | 285pp  | 9 | September 2013 |
|          | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |        |   |                |
| Vol. 51. | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Fifteen. Part One.         | 260pp  | 9 | September 2013 |
|          | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a> |        |   |                |



Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



179

[fw.html](#)

- |                     |                                                                                                                                                                  |       |                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------|
| <b>Vol.<br/>52.</b> | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Fifteen. Part Two.                                      | 268pp | 9<br>September<br>2013 |
|                     | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a>                              |       |                        |
|                     |                                                                                                                                                                  |       |                        |
| <b>Vol.<br/>53.</b> | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Sixteen.                                                | 247pp | 9<br>September<br>2013 |
|                     | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a>                              |       |                        |
|                     |                                                                                                                                                                  |       |                        |
| <b>Vol.<br/>54.</b> | A Lexicon of <b>Selective Segmentation</b> of <i>Finnegans Wake</i> (The 'Syllabifications'). FW Episode Seventeen.                                              | 241pp | 9<br>September<br>2013 |
|                     | <a href="http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html">http://editura.mttlc.ro/sandulescu-segmentation-of-fw.html</a>                              |       |                        |
|                     |                                                                                                                                                                  |       |                        |
| <b>Vol.<br/>55.</b> | <b>Theoretical Backup</b> One for the Lexicon of <i>Finnegans Wake</i> . Charles K. Ogden: <i>The Meaning of Meaning</i> .<br><b>Dedicated to Carla Marengo.</b> | 331pp | Noël 2013              |
|                     | <a href="http://editura.mttlc.ro/FW-lexicography-theoretical-backup.html">http://editura.mttlc.ro/FW-lexicography-theoretical-backup.html</a>                    |       |                        |
|                     |                                                                                                                                                                  |       |                        |
| <b>Vol.<br/>56.</b> | <b>Theoretical Backup</b> Two for the Lexicon of <i>Finnegans Wake</i> . Charles K. Ogden: <i>Opposition</i> .<br><b>Dedicated to Carla Marengo.</b>             | 93pp  | Noël 2013              |
|                     | <a href="http://editura.mttlc.ro/FW-lexicography-theoretical-backup.html">http://editura.mttlc.ro/FW-lexicography-theoretical-backup.html</a>                    |       |                        |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



180

- Vol. 57. Theoretical Backup** Three for the Lexicon of *Finnegans Wake*. Charles K. Ogden: *Basic English*.  
**Dedicated to Carla Marengo.**  
<http://editura.mttlc.ro/FW-lexicography-theoretical-backup.html> 42pp Noël 2013
- Vol. 58. A Lexicon of *Finnegans Wake*: Boldereff's Glosses Linearized.** FW Episode One.  
<http://editura.mttlc.ro/boldereff-linearized.html> 235pp 7 January 2014
- Vol. 59. A Lexicon of *Finnegans Wake*: Boldereff's Glosses Linearized.** FW Episode Two.  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html> 149pp 7 January 2014
- Vol. 60. A Lexicon of *Finnegans Wake*: Boldereff's Glosses Linearized.** FW Episode Three.  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html> 190pp 7 January 2014
- Vol. 61. A Lexicon of *Finnegans Wake*: Boldereff's Glosses Linearized.** FW Episode Four.  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html> 191pp 7 January 2014
- Vol. 62. A Lexicon of *Finnegans Wake*: Boldereff's Glosses Linearized.** FW Episode Five.  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html> 164pp 7 January 2014
- Vol. A Lexicon of *Finnegans Wake*: Boldereff's Glosses** 310p 7 January

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



181

- 63. Linearized.** FW Episode Six. 2014  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>
- Vol. 64. Linearized.** FW Episode Seven. 136pp 7 January 2014  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>
- Vol. 65. Linearized.** FW Episode Eight. 157pp 7 January 2014  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>
- Vol. 66. Linearized.** FW Episode Nine. 234pp 7 January 2014  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>
- Vol. 67. Linearized.** FW Episode Ten. 361pp 7 January 2014  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>
- Vol. 68. Linearized.** FW Episode Eleven, Part One. 337pp 7 January 2014  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>
- Vol. 69. Linearized.** FW Episode Eleven, Part Two. 266pp 7 January 2014

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



182

<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>

**Vol. 70.** A Lexicon of *Finnegans Wake*: **Boldereff's Glosses** 167pp 7 January 2014  
Linearized. FW Episode Twelve.

<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>

**Vol. 71.** A Lexicon of *Finnegans Wake*: **Boldereff's Glosses** 148pp 7 January 2014  
Linearized. FW Episode Thirteen.

<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>

**Vol. 72.** A Lexicon of *Finnegans Wake*: **Boldereff's Glosses** 174pp 7 January 2014  
Linearized. FW Episode Fourteen.

<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>

**Vol. 73.** A Lexicon of *Finnegans Wake*: **Boldereff's Glosses** 187pp 7 January 2014  
Linearized. FW Episode Fifteen Part One.

<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>

**Vol. 74.** A Lexicon of *Finnegans Wake*: **Boldereff's Glosses** 229pp 7 January 2014  
Linearized. FW Episode Fifteen Part Two.

<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>

**Vol. 75.** A Lexicon of *Finnegans Wake*: **Boldereff's Glosses** 191pp 7 January 2014  
Linearized. FW Episode Sixteen.

<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



183

[linearized.html](#)

- Vol. 76.** A Lexicon of *Finnegans Wake*: **Boldereff's Glosses** 215pp 7 January 2014  
Linearized. FW Episode Seventeen.  
<http://editura.mttlc.ro/FW-lexicography-boldereff-linearized.html>
- Vol. 77.** **Stories** from *Finnegans Wake*. Frances Boldereff: 171pp 17 January 2014  
Sireland calls you, James Joyce!  
<http://editura.mttlc.ro/FW-lexicography-boldereff-stories.html>
- Vol. 78.** Theoretical Backup Four for the Lexicon of *Finnegans Wake*. Volume 78. **Tatsuo Hamada**: *How to Read FW? Why to Read FW? What to Read in FW?* 271pp 23 January 2014  
<http://editura.mttlc.ro/FW-lexicography-hamada.html>
- Vol. 79.** Clive Hart's **Segmentation** as Exemplified by 246pp 11 February 2014  
**Romanian**. FW Episode One.  
<http://editura.mttlc.ro/FW-segmentation-romanian.html>
- Vol. 80.** Clive Hart's **Segmentation** as Exemplified by 141pp 11 February 2014  
**Romanian**. FW Episode Two.  
<http://editura.mttlc.ro/FW-segmentation-romanian.html>
- Vol. 81.** Clive Hart's **Segmentation** as Exemplified by 238pp 11 February 2014  
**Romanian**. FW Episode Three.  
<http://editura.mttlc.ro/FW-segmentation-romanian.html>



Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



184

[romanian.html](http://editura.mttlc.ro/FW-segmentation-romanian.html)

- Vol. 82.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Four. 246pp 11 February 2014  
<http://editura.mttlc.ro/FW-segmentation-romanian.html>
- Vol. 83.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Five. 168pp 11 February 2014  
<http://editura.mttlc.ro/FW-segmentation-romanian.html>
- Vol. 84.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Six. 325pp 11 February 2014  
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- Vol. 85.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Seven. 216pp 11 February 2014  
<http://editura.mttlc.ro/FW-segmentation-romanian.html>
- Vol. 86.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Eight. 164pp 11 February 2014  
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- Vol. 87.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Nine. 349pp 11 February 2014  
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Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



185

- Vol. 88.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Ten.  
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- Vol. 89.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Eleven Part One.  
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- Vol. 90.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Eleven Part Two.  
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- Vol. 91.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Twelve.  
<http://editura.mttlc.ro/FW-segmentation-romanian.html> 145pp 11 February 2014
- Vol. 92.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Thirteen.  
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- Vol. 93.** Clive Hart's **Segmentation** as Exemplified by **Romanian**. FW Episode Fourteen.  
<http://editura.mttlc.ro/FW-segmentation-romanian.html> 350pp 11 February 2014

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



186

- |                                    |                                                                                                                                                                                                                                           |                                   |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| <p><b>Vol.</b><br/><b>94.</b></p>  | <p>Clive Hart's <b>Segmentation</b> as Exemplified by<br/><b>Romanian</b>. FW Episode Fifteen Part One.<br/><a href="http://editura.mttlc.ro/FW-segmentation-romanian.html">http://editura.mttlc.ro/FW-segmentation-romanian.html</a></p> | <p>335pp 11 February<br/>2014</p> |
| <p><b>Vol.</b><br/><b>95.</b></p>  | <p>Clive Hart's <b>Segmentation</b> as Exemplified by<br/><b>Romanian</b>. FW Episode Fifteen Part Two.<br/><a href="http://editura.mttlc.ro/FW-segmentation-romanian.html">http://editura.mttlc.ro/FW-segmentation-romanian.html</a></p> | <p>339pp 11 February<br/>2014</p> |
| <p><b>Vol.</b><br/><b>96.</b></p>  | <p>Clive Hart's <b>Segmentation</b> as Exemplified by<br/><b>Romanian</b>. FW Episode Sixteen.<br/><a href="http://editura.mttlc.ro/FW-segmentation-romanian.html">http://editura.mttlc.ro/FW-segmentation-romanian.html</a></p>          | <p>316pp 11 February<br/>2014</p> |
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| <p><b>Vol.</b><br/><b>98.</b></p>  | <p>Alexandru Rosetti <i>echt rumänisch</i> Corpus<br/><a href="http://editura.mttlc.ro/FW-rosetti-corpus.html">http://editura.mttlc.ro/FW-rosetti-corpus.html</a></p>                                                                     | <p>227pp 11 February<br/>2014</p> |
| <p><b>Vol.</b><br/><b>99.</b></p>  | <p>Clive Hart <b>Segmentation Corpus</b> One (From A to M)<br/><a href="http://editura.mttlc.ro/FW-hart-segmentation-corpus.html">http://editura.mttlc.ro/FW-hart-segmentation-corpus.html</a></p>                                        | <p>322pp 11 February<br/>2014</p> |
| <p><b>Vol.</b><br/><b>100.</b></p> | <p>Clive Hart <b>Segmentation Corpus</b> Two (From N to Z)</p>                                                                                                                                                                            | <p>253pp 11 February<br/>2014</p> |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



187

<http://editura.mttlc.ro/FW-hart-segmentation-corpus.html>

- |                            |                                                                                                                         |       |                |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------|-------|----------------|
| <b>Vol.</b><br><b>101.</b> | Text Exegesis. Excerpts from <i>Assessing the 1984 Ulysses</i> (1986), edited by C. G. Sandulescu and C. Hart.          | 44pp  | 24 March 2014  |
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|                            | <a href="http://editura.mttlc.ro/FW-long-words.html">http://editura.mttlc.ro/FW-long-words.html</a>                     |       |                |
| <b>Vol.</b><br><b>105.</b> | <b>Long Words</b> in <i>Finnegans Wake</i> . From Episode Nine to Episode Fourteen.                                     | 218pp | 7 August 2014  |
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| <b>Vol.</b><br><b>106.</b> | <b>Long Words</b> in <i>Finnegans Wake</i> . From Episode Fifteen to Episode Seventeen.                                 | 156pp | 7 August 2014  |
|                            | <a href="http://editura.mttlc.ro/FW-long-words.html">http://editura.mttlc.ro/FW-long-words.html</a>                     |       |                |
| <b>Vol.</b><br><b>107.</b> | <b>Joyce's 'Words'</b> in <i>Finnegans Wake</i> . Letters A to C.                                                       | 239pp | 23 August 2014 |

Lidia Vianu  
Joyce Lexicography Volume 121  
**The "Quark"...**



188

<http://editura.mttlc.ro/FW-joyce-words.html>

- |                      |                                                                                                       |       |                         |
|----------------------|-------------------------------------------------------------------------------------------------------|-------|-------------------------|
| <b>Vol.<br/>108.</b> | <b>Joyce's 'Words'</b> in <i>Finnegans Wake</i> . Letters D to G.                                     | 203pp | 23 August<br>2014       |
|                      | <a href="http://editura.mttlc.ro/FW-joyce-words.html">http://editura.mttlc.ro/FW-joyce-words.html</a> |       |                         |
| <b>Vol.<br/>109.</b> | <b>Joyce's 'Words'</b> in <i>Finnegans Wake</i> . Letters H to M.                                     | 255pp | 23 August<br>2014       |
|                      | <a href="http://editura.mttlc.ro/FW-joyce-words.html">http://editura.mttlc.ro/FW-joyce-words.html</a> |       |                         |
| <b>Vol.<br/>110.</b> | <b>Joyce's 'Words'</b> in <i>Finnegans Wake</i> . Letters N to R.                                     | 208pp | 23 August<br>2014       |
|                      | <a href="http://editura.mttlc.ro/FW-joyce-words.html">http://editura.mttlc.ro/FW-joyce-words.html</a> |       |                         |
| <b>Vol.<br/>111.</b> | <b>Joyce's 'Words'</b> in <i>Finnegans Wake</i> . Letters S and T.                                    | 200pp | 23 August<br>2014       |
|                      | <a href="http://editura.mttlc.ro/FW-joyce-words.html">http://editura.mttlc.ro/FW-joyce-words.html</a> |       |                         |
| <b>Vol.<br/>112.</b> | <b>Joyce's 'Words'</b> in <i>Finnegans Wake</i> . Letters U to Z.                                     | 123pp | 23 August<br>2014       |
|                      | <a href="http://editura.mttlc.ro/FW-joyce-words.html">http://editura.mttlc.ro/FW-joyce-words.html</a> |       |                         |
| <b>Vol.<br/>113.</b> | <i>Finnegans Wake</i> Seen from the Angle of <b>Mathematics</b>                                       | 58pp  | 18 February<br>2015     |
|                      | <a href="http://editura.mttlc.ro/FW-mathematics.html">http://editura.mttlc.ro/FW-mathematics.html</a> |       |                         |
| <b>Vol.<br/>114.</b> | Dan Alexe: 'Romi', români și ceilalți în <i>Finnegans Wake</i> !                                      | 44pp  | 15<br>September<br>2014 |
|                      | <a href="http://editura.mttlc.ro/FW-dan-alexe.html">http://editura.mttlc.ro/FW-dan-alexe.html</a>     |       |                         |





189

- Vol. 115.** The Table of Contents of A Wake Newslitter, published by Clive Hart and Fritz Senn between March 1960 and December 1980  
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<http://editura.mttlc.ro/grownup-books-for-children.html> 149pp 1 June 2015
- Vol.** **The 'Quark'...** 184pp 11 June 2015

**The "Quark"...**



190

**121**

<http://editura.mttlc.ro/the-quark.html>

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**The "Quark"...**



191



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