PO(I)ETICS OF UNIVERSAL POETIC STRUCTURES

1. INTRODUCTION

When the greatest poet of South Slavic region, Petar II Petrovic sent the first of his three works (the famous triptych: The Ray of Microcosm, The Mountain Wreath, The False Tsar Steven the Small) to Belgrade to his former teacher Simo Milutinovic Sarajlija, to have it printed, he also attached a letter containing the program statement: "And I, as the intellectual substance of the Creator, must needs follow the general accord [1]." Njegosh therefore attempted, through a hidden code, to create poetic structures built on the same principles on which the entire Universe was built. Hence there comes the title of this article, in which we will show that Njegosh, in his attempt, only joined the poets of classic literature - Homer, Dante, Shakespeare and Goethe, who had incorporated the same idea into their works.

Njegosh's creation plan was not an ordinary plan, in terms of affiliation to this or that aesthetic category, this or different structures and compositions, which had been more or less already known, but it was also, at the same time, a plan of the Universe, *the general accord,* the implementation plan, a plan of harmonious relation between the whole and its parts; such relation which implies that those parts of the whole must be in the best possible - symmetry, proportion and harmony, the basis of which is the *golden mean*. And the unity of harmony, symmetry and proportion is also the basic plan, which must inevitably be the plan of creating any natural system, and accordingly the whole World, that is to say the Universe.

In my previous works I presented that Njegosh was not only aware of the plan, but following it through his own work, in form of two triptychs [2], he built a Poetic Universe, strictly correspondent to and in accordance with the Universe – World, where all living and nonliving things exist, and where we all exist. The manner in which Njegosh, through his two triptychs, together with several separate works, made *the general accord* I have presented in a two volume book [3] and here I will show the relations of Njegosh's accordance with, almost exactly the same accordance, inherently and consistently implemented in Homer's and Dante's works.

2. THE CONCEPT OF THE CODE AND THE UNIVERSAL CODE

In contemporary information science, cybernetics and system theory, under the term of coding we understand the process of linking the alphabet 1 – with the alphabet 2, where the rule -to move from one alphabet - 1 character to the cor-

responding alphabet – 2 character - is given as a list of connections, that is to say, a code. On the other hand, in semiotics (semiology) the very characters are the code, the characters which always represent a certain relation between the signifier and the signified, or language itself is the code meaning that every natural language is a kind of a special code.

Starting from the above presented definitions, it is not difficult to go a step further in generalizing and to define the code as correspondence, according to a certain rule and / or law, of any of the two subsystems (parts) within one natural system (the whole). If, thus, we take into account the systems whose organization of parts within the whole is such that they are in the best possible harmony [4], and, that at the same time there is a correspondence of the system structure with the sequence of natural numbers structure, then it makes sense to say that it is a universal code.

However, one has to bear in mind that under the term of "natural" system one must understand not only any real (by definition given) natural system, as the system of chemical elements, Bioelements system, the system of constituents of the genetic code, etc., but also the man-made "experiential" systems, as in the examples of the classic literary masterpieces (Homer, Dante, Shakespeare, Goethe, Pushkin, Njegosh, Tolstoy), of Athens' palaces and Egyptian pyramids built in the relation to the golden mean, and the like.

If, considering everything mentioned above, one also understands that in the definition of the universal code, the term 'numbers' must also mean 'numbers-relations', relations which are spatially logical [5], i.e. Boolean, generated from a universal cube, [Boolean space B^n (n = 0, 1, 2, 3 ...)], it becomes clear that the universal code must manifest itself in the form of spatially logical 'characters ': logical segment line, logical square, cube, hypercube, etc..

Ideal examples (aspects, that is, forms) of the universal code, according to the given definition, are the genetic code and Mendeleev's System of chemical elements (the chemical code). Here we deliberately refer to the System as "Mendeleev's" and not as any other (modern) system, because of the fact that only in the original Mendeleev's manuscript we can find confirmation of the above said. No one, neither before nor after Mendeleev, realized that this was the best possible harmony. No one, if not aware of the relation, between the system of chemical elements and the system of constituents of the genetic code. When, however, we are aware of this relation, then it is evident that even the ancient Chinese were aware of it five thousand years ago. Their system of 64 hexagrams, presented in the "Book of Changes - I Ching" is a hundred percent accurate 6-bit record of 64 codons within the genetic code [6]. If, on the other hand, one analyzes the binary-code tree of the genetic code [7], also present in I Ching, and reads it as a trinity-quaternity system or as the union of the cube and the hypercube, then it is evident that this is the same hypercube found in a three-dimensional system of chemical elements, drawn by Mendeleev himself [8]. And that is practically, the same hypercube found in Darwin's diagram, the only illustration given in his famous book *The Origin of Species,* and also the same hypercube that was so ingeniously grasped by the Moldavian monk, one of the greatest devotees - devotees of science - Gregor Johann Mendel by the formula $1^n 2^n 3^n 4^n$ (numbers 1, 2, 3 and 4 with an exponent *n,* (where *n* is the number of characteristics at the intersection, with the values *n* = 1, 2.3, ...) which reveals an unbreakable bond and unity: one

refers to the parenting pair, and two, three and four refer to a phenotype, genotype and type of an individual, respectively.

3. HOMER'S AND NJEGOSH'S CHOICE

Without the binary sequence 2^n (2 exp n), (n = 0, 1 2, 3 ...) the ancient Egyptians did not use the multiplication table either (according to the evidence found in Rhind papyrus and in Moscow mathematical papyrus); but they, in fact, reduced all the multiplication to repeated addition. Thus, whenever they multiplied two numbers, they asked which number, from the sequence of numbers 1, 2, 4, 8, and so on, should be added in order to obtain the required result. To understand the meaning of this kind of arithmetic it is important to find the key determinant of the multiplication table in terms of logic of the best possible harmony. If we know the fact that in the decimal numeral system, numerical basis is q = 10, then it is easy to realize that the key determinant has to appear in the process of multiplication by a half, i.e. by number 5, in the octal numeral system, where q = 8, it is multiplication by number 4, in the hexadecimal system where q = 16, it is the multiplication by number 8, etc.; in all cases, that key determinant is found in multiplication by number 3.

Let us reveal why this is so, in the example of the decimal numeral system. If we multiply number 5 by 1 and 2, the border of the numeral system basis where q = 10 is still not crossed. Only when multiplied by 3, the first case of "crossing the border" appears. Therefore, the key determinant of the multiplication table in the decimal numeral system is "Three times five equals fifteen"; in octal numeral system it is "three times four equals twelve," and in the hexadecimal numeral system it is "three times eight equals twenty-four" etc.

Bearing in mind the above mentioned facts, we could make an interesting task involving both the Egyptian sequence of numbers 1-2-4-8-16 - etc. and the key determinant of the multiplication table, for example, in the decimal numeral system, if it is reasonable to isolate the decimal numeral system as specific and (possibly) more powerful than any other system of numbers in "matters" of the Nature. Here is the task. We need to take 3 groups of 5 numbers from the Egyptian sequence 1-2-4-8-16-32 - ... etc.., but in such a way that these numbers are in the best possible symmetric-proportional-harmonious relation.

Here is the key to a solution to this problem: [11011] - [00100] - [11011]. The key is given as a palindrome, which means that it reads the same from both left and right. The solution is the following: [1 - 2 - (4) - 8 - 16] - [(32-64) - 128 - (256-512)] - [1024-2048 - (4096) - 8192-16384]. If we add up all the underlined numbers (out of round brackets), we get the number 27803, which is exactly the sum of the number of verses in Homer's Iliad and Odyssey. [If this number (27803) is translated into the binary numeral system (q = 2) from the decimal numeral system (q = 10), the result is exactly the number we have already observed in the form of the code key: 11,011,001,001,1011. In the octal numeral system (q = 8) number symmetry is obvious: 66,233] However, if we add up all other numbers (within round brackets), we get a total "space" of Njegosh's Mountain Wreath (total space: the number of verses, the number of persons, the number of pages, etc., as we have shown in our previous works) (cf. Box 1) [9]. Njegosh chose exactly what Homer did not choose. If you add Homer's (27803) to Njegosh's number (4964),

the number 32767 appears as the result, and in the octal numeral system (q = 8) that number is 77777.

Box 1. *The Homer's and Njegosh's (Boolean) space sequence*, $N=2^n$

(a) The binary sequence whose sum is 2^{15}-1=32767 (2 exp 15); (b) Homer's choice: $27803_{10} = 66233_8 = 110110010011011_2$ (the number of verses for the Iliad plus the Odyssey); (c) Njegosh's choice: $4964_{10} = 11544_8 = 001001101100100_2$ (The Mountain Wreath: printed version 2819 verses plus 318 person-scenes, plus 116 pages for printing = 3253; manuscript version 1528 verses plus 150 person-scenes plus 033 pages = 1711; all together - the total space of The Wreath: 3253 + 1711 = 4964); Homer's plus Njegosh's system: $66233_8 + 11544_8 = 77777_8$; (d) Homer's choice: $3583_{10} = 6777_8 = 000110111111111_2$. The number 3583 represents the difference between the Iliad and the Odyssey: 15693 - 12110 = 3583; (e) The number of Homer's choices (1) and non-choices (0); (f) The (in literary science) known composition sequence of the Iliad: from the middle point (Mission to Achilles): 1 day full, 9 empty of events etc., all adequate with choice and non-choice patterns, respectively.

4. RELATIONS WITH THE GENETIC CODE AND I CHING

In previous papers (listed in footnote 9, and elsewhere), we have shown that the logic of the arrangement of 64 hexagrams on the binary tree, in Chinese book "I Ching", also corresponds to the arrangement of 64 codons on the binary tree of the genetic code (as we presented in the book: *Logic of The Genetic Code,* Scientific Book, Belgrade, 1994). Since exactly 50 years ago [10] we have known that the Genetic Code language is a four-letter "alphabet" (uracil, cytosine, adenine, guanine) (U, C, A, G), and three-letter words generated from this alphabet. Logic (of Nature?) is this: if the alphabet is a quartet, the principle of minimal change requires the realization of triplets, doublets and singlets. Thus, in case of this (the only optimal?) alphabet, 64 triplets, 16 doublets and 4 singlets are possible to be derived. And that is exactly the same as found in the Chinese *Book of Changes* "I Ching", written at least five thousand years ago; and exactly the same on the binary tree, as well, identical in both cases, with 6-bit binary records: in the genetic code there are records of zeros and units (six digits per each codon), and in I Ching records are made using full and broken lines (six lines in each hexagram). The question is whether both cases are connected with the fact that number six is the first perfect number.

At the time when I realized the facts about these 6-bit and 6-hexagram records, I had already found that the genetic code was determined by perfect and friendly numbers [11]. The possiblity that Njegosh was influenced by the Biblical "Hexaemeron" (fully discussed in the book "*Njegosh's Primordial Logos*") [12] does not, however, contradict the possibility of having been influenced by the number six perfection [13], since, according to St. Augustine, God actually created the world in six days because of the fact that number six is the first perfect number. In his famous work *Civitas Dei,* St. Augustine, alias Aurelius Augustine, in the thirtieth chapter of the eleventh book, discussing perfect numbers, also presents the reason "why the Bible says that creation was completed in six days," and says that "God ... did not need any period of time, "but he chose the perfect number six" to symbolize the perfection of his work" [14]. As we can see, according to St. Augustine, even God acts by "general laws", exactly as Njegosh says: "The laws of universal order are/ My behest and the life of nature" *(The Ray of Microcosm* III, 261-262).

To emphasize it again: in the genetic code, the basic four-letter alphabet is represented by four nucleotide molecules, two simple pyrimidine molecules (cytosine and uracil) and two complex purine ones (adenine and guanine); in the "I Ching" system it is represented by two simple characters (a small Yin and a small Yang), and two complex ones (a big Yin and a big Yang). But in the genetic code, there is also a 20-letter "alphabet", made of 20 amino acid molecules. The link between 64 codons and 20 amino acids is actually given in the genetic code. However, the number of theoretical possibilities of joining (of these codons to these amino acids) has also been calculated - exactly 1741630 (one million seven hundred forty-one thousand six hundred and thirty) [15].

This number refers to all the possibilities (through every possible variation) of joining 64 codons, to every single amino acid (out of the 20 amino acids) as mediated by the genetic code. If we pay attention to the Chinese 4-letter alphabet (small and big YIN, and small and big YANG), which generates 64 6-bit "words", it cannot be directly seen that there was the awareness of the inevitability of the other, 20-letter alphabet (indirectly, however, it can be seen, but it is a matter of a separate research). Njegosh's result, which is identical to Homer's (Figure 5, p. 191, second volume of our book "*Njegosh's Primordial Logos*") (Njegošev iskonski logos), gives evidence of the presence of such an awareness of both the authors.

However, there is a surprising fact - the fact that everything is arranged in such a manner that it is reduced to the balance level (2 0 2 0 2 0), corresponding with and analogous to the binary sequence of the biggest change in the binary tree (101010). Having put the sequence 2 0 2 0 2 0 in the operating association with the digit record (11111), Njegosh also implemented the number 1,741,630, which is, as we have seen, an important determinant of the genetic code (p. 60 in Volume II of the above mentioned book). What, however, is particularly important from the aspect of this analysis is the fact that the same number follows from the distribution of the verse number in the 24 poems in The Iliad and in the 24 poems in The Odyssey (if they are related in the following way: the first 12 and the second 12, 12 in even and 12 in odd positions) (Ibid, p. 191).

5. PYTHAGORAS, DANTE AND NJEGOSH

If we know that in the sequence of natural numbers there is only one triplet (3-4-5) for which the Pythagoras' law is valid, it is inevitable to conceive the sequence of natural numbers as a sequence of triangles: 0-1-2, 3-4-5, 6-7-8, 9-10-11, etc. In addition, all the triangles geometrically read in the Boolean space are actually Pythagoras', whereas in the arithmetic reading, only one is Pythagoras' (3-4-5). However, if we consider only the central "vertices" of the triangles, then we get the following sequence of numbers: 1, 4, 7, 10, 13, 16, etc... Numeral systems which take numbers from this sequence (except number 1) as the q basis, have specific characteristics. Thus, in the decimal numeral system (q = 10) number 037 is the only two-digit number (read from three positions) which is able to generate full cycles according to module 9. Thus 1 x 037 = 037, 10 x 037 = 370 and 19 x 037 = 703, 2 x 037 = 074, 11 x 037 = 407 and 20 x 037 = 740 and so on [16]. Everything that is possible for number 037 in the numeral system where q = 10, can also be adequate for corresponding numbers in numeral systems with the following bases 4, 7, (10), 13, 16, etc.. This was first presented by Vladimir Shcherbak in 1993-1994

[17]. when he, at the same time, showed that number 013 in the quaternary numeral system (q = 4) determines the cyclicity of 64 codons in the genetic code, and number 037 in the decimal numeral system (q = 10) determines the corresponding cyclicity which is valid for the system of 20 protein amino acids that have the status of "canonical" amino acids in the genetic code.

Thus, it was Shcherbak who first realized that this is the ability of number 037 in the decimal numeral system, and also the ability of its analogues, generated in numeral systems through moving in three steps. It is our insight, however, that these numeral systems are generated from the system of triangles in a sequence of natural numbers. However, our observations are also illustrating that all of this, before all of us was understood by Dante Alighieri, who, with an ultimate precision, expressed it in his *Divine Comedy (La Divina Commedia)*. How did he do that? He took care that the number of verses in any of his 100 songs could only be a number whose sum of digits had to be 4, 7, 0 or 13 and in the second cycle of addition 1, 4, 7, and that is actually the realization of the central figures of the first three triangles in the sequence mentioned above. The answer to the question why Dante stopped at number 13, today remains unknown, but we can present the principle which extends right up to that number. The sequence of analogues of number 037 (10) for the above given numerical bases is the following: 013 (4), 025 (7), 037 (10) 049 (13), 05B (16) 06D (19) ... We perceive that the figures, only up to number 13, are given in the decimal numeral system, and if we proceed, we must borrow the figures from hexadecimal numeral system and from other higher systems of numbers.

Portuguese mathematician L. de Freitas revealed (1989.) that the last verse of Dante's *Divine Comedy* is a palindrome. In the old-Italian original it reads: "En giro torte sol ciclos et rotor igne," and in contemporary Italian: "L'amor che move il sole e l'altre stele", in Serbian: "Ljubav pokretac sunca i svih zvezda. " (Near the last verse there is another palindrome: "In girum imus nocte et consumimur igni.") [18]. Stijepo Kastrapeli, a renowned researcher of Njegosh's works of the late nineteenth and early twentieth century, states that Njegosh read and studied the *Divine Comedy* together with his teacher Simo Milutinovic Sarajlija. If so, then could it be possible that, just under the influence of these Dante's twists (palindromes), Njegosh did what he did: He wrote the names of all those wrong-doers of the past (or perhaps of the present as well) in the wrong way. Thus, there are all of them, (in *The Ray of Microcosm*): Napoleon, Caesar, Alex, Prince of the Evil, Evil Spirit, The Head of the Evil and so on. ("Satan's sinners head to him after mutual agreement... Live eht fo Daeh, Tirisp Live, Live eht fo Ecnipr ... Noelopan, Raseac and Xela") [In Serbian: Napoleon, Cezar, Aleksa, Knez zla, Duh zli, Glava zla etc. ("Satanini zloumišljenici idu k njemu s opšteg dogovora ... Alzzenk, Ilzhud i Alzavalg Gordi ... Noelopan, Razec i Askela")]. Our answer to the question is affirmative.

Box 2 *Numbers on bones*

In Natural History Museum in Brussels there is a small, 10 centimetres long animal bone, which was found in Central Africa near the Lake Isango, in Congo, on the border with Uganda, about 1960. The bone was found in a village near the lake covered with ash after the eruption of a volcano (some kind of prehistoric Pompeii). On the basis of the modern radiocarbon dating, the bone is estimated to be over twenty thousand years old. On this bone, there are notches in small groups, arranged in three rows. In one of the rows there are groups of 9, 11, 19 and 21 notches (making a total of 60), in the second row there are groups of 11, 13, 17 and 19 notches – these are the prime numbers between 10 and 20 - again, making a total of 60 ... Apparently, in the times of illiteracy, somebody "played" with numbers and presented prime numbers, ("atoms" of arithmetic) to future generations. This is, actually, the oldest known testimony of mathematical culture (Gunter Ziegler, *Can I count - math stories,* Mathematical Institute SANU, Belgrade, 2012).

The fact that prime numbers were presented (as well as the exact number of prime numbers between 10 and 20) is what we know about this oldest testimony of mathematical culture. However, more than that can be concluded. Having presented the fact, that between 10 and 20 there are four prime numbers whose sum is 60, and that we get the same sum by adding up their neighbouring numbers (one prime number together with one composite number: [(9 + 11) + (19 + 21) = 60]), the oldest known "mathematician" was actually studying the decimal numeral system. If one would search the Lake better, I presume that at least one bone with similar records would be found, and not in the decimal but in the octal numeral system, because of the complementary situation: {(7 + 9) + (1 5 + 17) = 48} [19].

If one wanted to know how come that Homer, Dante and Njegosh dealt with mathematics, before answering this question, one should keep in mind this old mathematical record.

6. CONCLUSION

Everything presented above leads to the conclusion that Njegosh's intention to make "*the general accord*" really refers to the correspondence of poetic structures with the structures of natural systems, in the same manner in which that correspondence was achieved in the works of Njegosh's precursors (forerunners), Homer and Dante.

(Translation into English: Danijela Veselinović)

FOOTENOTES

[1] The whole paragraph in the letter reads: "Ants, brought to life by the Creator build their artistic anthills, and bees, their majestic palaces. And I, as the intellectual substance of the Creator, must needs follow the general accord."

[2] The first triptych: The Voice of Mountaineers, The Song of Freedom, The Serbian Mirror, and the second triptych: The Ray of Microcosm, The Mountain Wreath and The False Tsar Stephen the Small.

[3] M. Rakocevic Njegosh's Primordial Logos (in Serbian), Volume I in 2000. and Volume II in 2003. (Interpres, Belgrade). This book will soon be available on the website: www.rakocevcode.rs

[4] The best possible harmony (coherence) implies relations of the best possible symmetry, reduced to division of the segment line into two equal parts; as well as the relations of the best possible harmony, presented with the harmonic mean of the system (seen as a unit segment line) and the golden mean, which represents the relations of the best possible proportion, as well.

[5] The Ray, III 148-150: "Steps are mine Devine, / Yet I may name it the space".

[6] M. Schonberger, The I Ching and Genetic Code (ASI, New York, 1980).

[7] M.M. Rakočević, The genetic code as a Golden mean determined system, BioSystems, 46 (1998).

[8] B.M. Kedrov, Prognozy D.I. Mendelyeva v atomistike – neizvestnie elementi, Atomizdat, Moskva, 1977.

[9] See the following works: 1. M.M. Rakocevic, Univerzalna svest i univerzalni kod, in: Consciousness - Scientific Challenge of the 21st Century, Symposium (ECPD, Belgrade, 1996); 2. M.M. Rakocevic, The Universal Consciousness and The Universal Code. In: Consciousness - Scientific Challenge of the 21st Century (ECPD, Belgrade, 1995), 3. M.M. Rakocevic, The Universal Consciousness as a Universal Comprehension of the Universal Code. In: Brain and Consciousness (ECPD, Belgrade, 1997). The second, hereby suggested paper can be found in the book: M.M. Rakocevic, Genetic Code as a Unique System (SKC, Beograd, 1997), which is also available on our website (www.rakocevcode.rs). The same illustrations can be found in Annex. No. 7 in the second volume of our book "Njegosh's Primordial Logos."

[10] In relation to this, 2013th year, it has been exactly 60 years since in 1953., Francise Crick and James Watson revealed the structure of the gene (nucleic acid, DNA), and 50 years, since in 1963. experimental studies (which showed that the triplet molecular aggregations of DNA (more exactly, of RNA) are coded for 20 amino acid molecules in their building of proteins) were finished.

[11] That is also stated in my book, Genetic Code as a Unique System (SKC Nis; Bina, Belgrade, p. 60, also available on the website: www.rakocevcode.rs).

[12] There are six songs in the Ray; then 'Kolo' six times in The Wreath; there also are 6 +1 Montenegrins in The Wreath as Vuk (six active persons and one silent character: Vuk Borilović), there are also 6 +1 Turks (six Turkish chiefs and one Turkish wedding guest).

[13] See "Explanations with The Ray of Microcosm" in: P. P. Njegoš, Celokupna dela, Prosveta-Beograd and Obod-Cetinje, seventh edition, Book III, p. 351, where it is said that Nikola Banašević in 1954. proposed such a hypothesis.

[14] Aurelius Augustine, God's Country, (CID, Podgorica, 2004, p. 473).

[15] Alvager et al, 1989, *Biosystems*, 22, p. 191: „The number of all distributions in the set of 64 codons is 1741630."

[16] Permutation cyclicity in two steps is achieved by each (read in three positions) two-digit number, whereas in the third step cyclicity, i.e. conservation of the three figures altogether, is achieved solely by number 037 .However, the next number, number 038, cannot achieve that. Namely, 1 x 038 = 038 and 10 x 038 = 380, but already in the next modular cycle the three figures disappear because 19 x 038 = 722, and not 803 as expected according to the rules.

[17] V.I. Shcherbak, Sixty-four triplets and 20 canonical amino acids of the genetic code: the arithmetical regularities. Part II. *J Theor. Biol.* 166 (1994), pp. 475-477.

[18] L. de Freitas, 515 – a symmetric number in Dante, *Computers Math. Applic*. 17 (1989), pp. 887-897.

[19] The numbers are written in the decimal numeral system digits. The result of "48" in the octal system is written as "60". It should be noted that the simple / composite number positions are different from the situation in the decimal numeral system.

3. ПОИМАЊЕ ЛОГОСА И КÔДА

У савременој информационој науци, кибернетици и теорији система, под кодирањем се подразумева процес повезивања алфабета-1 са алфабетом-2. Корак даље у уопштавању и дефинисању кôда јесте разумевање кода као кореспонденције, по одређеном правилу и/или закону, свака два подсистема (као делова) унутар једног природног система (као целине). Ако је при томе реч о системима чија је организација делова у оквиру целине таква да су они у најбољем могућем складу,[15] и, истовремено постоји кореспонденција структуре система са структуром низа природних бројева, тада има смисла рећи да је реч о универзалном коду, као најзначајнијем аспекту универзалног логоса (закона).

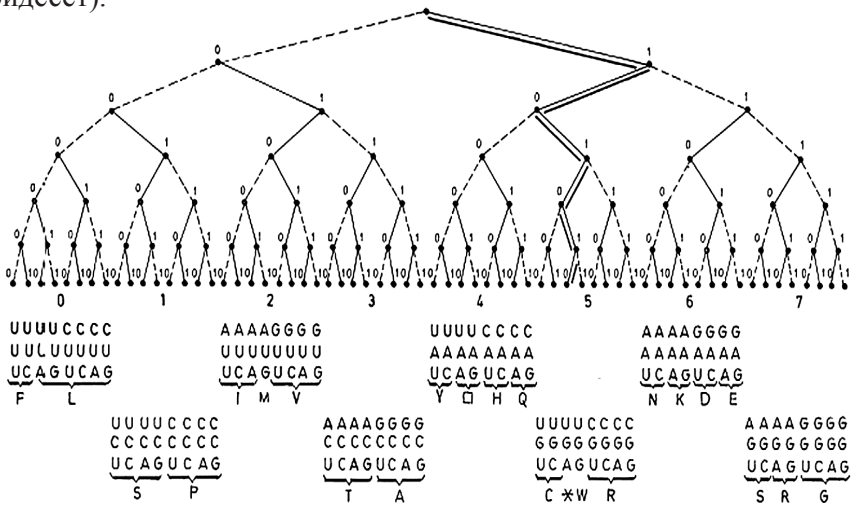
Кључно питање, међутим, у оквиру ових разматрања, јесте – како је Његош могао да досегне и појми тај и такав логос (*согласије опште*), кроз разумевање најдубље суштине природне математике и природне науке, кад није имао редовно школовање, односно образовање (у данашњем смислу) и наводно је био „самоук“? Уз све знано о малобројним Његошевим учитељима, о Његошевој библиотеци и библиотеци његовог стрица Петра I Петровића Његоша, о могућим утицајима Ломоносова и Бифона (чија је сабрана дела поседовао), кад је реч о формирању погледа на свет, подсећамо овде и на речи епископа Николаја Велимировића на трагу одгонетања Његоша: „загонетка природе је прва пред којом се човек нађе, кад протре очи и обазре се по овом великом свету“; загонетка, која је инспирисала и Његошеву идеју о „согласију општем.“

4. РЕЛАЦИЈЕ СА ГЕНЕТСКИМ КОДОМ

Логика распореда 64 речи (хексаграма) на шестобитном бинарном дрвету у кинеској књизи *Ји Ђинг* (старој пет хиљада година) стопроцентно кореспондира са распоредом 64 речи (кодона) на бинарним дрвету генетског кода (како смо показали у књизи *Logic of genetic code*, Научна књига, Београд, 1994). При томе, у оба случаја, „речи“ су трословне, генерисане из четворословне азбуке; у генетском коду четворословну азбуку представљају четири нуклеотидна молекула, два једноставна (једнострука), пиримидинска – урацил и цитозин; и два сложена (двострука), пуринска – аденин и гуанин; у систему „Ји Ђинг“, два једноставна знака (мали Јин и мали Јанг) и два сложена (велики Јин и велики Јанг). Али у генетском коду постоји још и 20-словна „азбука“, 20 аминокиселинских молекула. Веза између 64 кодона и 20 аминокиселина управо је и дата генетским кодом. Међутим, поставља се питање, колико има теоријских могућности придруживања речи прве азбуке словима друге азбуке, и израчунато је да

15 Најбољи могући склад (кохеренција) подразумева односе најбоље могуће симетрије, сведене на поделу дужи на два једнака дела [S. Marcus, Symmetry in the Simplest Case: the Real Line, *Computers Math. Applic.* 17 (1989), pp. 103-115]; такође и односе најбоље могуће хармоније, изражене преко хармонијске средине система (сведеног на јединичну дуж) и златног пресека, који представља и односе најбоље могуће пропорције.

их има 1741630 (милион седамсто четрдесет и једна хиљада шест стотина и тридесет).[16]



Слика 1. Шестобитно бинарно дрво генетског кода, са распоредом 64 трословне „речи“ (кодона), генерисаних из четворословне азбуке (U, C, A, G), од почетне, то јест нулте, UUU (000000), преко „хармонијске“ (у позицији хармонијске средине), са највећом променом, UGA 101010, до последње, на позицији 63 (111111). [Према: M. M. Rakočević, BioSystems 46 (1998) 283–291.]

Реч је о свим могућностима (кроз сва могућа варирања) придруживања 64 кодона, свакој појединој од 20 аминокиселина колико је посредовано генетским кодом. Кад се посматра кинески четворословни алфабет (мањи и већи *јин*, и мањи и већи *јанг̄*), из кога се генеришу 64 шестобитне „речи“, непосредно се не види да је присутна и свест о неминовности и другог, 20-словног алфабета. (Посредно се, ипак, та веза види, како је објашњено у Appendix-у.)

202020 –	1546 (ГК) =	200474
202020 –	6668 (СВ) =	195352
202020 –	13599(ОС) =	188421
	1752741 =	3 x 584247
	11111	
	1741630	

Слика 2. Број стихова у три Његошева дела, у релацији са „референтном“ тачком. (Према: ММР, Његошев исконски логос, II том, стр. 60.)

16 Alvager et al, 1989, *Biosystems*, 22, p. 191: „The number of all distributions in the set of 64 codons is 1741630.“

4.1. Његошеве и Хомерове кодовне структуре

Његошев резултат, истоветан са Хомеровим, сведочи о присуству свести код обојице аутора о специфичности и уникатности везе између две горе предочене азбуке – четворословне и двадесетословне (слика 2 у релацији са сликом 3). Осим тога, видимо да је, на слици 2, тако „удешено" да све буде сведено на равнотежни ниво („202020"), кореспондентно и аналогно са бинарном секвенцом највеће промене на бинарном дрвету „101010" (двострука линија на слици 1). Стављајући секвенцу „202020" у операцијску везу са цифарским записом „11111", Његош је реализовао и крајњу секвенцу (запис) на бинарно-кодном дрвету (слика 1),[17] али је истовремено реализовао и број 1741630 који је, како смо видели, битна детерминанта генетског кода. Оно што је, међутим, посебно значајно, са аспекта ове анализе, јесте чињеница да исти тај број следи и из дистрибуције броја стихова у 24 песме Илијаде и 24 песме Одисеје (кад се ставе у однос: 12 првих и 12 других; 12 на непарним и 12 на парним позицијама) (слика 3).

Оно што, међутим, изненађује, јесте чињеница да постоји и једна још непосреднија кореспонденција између Хомерових и Његошевих поетских структура, поново у релацији и са генетским кодом. Реч је о бинарном низу (геометријској прогресији са количником 2) 2^n (2 exp n), (n = 0, 1, 2, 3, ...), из које следи низ бројева: 1, 2, 4, 8, итд. (слика 4). А, сада има смисла поставити следећи задатак: да из секвенце 1-2-4-8-16-32- ..., итд. узмемо 3 пута по 5 бројева, али тако да буду у најбољем могућем симетрично-пропорционално-хармоничном односу.[18] Кључ решења је палиндром [11011] – [00100] – [11011], а сâмо решење: [1-2-(4)-8-16] – [(32-64)-128-(256-512)] – [1024-2048-(4096)-8192-16384], како је и предочено на слици 4. Ако се саберу сви подвучени бројеви (изван малих заграда), добија се број 27803, што је тачно збир броја стихова Хомерове Илијаде и Одисеје. Ако се, пак, саберу сви неподвучени бројеви (у малим заградама), добија се укупан „простор" Његошевог Горског вијенца (укупан простор: број стихова, број личности, број страница, итд, како је наведено у легенди слике 4. Оно што Хомер није изабрао, изабрао је Његош. Ако се сабере Хомеров (27803) и Његошев број (4964) добија се број 32767, који у окталном бројевном систему (q = 8) износи 77777, што представља својеврсну равнотежу и признање Његошу у напору да своје поетске и просторне структуре стриктно доведе у везу са Хомеровим.

17 Ако се питамо шта је смисао оваквог Његошевог избора, одговор је следећи. На бинарном дрвету смо у бинарним просторима, а изван њега у не-бинарним („у просторе и за просторима"). У односу на кључну бинарну секвенцу, 101010, „излазак" у не-бинарност (преко „границе" 111111) иде путем секвенци: 202020, 303030, 404040 итд. Парадоксално, не-бинарност поново започиње (једном другачијом) бинарношћу: 202020!? Како видимо, Његош је на свој (кодогено-скривалачки) начин предочио постојање овог парадокса.

18 Кључна детерминанта *Таблице множења*, у декадном бројевном систему, са аспекта логике остваривања симетрије и најбољег могућег склада, јесте множење са половином бројевне основе, q = 10, дакле са бројем 5. Множењем броја 5 са 1 и са 2 још увек се не прелази граница основе бројевног система, q = 10. Тек множењем са 3, имамо први случај "прелаза преко границе". Према томе, кључна детерминанта за Таблицу множења у декадном бројевном систему јесте "три пута пет једнако петнаест."

ODISSEY	O)	**12110**					
			1393				
EVEN	(I & O) - 1 =	**13503**		*1095*			
			298		*998*		
FIRST	(I & O) - 0 =	**13801**		*97*		*998*	
			201		*0*		*0*
SECOND	(I & O) + 0 =	**14002**		*97*		*998*	
			298		*998*		
ODD	(I & O) + 1 =	**14300**		*1095*			
			1393				
ILIAD	(I	**15693**					
		83409			*9959*		
		x 21			*x 01*		
		1751589			*9959*		
			1741630				

Слика 3. Број стихова у Илијади и Одисеји, исказан кроз битне (питагорејске) дистинкције. Главни резултат (1741630) одговара броју дистрибуција у генетском коду (према: ММР, *Њего̄шев исконски ло̄гос*, II том, стр. 60).

4.2. Њего̄шеве и Данте̄ове кодовне стрӯктӯре

Са сазнањем да се на почетку низа природних бројева налази „тројка“ бројева (1-2-3), која представља чиниоце првог савршеног броја, броја шест, и која се преклапа са једином (у низу) Питагорином тројком (3-4-5)[19] неминовно је појмити да се низ природних бројева мора прочитати и као низ троуглова, и то на два начина: 1-2-3, 4-5-6, 7-8-9, 10-11-12 ..., и 0-1-2, 3-4-5, 6-7-8, 9-10-11 итд. (табела 3). При томе, у овом другом случају, сви троуглови, геометријски прочитани у Буловом простору, јесу заиста Питагорини, док је у аритметичком читању само један Питагорин (3-4-5). Ако, међутим, посматрамо само средишња “темена” ових троуглова, тада се добија следећи низ бројева: 1, 4, 7, 10, 13, 16 итд. Бројевни системи који за основу *q* имају бројеве из овог низа (осим броја 1) имају специфична својства. Тако, у декадном бројевном систему (q = 10) број 037 је једини од двоцифрених бројева (прочитаних тропозиционо) који је у стању да генерише пуну цикличност по модулу 9. Тако, 1 x 037 = 037, 10 x 037 = 370 и 19 x 037 = 703; 2 x 037 = 074, 11 x 037 = 407 и 20 x 037 = 740 итд.[20] Све то што може број 037 у бројевном систему са q = 10 могу

19 У *Њего̄шевој биљежници* (Историјски институт – Цетиње, 1956), на стр. 128, налазимо да је Његош изабрао тачно оне звонике, чије висине се исказују бројевима, са цифрама које представљају искључиво Питагорину тројку.

20 Цикличност пермутација у два корака достиже сваки (тропозиционо читани) двоцифрени број, док у трећем кораку цикличност, то јест очуваност све три цифре, постиже једино број 037. Већ следећи број 038 то не може да постигне. Наиме, 1 x 038 = 038 и 10 x 038 = 380, али већ у следећем модуларном циклусу нестају све три цифре јер је 19 x 038 = 722, а не 803 како би се на основу правила очекивало.

и одговарајући бројеви у бројевним системима са основама 4,7, (10), 13, 16, итд. [У кватернерном бројевном систему аналогон броја 37 је број који има форму „13“, а сви заједно сачињавају следећи низ: 13(**4**), 25(**7**), 37(**10**), 49(**13**), 5B(16), 6D(19), 7F(21) итд.(видети средишњи блок бројева, десно, у табели 3).] Да је то тако први је предочио Владимир Шчербак (Shcherbak) 1993-1994. године.[21]

0-1-2 1-2-3 2-3-4	3-4-5 4-5-6 5-6-7	6-7-8 7-8-9 8-9-10	9-10-**11** 10-11-12 11-12-13	**01, 02, 03,..., 09, 10, 11** **12, 13, 14,..., 20, 21, 22** 23, 24, 25,..., 31, 32, 33 34, 35, 36,..., 42, 43, 44
3-4-5 4-5-6 5-6-7	6-7-8 7-8-9 8-9-10	9-10-11 10-11-12 11-12-13	12-13-14 13-14-15 14-15-16	45, 46, 47,..., 53, 54, 55 56, 57, 58,..., 64, 65, 66 67, 68, 69,..., 75, 76, 77 78, 79, 80,..., 86, 87, 88
6-7-8 7-8-9 8-9-10	9-10-11 10-11-12 11-12-13	12-13-14 13-14-15 14-15-16	15-16-17 16-17-18 17-18-19	89, 90, 91,..., 97, 98, 99 13_4, 25_7, 37_{10}, 49_{13}, $5B_{16}$, $6D_{19}$, $7F_{21}$, ...
9-10-11 10-11-12 11-12-13	12-13-14 13-14-15 14-15-16	15-16-17 16-17-18 17-18-19	18-19-20 19-20-21 20-21-**22**	1 10 19 037, 370, 703 038, 380, 722

Табела 3. Аранжман низа природних бројева, сагласан са принципом континуитета и принципом минимума промене (промена за јединицу по хоризонтали и по вертикали). У десном горњем блоку дат је редослед појединачних бројева, док је у левом (обједињеном) блоку дат редослед бројевних „тројки“. У десном средишњем и доњем блоку дати су Шчербакови, односно Дантеови, бројеви (објашњење у тексту).

Шчербаков је увид, дакле, да то тако може број 037 у декадном и његови аналогони, генерисани у бројевним системима са померањем за три корака. Наш је увид, међутим, да се ти бројевни системи генеришу и из система троуглова у низу природних бројева. Али, нашим увидом се такође предочава да је све то, пре свих нас, увидео Данте Алигијери (Dante Alighieri) и до крајње прецизности исказао у својој *Божанственој комедији* (*La divina commedia*). Како је то урадио? Учинио је тако да број стихова у било којој од 100 песама може бити само број чији збир цифара износи 4,7,10 или 13, што је заправо реализација средишњих цифара из прва три троугла горе поменутог низа. Одговор на питање зашто се Данте зауставио код броја 13 данас не можемо знати, али можемо да предочимо законитост која се протеже управо до тог броја. Низ аналогона броја 037(10) за горе дате бројевне основе јесте овај: 013(4), 025(7), 037(10), 049(13), 05B(16), 06D(19) ... Видимо да декадни бројевни систем “даје” цифре само до броја 13, а надаље их морамо позајмити из хексадекадног и виших бројевних система.[22]

21 V.I. Shcherbak, Sixty-four triplets and 20 canonical amino acids of the genetic code: the arithmetical regularities. Part II. *J Theor. Biol.* 166 (1994), pp. 475-477.

22 У хексадекадном бројевном систему, једноцифрени бројеви већи од 9 означавају се словима абецеде: 10(A), 11(B), 12(C), 13(D), 14(E), 15(F).

d	c	b	a	e	f
				.	1
1	0	1	00001	2	9
1	0	1	00002		
1	1	0	00004	1	1
1	0	1	00008	2	12
1	0	1	00016		
1	1	0	00032	2	3
1	1	0	00064		
1	0	1	00128	1	M
1	1	0	00256	2	3
0	1	0	00512		
1	0	1	01024	2	12
1	0	1	02048		
0	1	0	04096	1	1
0	0	1	08192	2	9
0	0	1	16384		
				.	1

Слика 4. Сједињени Хомеров и Његошев систем у форми просторног низа, $N=2^n$: (a) Бинарна секвенца чија сума је $2^{15}-1=32767$ (2 exp. 15); (b) Хомеров избор: $27803_{10} = 66233_8 = 110110010011011_2$ (број стихова Илијаде и Одисеје заједно); (c) Његошев избор: $4964_{10} = 11544_8 = 001001101100100_2$. Горски вијенац, штампана верзија: 2819 стихова, плус 318 сцена (ситуација са појавом сваке следеће личности на сцени), плус 116 штампаних страница = 3253; Горски вијенац, рукописна верзија: 1528 стихова, плус 150 сцена, плус 33 рукописне странице = 1711; све заједно даје укупни „простор" Вијенца: 3253 + 1711 = 4964; Хомеров плус Његошев систем: $66233_8 + 11544_8 = 77777_8$; (d) Хомеров избор: $3583_{10} = 6777_8 = 000110111111111_2$. Број 3583 представља разлику броја стихова Илијаде и Одисеје: 15693 - 12110 = 3583; (e) Број Хомерових избора (подвучено)/ неизбора (неподвучено): 0, 2, 1, 2, 2, 1, 2, 2, 1, 2, ø; (f) У књижевничкој науци познати композициони след у *Илијади* (у односу на средишњу тачку, коју представља Мисија Ахилеју): 1 дан пун догађаја, 9 дана без догађаја итд, где догађања одговарају неизборима и обрнуто. (Напомена: нула на почетку одговара стварној нули на почетку низа природних бројева, а прецртана нула на крају, одговара неизбору бројева који следе изван Хомерове тро-петорке.)