SCQ Two high cycles of links

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Author of : Syracuse Conjecture Quadrature © viXra 2305.0029

ABSTRACT

With reference to the Syracuse Conjecture Quadrature (SCQ), this article reports two links of high horizons such that Ɵ(l) < Ɵ(m), calculated by Theorem of Independence. By application of the same theorem it's confirmed the link of the odd number 27. In this way it's sure that the cycles of links can be managed to our liking. Moreover the procedure explains show the beauty and the magical harmony of odd numbers. At the same time it's confirmed that SC (or CC) is not fully verifiable as further highlighted by the four illustrative patterns. There are no doubts: it's a particular sort of the *Circle Quadrature*, but its initial statement is true. In other words: BIG CRUNCH is always possible but BIG BANG has no End.

CONTENTS

1. Introduction

The introduction to this article is the ABSTRACT of the paper Syracuse Conjecture Quadrature, of which it's a further confirmation of the result contained therein.

Abstract SCQ

After circa 2300 years (Circle Quadrature; Archimèdès, Syracuse 287 – 212 BC) the history of mathematics repeats itself in a different problem. In this paper the conjecture of Syracuse (or Collatz conjecture) is approached from a completely dissimilar point of view than many previous attempts. One of its features suggests a process that leads to Theorem 2n+1, whose demonstration subdivided the set of odd numbers in seven disjoint subsets which have different behaviors applying algorithm of Collatz. It allows us to replace the Collatz cycles with the cycles of links, transforming their oscillating sequences in monotone decreasing sequences. By Theorem of Independence we can manage cycles of links as we like, also to reach very high horizons and when we decide go back to lower horizons. In this article it's proved that Collatz conjecture is not fully verifiable. In fact, if we consider the banal link n < 2n, there are eight cycles which connect each other in an endless of possible links. It is a particular type of *Circle Quadrature,* but its statement is confirmed. In other words: BIG CRUNCH (go back to 1) is always possible, but BIG BANG (to move on) has no End.

Remark

At page 27 of the paper SCQ Vixra 2305.0029 there is a banal error in a copy and paste. Here it's :
$3^{16}\cdot(n + k)+37390952 < 2^{26}\cdot(n + k)+58291647$ O_{3a} ; not $3^9\cdot(n + k)+15433 < 2^{15}\cdot(n + k)+25691$ O_{2a}

2. Results, explanatory notes and formulas of the paper SCQ

Syracuse conjecture plan Theorem 2n+1

2n+1 O → 6n+4 E → 3n+2 O ∨ **E → (3n+2)/2** **O_1 : 3** steps
↓
9n+7 E → (9n+7)/2 O ∨ **E → (9n+7)/4** **O_2 : 5** steps
↓
(27n+23)/2 E → (27n+23)/4 **O_3 : 6** steps

Notes

a) Definition: *A cycle of link is the number of steps required for to arrive from the main horizon of a generating number* (Start) *to the lower horizon of its link* (End).

We point: Θ(m) : main horizon
Θ(l) : lower horizon
N(s) : number of steps

b) Definition: *Two cycles of links,* c1, c2, *are equivalent if contain the same number of steps, i.e. :* c1 ~ c2 ↔ N(s)[c1] = N(s)[c2].

c) **O_1 = {5; 9; 13; 17; 21; 25; 29; 33; …; 4n+1}** [n > 0]
O_2 = {3; 11; 19; 27; 35; 43; 51; 59; …; 8n+3} [n ≥ 0]
O_3 = {7; 15; 23; 31; 39; 47; 55; 63; …; 8n-1} [n > 0]

A number n is in O_1 if n-1 is divisible by 4 .
We pose : u = (n-1)/4 ; x = 2u = (n-1)/2 ⟶ f(x) = (3x+2)/2 after N(s) = **3**
A number n is in O_2 if n-3 is divisible by 8 .
We pose : v = (n-3)/8 ; y = 4v+1 = (n-1)/2 ⟶ f(y) = (9y+7)/4 after N(s) = **5**
A number n is in O_3 if n+1 is divisible by 8 .
We pose : w = (n+1)/8 : z = 4w-1 = (n-1)/2 ⟶ f(z) = (27z+23)/4 after N(s) = **6**

d) Important remark
We use binomials of 4 types:
1) (even number)·n + (even number) ⟶ divisible by 2
2) (odd number)·n + (even number) : it can be Odd or Even. Is Odd if n = **2n+1** ; is Even if n = **2n**
3) (odd number)·n + (odd number): it can be Odd or Even. Is Odd if n = **2n** ; is Even if n = **2n+1**

4) (even number)·n + (odd number): it can be in O_1 or in O_2 or in O_3 :
   4a) It's in O_1 if n = **2n** or if n = **2n+1**.
   4b) It's in O_2 if n = **4n+1** or if n = **4n+3** ; if n = **4n** or if n = **4n+2**
   4c) It's in O_3 if n = **4n+3** or if n = **4n+1** ; if n = **4n+2** or if n = **4n**

e) If it is written E; O; O_1; O_2; O_3 it is an obligation; instead [E]; [O]; [O_1]; [O_2]; [O_3] it is a choice

Summarizing :

$\mathbf{O = O_1 \cup O_2 \cup O_3}$
$\mathbf{O_2 = O_2^* \cup O_{2a}}$
$\mathbf{O_3 = O_3^* \cup O_{3a} \cup O_{3b} \cup O_{3c}}$

$O_1 = 4n+1 : n > 0$
$O_2 = 8n+3 : n \geq 0$
$O_3 = 8n-1 : n > 0 \sim 8n+7 : n \geq 0$
$O_2^* = 16n+3 : n \geq 0$
$O_{2a} = 16n+11 : n \geq 0$
$O_3^* = 32n-9 : n > 0 \sim 32n+23 : n \geq 0$
$O_{3a} = 32n-1 : n > 0 \sim 32n+31 : n \geq 0$
$O_{3b} = 32n+7 : n \geq 0$
$O_{3c} = 32n+15 : n \geq 0$

General List binomial inequalities N(s) ≤ 21

By the procedure previously illustrated, appropriately choosing the connections between the eight cycles, applying the formulas obtained from Theorem 2n+1, using Theorem of Independence explained later (§ 3.2.); we arrive to the following list binomial inequalities N(s) ≤ 21 :

3n+1 < 4n+1 O_1 : n > 0 ; N(s) = 3
9n+2 < 16n+3 O_2^* : n ≥ 0 ; N(s) = 6
27n+20 < 32n+23 O_3^* : n ≥ 0 ; N(s) = 8
27n+10 < 32n+11 O_{2a} : n ≥ 0 ; N(s) = 8
243n+91 < 256n+95 O_{3a} : n ≥ 0 ; N(s) = 13
81n+5 < 128n+7 O_{3b} : n ≥ 0 ; N(s) = 11
81n+10 < 128n+15 O_{3c} : n ≥ 0 ; N(s) = 11
… …
… …
… …

From the general list above we covered 96% of ℕ.
The remaining 4% is covered by the binomial inequalities of the infinite cycles of links. By apposite calculation tools it is possible to reach close by 100% of ℕ, but, as it will be proved it's not possible to arrive 100% coverage of ℕ.

The binomial inequalities are of type:

$$3^h \cdot n + q < 2^k \cdot n + p$$

- *p* is the well-know term of the binomial main horizons; *q* is the corresponding well-know term of the binomial lower horizons : $q < p$.
- h + k = number of steps N(s) : N(s) increment = 2 or 3
- Increase of k 1 or 2 : 1 if N(s) increment = 2 ; 2 if N(s) increment = 3
- Increase of h always 1

Collatz sequences arrive at their respective links by unpredictable ways and without generalized rules, except those indicated above. For N(s) = 21 there are 85 chains of connections and related links. The number of links increase considerably with the increase of N(s).

Theorem of Independence

In every horizon $2^{\alpha}\cdot n+p$ the well-know term of the principal binomial inequality is independent of the term parametric from an appropriate exponent α onwards.

… …

Remembering : $\begin{cases} x = \frac{n-1}{2} \rightarrow f(x) = \frac{3x+2}{2} : N(s) = 3 \\ y = \frac{n-1}{2} \rightarrow f(y) = \frac{9y+7}{4} : N(s) = 5 \\ z = \frac{n-1}{2} \rightarrow f(z) = \frac{27z+23}{4} : N(s) = 6 \end{cases}$

3. Two high cycles of links and relative tests of odd nude numbers

Remark

In the calculus of the following cycles of links we apply immediate substitutions highlighted by bold font. We used the utmost accuracy in making the calculations

(1)

$\mathbf{2^{\alpha}\cdot n+32k+31}$ O_{3a} : $z = 2^{\alpha-1}\cdot n+16k+15 \rightarrow f(z) = 3^3\cdot 2^{\alpha-3}\cdot n+108k+107$ [O_2] : k = **4k**

$\mathbf{2^{\alpha}\cdot n+128k+31}$ O_{3a}
$3^3\cdot 2^{\alpha-3}\cdot n+432k+107$ O_2 : $y = 3^3\cdot 2^{\alpha-4}\cdot n+216k+53 \rightarrow f(y) = 3^5\cdot 2^{\alpha-6}\cdot n+486k+121$ [O_2] : k = **4k+3**

$\mathbf{2^{\alpha}\cdot n+512k+415}$ O_{3a}
$3^5\cdot 2^{\alpha-6}\cdot n+1944k+1579$ O_2 : $y = 3^5\cdot 2^{\alpha-7}\cdot n+972k+789 \rightarrow f(y) = 3^7\cdot 2^{\alpha-9}\cdot n+2187k+1777$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+1024k+415}$ O_{3a}
$3^7\cdot 2^{\alpha-9}\cdot n+4374k+1777$ [O_3] : k = **4k+1**

$\mathbf{2^{\alpha}\cdot n+4096k+1439}$ O_{3a}
$3^7\cdot 2^{\alpha-9}\cdot n+17496k+6151$ O_3 : $z = 3^7\cdot 2^{\alpha-10}\cdot n+8748k+3075 \rightarrow$
$f(z) = 3^{10}\cdot 2^{\alpha-12}\cdot n+59049k+20762$ [O] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+8192k+5535}$ O_{3a}
$3^{10}\cdot 2^{\alpha-12}\cdot n+118098k+79811$ [O_1] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+16384k+13727}$ O_{3a}
$3^{10}\cdot 2^{\alpha-12}\cdot n+236196+197909$ O_1 : $x = 3^{10}\cdot 2^{\alpha-13}\cdot n+118098k+98954 \rightarrow$
$f(x) = 3^{11}\cdot 2^{\alpha-14}\cdot n+177147k+148432$ [O] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+32768k+30111}$ O_{3a}
$3^{11}\cdot 2^{\alpha-14}\cdot n+354294k+325579$ [O_1] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+65536k+62879}$ O_{3a}
$3^{11}\cdot 2^{\alpha-14}\cdot n+708588k+679873$ O_1 : $x = 3^{11}\cdot 2^{\alpha-15}\cdot n+354294k+339936 \rightarrow$
$f(x) = 3^{12}\cdot 2^{\alpha-16}\cdot n+531441k+509905$ [E] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+131072k+128415}$ O_{3a}
$3^{12}\cdot 2^{\alpha-16}\cdot n+1062882k+1041346 \rightarrow 3^{12}\cdot 2^{\alpha-17}\cdot n+531441k+520673$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+262144k+128415}$ O_{3a}
$3^{12}\cdot 2^{\alpha-17}\cdot n+1062882k+520673$ [O_1] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+524288k+128415}$ O_{3a}
$3^{12}\cdot 2^{\alpha-17}\cdot n+2125764+520673$ O_1 : $x = 3^{12}\cdot 2^{\alpha-18}\cdot n+1062882+260336 \rightarrow$
$f(x) = 3^{13}\cdot 2^{\alpha-19}\cdot n+1594323k+390505$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+1048576k+128415}$ O_{3a}
$3^{13}\cdot 2^{\alpha-19}\cdot n+3188646k+390505$ [O_2] : k = **4k+3**

$\mathbf{2^{\alpha}\cdot n+4194304k+3274143}$ O_{3a}
$3^{13}\cdot 2^{\alpha-19}\cdot n+12754584k+9956443$ O_2 : $y = 3^{13}\cdot 2^{\alpha-20}\cdot n+6377292k+4978221 \rightarrow$
$f(y) = 3^{15}\cdot 2^{\alpha-22}\cdot n+14348907k+11200999$ [E] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+8388608k+7468447}$ O_{3a}
$3^{15}\cdot 2^{\alpha-22}\cdot n+28697814k+25549906 \rightarrow 3^{15}\cdot 2^{\alpha-23}\cdot n+14348907k+12774953$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+16777216k+7468447}$ O_{3a}
$3^{15}\cdot 2^{\alpha-23}\cdot n+28697814k+12774953$ [O_1] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+33554432k+7468447}$ O_{3a}
$3^{15}\cdot 2^{\alpha-23}\cdot n+57395628k+12774953$ O_1 : $x = 3^{15}\cdot 2^{\alpha-24}\cdot n+28697814k+6387476 \rightarrow$
$f(x) = 3^{16}\cdot 2^{\alpha-25}\cdot n+43046721k+9581215$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+67108864k+7468447}$ O_{3a}
$3^{16}\cdot 2^{\alpha-25}\cdot n+86093442k+9581215$ [O_2] : k = **4k+2**

$\mathbf{2^{\alpha}\cdot n+268435456k+141686175}$ O_{3a}
$3^{16}\cdot 2^{\alpha-25}\cdot n+344373768k+181768099$ O_2 : $y = 3^{16}\cdot 2^{\alpha-26}\cdot n+172186884k+90884049 \rightarrow$
$f(y) = 3^{18}\cdot 2^{\alpha-28}\cdot n+387420489k+204489112$ [O] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+536870912k+410121631}$ O_{3a}
$3^{18}\cdot 2^{\alpha-28}\cdot n+774840978k+591909601$ [O_3] : k = **4k+3**

$\mathbf{2^{\alpha}\cdot n+2147483648k+2020734367}$ O_{3a}
$3^{18}\cdot 2^{\alpha-28}\cdot n+3099363912k+2916432535$ O_3 : $z = 3^{18}\cdot 2^{\alpha-29}\cdot n+1549681956k+1458216267 \rightarrow$

$f(z) = 3^{21}\cdot 2^{\alpha-31}\cdot n+10460353203k+9842959808$ [E] : k = **2k**

$2^{\alpha}\cdot n+4294967296k+2020734367$ O_{3a}
$3^{21}\cdot 2^{\alpha-31}\cdot n+20920706406k+9842959808 \rightarrow 3^{21}\cdot 2^{\alpha-32}\cdot n+10460353203k+9842959808$ [E] : k = **2k**

$2^{\alpha}\cdot n+8589934592k+2020734367$ O_{3a}
$3^{21}\cdot 2^{\alpha-32}\cdot n+20920706406k+4921479904 \rightarrow 3^{21}\cdot 2^{\alpha-33}\cdot n+10460353203k+2460739952$ [O] : k = **2k+1**

$2^{\alpha}\cdot n+17179869184k+10610668959$ O_{3a}
$3^{21}\cdot 2^{\alpha-33}\cdot n+20920706406k+12921093155$ [O_2] : k = **4k**

$2^{\alpha}\cdot n+68719476736k+10610668959$ O_{3a}
$3^{21}\cdot 2^{\alpha-33}\cdot n+83682825624k+12921093155$ O_2 : $y = 3^{21}\cdot 2^{\alpha-34}\cdot n+41841412812k+6460546577 \rightarrow$
$f(y) = 3^{23}\cdot 2^{\alpha-36}\cdot n+94143178827k+14536229800$ [O] : k = **2k+1**

$2^{\alpha}\cdot n+137438953472k+79330145695$ O_{3a}
$3^{23}\cdot 2^{\alpha-36}\cdot n+188286357654k+108679408627$ [O_1] : k = **2k+1**

$2^{\alpha}\cdot n+274877906944k+216769099167$ O_{3a}
$3^{23}\cdot 2^{\alpha-36}\cdot n+376572715308k+296965766281$ O_1 :
$x = 3^{23}\cdot 2^{\alpha-37}\cdot n+188286357654k+148482883140 \rightarrow$
$f(x) = 3^{24}\cdot 2^{\alpha-38}\cdot n+282429536481k+222724324711$ [E] : k = **2k+1**

$2^{\alpha}\cdot n+549755813888k+491647006111$ O_{3a}
$3^{24}\cdot 2^{\alpha-38}\cdot n+564859072962k+505153861192 \rightarrow$
$3^{24}\cdot 2^{\alpha-39}\cdot n+282429536481k+252576930596 < 2^{\alpha}\cdot n+549755813888k+491647006111$ O_{3a}

$\alpha = 39 \rightarrow 3^{24}\cdot n+3^{24}\cdot k+252576930596 < 2^{39}\cdot n+ 2^{39}\cdot k+491647006111$ O_{3a}

$3^{24}\cdot(n + k)+252576930596 < 2^{39}\cdot(n + k)+491647006111$ O_{3a} : N(s) = **63**
$n = 0 \rightarrow 3^{24}\cdot k+252576930596 < 2^{39}\cdot k+491647006111$ O_{3a} principal inequality
$n = k = 0 \rightarrow 252576930596 < 491647006111$ O_{3a} nude number

Check link nude number :
491647006111 O_{3a} : z = 245823503055 → f(z) = 1659308645627 O_{2a} : y = 829654322813 →
f(y) =1866722226331 O_{2a} : y = 933361113165 → f(y) = 2100062504623 O_{3c} :
z = 1050031252311 → f(z) = 7087710953105 O_1 : x = 3543855476552 →
f(x) = 5315783214829 O_1 : x = 2857891607414 → f(x) = 3986837411122 → 1993418705561 O_1 :
x = 996709352780 → f(x) = 1495064029171 O_2^* : y = 747532014585 →
f(y) = 1681947032818 → 840973516409 O_1 : x = 420486758204 → f(x) = 630730137307 O_{2a} :
y = 315365068653 → f(y) = 709571404471 O_3^* : z = 354785702235 → f(z) = 2394803490092 →
1197401745046 → 598700872523 O_{2a} : y = 299350436261 → f(y) = 673538481589 O_1 :
x = 336769240794 → f(x) = 505153861193 → **252576930596 < 491647006111** O_{3a}

Chain of connections :
O_{3a} $\rightarrow O_{2a} \rightarrow O_{2a} \rightarrow O_{3c} \rightarrow O_1 \rightarrow O_1 \rightarrow E \rightarrow O_1 \rightarrow O_2^* \rightarrow E \rightarrow O_1 \rightarrow O_{2a} \rightarrow O_3^* \rightarrow E \rightarrow E \rightarrow$
$O_{2a} \rightarrow O_1 \rightarrow E < O_{3a}$: N(s) = **63**

(2)

$2^{\alpha}\cdot n+16k+11$ O_{2a} : $y = 2^{\alpha-1}\cdot n+8k+5 \rightarrow f(y) = 3^2\cdot 2^{\alpha-3}\cdot n+18k+13$ [O_3] : k = **4k+1**

$\mathbf{2^{\alpha}\cdot n+64k+27}$ O_{2a}
$3^2\cdot 2^{\alpha-3}\cdot n+72k+31$ O_3 : $z = 3^2\cdot 2^{\alpha-4}\cdot n+36k+15 \rightarrow f(z) = 3^5\cdot 2^{\alpha-6}\cdot n+243k+107$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+128k+27}$ O_{2a}
$3^5\cdot 2^{\alpha-6}\cdot n+486k+107$ [O_1] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+256k+155}$ O_{2a}
$3^5\cdot 2^{\alpha-6}\cdot n+972k+593$ O_1 : $x = 3^5\cdot 2^{\alpha-7}\cdot n+486k+296 \rightarrow f(x) = 3^6\cdot 2^{\alpha-8}\cdot n+729k+445$ [E] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+512k+411}$ O_{2a}
$3^6\cdot 2^{\alpha-8}\cdot n+1458k+1174 \rightarrow 3^6\cdot 2^{\alpha-9}\cdot n+729k+587$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+1024k+411}$ O_{2a}
$3^6\cdot 2^{\alpha-9}\cdot n+1458k+587$ [O_2] : k = **4k**

$\mathbf{2^{\alpha}\cdot n+4096k+411}$ O_{2a}
$3^6\cdot 2^{\alpha-9}\cdot n+5832k+587$ O_2 : $y = 3^6\cdot 2^{\alpha-10}\cdot n+2916k+293 \rightarrow f(y) = 3^8\cdot 2^{\alpha-12}\cdot n+6561k+661$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+8192k+411}$ O_{2a}
$3^8\cdot 2^{\alpha-12}\cdot n+13122k+661$ [O_1] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+16384k+411}$ O_{2a}
$3^8\cdot 2^{\alpha-12}\cdot n+26244k+661$ O_1 : $x = 3^8\cdot 2^{\alpha-13}\cdot n+13122k+330 \rightarrow$
$f(x) = 3^9\cdot 2^{\alpha-14}\cdot n+19683k+496$ [O] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+32768k+16795}$ O_{2a}
$3^9\cdot 2^{\alpha-14}\cdot n+39366k+20179$ [O_2] : k = **4k**

$\mathbf{2^{\alpha}\cdot n+1310728k+16795}$ O_{2a}
$3^9\cdot 2^{\alpha-14}\cdot n+157464k+20179$ O_2 : $y = 3^9\cdot 2^{\alpha-15}\cdot n+78732k+10089 \rightarrow$
$f(y) = 3^{11}\cdot 2^{\alpha-17}\cdot n+177147k+22702$ [O] : k = **2k+1**

$\mathbf{2^{\alpha}\cdot n+262144k+147867}$ O_{2a}
$3^{11}\cdot 2^{\alpha-17}\cdot n+354294k+199849$ [O_1] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+524288k+147867}$ O_{2a}
$3^{11}\cdot 2^{\alpha-17}\cdot n+708588k+199849$ O_1 : $x = 3^{11}\cdot 2^{\alpha-18}\cdot n+354294k+99924 \rightarrow$
$f(x) = 3^{12}\cdot 2^{\alpha-19}\cdot n+531441k+149887$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+1048576k+147867}$ O_{2a}
$3^{12}\cdot 2^{\alpha-19}\cdot n+1062882k+149887$ [O_3] : k = **4k**

$\mathbf{2^{\alpha}\cdot n+4194304k+147867}$ O_{2a}
$3^{12}\cdot 2^{\alpha-19}\cdot n+4251528k+149887$ O_3 : $z = 3^{12}\cdot 2^{\alpha-20}\cdot n+2125764k+149887 \rightarrow$
$f(z) = 3^{15}\cdot 2^{\alpha-22}\cdot n+14348907k+505871$ [O] : k = **2k**

$\mathbf{2^{\alpha}\cdot n+8388608k+147867}$ O_{2a}
$3^{15}\cdot 2^{\alpha-22}\cdot n+28697814k+505871$ [O_3] : k = **4k**

$\mathbf{2^{\alpha}\cdot n+33554432k+147867}$ O_{2a}

$3^{15}\cdot 2^{\alpha-22}\cdot n+114791256k+505871$ O_3 : $z = 3^{15}\cdot 2^{\alpha-23}\cdot n+57395628k+252935 \rightarrow$
$f(z) = 3^{18}\cdot 2^{\alpha-25}\cdot n+387420489k+1707317$ [O] : k = **2k**

$2^{\alpha}\cdot n+67108864k+147867$ O_{2a}
$3^{18}\cdot 2^{\alpha-25}\cdot n+774840978k+1707317$ [O_1] : k = **2k**

$2^{\alpha}\cdot n+134217728k+147867$ O_{2a}
$3^{18}\cdot 2^{\alpha-25}\cdot n+1549681956k+1707317$ O_1 : $x = 3^{18}\cdot 2^{\alpha-26}\cdot n+774840978k+853658 \rightarrow$
$f(x) = 3^{19}\cdot 2^{\alpha-27}\cdot n+1162261467k+1280488$ [E] : k = **2k**

$2^{\alpha}\cdot n+268435456k+147867$ O_{2a}
$3^{19}\cdot 2^{\alpha-27}\cdot n+2324522934k+1280488$ E $\rightarrow 3^{19}\cdot 2^{\alpha-28}\cdot n +1162261467k+640244$ [E] : k = **2k**

$2^{\alpha}\cdot n+536870912k+147867$ O_{2a}
$3^{19}\cdot 2^{\alpha-28}\cdot n+2324522934k+640244 \rightarrow 3^{19}\cdot 2^{\alpha-29}\cdot n+1162261467k+320122$ [E] : k = **2k**

$2^{\alpha}\cdot n+1073741824k+147867$ O_{2a}
$3^{19}\cdot 2^{\alpha-29}\cdot n+2324522934k+320122 \rightarrow 3^{19}\cdot 2^{\alpha-30}\cdot n+1162261467k+160061$ [O] : k = **2k**

$2^{\alpha}\cdot n+2147483648k+147867$ O_{2a}
$3^{19}\cdot 2^{\alpha-30}\cdot n+2324522934k+160061$ [O_3] : k = **4k+3**

$2^{\alpha}\cdot n+8589934592k+6442598811$ O_{2a}
$3^{19}\cdot 2^{\alpha-30}\cdot n+9298091736k+6973728863$ O_3 : $z = 3^{19}\cdot 2^{\alpha-31}\cdot n+4649045868k+3486864431 \rightarrow$
$f(z) = 3^{22}\cdot 2^{\alpha-33}\cdot n+31381059609k+23536334915$ [E] : k = **2k+1**

$2^{\alpha}\cdot n+17179869184k+15032533403$ O_{2a}
$3^{22}\cdot 2^{\alpha-33}\cdot n+62762119218k+54917394524 \rightarrow 3^{22}\cdot 2^{\alpha-34}\cdot n+31381059609k+27458697262$ [E] : k = **2k**

$2^{\alpha}\cdot n+34359738368k+15032533403$ O_{2a}
$3^{22}\cdot 2^{\alpha-34}\cdot n+62762119218k+27458697262 \rightarrow$
$3^{22}\cdot 2^{\alpha-35}\cdot n+31381059609k+13729348631 < 2^{\alpha}\cdot n+34359738368k+15032533403$ O_{2a}

$\alpha = 35 \rightarrow 3^{22}\cdot n+3^{22}\cdot k+13729348631 < 2^{35}\cdot n+2^{35}\cdot k+15032533403$ O_{2a}

$3^{22}\cdot(n + k)+13729348631 < 2^{35}\cdot(n + k)+15032533403$ O_{2a} : N(s) = **57**
$n = 0 \rightarrow 3^{22}\cdot k+13729348631 < 2^{35}\cdot k+15032533403$ O_{2a} principal inequality
$n = k = 0 \rightarrow 13729348631 < 15032533403$ O_{2a} nude number

Check link nude number :
15032533403 O_{2a} : y = 7516266701 → f(y) = 16911600o79 O_{3c} : z = 8.455800039 →
f(z) = 57076650269 O_1 : x = 28538325134 → f(x) = 42807487702 → 21403743851 O_{2a} :
y = 10701871925 → f(y) = 24079211833 O_1 : x = 12039605916 → f(x) = 18059408875 O_{2a} :
y = 9029704437 → f(y) = 20316834985 O_1 : x = 10158417492 → f(x) = 15237626239 O_{3a} :
z = 7618813119 → f(z) = 51426988559 O_{3c} : z = 25713494279 → f(z) = 173566086389 O_1 :
x = 86783043194 → f(x) = 130174564792 → 65087282396 → 32543641198 →
16271820599 O_3^* : z = 8135910299 → f(z) = 54917394524 → 27458697262 →
13729348631 < 15032533403 O_{2a}

Chain of connections :

$O_{2a} \to O_{3c} \to O_1 \to E \to O_{2a} \to O_1 \to O_{2a} \to O_1 \to O_{3a} \to O_{3c} \to O_1 \to E \to E \to$
$E \to O_3^* \to E \to E < O_{2a}$: N(s) = **57**

Changing the last connection in the cycle of links high horizons exposed above, we found two higher horizons Θ(m) and Θ(l) such that $\Theta(l) < \Theta(m)$, and so on for an endless of links; it would be enough to have appropriate calculation tools. Therefore we can affirm that for every biggest horizon we are able to cover by a binomial inequality after N(s) steps, there is an upper horizon that needs a greater number of steps to become lower than itself. So it's proved that SC is not fully confirmable and it's a sort of *Circle Quadrature*.

4. Cycle of link number 27 by application Independence Theorem

$\mathbf{2^k \cdot n+27}$ O_{2a} : $y = 2^{k-1}\cdot n+13 \to 3^2\cdot 2^{k-3}\cdot n+31$ O_{3a} : $z = 3^2\cdot 2^{2k-4}\cdot n+15 \to f(z) = 3^5\cdot 2^{k-6}\cdot n+107$ O_{2a} :
$y = 3^5\cdot 2^{k-7}\cdot n+53 \to f(y) = 3^7\cdot 2^{k-9}\cdot n+121$ O_1 : $x = 3^7\cdot 2^{k-10}\cdot n+60 \to f(x) = 3^8\cdot 2^{k-11}\cdot n+91$ O_{2a} :
$y = 3^8\cdot 2^{k-12}\cdot n+45 \to f(y) = 3^{10}\cdot 2^{k-14}\cdot n+103$ O_{3b} : $z = 3^{10}\cdot 2^{k-15}\cdot n+51 \to f(z) = 3^{13}\cdot 2^{k-17}\cdot n+350 \to$
$3^{13}\cdot 2^{k-18}\cdot n+175$ O_{3c} : $z = 3^{13}\cdot 2^{k-19}\cdot n+87 \to f(z) = 3^{16}\cdot 2^{k-21}\cdot n+593$ O_1 : $x = 3^{16}\cdot 2^{k-22}\cdot n+296 \to$
$3^{17}\cdot 2^{k-23}\cdot n+445$ O_1 : $x = 3^{17}\cdot 2^{k-24}\cdot n+222 \to f(x) = 3^{18}\cdot 2^{k-26}\cdot n+167$ O_{3b} : $z = 3^{18}\cdot 2^{k-27}\cdot n+83 \to$
$f(z) = 3^{21}\cdot 2^{k-29}\cdot n+566 \to 3^{21}\cdot 2^{k-30}\cdot n+283$ O_{2a} : $y = 3^{21}\cdot 2^{k-31}\cdot n+141 \to f(y) = 3^{23}\cdot 2^{k-33}\cdot n+319$ O_{3a} :
$z = 3^{23}\cdot 2^{k-34}\cdot n+159 \to f(z) = 3^{26}\cdot 2^{k-36}\cdot n+1079$ O_3^* : $z = 3^{26}\cdot 2^{k-37}\cdot n+539 \to$
$f(z) = 3^{29}\cdot 2^{k-39}\cdot n+3644 \to 3^{29}\cdot 2^{k-40}\cdot n+1822 \to 3^{29}\cdot 2^{k-41}\cdot n+911$ O_{3c} : $z = 3^{29}\cdot 2^{k-42}\cdot n+455 \to$
$f(z) = 3^{32}\cdot 2^{k-44}\cdot n+3077$ O_1 : $x = 3^{32}\cdot 2^{k-45}\cdot n+1538 \to f(x) = 3^{33}\cdot 2^{k-46}\cdot n+2308 \to$
$3^{33}\cdot 2^{k-47}\cdot n+1154 \to 3^{33}\cdot 2^{k-48}\cdot n+577$ O_1 : $x = 3^{33}\cdot 2^{k-49}\cdot n+288 \to f(x) = 3^{34}\cdot 2^{k-50}\cdot n+433$ O_1 :
$x = 3^{34}\cdot 2^{k-51}\cdot n+216 \to f(x) = 3^{35}\cdot 2^{k-52}\cdot n+325$ O_1 : $x = 3^{35}\cdot 2^{k-53}\cdot n+162 \to f(x) = 3^{36}\cdot 2^{k-54}\cdot n+244 \to$
$3^{36}\cdot 2^{k-55}\cdot n+122 \to 3^{36}\cdot 2^{k-56}\cdot n+61$ O_1 : $x = 3^{36}\cdot 2^{k-57}\cdot n+30 \to f(x) = 3^{37}\cdot 2^{k-58}\cdot n+46 \to$
$\mathbf{3^{37}\cdot 2^{k-59}\cdot n+23} < \mathbf{2^k\cdot n+27}$ O_{2a}

k = 59 → $\mathbf{3^{37}\cdot n+23} < \mathbf{2^{59}\cdot n+27}$ O_{2a} : N(s) = **96**

Chain of connections:
$O_{2a} \to O_{3a} \to O_{2a} \to O_1 \to O_{2a} \to O_{3b} \to E \to O_{3c} \to O_1 \to O_1 \to E \to O_{3b} \to E \to O_{2a} \to$
$O_{3a} \to O_3^* \to E \to E \to O_{3c} \to O_1 \to E \to E \to O_1 \to O_1 \to O_1 \to E \to E \to O_1 \to E \to$
$E < O_{2a}$: N(s) = **96**

The magical harmony of odd numbers

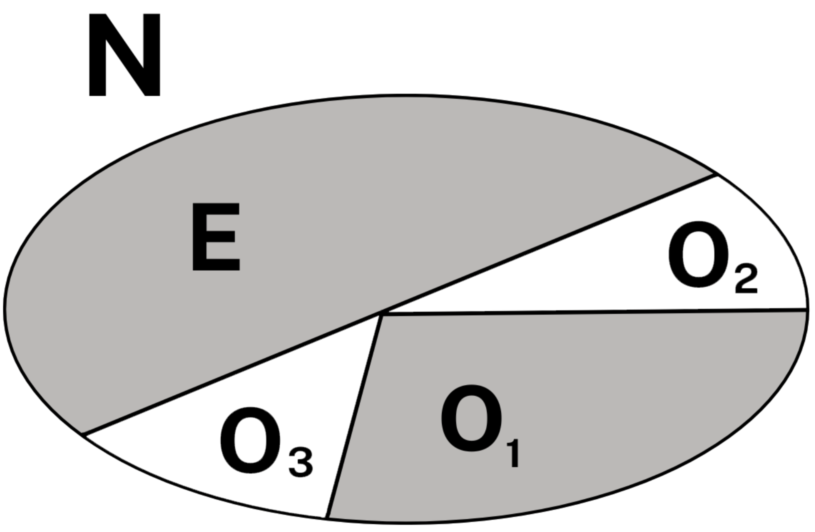
In the cycles of links illustrated above, if we compared our choices with the chain of connections, we note that :
O_3 is O_3^* if it's connects to E; O_3 is O_{3a} if it's connects to O_2 or O_3; O_3 is O_{3b} if it's connects to E just a time; O_3 is O_{3c} if it's connects to O_1 .
O_2 is O_2^* if it's connects to E; O_2 is O_{2a} if it's connects to O_3 or O_2 or O_1 .
O_1 can be connects to E or O_1 or O_2 or O_3 , and then follow the rules listed above.

The same rules are repeated in the cycle of link number 27.

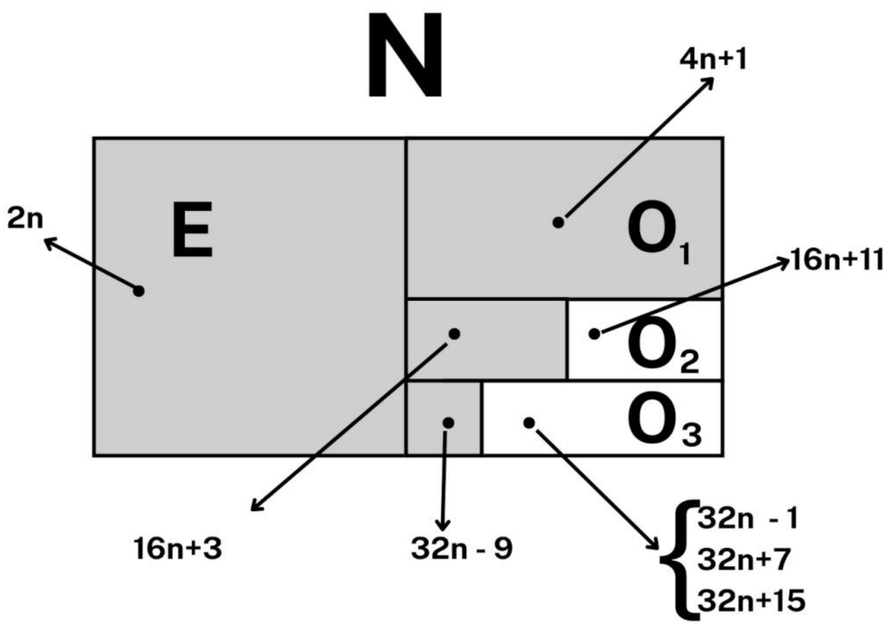
Independence Theorem show the beauty of SCQ and the magical harmony hidden in odd numbers cycles links.

5. Four illustrative patterns

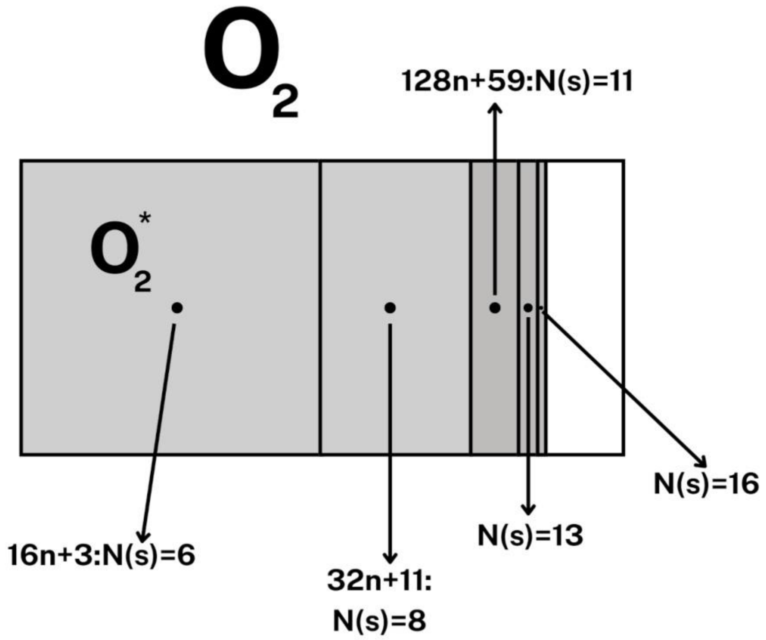
(1)



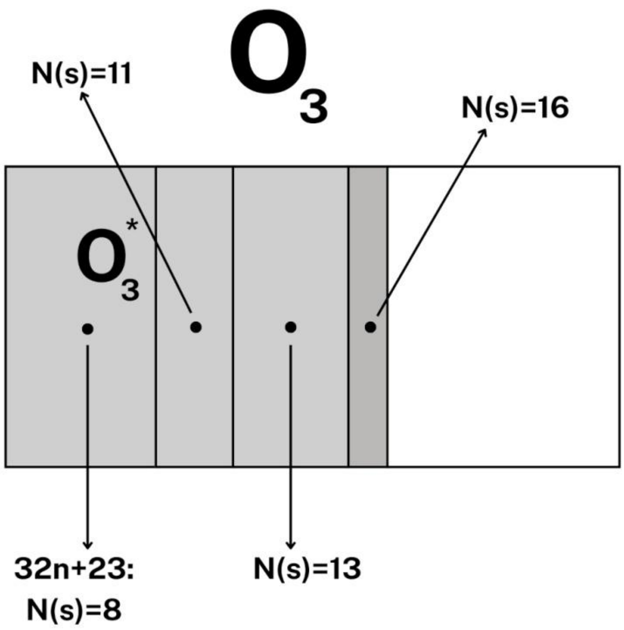
(2)



(3)



(4)



6. Conclusion

Odd generating numbers in O_1 become lesser than themselves after one application of Theorem 2n+1. So also it is for odd generating numbers in O_2* of type 16n+3. So also it is for odd generating numbers in O_3* of type 32n-9 ~ 32n+23. For the others odd generating numbers in O_2 – O_2* of type

16n+11 O_{2a} and in O_3 - O_3* of type 32n-1 ~ 32n+31 O_{3a} ; 32n+7 O_{3b} ; 32n+15 O_{3c} ; Theorem 2n+1 must be iterated two, three, or more times, or very many times, until the odd generating number becomes lesser than itself. In this way the blanks in the previous patterns (2) (3) (4) they fill more and more with grey almost to complete the set ℕ.

7. Finale

The starting odd numbers O ⊂ ℕ become lesser than themselves after a number of steps, i.e. applications Collatz algorithm, from N(s) = 3 (O_1) until N(s) → ∞ . THERE ARE NO DOUBTS. Syracuse Conjecture (Collatz Conjecture) is a new marvelous type of *Circle Quadrature*. After circa 2300 years (Archimèdès, Syracuse 287 – 212 BC) the history of mathematics repeats itself in a different problem.

References

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[**2**] Zucchini R. *The logical solution Syracuse conjecture* (February 2022); Amazon on demand, Mnamon Milano Italy