Fractal Values of Selected Fundamental Physical Constants:
Ancient Reckoning and CODATA Reckoning

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The fundamental physical constants are generally offered in most reference works of physics and chemistry. Sources general cite the Committee on Data for Science and Technology (CODATA), Reports of the CODATA Task Group on Fundamental Physical Constants, the CODATA Bulletin, and CODATA placed on different web-sites on the Internet. The objective of CODATA is to establish internationally agreed upon values.

In previous essays, we have discussed briefly the concept of a constant numerical value, whereby it is often held to reflect an invariable relationship of matter-energy. Yet, the numerical value of the constant has often undergone change in value over the years, as scientists have been able to improve their measuring devices and systems. Today, the physical constants are generally offered with "relative uncertainty, in parts per million", and on some occasions are deemed as being "exact".

Yet, as we observe the different fundamental physical constants in handbooks on physics and chemistry, we are surprised by the apparent lack of relationship among the numerical values. One fundamental value would appear to have not relationship with other values, at least, at the initial view. But, as we treat the numerical values of physical constants in relationship to the ancient reckoning systems, certain relationships make their appearance.

In this essay, we shall examine a few of these possible relationships among the fundamental physical constants at the level of their fractals and multiples of those fractals. From this perspective, the analytical exercise shall produce perceived relationships, which we have not observed in the literature. These relationships shall become significant in our treatment of **The Schemata of the Elements**, which we have produced and publish on our web-site, **Earth/matriX: Science Today (www.the-periodic-table.com)**.

In this essay, we shall treat only a few of the more obvious relational computations, but shall be offering greater detail in the analysis as we explore other themes later. We invite the reader to visit studies at our main web-site on ancient knowledge, **Earth/matriX: Science in Ancient Artwork (www.earthmatrix.com).**

There are four main fundamental physical constants that require analysis above all others. These relate to the structure of the atom, and are: *proton* mass, *electron* mass, *neutron* mass, and *deuteron* mass.

Quantity	Value	Units	Relative Uncertainty (ppm)
Proton mass	**1.67**26231(10)	10^{-27} kg	0.59
Electron mass	*9.1093897*(54)	10^{-31} kg	0.59
Neutron mass	**1.67**49286(10)	10^{-27} kg	0.59
Deuteron mass	*3.3435860*(20)	10^{-27} kg	0.59

We shall not consider the number of decimal places, nor shall we contemplate the relative size to other physical constants. We shall only compare their fractal, numerical expressions. At first glance, there appears

to be no relationship among these numerical constants, other than the similarity of the first three digits of the proton and neutron masses (**167c** fractal).

Once we divide the deuteron mass in half, then its relational significance to the proton and electron becomes apparent:

3.3435860 / 2 = **1.67**1793

And, in the same manner as the proton and electron masses, the **167c** fractal makes its appearance. A suggestion could be made that this particular physical constant might be added to the lists often offered in reference works. Obviously, physicists and chemists know of this relationship, but listing it in handbooks and reference works might save students some time in finding out such an aspect of the numbers related to the structure of the atom. One immediately thinks of the possibility of the fractal, numerical average for these three events.

       1.6726231
       1.6749286
       1.671793
   +_____

       5.0193447 / 3 = **1.6731149**

The above fractal, numerical average of the proton, electron and deuteron immediately causes us to think about the ancient reckoning system. There are two numbers that we have examined throughout the Earth/matriX series in great detail. These are:

   1366560   (the maya companion number; an ancient day-count)

   31104   (a number that is cited in different ancient reckoning
                   systems around the world)

There is no apparent relationship among these numbers and those cited above for the fundamental physical constants, other than the obvious fractal relationship of the **3114 : 31104** comparison. Many readers will

declare foul, and simply invoke happenstance and circumstantial coincidence. But, as we explore the ancient reckoning numbers in comparison to the fundamental physical constants, the idea of chance seems to be overwhelmed by the number of coincidences. For, as we shall illustrate, one may employ the ancient reckoning numbers in the computations of physics and chemistry with little effort.

Now, consider the 167c fractal expression in relation to an historically significant number found throughout many ancient cultures. The number seven reoccurs in many ancient systems, and we have discussed some of these aspects in relationship to the reciprocal of seven. But, for now, let is simply multiply the 167c fractal number by the ancient, sacred seven:

167 x 7 = 1169

A reasons for such a computation could be the simple fact of having seven atoms, with seven protons (or electrons, or deuterons). We could then imagine the existing quantity of 1169 atoms in relation to that same number; in other words *the square of 1169*:

$1169^2 =$ 1366561

With that, we see a number appear that is only one digit off from the maya companion number, 1366560. The square root of the maya companion number is:

1168.999572

Now, consider the difference between these two numbers:

1169 - 1168.999572 = 4.27716^{-4}
2.**13858**

With that another analytical surprise arises. The *second* maya companion number is that of **1385540**. It were almost as though the ancients were indicating just such a relationship in fractal expression 2-1385 above. But, let us for now, simply assume that all of these numerically expressed coincidences are simply that: coincidences. For we are comparing

apples and oranges. The ancient day-counts (1366560 and 1385540) concern the counting of time, and the fundamental physical constants refer to the physical aspects of matter-energy.

But, before we become too comfortable with our reasoned doubts about possible relationships between the ancient reckoning system and today's fundamental physical constants, let us examine a few more computations.

Current reasoning would have it that the other ancient maya dates and time concepts exist, surely can have no relationship to the fundamental physical constants. Let us examine the previous constants as of their multiples. Much like nature, the ancient employed the computational system of doubling and halving numbers. The ancient maya further tripled them or divided them by three.

One of those historically significant numbers of the maya reckoning system is that of **1872000** days, which represents the cited maya long-count period. Now remember, we are concerned with only the fractal expressions in our analysis, and not the number of decimal places either left or right of the fractal expression.

Consider the following set of coincidences:

Proton mass:

1.**6726231** **x 7 =**   **117**083617
                                234167234 [234-**167**-234!]
                                468334468
                                936668936
                                1873337872

In this manner, on the fifth computational step (remember the Five-Worlds of the ancient Meso-American cultures), we see a number/fractal relational to the maya long-count period (1872c) fractal appear:

1873.337872 - 1872 = 1.337872

Further, keep in mind that 1873337872 is a multiple **56** times greater than the 16726231c fractal number. And, we shall only state in passing, that

the initial **117**083617 fractal expression reminds us of the ancient maya k'awil (**819c**) count.

117 x 7 = 819

Let us return to the 167c fractal expressions of the structure of the atom's particles.

Neutron mass:

1.6749286 x 7 =　　　**117**245002
　　　　　　　　　　　234490004
　　　　　　　　　　　468980008
　　　　　　　　　　　937960016
　　　　　　　　　　1875920032

Relational deuteron mass:

1.671793 x 7 =　11702551
　　　　　　　　　3405102
　　　　　　　　　46810204
　　　　　　　　　93620408
　　　　　　　　187240816

1872.40816 - 1872c =　40816
　　　　　　　　　　20408
　　　　　　　　　　10204
　　　　　　　　　　…halves down to
　　　　　　　　　　3.114013672^{-6}

The 1872c habors a distinct relationship to the number seven as well.

1872c x 7 = **13104**

Throughout the Earth/matriX series, we have discussed how the ancients around the world appear to have developed number series, such as, 31104, 11340, 11430, and the 13104 would forma part of that series. However, the

symbolic significance of the 13104c may be more impressive when considered as follows. The ancient maya reckoning system employed the **13c** and the **104c, (13-104**), which is double the **52c** calendar-round count of the 18980c days. The numbers/fractals of the ancient maya system appear to have a double aspect: they are symbolic and functional at the same time.

Now, let us bring the ***electron*** into analytical view. There is no apparent relationship between the previously cited 167c fractal counts, and the value assigned to the electron

Electron mass   **9.1093897**(54) 10^{-31} kg   0.59

However, let us multiple the value by the number seven:

9.1093897 x 7 =   637657279
                      1275314558
                      2550629116
                      5101258232
                      1020251646
                      2040503293
                      …doubles to
                      167*1580297*

In this manner, we find that the fundamental physical value of the electron mass represents a multiple for a similar 167c fractal expression, that is similar to the masses of the other subatomic particles cited above.

Now, let us view the same procedure as above; first, multiplying by seven and then by two and its multiples thereof:

167.1580297 x 7 =   117010614
                      234021228
                      468042456
                      936084912
                      18721698240

The relational mass of the electron to the 167c count reveals itself as being even more directly relational to the ancient maya long-count period fractal expression (1872), than the other masses.

The 1671580297 fractal represents a multiple **18350080** times greater than the 91093897c fractal count of the electron mass.

When we further consider the fact that the fundamental physical value offered for the proton-electron mass ratio is cited as **1836**.152701, then the 1835c value appears to be of relational significance.

1838.152701 - 1835.0080 = 1.**144**701 (maya long-count 144000).

Now, when we add the electron's relational fractal value, 1.671580297, to those of the proton, neutron and deuteron, a distinct average is obtained:

Proton mass   1.6726231
Neutron mass   1.6749286
Deuteron mass   1.671793
Electron mass   1.671580297
                  +_____

6.6909249 / 4 = **1.67*2731225***

With this fractal expression, one obtains the view of the maya companion number, as 2731225 accompanies the 167c fractal expression, for consider:

2731225 as against   1366560 x 2 = **2733120**

One could easily imagine a fractal value to be **1.672733120** for the above-cited expression.

1.672733120 x 2 =   3.34546624
                         ...doubles to
                         13703.02972

which reminds us of the electron-α-particle mass ratio, given as the fundamental physical value of **137.*093354*(3) 10^{-4}** in the CODATA values.

137.0302972 - **137.0**93354 = .0**630568**

Many other possible relationships exist. On may consider the atomic mass constant, **1.660**5402(10) 10^{-27} kg, which is significantly below the previous figures. Or, one may consider the elementary charge expression, **1.602**17733 10^{-19} C, which is fractally even lower.

But, the significance with respect to the 1872c fractal expression is impressive:

        1.60217733 x 7 =   1121524131
                                243048262
                                4486096524
                                8972193048
                                179443861

        1794.43861 - 1872.0 = **7.756**3904

As we examine the Great Pyramid of the Giza Plateau in other essays, we observe how the **7-756** fractal expression takes on a distinctive meaning. To find such a numerical fractal expression at the level of differences with regard to the fundamental physical values is no surprise to us, especially when so many authors are beginning to view such relationships as the norm for the ancient reckoning system of knowledge.

The ancient numbers, we must remember, are symbolic and functional:

        7 x 756 = 5292

        5292 - 2592 = 2700   [25920c the Great Cycle; 2700c kemi]
                                      [5292c a component of 2592c series]

Given the nature of matter-energy, it would only make sense to devise a computational system that not only relates the different fundamental physical constants, but the *differences* among those same expressions. So, even though it may appear that we are solely concerned with exploring the relational aspects of the fundamental physical constants, we are in fact drawing attention to the need to examine their differences, which, logically enough, would express those same terms.

In our minds, the world of matter-energy (spacetime/motion) would make little sense if the fundamental physical constants were found to be relational to one another, but their differences were not. In a sense, then, we are expecting to find whole numbers at the level of the main terms of the constants, as well as at the level of their differences. The numerical, fractal, measuring system of today would appear to deny both of these suppositions. But, this may be only in appearance of measurement, since reality exists in a distinct manner from our measurements; or, so it would appear.

Let us offer a single example of this point. Let us employ the second maya companion number, **1385540c** days. For this example, and for the sake of comparison between the ancient system and today's values, we shall bring into view the square root of the 1385540c and the Muon mass, as fundamental physical constant:

Muon mass   **1.8835327**(11) 10^{-28} kg

The square root of the maya companion number, 1385540c, is:

1177.089631
2354.179263
4708.358525
9416.71705
18833.4341

Consider, then, the comparable difference:

1.8835327 - 1.88334341 =   1.89289997c fractal
                             3.78579994
                             7.57159988 [**756c** kemi-GreatPyramid]

Further consider, the relationship to the maya 1872c count:

1883.34341 - 1872.0 = 11.34341
                      22.68682001 [2268c Nineveh]

Even more relevant to this study, consider:

1883.5327 - 1872.0 =   11.5327
                                         23.0654   [**2304c** maya long-count]

By employing the maya long-count fractal expressions, one could come very close to computations with today's fundamental physical constant values.

The coincidences and oddities that arise from a comparison of today's fundamental physical constants and the fractal, numerical expressions coming out of the ancient reckoning system defy explanation. There is little reason to consider any relationship between the speed of light in a vacuum and the maya companion number; in spite of the fact that the latter is a reflection of time.

The figure **299 792 458** ms^{-1} kg (exact) is offered as the speed of light in a vacuum for the fundamental physical constant. If we employ the ancient method of doubling/halving the numbers, in a search for their multiples, we find something quite relational to the maya companion number, 13**6656**0c, especially when we consider the symbolic computational possibility of 13 x 6656 = **86528.**

299792458
149896229
74948114.5
…halves to
6.65672979^{-8}

Further, 6.65672979 x **86528** = 575993.5153 [**576c** maya long-count]

Now, let us recall some of the previous computations regarding the 311040c and the electron's fundamental physical value.

A relationship that comes to mind is simply that of tripling the value for the electron's mass:

9.1093897 x 3 = **273**81691 / 2 = **1366**40845.5

This relationship reminds us of that which exists between the freezing and boiling points of water on this planet, Earth:

373.15 / 273.15 = **1.366**099213

[We invite the reader to examine our work, ***The Earth/matriX Thermodynamic Scale*** for a more in-depth view of this particular relationship.]

Now, for a little reverse engineering, as we consider what might be the expression for the electron mass as of the thermodynamic value and that of the maya companion number, in the above terms:

2.732198426 / 3 = **9.107**328086 fractal

2.733120 / 3 = **91104**   [remember the ancient 31104c count]

The maya companion number, 1366560c, in this manner could be employed for computations for both the electron mass and the 167c counts of the masses of the other related sub-atomic particles.

A multiple derivative from the electron's mass figure, 1.366408455 offers impressive computational relationships to the ancient reckoning system.

1366408.455 - 1366560 = 151.545

1366560 / 9 = 151840

$$151840 - 151545 = \begin{array}{l} 295 \\ 590 \\ 1180 \\ \mathbf{2360} \end{array}$$

The 236c count difference causes us to recall the maya Dresden Codex number for the Venus cycle, which is often cited as being erroneous by contemporary scholars.   The scholars and astronomers have no idea why the 236c is there within the Venus cycle numbers. A possible answer may be that it suggests a distinct symbolism.

For the **236c** number doubles to **1168**.615397[28]

The square of this fractal expression is:
1365661946 fractal: a partial mirror image of the 136656c, the maya companion number.   The same above as below, also confirms the same reflective mirrored image way of thinking in so many ancient cultures.

Strange oddities occur time and again in the computations. If we take the number seven, which has been determinant in these computations in the following manner, we find a relationship between the electron's mass constant value and the ancient Nineveh number/fractal expression, 1959552c, which we have discussed in previous essays.

$7 \times 777777777777 = 5.444444444444444\ldots$

$5.444444444444 \times 9.1093897 = 4.959556614\ldots$

4.959556614 - 1.959552 = 3.000004614

But, one may question whether such oddities are in fact s spin-off from the general concept and value assigned to the number seven in the ancient reckoning systems.

Further, consider how the apparently insignificant 4.959556614 fractal value relates to the electron's mass term:

$91093897 / 4959556614 = $ fractal **183673469**

Thereby, bringing to mind the fundamental physical constant for the proton-electron mass ratio (**1836**.152791c).

But, there is one particular fundamental physical constant, that appears to relate to the maya companion number, is an almost exact manner. The Newtonian Constant of Gravitation is cited as being:

6.67259 (85) $10^{-11} m^3 kg^{-1} s^{-2}$

One may observe an initial similarity between the already-cited 6.656, that is suggestive of the maya long-count 1366560c, but the relationship is much more direct. All one need do is simply double the value a certain amount of times.

6.67259
13.34518
26.69036
53.38072
…doubles to
13665.46432   [1366560c maya; note the **432c** ending]
                          [= 6.67259 x **2048c,** an ancient constant series]

If one were to employ the ancient, maya companion constant number, 1366560c, as the fundamental value for the constant of gravitation, then a value of **6.67265**625 would appear.

Observations

The computations in this essay shall be difficult to accept as representing anything other than mere happenstance. The vast majority of scholars are not willing to cede any hard-earned ground for their knowledge about science, specifically, about physics and chemistry. There is an underlying belief that the ancients were incapable of such knowledge. There is no historical evidence, which may substantiate the idea that the ancients knew of atomic particles, much less of sub-atomic events.

Many are those, however, who cite just such a possibility as having existed. One thing may be certain from the previous computations. Whether or not the ancients enjoyed such information, shall be reserved for subsequent themes in the Earth/matriX series. For now, one may only add that the ancient reckoning numbers could very well serve in contemporary computations of the fundamental physical constants. At times, as we have observed above, some of those computations are going to be only off by one digit; at other times, there may be no difference between the two systems.

If the ancients and contemporary scientists are studying the same object of matter-energy, and apprehending that object in terms of spacetime/movement, then it is only logical that the numerical/fractal expression of those studies be similar, if not the same in value. Such are the cases that we have reviewed in this essay.

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